CLARE COUNTY HAZARD MITIGATION PLAN

FEMA Review Version

July 2016

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CHAPTER 1: INTRODUCTION

Clare County is in the mid-section of the lower peninsula of Michigan situated as a gateway to the North. The County is bordered on the north by Missaukee and Roscommon Counties, on the west by Osceola County, on the south by Isabella County and on the east by Gladwin County. According to the US Census, the County covers an approximate area of 361,152 acres or about 564 square miles. Using the 2010 US Census population figures of 30,926, the population density of the county is roughly 55 people per square mile. The County consists of sixteen townships, two cities, and one village. The county seat in located in the City of Harrison.

Predominantly regarded as a recreational and tourist area, there are several auto related manufacturers, local health services, and retail trade that contributes to the local economy.

Approximately fifteen (15) percent of the county is held in public ownership (State of Michigan Lands and Au Sable State Forest lands). The Muskegon River runs across the northwest portion of the county, while the tributaries of the Tobacco River are in the southeast. Forests, inland waters, and wetlands comprise over 68% of the County's surface area. Agricultural uses account for approximately 14.5% of the area. Several inland lakes in the county have significant resort developments. These cottages are becoming retirement homes for many former seasonal vacationers.

North-south access is provided by US-127 in the central portion and by M-18 on the northeast border. East-West access is provided by M-115 from the south heading diagonally to the west central portion of the county. US-10 spurs off of US-127 three miles north of the City of Clare to provide east-west access. M-61 provides east-west access in the center of the county through the City of Harrison. US-127 business routes are designated in the City of Clare and the City of Harrison.

What is Hazard Mitigation?

Hazard Mitigation is any action taken before, during, or after a disaster to permanently eliminate or reduce the long term risk to human life, and property from natural, societal, and technological hazards. Hazard mitigation, along with preparedness, response, and recovery comprise the four phases of emergency management. There is a cyclical relationship between these four phases of emergency management: a community prepares for disaster, including hazard mitigation activities, and then responds to a disaster when it occurs. Following the response, there is a transition into the recovery process, during which hazard mitigation measures can be evaluated and adopted. This in turn, improves the resilience of the community for the next incident, and so on. When successful, hazard mitigation will lessen future impacts to such a degree that succeeding occurrences will remain incidents and not become disasters.

Hazard mitigation strives to reduce the impact of hazards on people and property through the coordination of resources, programs, and authorities so that, at the very least, communities do not contribute to the increasing severity of the problem. When repairs and reconstruction are completed as quickly as possible to pre-disaster conditions, then pre-disaster conditions may simply result in a cycle of repeated damages. However, post-disaster repairs and reconstruction provide an opportunity to

strengthen a community's resilience. Recovery projects can rebuild things in a safer manner, informed by the lessons of past disasters, so that future disasters will not have as much of an impact.

Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction take place after damages are analyzed, and that sounder, less vulnerable conditions are produced. Through a combination of regulatory, administrative, and engineering approaches, losses can be limited by reducing susceptibility to damage. Hazard mitigation provides the mechanism by which communities and individuals can break the cycle of damage, reconstruction, and damage again.

Recognizing the importance of reducing community vulnerability to natural and technological hazards, Clare County is actively addressing the issue through the development and subsequent implementation of this plan. The many benefits to be realized from this effort – protection of the public health and safety, preservation of essential services, prevention of property damage, and preservation of the local economic base, to mention just a few – will help ensure that Clare County remains a vibrant, safe, and enjoyable place in which to live, raise a family, and conduct business.

Under the Disaster Mitigation Act of 2000, state and local governments are required to develop local hazard mitigation plans in order to be eligible for pre- and post-disaster funding from the federal government. The Plan was prepared in accordance with the Federal Emergency Management Agency (FEMA) documents: Local Mitigation Handbook and the Local Mitigation Plan Review Guide, and the Michigan State Police Emergency Management Homeland Security Division (MSP/EMHSD) publication 207: Local Hazard Mitigation Workbook.

The Clare County Hazard Mitigation Plan ("Plan") serves as the foundation for hazard mitigation activities within the community. Implementation of the plan's recommendations will assist in the reduction of injuries, loss of life, and destruction of property due to natural and technological hazards. The Plan provides a path toward continuous, proactive reduction of vulnerability to the most frequent hazards that result in repetitive and often severe social, economic and physical damage. The ideal end-state would be the total integration of hazard mitigation activities, programs, capabilities, and actions into normal, day-to-day governmental functions and management practices.

Clare County Emergency Management Director and the Clare County Hazard Mitigation Advisory Committee (CCHMAC) worked with the East Michigan Council of Governments (EMCOG) and the MSP/EMHSD to develop this Plan. The intent of the Plan is to work with those familiar with Clare County to describe the County, and to create an action plan to protect the health, safety, and economic interests of residents through hazard mitigation, planning, awareness, and implementation.

In the Plan, the hazard analysis section describes the major categories of hazards that affect Clare County (and provides some additional information about lesser hazards). The analysis of hazards makes use of community profile information that includes a description of community organization and potential resources. The major hazards have been identified as severe weather, geological threats, fires, floods/drought, hazardous materials, infrastructure problems, public health emergencies, transportation incidents, seasonal population shifts, and civil unrest and war. For each of the major hazards, the following is provided:

- Description of the hazard;
- Explanation of how it affects the County;
- Requirements/Rules affecting the County;
- Hazard mitigation Goal(s) that have been identified; and
- Description and explanation of the Action Item proposed.

This new Plan updates the previous Clare County Hazard Mitigation Plan that was approved in 2007. This process began in 2012, as recertification of the Hazard Mitigation Plan shall take place at least once every five (5) years. It has been modified so that it is easier to find and use information contained within it. This should be helpful for stakeholders to more easily find and review the information that is most relevant for their jurisdictions and areas of expertise/interest.

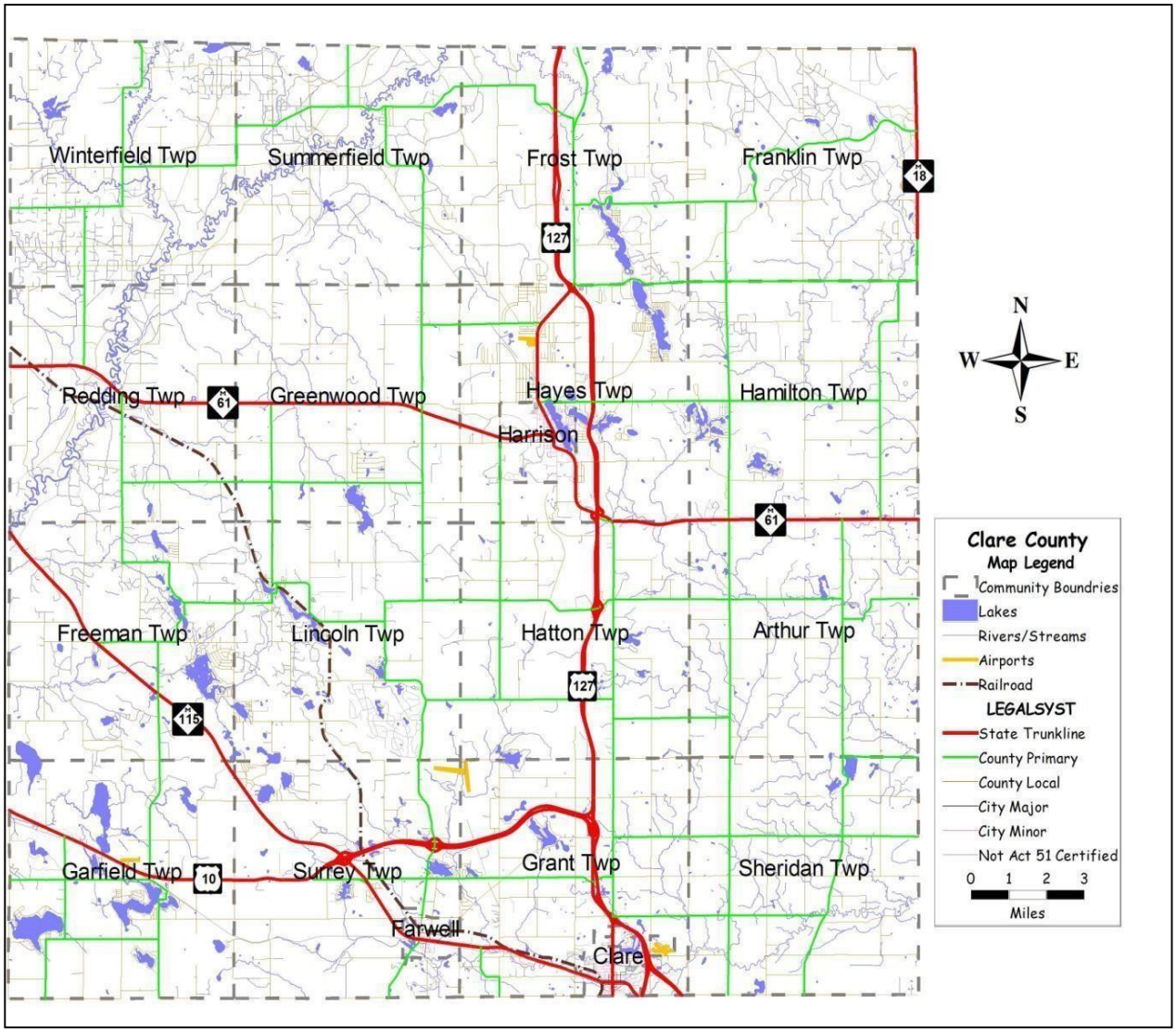
Certain information that is considered confidential or too sensitive for widespread public distribution has been kept out of this document, and will only be distributed at the discretion of the Clare County Office of Emergency Management.

This plan is the culmination of our interdisciplinary and interagency planning effort that required the assistance and expertise of numerous agencies, organizations, and individuals. Without their technical assistance and contributions of time and ideas this plan could not have been completed.

A map of Clare County identifying the local units of government follows.

Clare County

MAP 1.1



Executive Summary

The Clare County Hazard Mitigation Plan was created to protect the health, safety, and economic interests of the Clare County residents and businesses by reducing the impacts of natural and technological hazards through hazard mitigation planning, awareness, and implementation. The plan serves as the foundation for hazard mitigation activities and actions within Clare County. Implementation of recommendations will reduce loss of life, destruction of property, and economic losses due to natural and technological hazards. The plan provides a path toward continuous, proactive reduction of vulnerability to hazards which result in repetitive and often times severe social, economic, and physical damage. The ideal end state is full integration of hazard mitigation concepts into day-to-day governmental and business functions and management practices.

This plan employs a broad perspective in examining multi-hazard mitigation activities and opportunities in Clare County. Emphasis is placed on hazards which have resulted in threats to the public health, safety and welfare, as well as the social, economic and physical fabric of the community. This plan addresses such hazards as floods, tornadoes, windstorms, winter storms, forest fires, structural fires, hazardous material incidents and secondary technological hazards which result from natural hazard events. Each hazard is analyzed from a historical perspective, evaluated for potential risk, and considered for possible mitigative action. The plan also lays out the legal basis for planning and the tools to be used for its implementation.

Local Units of Government

While the Hazard Mitigation Plan was performed by Clare County, it involved the participation of the communities within the County. Clare County's communities consist of two cities, one village, and 16 Townships. The communities are listed below:

Cities

Clare, Harrison

Village

Farwell

Townships

Arthur, Franklin, Freeman, Frost, Garfield, Grant, Greenwood, Hamilton, Hatton, Hayes, Lincoln, Redding, Sheridan, Summerfield, Surrey, and Winterfield.

In addition to the cities, places, and townships, there exists a large Amish Community within Clare County. Numbering about 400 in population, the Amish inhabit areas mainly in the Southeastern and Northwest portions of Clare County.

Clare County Community Information

TABLE 1.1

Community Name	2000 pop.	2010 pop.	Change	Participated in the 2006 Plan	Currently a participant in 2016 plan	NFIP Digitalized Map Available	NFIP participant	NFIP map date
Clare County	31,252	30,926	1.0%	YES	YES			
Arthur Twp	667	647	-3.0%			NO	NP	
Franklin Twp	809	825	2.0%		YES	NO	YES	
Freeman Twp	1,118	1,157	3.5%			YES	YES	12/3/10
Frost Twp	1,159	1,047	-9.7%		YES	YES	NP	12/3/10
Garfield Twp	1,968	1,882	-4.4%	YES	YES	YES	YES	12/3/10
Grant Twp	3,034	3,259	7.4%			YES	NP	12/3/10
Greenwood Twp	1,059	1,041	-1.7%	YES	YES	YES	YES	12/3/10
Hamilton Twp	1,988	1,829	-8.0%		YES	NO	NP	
Hatton Twp	923	933	1.1%	YES	YES	NO	NP	
Hayes Twp	4,916	4,675	-4.9%		YES	YES	YES	12/3/10
Lincoln Twp	1,758	1,824	3.8%	YES	YES	YES	NP	12/3/10
Redding Twp	526	526	0.0%		YES	YES	YES	12/3/10
Sheridan Twp	1,588	1,575	-.8%	YES	YES	YES	NP	12/3/10
Summerfield Twp	453	456	.7%	YES	YES	YES	YES	12/3/10
Surrey Twp	2,700	2,735	+1.3%	YES	YES	YES	YES	12/3/10
Winterfield Twp	483	459	-5.0%	YES	YES	YES	NP	12/3/10
City of Harrison	2,108	2,114	.3%		YES	YES	YES	12/3/10
City of Clare	3,140	3,071	-2.2%		YES	YES	YES	12/3/10
Village of Farwell	855	871	1.9%		YES	YES	YES	12/3/10

CHAPTER 2: THE PLANNING PROCESS

In 2013, the Clare County Emergency Management staff began the update process by hosting a meeting at the Clare County Building with East Michigan Council of Governments (EMCOG) staff and the Michigan State Police Emergency Management and Homeland Security Division (EMHSD) Staff. The purpose of the meeting was to advise the public and Clare County representatives of the need to update the 2007 Clare County Hazard Mitigation Plan (Plan) and the process that would be utilized.

This update was made possible after the County, along with four other counties were awarded a grant from the Federal Emergency Management Agency (FEMA) through the Michigan State Police to update their hazard mitigation plans. EMCOG staff worked with the Clare County Emergency Management Director (EMD), Jerry Becker and the Clare County Hazard Mitigation Advisory Committee (CCHMAC) who was designated as the steering committee for the Plan update.

The CCHMAC was formed with members of the Clare County Local Planning Team (LPT) along with other local representatives. It is composed of volunteers and professionals from county municipalities and various agencies located throughout the county/region, including the Michigan State Police, American Red Cross, Michigan Department of Health and Human Services, and the Department of Natural Resources.

To further promote the update and municipal participation, two written questionnaires were sent to the municipal governments for their input on the update process. The first questionnaire sought information on the hazards and how they impacted the Municipality. The follow-up questionnaire sought information on the mitigation measures to address the hazards and what measures would be most beneficial for each municipality. Copies of the questionnaires are included in Appendix B, which also includes a summary of the municipalities' responses. In addition, the EMD and EMCOG staff on two separate occasions met with Clare County Township officials at their monthly meetings to further encourage their participation in the monthly update meetings as well as respond to the questionnaires. The responses from several municipal governments were incorporated into the final mitigation actions found in Chapter 5. However, several municipalities submitted their responses after the action list was completed, which prohibited the inclusion of those items into the plan if they were not already been included.

Through a series of open meetings to the public, the EMD and EMCOG staff directed the CCHMAC through an assessment of the Plan in order to determine what changes, if any, would be necessary for the update. The CCHMAC and municipal officials were provided meeting agendas and any accompanying memos regarding the Plan update the week before each meeting, at which time the agendas were also posted on the public bulletin board at the Clare County Building. The following table (Table 2.1) identifies the meeting dates, locations, and subject matter for the CCHMAC and township association meetings. At the end of this chapter are two tables identifying the agencies represented at the meetings (Table 2.2) and the individuals at each meeting (Table 2.3). Appendix A includes the sign-in sheets for all the public meetings for this update.

Clare County Hazard Mitigation Advisory Committee
Meeting Schedule/Discussion Topic
TABLE 2.1

Meeting Date	Meeting Location	Discussion Topic(s)
5-10-13	Clare County Building 225 W. Main St., Harrison, MI	Kick-off meeting to provide information to public on the Hazard Mitigation Plan (Plan) update process.
7-22-14	Clare County Transit Corporation (CCTC) Board Room 1473 Transportation Dr., Harrison	Initial meeting of CCHMAC, they were provided an overview of the process, and a discussion was held on hazards occurring in Clare County.
10-21-14	CCTC Board Room	Discussion on the hazards and finalized the hazard assessment criteria.
11-12-14	CCTC Board Room	Discussion on Community Profile, and hazard assessment to determine what hazard have the greatest impact in Clare County.
12-15-14	Surrey Township Fire Department 110 E. Michigan St., Farwell	Completed hazard assessment and vulnerability assessment. Initiated discussion on goals and objectives for the Plan update.
1-27-15	CCTC Board Room	Completed discussion on goals and objectives, began a discussion on the status of the Plan's Strategy Table.
2-24-15	Clare County Sheriff's Department 255 W. Main St., Harrison	Completed the status of the projects identified in Plan's Strategy Table
3-17-15	Clare County Sheriff's Department	Provided criteria for notable events in Clare County (This was provided by the EMD at a previous meeting on 3-4-15 in his office.)
4-21-15	Harrison City Hall 229E. Beech St., Harrison	Continued discussion on notable events, began identifying mitigation strategies to address hazards.
5-19-15	Harrison City Hall	Initiated discussion on updated implementation strategies (2016 Action List)
7-28-15	CCTC Board Room	Finalized the priority chart, continued discussion on Action List with a focus on the number of projects (12-20).
8-17-15	Clare County Building	Meeting with municipal officials to (again) promote their participation in the update process. Redistributed the municipal questionnaire to complete/submit.

10-27-15	CCTC Board Room	Action list items proposed.
12-8-15	CCTC Board Room	Criteria set to prioritize projects, projects prioritized.
3-21-16	Clare City Hall 202 W. 5th St. Clare	CCHMAC reviewed proposed changes requested by FEMA and EMSHD staff on action list items as presented by the EMD. Discussed the final review and approval process.

Through the meetings above, the chapters of the Plan were evaluated and modified accordingly. Below are the results of the chapter reviews for each chapter in the Plan.

- Reviewed and updated Chapter 1: Introduction. Reviewed and updated information on Clare County, as well as on the process. Information is included in Chapter 1: Introduction, and Chapter 2: Planning Process of the update.
- Reviewed and updated Chapter 2: Environment. Reviewed and updated information on the physical characteristics of Clare County. Information is included in Chapter 3: Community Profile of the update.
- Reviewed and updated Chapter 3: Social Features. Reviewed, updated, and modified the social and demographic data of Clare County. Information is included in Chapter 3: Community Profile of the update.
- Reviewed and updated Chapter 4: Land Use Characteristics. Reviewed land use characteristics of Clare County. Information is included in Chapter 4: Hazard Analysis of the update.
- Reviewed and updated Chapter 5: Public Facilities and Services. Updated and reviewed the public services being available in Clare County. Information is included in Chapter 3: Community Profile of the update.
- Reviewed and updated Chapter 6: Advanced Analysis. Reviewed and updated the analyses for the hazards identified in Clare County. Information is included in Chapter 4: Hazard Analysis of the update.
- Reviewed and updated Chapter 7: Risk and Vulnerability Assessment. Reviewed and updated the risk and vulnerability assessments for Clare County. Information is included in Chapter 2: Planning Process of the update.
- Reviewed and updated Chapter 8: Goals and Objectives. Reviewed and updated the goals and objectives for Clare County. Updated goals and objectives are found in Chapter 6: Action Items.
- Reviewed and updated Chapter 9: Mitigation Strategies and Priorities. Reviewed the mitigation strategies and priorities for Clare County. Status of the mitigation strategies is found in Chapter 5: Evaluation of Alternatives. Updated priorities are found in Appendix C.
- Reviewed and updated Chapter 10: Approval and Implementation. Reviewed and updated the approval and implementation schedule for Clare County. The revised implementation process is included in Chapter 7: Follow-up.

This update process included the review of the Clare County Master Plan, the 2014 Michigan Hazard Mitigation Plan, county maps and studies, municipal master plans, as well as ongoing activities. This included the review of informational sources such as: U.S. Census, National Weather Services, emergency

management plans, Michigan Department of Transportation, Michigan Department of Natural Resources, and local health departments.

In January 2016, the action list was sent to the EMHSD staff for their review and comment. This list was then sent to FEMA staff for their comments. In February, the EMD and EMCOG staff were notified that FEMA staff suggested that a larger proportion of action items involve mitigation activities rather than education and preparedness activities.

Also, in February 2016 the EMD and the EMCOG regional planner met to plan out the proofing of the draft document and to plan the scheduling for the approval of the Plan. This scheduling included the timing for the public hearing, the approval of the plan by EMHSD staff, FEMA staff, and the adoption of the Plan by the County Board and other municipal agencies.

In March, the EMD and EMCOG regional planner met to discuss the suggestions of FEMA staff. As a result of the meeting, a meeting with the CCHMAC to discuss the additional action items (mitigation activities) was scheduled and held on March 21, 2016. After reviewing these items and proofing the document the CCHMAC then recommended approval of the draft document and recommended to schedule a public hearing to present the document to the public and seek additional input.

The public hearing took place on April 18, 2016, as part of the Municipal Township Association meeting for Clare County. In attendance were township officials, county officials, and the general public. In total over 30 people were in attendance. To ensure maximum input on the plan, notices for the meeting were sent to both local newspapers, were posted at the Clare County Courthouse, sent to and posted at the local libraries, and sent to each municipality within the County. Letters were also sent to the neighboring counties' emergency management staff advising them of the update and the location of the draft, should they have the time to review the document. Copies of the draft were sent to each library, to each municipality and a copy was posted on the Clare County website.

The draft was also presented to the Clare County Board of Commissioners at their April 20, 2016 meeting. The presentation was part of their regular meeting agenda, which was posted per municipal regulations. There were approximately 20 people in attendance during the presentation.

The 30-day comment period was held to allow ample time to submit comments to the Emergency Management Director. These comments were then reviewed and the following items were addressed:

- Several comments were received to correct municipal addresses;
- Several comments were also submitted to advice of spelling errors; and
- The Enhanced Fujita Scale for Tornado Intensity was used rather than the Fujita Scale based on a comment that was received on another plan.

On April 12, 2016, the draft plan was sent to the MSP/EMHSD staff for comments and reviews. Based on their suggestions, changes included the following: the addition of frequency and probability to the natural hazards in Chapter 3; more information was provided on NFIP participation and FIRM maps, additional information was provided on the action list prioritization, and the process to include reference to the Hazard Mitigation Plan in other county documents.

Clare County Hazard Mitigation Advisory Committee Attendance Table

TABLE 2.2

Participating Agency or **Jurisdiction**	Returned Questionnaires 1 and 2	Meeting Attended														
		5-13	7-14	10-14	11-14	12-14	1-15	2-15	3-15	4-15	5-15	7-15	8-15	10-15	12-15	3-21
East Michigan Council of Governments		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Clare County	NA	X	X		X	X	X	X	X	X		X	X	X	X	X
City of Clare	1	X	X	X	X	X	X				X	x		X	X	X
City of Harrison	1	X	X	X	X		X	X	X	X	X	X		X	x	
Village of Farwell		X				X										
Arthur Township	1															
Franklin Township	1	X											X			
Freeman Township																
Frost Township	1 2												X			
Garfield Township	1			X			X					X	X	X		
Grant Township																
Greenwood Township	1												X			
Hamilton Township	1 2															
Hatton Township	1 2															
Hayes Township	1 2				X					X	X					X
Lincoln Township	1															
Redding Township	1												X			
Sheridan Township	1															
Summerfield Township	1															

Surrey Township			X	X	X	X	X									
Winterfield Township	1 2												X			
American Red Cross	NA		X				X					X				
Amateur Radio	NA	X	X									X				
Central Michigan District Health Department	NA		X	X	X	X								X		
Clare County 911	NA		X	X	X		X	X		X	X	X		X	X	X
Clare County Drain Commission	NA															X
Clare County Road Commission	NA		X	X		X					X			X		X
Clare County Sheriff's Dept.	NA	X	X		X	X		X		X	X	X		X		X
MediLodge of Clare	NA											X				
Michigan State Police	NA		X				X					X		X		
Michigan DNR	NA						X					X				
Mid-Michigan Medical Center	NA		X				X					X			X	
Mobile Medical Response	NA													X		
Northwest Nursing Home	NA		X	X												
Prestige Place	NA			X												
Renosol Lear Corp	NA			X								X		X		
Tendercare	NA		X									X				

Jurisdictions in bold font have contributed to the Plan update.

Clare County Hazard Mitigation Advisory Committee Attendance Table

TABLE 2.3

Person	Agency	Hazard Mitigation Advisory Committee Member	Number of Meetings Attended
Terry Acton	**Hayes Township/Supervisor**		**5**
Pat Agin	City of Harrison/Fire Chief	X	11
Mike Bailey	Clare County Sheriff's Dept./Lt.		
Linda Bailow	**Greenwood Township/Clerk**		1
Tracey Beadle	City of Harrison/City Manager	X	11
MaryJo Beal	MidMichigan Health/EM Coordinator	X	4
Jerry Becker	Clare County/EMD Director	X	16
Diane Blackburn	**Franklin Township/Clerk**		**1**
Mary Borgula	Redding Township/Clerk	X	1
Thomas Brubaker	Clare County 911/Director	X	9
Tracy Byard	Clare County Controller	X	1
Jim Chapman	City of Clare/Fire Chief	X	8
Janet Conlay	Village of Farwell/Clerk	X	
Marion Coon	**Frost Township/Supervisor**		1
Dave Cooper	Hamilton Township/Supervisor	X	
Brian David	**City of Harrison/Police Liaison Officer**		1
Kathryn Decker	Winterfield Township/Clerk	X	1
Mellissa DeRoche	Central Michigan District Health Dept.	X	2
Bill Ernat	**EMCOG**	**X**	**15**
Ed Erskine	Franklin Township/Supervisor	X	
Doug Fitzgerald	**Central Michigan District Health Dept.**		**1**
Mark Fitzpatrick	**City of Harrison/Building Dept.**		3
Mike Gray	Prestige Place/LTC Facility Maint. Mgr.	X	1
Steven Grim	Citizen at Large/Surrey Township	X	1
Kim Halis	Clare County/Equalization Director	X	1
Russ Hamilton	**Surrey Township/Supervisor**		
Brett Hansen	**Mobile Medical Response/ Supervisor**		**1**
Cindy Havens	**American Red Cross**		**3**
Ken Hibl	City of Clare/City Manager	X	
Tom House	RESD Harrison Schools	X	

Person	Agency	Hazard Mitigation Advisory Committee Member	Number of Meetings Attended
Mark Irland	**Northwest Nursing Home/Maint. Supervisor**		**1**
Al Jessup	City of Clare/DPW Superintendent	X	3
Richard Johnson	RACES/ARES Coordinator	X	3
Ndum Jwad	**Lear Corp-Renosol/EHS Supervisor**		**3**
Jack Kleinhardt	Clare County Board CEO	X	
Steve King	**Central Michigan District Health Dept.**		**1**
Steve Kingsbury	City of Clare/Treasurer-Controller	X	
Teresa Lane	Clare County 911	X	9
Josh Lator	**Michigan State Police**		**2**
Dale Majewski	Lincoln Township/Fire Chief	X	2
Dwayne Miedzianowski	Clare County Sheriff Dept./ Undersheriff	X	4
Harmony Nowlin	Consumers Energy	X	
Jim Osborne	**Medilodge LTC Clare/Maint. Supervisor**		**2**
Nick Oster	**Clare County Sheriff's Dept./Schools Liaison Officer**		
Carl Parks	Clare County/Drain Commissioner	X	1
John Pedjac	City of Clare/Police Dept. Admin.	X	
Tom Pirnstill	Clare County Transit Corporation/ Director	X	3
Luke Potter	**City of Clare/DPW**		1
Martha Rottiers	**Garfield Township/Clerk**		1
David Saad	**Clare Police Dept.**		**2**
Larry Schloegl	**Michigan State Police**		**2**
Steve Schummer	Michigan DNR	X	2
Rebecca Smith	**Medilodge of Clare/Director**		**1**
Paul Spata	**American Red Cross**		**1**
Dawn Stafford	Clare County Admin. Asst.	X	
Dave Sunday	Clare County Road Commission/ Supervisor	X	7
Marlana Terrian	**Clare County 911/Director**		**4**
Kevin Tubbs	**Garfield Township/Fire Chief**		**4**

Person	Agency	Hazard Mitigation Advisory Committee Member	Number of Meetings Attended
Lori Ware	Clare County/Economic Development and Senior Services Director	X	
Dave Williams	**Surrey Township/Fire Chief**		4
Ed Williams	**Clare County Sheriff's Dept./Lt.**		**4**
Rod Williams	Surrey Township/Zoning Code Inspector	X	
Aaron Woods	**North Woods Nursing Center/ Director**		**1**
Dennis Zimmerman	Lincoln Township/Supervisor		

Bold print denotes a person not on the CCHMAC

CHAPTER 3: COMMUNITY PROFILE

NATURAL FEATURES OF CLARE COUNTY

Clare County is located in the middle of the Lower Peninsula of the State of Michigan. The counties surrounding Clare County are: Isabella to the South, Osceola to the west, Roscommon and Missaukee to the north and Gladwin to the east.

Considered the "Gateway to the North", Clare County is within an hour to an hour and a half drive from several of Michigan's largest cities, such as Grand Rapids and Lansing. Lake Michigan is 80 miles to the west, the Michigan/Indiana border is 150 miles to the south, the Straits of Mackinac and the Mackinac Bridge are 125 miles to the north and Lake Huron (Saginaw Bay) is fifty (50) miles to the east.

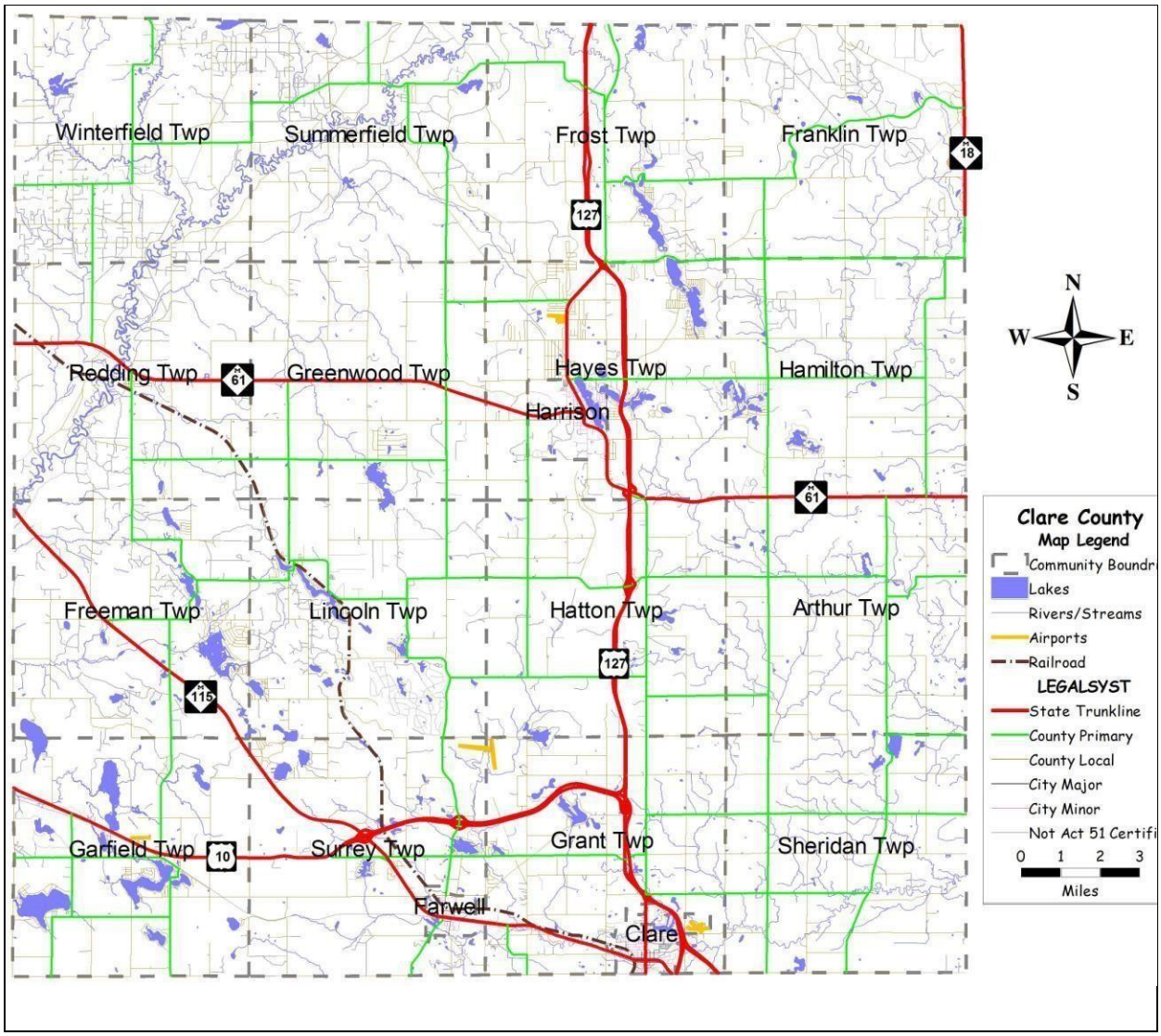
Clare County is composed of 368,140.8 acres or 575.22 square miles of land. The primary land use in Clare County is forestry with much of that being pine, aspen, and birch. Approximately sixty-three (63%) percent of the land is forested. Ninety eight (98%) of this forested land is classified as commercial forest land. The remaining two (2%) is classified as non-commercial. Approximately twenty-four (24%) of the land in Clare County is used for cash crops, dairy, livestock production, and other farm enterprises. The remaining 13% is roads, other rural land, urban land, and water areas.

Clare County contains nineteen (19) local units of government, including 16 townships, two (2) cities, and one (1) village. The City of Harrison is the County seat. These communities are represented by a seven (7)-member Clare County Board of Commissioners, which cover as many districts. The following table lists all 19 of the local units of government with their population data and trends from the last two United States decennial censuses. The 2010 census of the County was 30,926.

Clare County is covered by District 6 of the Emergency Management & Homeland Security Division of the Michigan State Police.

Clare County

MAP 3.1



Clare County Population

TABLE 3.1

Minor Civil Division	2010 population	2000 population	Change in population
Arthur Township	647	667	-3%
Franklin Township	825	809	+2%
Freeman Township	1,157	1,118	+4%
Frost Township	1,047	1,159	-10%
Garfield Township	1,882	1,968	-5%

Grant Township	3,259	3,034	+7%
Greenwood Township	1,041	1,059	-2%
Hamilton Township	1,829	1,988	-9%
Hatton Township	933	923	+1%
Hayes Township	4,675	4,916	-6%
Lincoln Township	1,824	1,758	+4%
Redding Township	526	526	0%
Sheridan Township	1,575	1,588	-1%
Summerfield Township	456	453	+1%
Surrey Township	2,735	2,700	+1%
Winterfield Township	459	483	-6%
City of Harrison	2,114	2,108	+1%
City of Clare	3,071	3,140	-3%
Village of Farwell	871	855	+2%
CLARE COUNTY TOTAL	30,926	31,252	-1%

Clare County Top Employers

TABLE 3.2

Company Name	Location	# of Employees
Mid-Michigan Community College	Harrison	551
Mid-Michigan Medical Center	Clare	324
Stage Right Corporation	Clare	220
Farwell Area School District	Farwell	200
Clare Public Schools	Clare	185
Jay's Sporting Goods, Inc.	Clare	150
Medilodge of Clare	Clare	135
Clare-Gladwin School District	Clare	130
Mid-MI Community Action	Clare	120
Letherer Truss & Wall Systems	Clare	110
Witbeck's Family Food	Clare	93
Doherty Hotel	Clare	90
Farwell Elementary School	Farwell	90

Source: 2013 Data provided by Region 7B Michigan Works

LAND USE

Included is the latest Land Use Map, as completed in 2003 and approved in the 2009 Clare County Master Plan, the last master plan approved by the County. Being a County dominated by forest and rural lands, there have not been any substantial changes within the County since the Plan was adopted in 2009.

Land Use Categories

Ag-Farm-Forestry-Rural Residential – Basic wooded rural residential dominated by single-family homes, hunting cabins and recreational lands. This category is so named because of differing township zoning/ land use plans using these names interchangeably for the same type of properties.

State/Federal/County/Twp – Government owned lands covering a wide variety of uses including municipal offices, federal, state, county, and township office facilities, schools, libraries, parks, cemeteries, recreational lands, and other areas funded by the general public. A map of the state-owned land is included as map 3.3.

Resort Residential – Usually lands located around lakes consisting of primarily single-family homes year-round and seasonal.

Ag as taxed – Land actually used for agriculture including a variety of uses including crops, orchards, Christmas trees, livestock and other uses related to agriculture. Barns and other outbuildings are also included in this category, as are homes associated with the agricultural uses.

Commercial – This category includes retail and wholesale businesses, business and professional services, personal services, and other business that provide good or services to the general public.

Recreation – Lands owned by groups engaged in providing recreation, primarily for youth.

Industrial – This category includes sites where any type of manufacturing process occurs. Industries can include those that produce various emissions in the process (smoke, odor, noise, light, vibrations, etc.) or those that do not produce emissions detectable to surrounding areas – such as the assembly of parts shipped from other facilities.

Mobile Home Park – Provides rental spaces for mobile homes.

Clare County Land Use by Acre and Percentage

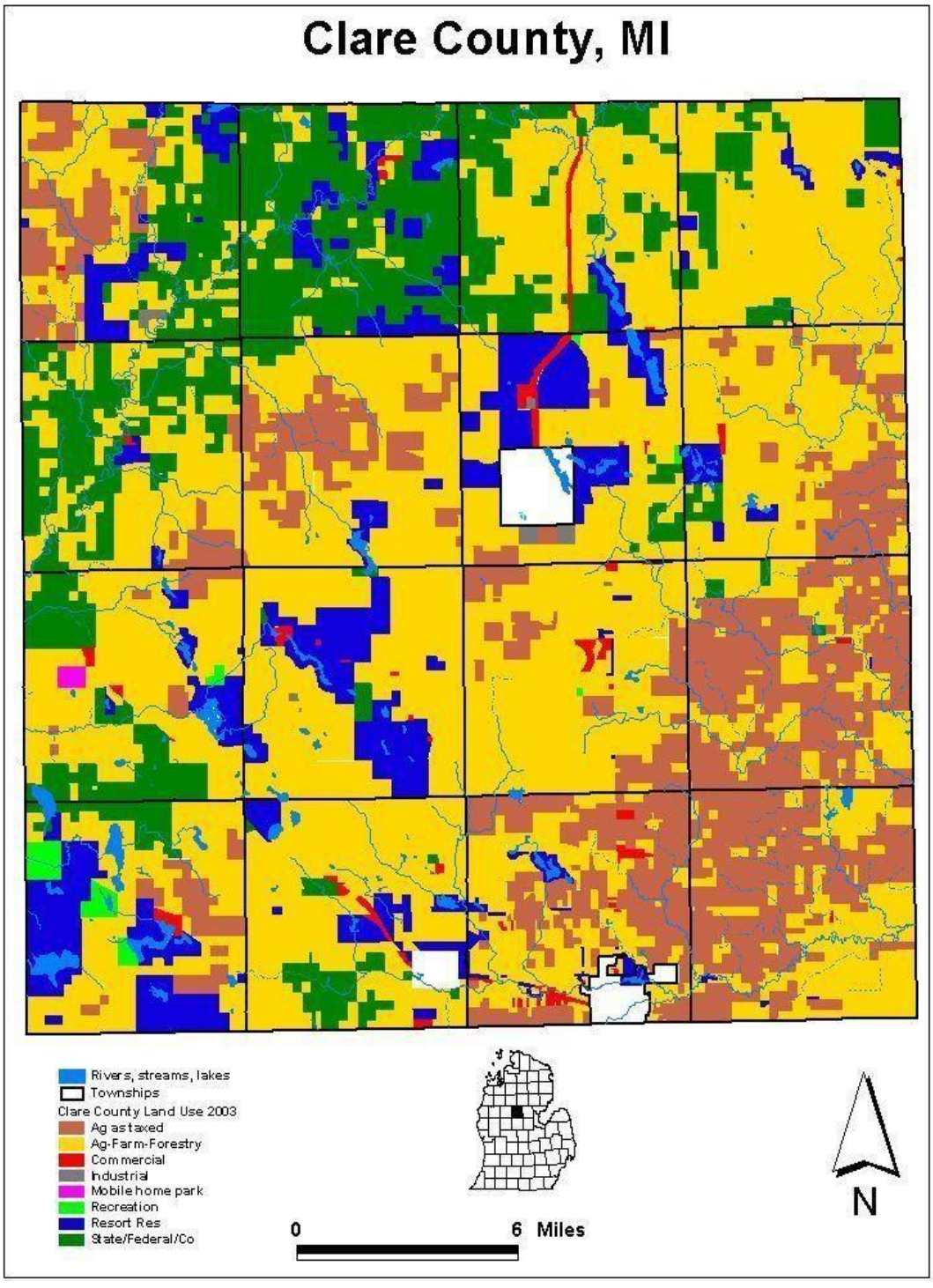
TABLE 3.3

Land Use	Acres	Percentage
Agriculture, Farm, Forest, Rural Residential	201,223	55.8%
Agriculture as Taxed	65,048	18.0%
Government (Federal, State, County, and Township)	55,495	15.4%
Resort Residential	33,190	9.2%
Commercial	3,250	.9%
Recreation	1,494	.4%
Industrial	633	.2%
Mobile Home Park	259	.1%
Total	360,592	100%

Source: 2009 Clare County Land Use Plan

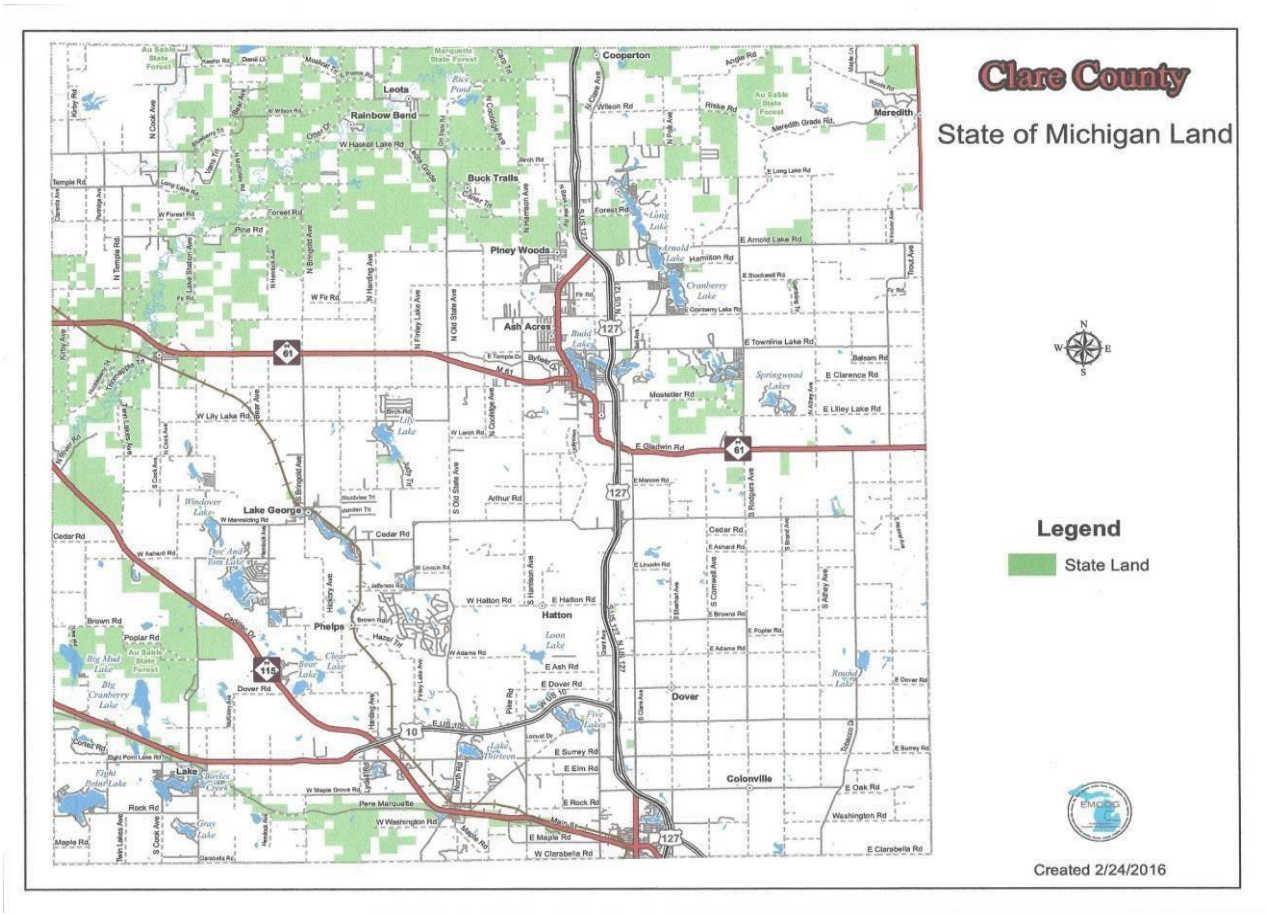
Clare County Current Land Use Map

MAP 3.2



Clare County State-Owned Land Map

MAP 3.3



FUTURE LAND USE

Methodology

The Clare County Planning Commission does not want to tread on Township authority in advocating any particular land uses; however, they do want to encourage responsible planning for future land use. No future land use map has been created as a result.

The most immediate threat for future land uses in Clare County is the fragmentation of large parcels that diminish the recreational uses of the properties. (This is especially true where a new house will render approximately 15 acres of land off limits to hunting.) Cluster zoning, if done properly, can reduce the impact of fragmentation on new housing and hunting.

Loss of farmland is another threat for future land uses in Clare County. Farmland is expected to be threatened by urban sprawl and fragmentation. The County's agricultural land is currently grouped in specific areas of the County, which allows Farmland Preservation to occur more easily. Government entities have been strongly urged to address the preservation of open space and agricultural land. Clare

County officials expect to develop an implementation plan for open space/agricultural land in the next stages of planning.

Residential housing pressure is expected to continually build. Projections expect areas already devoted to denser housing to spread to form clusters in and around the lakes and subdivisions that are already in place.

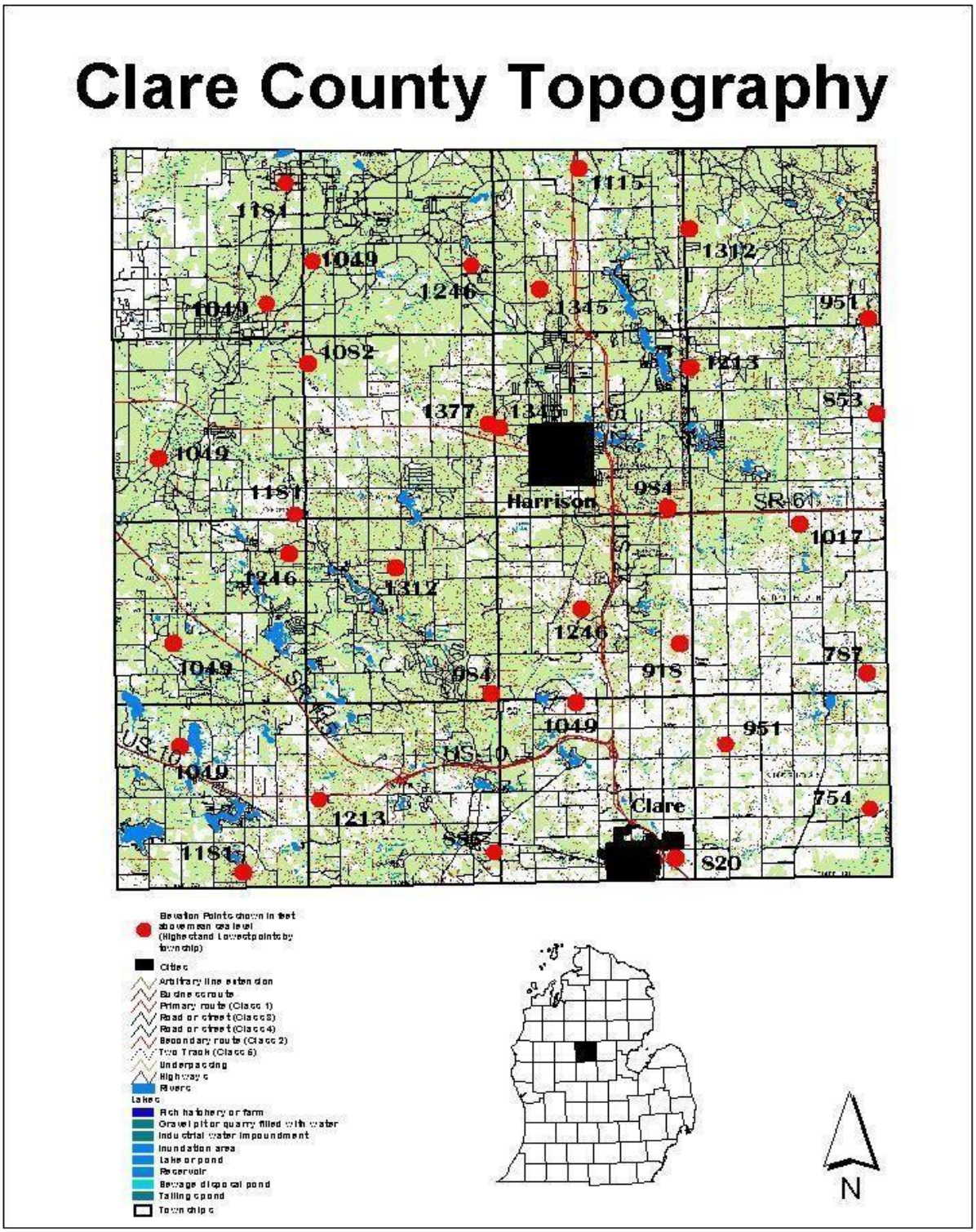
The same should be true for commercial and industrial uses. Most of the expected commercial/industrial areas are already in place and it is expected that they expand from this base.

TOPOGRAPHY

The land surface of Clare County was shaped by glaciation. The County is split nearly in half by two types of glacier related landforms. The southern portion of the county is the northern edge of a post glacial lake that has the characteristics of being flat land (elevations between 700' to 1,000' above sea level) with soils made up in clay and silt materials. The northern portion of the County is the southern edge of the glacial moraine area that makes up most of northern Michigan. This area is made up of gently rolling to steeply sloping terrain (elevations between 1,000' to 1,400') and consists of soils of sand and gravel material. The highest elevation is located in Greenwood Township at 1,377' above sea level and the lowest elevation is located in Sheridan Township at 754' above sea level.

Clare County Topography Map

MAP 3.4



SOILS

Three basic types of soil formations exist in Clare County. These are (1) moraine, (2) outwash and (3) till plain. The moraine is composed of undifferentiated Punctino sand, clay-gravel and silt; outwash being comprised of sand and gravel and till- plain is clay and silt. Old channel and lake beds are scattered throughout. Soils vary from clay to sand. Eight different soil types make up the County. They are:

1. Mancelona-Gladwin-Wheatly- Nearly level to gently rolling, somewhat excessively drained and somewhat poorly drained to very poorly drained soils that have a sandy and loamy subsoil or a sandy and gravely substratum**. 5% of the County**

2. Montcalm-Menominee-Nester- Nearly level to rolling soils, well drained and moderately well drained soils that have sandy and loamy subsoil. **15% of the County**

3. Menominee-Iosco-Kawkawlin – Nearly level to gently rolling, well drained to somewhat poorly drained soils that have sandy and loamy subsoil. **11% of the County**

4. Nester-Kawkawlin-Sims – Nearly level to rolling, well drained to very poorly drained soils that have loamy subsoil. **14% of the County**

5. Graycalm-Moncalm – Nearly level to steep, somewhat excessively drained and well drained soils that have sandy and loamy subsoil. **29% of the County**

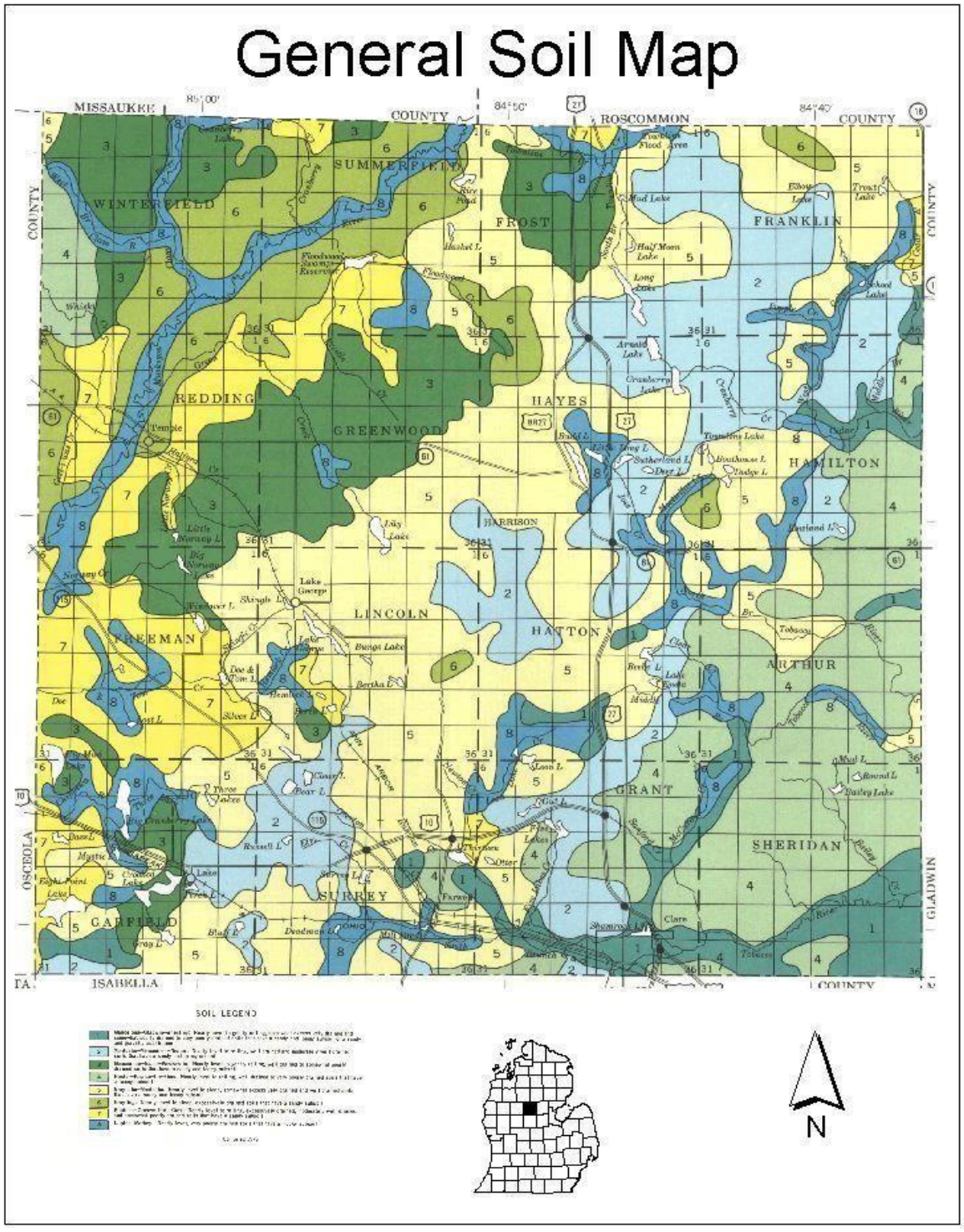
6. Grayling – Nearly level to steep, excessively drained soils that have sandy subsoil. **8% of the County**

7. Rubicon-Croswell-AuGres – Nearly level to rolling, excessively drained, moderately well drained, and somewhat poorly drained soils that have sandy subsoil. **9% of the County**

8. Lupton-Markey – Nearly level, very poorly drained soils that have mucky subsoil. **9% of the County**

Clare County Soils Map

MAP 3.5



CLIMATE

Climate has a strong influence on the way of life and the activities of the people of Clare County. It is considered a continental type of climate which is characterized by larger temperature ranges than in areas at the same latitude near the Great Lakes which have moderated temperatures. As a result of the prevailing westerly winds, this region experiences some lake effect snow. Like the rest of the State, the County has four distinct seasons that allow for a wide variety of outdoor activities. In table below is a breakdown of the average mean temperatures for each month (daily average), along with the monthly average precipitation and snowfalls. The first column in each category is from 1929-2000 and the second column is for the period from 2001-2015.

Clare County Climate

TABLE: 3.4

MONTH	AVERAGE TEMPERATURES		AVERAGE PRECIPITATION		AVERAGE SNOWFALL	
	1929 to 2000	2001 to 2015	1929 to 2000	2001 to 2015	1929 to 2000	2001 to 2015
January	20.0	21.2	1.86	1.78	13.0	12.6
February	21.2	20.8	1.40	1.64	10.3	13.2
March	30.8	31.1	2.17	1.82	7.6	7.0
April	43.8	44.3	3.00	3.70	2.0	1.6
May	55.4	55.6	3.10	4.11	0	0
June	65.1	65.5	3.30	3.46	0	0
July	69.3	69.7	3.10	3.12	0	0
August	67.4	67.9	3.42	3.06	0	0
September	59.5	60.8	3.30	2.80	0	0
October	48.4	48.8	2.79	3.18	0.3	0
November	36.4	38.3	2.70	2.46	3.7	2.7
December	25.3	26.4	2.17	2.36	11.0	12.5
Year	45.1	45.9	32.30	33.50	47.9	49.5

Source: National Weather Service

WATER FEATURES AND WETLANDS

Clare County has a variety of water features such as rivers, streams, lakes and wetlands. The County has more than 6,000 acres of lake surface and 20,000 acres of wetlands. Combined they account for approximately seven (7%) of the County's total acreage.

Thirty two lakes occupy more than 50 acres within the County and provide ample opportunity for water related activities such as fishing and boating. The most significant lakes include: Arnold, Budd, Cranberry, Crooked, Eight Point, Five Lakes, Lake George, Lily, Long, and Sutherland.

Two major watersheds, Muskegon and Saginaw Bay, divide the County in half. The Muskegon River, which drains the western portion of the County, is the largest river in the County and provides a number of recreational opportunities from canoeing to camping. The Tobacco and Cedar Rivers drain the eastern portion of the County and are a part of the Saginaw Bay watershed. Each of these rivers has their beginnings in Clare County.

Wetlands are defined by the existence of water, either on or near the surface for a portion of the year and by the type of vegetation present. Wetlands may have many names and are often referred to as bogs, marshes, and swamps. Wetlands are an important resource to the people of Clare County. They improve the water quality of lakes and streams by filtering polluting nutrients and chemicals. More importantly, wetlands recharge aquifers, support wildlife and vegetation, and protect shorelines from erosion. See following table for detail.

Clare County Water and Wetland Acreage

TABLE 3.5

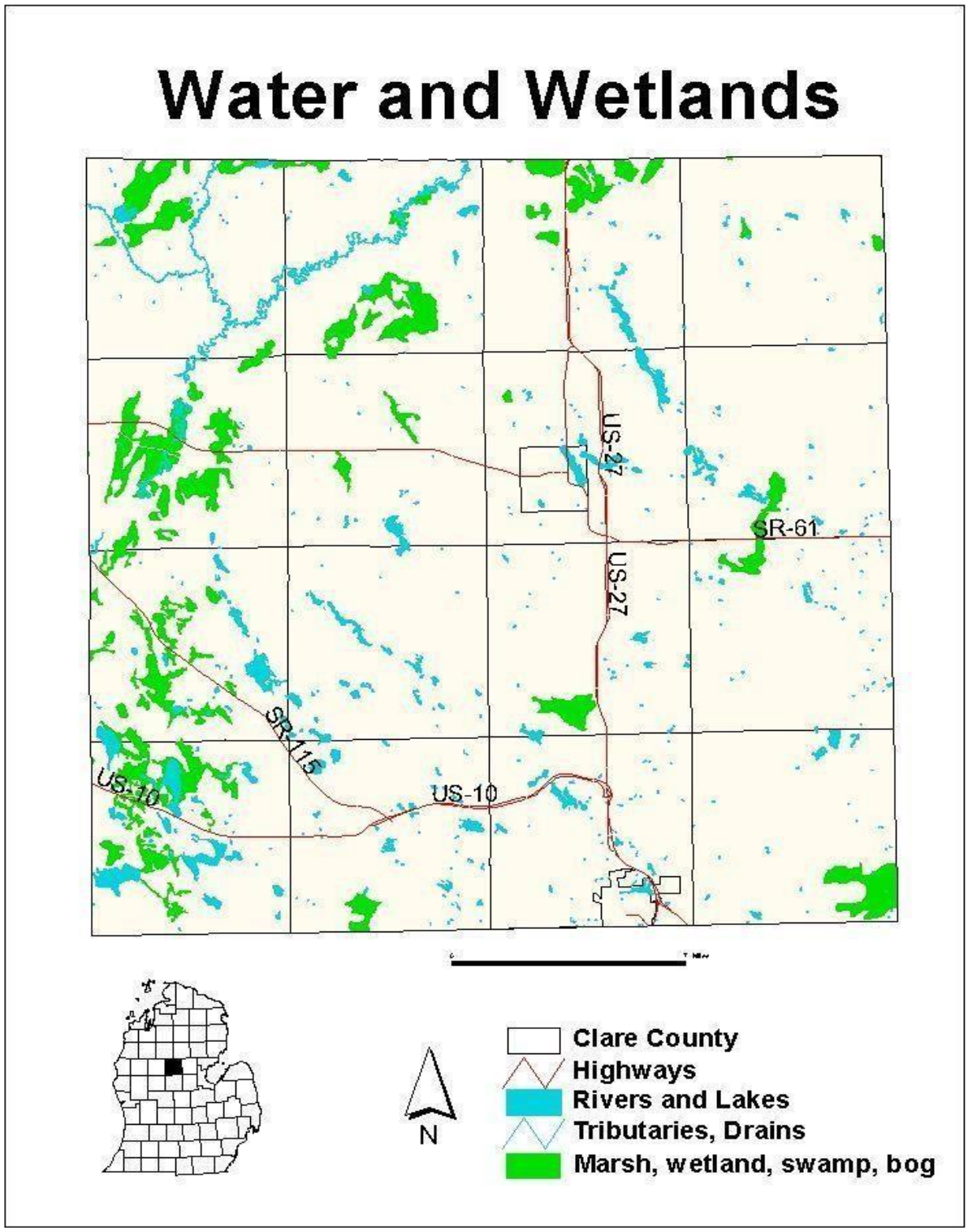
	Acreage			% of Area
	Water	**Wetlands**	**Total**	
Arthur Township	122.69	593.02	715.71	3.1%
Franklin Township	96.46	175.42	271.88	1.2%
Freeman Township	852.04	7,417.80	8,269.84	36.3%
Frost Township	404.60	1,763.23	2,167.83	9.6%
Garfield Township	1,647.69	3,482.66	5,130.35	22.5%
Grant Township (including City of Clare)	484.02	0.0	484.02	2.1%
Greenwood Township	228.0	905.15	1,133.15	5.0%
Hamilton Township	308.03	918.52	1,226.55	5.3%
Hatton Township	191.08	702.04	893.12	3.9%
Hayes Township (including Harrison)	1,038.63	54.0	1,092.63	4.7%
Lincoln Township	686.53	0.0	686.53	3.0%
Redding Township	323.84	5,133.71	5,457.55	24.2%
Sheridan Township	210.55	1,412.12	1,622.67	6.9%

Summerfield Township	432.93	2,603.68	3,036.61	13.2%
Surrey Township	499.80	431.90	931.70	4.1%
Winterfield Township	584.04	2,633.60	3,217.64	13.7%
Total	8,110.93	28,226.85	36,337.78	9.9%

Source: Michigan Department of Environmental Quality

Clare County Wetlands

MAP 3.6



VEGETATION

Originally, Clare County was covered with a dense mixture of coniferous (white pine) and deciduous (oak and maple) forests. In the late 1800's the County's forests were cleared leaving an open landscape littered with stumps. Much of the land was converted to farmland or ranch land.

Current Vegetation

Today, Clare County has a mixture of open farmland and forested areas. The southern portion of the County is predominantly farmland with smaller forest areas found along rivers, streams, and wetlands. The northern portion of the County is predominantly forest land with some open farmland. The Pere Marquette State Forest encompasses a large area in northwest Clare County and is the current location of the Kirtland Warbler habitat area. The area was either burned or clear cut and replanted naturally or by humans with jack pine, which the Kirtland Warble requires for nesting and breeding.

Forest Cover

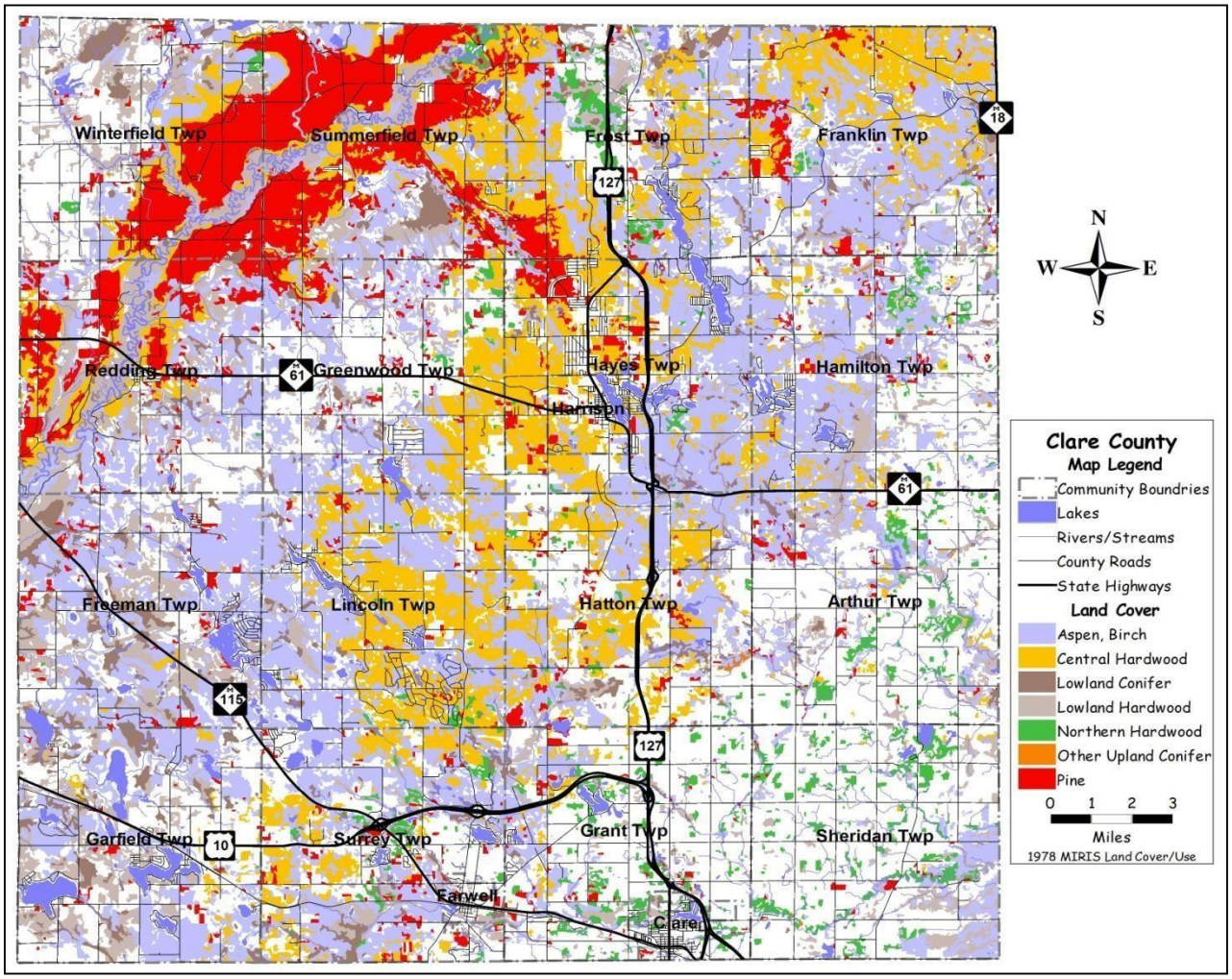
About 62 percent of the County is forested and, an analysis of forest types will assist in defining vulnerable areas and populations. The Michigan Resource Information System's (MIRIS) 1978 land use inventory compiled land cover maps that depict forest types in the county (Map 9). Tree species vary depending upon the soils, moisture and past activities such as logging, fires and land clearing. Aspen-Birch, central hardwoods, and pine are the most common forest types. Under dry spring conditions forest fires can occur in any forests type. However some forest types have higher risks. Jack and red pine forests have a high risk for wildfires. Oak and white pine forests have a moderate risk for wildfires. According to the MIRIS Land Cover/Use Inventory, jack pine and red pine forest types cover approximately 12 percent of the forestland. Draughty, low fertility sandy soils, found in outwash plains and channels, supported presettlement pine forests that for thousands of years were perpetuated by wildfires. Today, residential development has occurred within the same wildfire prone areas. There is a concentration of pine forest types in Redding, Winterfield, Summerfield, Hayes, Frost, and Franklin Townships.

Red jack and white pine forest types are included in the pine forest category. Bigtooth aspen, quaking aspen, white birch, red maple and red oak are the primary tree species found in the aspen birch type. Red oak, white oak, black oak and northern pin oak are the primary species growing in the oak forests. Northern hardwoods include species such as sugar maple, red maple, American beech, basswood and yellow birch.

Poorly drained, lowland areas support northern white cedar, tamarack, balsam fir, black spruce, eastern hemlock, white pine, balsam poplar, trembling aspen, paper birch, black ash, speckled alder and shrub willows. Northern white cedar dominates the wetland areas where there is good lateral water movement and the soils are high in organic content. Lowland forests are typically located adjacent to water features and function as riparian forests and water quality buffers. The network of lowland forests, associated with rivers and creeks, also function as wildlife corridors and are the backbone of large regional ecological corridors. Lowland forests adjacent to the Great Lakes are prone to flooding during periods of high lake levels. Lowland forests adjacent to rivers and streams are prone to flooding during the spring snow melt, particularly when combined with heavy spring rains. Extensive areas of lowland forests can be found along the Muskegon River, Winterfield, Summerfield, Redding, Freeman, Hamilton, Garfield, and Surrey Townships.

Clare County Forested Areas

MAP 3.7



COMMUNITY ORGANIZATION AND RESOURCES FOR HAZARD MITIGATION including
County and Local Community Agencies, Departments and organizations potentially relevant for Hazard Mitigation.

Emergency Services
Emergency services are very important for the Hazard Mitigation Process. These services help serve the public in times of natural disasters and other emergency situations. It is crucial for the public to know where these services exist and how to reach them in times of need.

Clare County Office of Emergency Management Adjacent to (CLARE County Sheriff's Office) 255 West Main Street
Harrison, MI 48625
989-539-6161
FAX: 989-539-6389
This office was established under the provisions of the Michigan Emergency Management Act, PA 390 of 1976, as amended, to ensure a coordinated public response in the event of a natural or man-made disaster. The purpose of Emergency Management is to plan and prepare for high impact, low probability events. The Clare County Emergency management office assesses local capabilities to respond to emergency and disaster situations, and advocate emergency preparedness in both the public and private sectors and works to assure a comprehensive approach is used involving a range of public and private agencies including local police, fire and EMS agencies, the Michigan State Police Emergency Management and Homeland Security Division, the Michigan Department of Environmental Quality, the Region 6 Homeland Security Board, and the National Weather Service. Other agencies coordinating with emergency management include the American Red Cross, local and state health departments, educators and amateur radio operators. This office tends to be central for all major threats and incidents within the County. This office also handles all Public Warning and Communications services, NOAA Weather alerts, Broadband, LEPC/LPT Boards, EOC Operations and Management, Training and Education programs, and all related Homeland Security matters.

Warning Sirens or System
Clare County has a system of fourteen (14) active Emergency Alert Sirens controlled by the counties dispatch system. These sirens are located in the following communities.

1. City of Harrison (Tank Hill Area) West Lawn Street
2. Redding Township (Temple) located in cemetery area
3. Freeman Township Hall
4. Lake George (Silver Lake Beach)
5. Surrey Township Transfer Station (Near Lake 13)
6. Grant Township (City of Clare North end near Burger King)
7. City of Clare (Near the cemetery)
8. Hamilton Township Park (Dodge City)
9. Harrison Airport
10. Greenwood Township at Township Hall M-61.
11. Summerfield Township (Leota) at Township Hall
12. Summerfield Township West Haskell Lake Road and Jackson Avenue
13. Lincoln Township Fire Department
14. Garfield Township Fire Department

Police

Clare County has one police department within the County outside the Sheriff's Department. The Clare County Sheriff Department is located in the City of Harrison and the City of Clare has a full time police department. In addition, the County is served by the Michigan State Police Post from Mt. Pleasant.

Clare County Sheriff's Department
255 W Main St
Harrison, MI 48625
Phone: (989) 539-7166

City of Clare Police Department
206 W Fifth St
Clare, MI 48617
Phone: (989) 386-2121

Michigan State Police-Mt. Pleasant Post 63
3580 S Isabella Rd
Mt. Pleasant, MI 48858
Phone: (989) 773-5951

Fire

There are five (5) fire departments located in Clare County, with Marion Fire Department from Osceola County serving Winterfield Township as well. The five departments are located in the City of Harrison, serving nine (9) townships, the City of Clare, serving two townships, Lincoln Township serving two townships, Surrey Township serving townships in Clare and Isabella Counties, and Garfield Township. There is a County-wide Mutual Aid Agreement between all of the fire departments.

Clare Fire Department
207 W Fifth St
Clare, MI 48617
Phone: (989) 386-2151

Harrison Community Fire Department
2115 Sullivan Drive
Harrison, MI 48625
Phone: (989) 539-3617

Garfield Township Fire Rescue
9460 Terry St,
Lake, MI 48632
Phone: (989) 544-2711

Lincoln Township Fire Department
310 Bringold
Lake George, MI 48633
Phone: (989) 588-9402

Surrey Township Fire Rescue
185 N Superior
Farwell, MI 48622
Phone: (989) 588-9571

Marion Fire Rescue
116 East Main St
Marion, MI 49665
Phone: (231) 743-6801

Ambulance

Mobile Medical Response (MMR) is based out of Saginaw, Michigan. They currently have stations located in Clare and Harrison with ambulances. Using a "System Status", units are shifted to where they are needed on a continual basis. These units are Advanced Life Support/Paramedic staffed. They do have other units available if needed, including disaster services.

MMR/Mobile Medical Response 8746 S. Clare Ave.
Clare, MI 48617
Phone: (989) 386-0911 or 1-800-232-5216

Health Care

Clare County has one hospital, Mid-Michigan Medical Center Clare, which provides a range of services that include hospital care, outpatient care, urgent care, home care, nursing home care, and wellness. There is also an urgent care center, a county health department in Harrison, and a community mental health department, also located in Harrison.

Mid-Michigan Medical Center-Clare
104 W Sixth St
Clare, MI 48617
Phone: (989) 802-5000
www.midmichigan.org.

Central Michigan District Health Department
815 North Clark Ave, Suite A
Harrison, MI 48625
Phone: (989) 539-6731

Mid MI Urgent Care
700 W Fifth St
Clare, MI 48617
Phone: (989) 386-9911

Community Mental Health Department
789 N. Clare Ave.
Harrison, MI 48625
Phone: (989) 539-2141

Government Facilities

Government facilities have a large impact on how emergencies are handled. They provide services to the public such as shelter in times of natural disasters. They also serve as a way to distribute information on how to handle emergency circumstances.

Government Offices and Facilities (Main Office Locations)

County Clare County 225 W. Main St.
Harrison, MI 48625
Phone: (989) 539-2510
Fax: (989) 539-2588

Cities

City of Clare
202 West Fifth Street
Clare, MI 48617-1490
Phone: (989) 386-7541
Fax: (989) 386-4508

City of Harrison
229 E. Beech
Harrison, MI 48625
Phone: (989) 539-7145

Village

Village of Farwell
109-1/2 S. Hall
P.O. Box 374
Farwell, MI 48622
Phone: (989) 588-9926 Fax: (989) 588-4352

Townships

Arthur Township
3031 S. Athey Ave.
Clare, MI 48617
Phone: (989) 386-5305

Franklin Township
9809 N. M18
Gladwin, MI 48624
Phone: (989) 246-0692
Franklin-twp.webs.com

Freeman Township
7280 Mannsiding Rd,
Lake, MI 48632
Phone: (989) 588-2752
Fax: (989) 588-4470
www.freemantwp.com

Frost Township
7255 N. Clare Ave,
Harrison, MI 48625
Phone: (989) 539-3804

Garfield Township
9348 Terry St., P. O. Box 390
Lake, MI 48632
Phone: (989) 544-2445
Fax: (989) 544-3174
www.garfieldtownship.net
info@garfieldtownship.net

Grant Township
3022 Surrey Rd.,
Clare, MI 48617
Phone: (989) 386-4209

Greenwood Township
2876 N. Harding
Harrison, MI 48625
Phone: (989) 539-6881
www.greenwoodtownship.org

Hamilton Township
8996 E. Townline Road
Harrison, MI 48625
Phone: (989) 539-7943
Fax – (989) 539-3950
www.hamiltontwp.us

Hatton Township
3988 E. Ashard Road
Harrison, MI 48625
Phone: (989) 386-8123

Hayes Township
2055 E. Townline Lake Rd.
P.O. Box 310
Harrison, MI 48625
Phone: (989) 539-7128
Fax: (989) 539-7129
www.hayestownship.com

Lincoln Township
175 Lake George Ave.
Lake George, MI 48633
Phone: (989) 588-9841
Fax: (989) 588-2574
www.lincolntwp.com

Redding Township
101 S. Main Street
Temple, MI
Phone: (231) 743-6170
www.reddingtownship.net

Sheridan Township
8987 E. Surrey Road
Clare, MI 48617
Phone: (989) 386-7648

Summerfield Township
9971 N. Finley Lake,
Harrison, MI 48632
Phone: (989) 539-2501

Surrey Township
101 E. Michigan
Farwell, MI 48622
Phone: (989) 588-6691
Fax: (989) 588-3524

Winterfield Township
8987 Cook Ave.
Marion, MI 48665
Phone: (231) 743-6888
www.winterfieldtownship.org

Schools

There are three (3) primary school districts in Clare County. The Clare Public Schools are located in the City of Clare and serve students in Clare and Isabella Counties. The School District's K-12 programs are offered on a single campus with one elementary school, one middle school, one high school, and adult and alternative education programs (Pioneer High). Athletic events are held at Brookwood Park. Enrollment is approximately 1,550 students.

The Harrison School District is located on several sites in the City of Harrison and serves students in Clare County and Gladwin County. The School District's K-12 programs involve two elementary schools, one middle school, one high school, and an alternative education program (located adjacent to the Middle School). Athletic events are held near Harrison High School. Enrollment is approximately 2,185 students.

Farwell Area Schools are located in the Village of Farwell and serve students in Clare County and Isabella County. The School District's K-12 programs are also offered on a single campus with one elementary school, one middle school, one high school, and an alternative education program (Timberland). Athletic events are held north of the Village of Farwell on North Avenue. Enrollment is approximately 1,625 students.

Clare County has one community college. Mid-Michigan Community College offers two year associate degree programs on a wide variety of academic courses, technical programs.

Clare Public Schools
201 E. State Street
Clare, MI 48617
Phone: (989) 386-9945
Website: www.clare.k12.mi.us

Farwell Area Schools
399 E. Michigan St
Farwell, MI 48622
Phone: (989) 588-9917
Fax: (989) 588-6440
Website: www.cgresd.net/hcs

Harrison Community Schools
224 W Main St
PO Box 529
Harrison, MI 48625
Phone: (989) 539-7871
Fax: (989) 539-7491
www.cgresd.net/hcs

Beaverton Rural Schools/Gladwin District
468 S Ross St
Beaverton, MI 48612
Phone: (989) 246-3000

Evart Public Schools/Osceola District
321 N Hemlock
Evart, MI 49631
Phone: (231) 734-5594

Gladwin Community Schools/Gladwin District
401 N. Bowery
Gladwin, MI 48624
Phone: (989) 426-9255

Marion Public Schools/Osceola/Winterfield
510 W Main St
Marion, MI 49665
Phone: (989) 743-2486

McBain Rural Agricultural Schools/Missaukee/
Winterfield/Summerfield
107 E. Maple Street
Mc Bain, MI 49657
Phone: (231) 825-2165

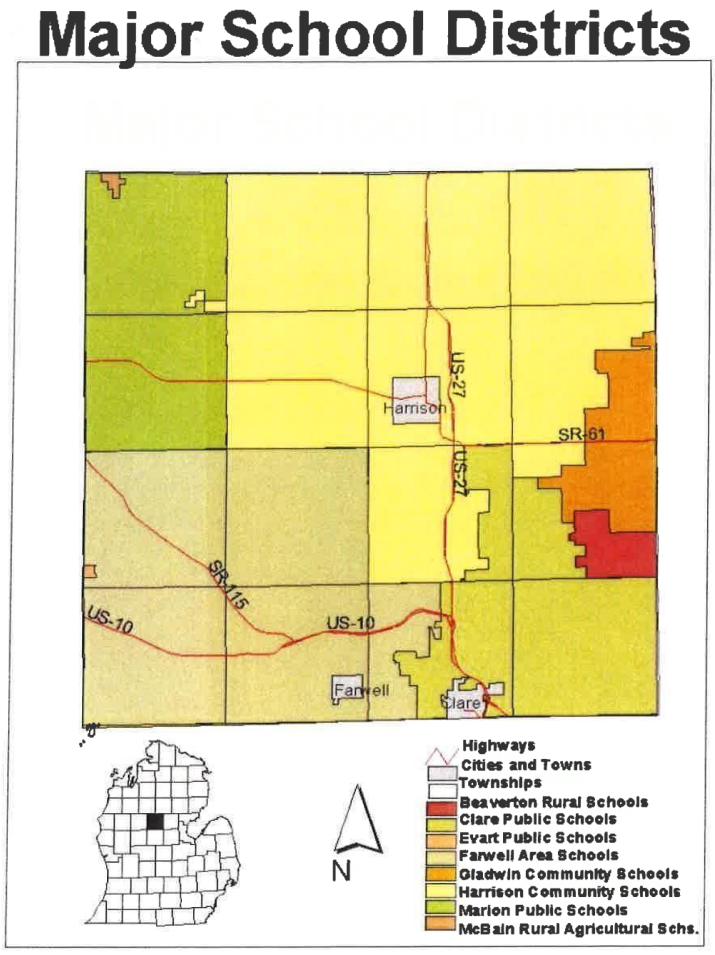
Skeels Christian School (Private)
3956 N. M-18
Gladwin, MI 48624
Phone: (989-426-2054
(Pre-school through grade 12)

Clare-Gladwin RESD
4041 E. Mannsiding Rd.
Clare, MI 48617
Phone: (989) 386-3851
Fax: (989) 386-3238
Website: www.cgresd.net

In addition to the above non-public schools, the Amish community operates four one-room schools for grades first through eighth.

Clare County School District Map

MAP 3.8



Service Agencies

Utilities

Information on the utilities provided to communities within the County is essential to distribute information to the public in times of need. Also, certain locations that provide these services may be the source of emergency situations (transformer problems, gas leaks, etc.).

Water

There are three Public Works agencies in Clare County. They are located in the City of Harrison, the City of Clare, and the Village of Farwell. The water supply for the City of Harrison consists of three wells via a water tower. The City of Clare also has three wells and the Village of Farwell has two.

Telephone Service
Landline/SBC Ameritech Corporation

Electricity
Consumers Power Company/Tri-County (Southwest Corner of Clare County).

Natural Gas
Michigan Consolidated Gas/ DTE Energy

Transportation
Roads
Clare County is served by an extensive highway system. The US-127 expressway provides North and South access through the County and the US-10 expressway provides East and West access in the southern portion of the County. Both are major linkages for goods and services from Southern Michigan to Northern Michigan.

Two state highways serve the county. M-115 provides Northwest/Southeast access through the County and is a major route for tourist to Northwest Michigan and Traverse City. M-61 provides East and West access and divides the County nearly in half.

The Clare County Road Commission office is located in Hatton Township.

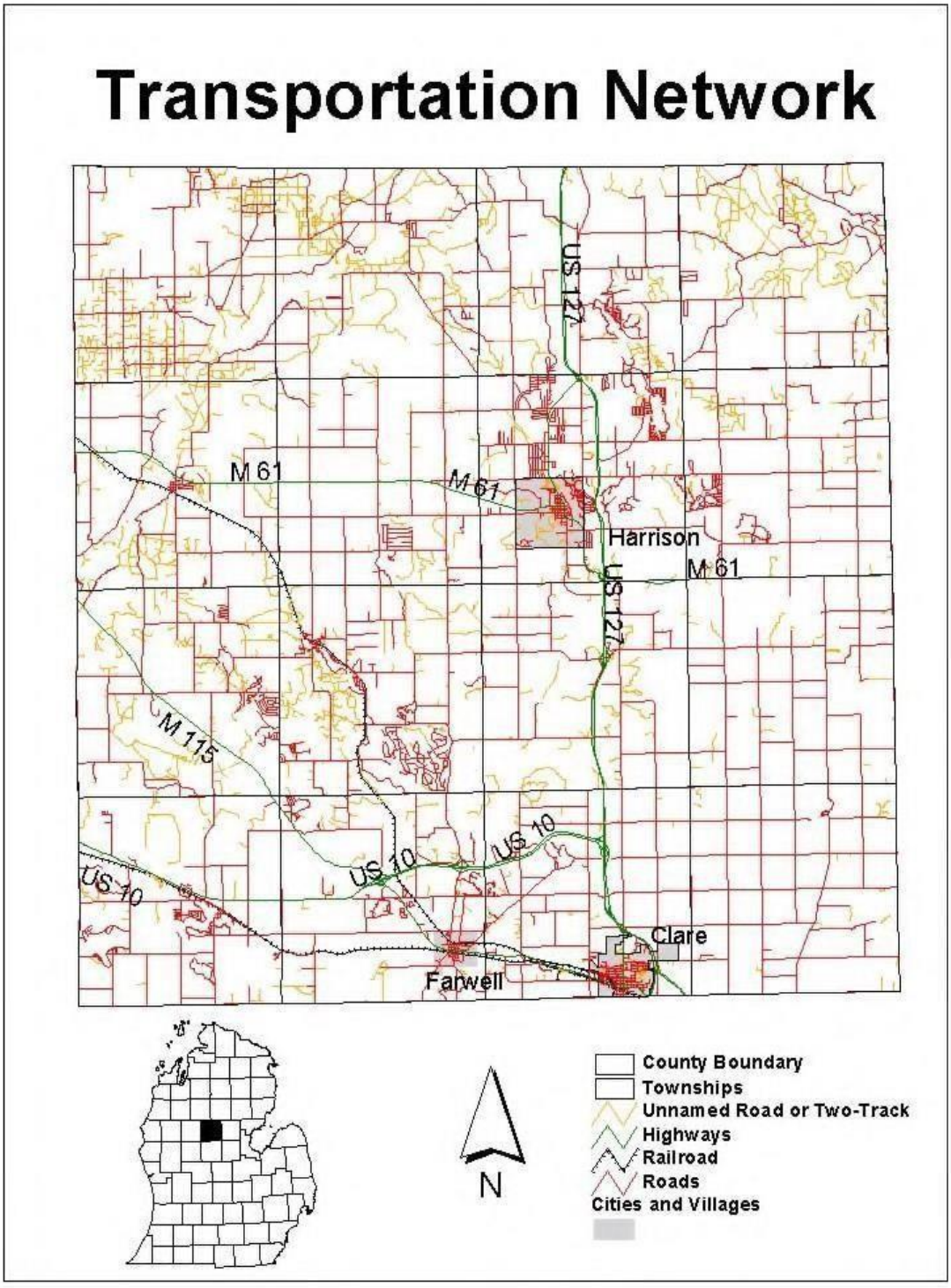
The County has 390 total miles of roads that are Federal Aid eligible. Clare County Transit Corporation (CCTC) provides county-wide busing.

Clare County Road Commission
3900 E. Mannsiding Road
MI 48625
Phone: (989) 539-2151

Michigan Department of Transportation
Bay City Transportation Service Center Harrison,
2590 E. Wilder Rd.
Bay City, MI 48706

Clare County Transportation Map

MAP 3.9



Railroads

Clare County has one active rail line running through it. It is the Great Lakes Central Railroad (GLC), which runs from Ann Arbor to Traverse City and Petoskey. The portion from Owosso north is state-owned and operated under contract by Great Lakes Central.

Shipping Ports
The nearest shipping port is located in Bay City on Lake Huron, with Ludington being the closest port on Lake Michigan. Conrail and the Tuscola and Saginaw Bay rail company provides rail service for Clare County.

Airports
Clare County has two public airports. Clare Municipal Airport, which is located in the City of Clare, and the Clare County Airport, which is located in Hayes Township. The closest commercial airport for residents of Clare County would be the MBS (Tri-City) International Airport located in Freeland, Michigan.

Clare Municipal Airport
Gary Todd, Manager
10725 South Eberhart
Clare, MI 48617
Phone: (989) 386-0445/ (989) 429-1874

Clare County Airport
Ron (Red) Spencer
4527 North Clare Ave.
Harrison, MI 48625
Phone: (989) 205-4142

Public Transportation
Greyhound – There is a greyhound bus route that has a local stop in the City of Clare.

American Tour Club – The American Tour Club offers private tours throughout the state. It is located in Arthur Township. They have three (3) buses.

Clare County Transit - Clare County Transit is a government subsidized service. Clare County Transit operates with thirty-three (33) vehicles on a demand-response basis. Of the 33 vehicles, thirteen are handicap accessible. This service travels on all Clare County roads. The Isabella Transportation Authority covers just into the City of Clare within the Isabella County section. Clare County Transit has a Memorandum of Understanding (MOU) with Clare County Emergency Management as the primary emergency transportation system.

School Buses – The Clare School District and the Farwell School District own and operate their own Transportation (Bus) System for student transport. The Harrison School System contracts with (First Student Corporation) and the Clare Gladwin RESD Contracts with (Dean Transportation Corporation).

CLARE COUNTY (2011 population: 31,033)

Clare County Drain Commissioner
P. O. Box 564,
Harrison, MI 48625
989-539-7320
FAX: 989-539-7385
The mission of this office is to provide for the health, safety and welfare of Clare County citizens, the protection of surface waters and the environment, and to promote the long-term environmental sustainability of Clare County by providing storm water management, flood control, soil erosion control and education. The office is particularly relevant for hydrological hazards.

Central Michigan District Health
815 North Clare Ave,
Harrison, MI 48625
Phone: (989) 539-6731
www.cmdhd.org
The mission of the Central Michigan District Health Department (CMDHD) exists is to promote health and physical well-being by providing preventive health care, education and environmental safety to all members of the community, and to become recognized by the public as the local advocate in promoting, assessing and safeguarding public health, and the environment. This will be done through coordinated planning, resource development, and service delivery. The human impacts of hazards may require their involvement. Public health emergencies threatening the area would certainly involve this department.

Michigan State University Extension – CLARE Office
225 West Main, P. O. Box 439,
Harrison, MI 48625
Phone: 989-539-7805
Fax: 989-539-2791
The office is involved in various educational and outreach activities involving agriculture and health. They should be valuable in events concerning such matters, such as droughts, pandemics, etc.

Department of Community Development
225 West Main,
Harrison, MI 48625
Phone: 989-539-2761
The Clare County Department of Community Development is responsible for the administration of the housing program benefiting low and moderate income families, for administering the State of Michigan Construction codes via inspections and permits, and for information on who needs Flood insurance along with the criteria for requiring flood plain building inspections. The Department also works closely with the Clare County Planning Commission.

Clare County Planning Commission
225 West Main, P. O. Box 438,
Harrison, MI 48625
Phone: (989) 539-2761
FAX: (989) 539-2588
The mission of the Clare County Planning Commission is to assist with the creation of a healthy, safe and sustainable community of choice, through leadership, education, partnerships and stewardship of resources and assets.

Clare County Road Commission
3900 East Mannsiding Road,
Harrison, MI 48625
Phone: (989) 539-2151
The Clare County Road Commission uses their expertise, energy, and funds to provide the safest and most convenient road system possible, and contributes to economic development and the high quality of life throughout the County. Their goal is to maintain a county road system that is safe and convenient for

public travel and to manage the roadside environment, with a view toward preservation. (Currently under contract with MDOT to plow US-127, M-61, M-115, and US-10).

Clare County Sheriff's Office
255 West Main Street,
Harrison, MI 48625
Phone: (989) 539-7166
The Sheriff's Office provides law enforcement and services to protect the lives and property of Clare County citizens-enforcing State laws and local ordinances, investigating crimes, and detaining prisoners remanded to the county jail. This is accomplished in a manner that maintains the highest degree of professional excellence, integrity, and courtesy. Sheriff's Office personnel would be involved in protective actions during a serious community emergency.

Clare County Transit Corporation (CCTC)
1473 Transportation Drive,
Harrison, MI 48625
Phone: (989) 539-1473 or (989) 539-1474
The purpose of the Clare County Transit Corporation (CCTC) is to plan, promote, finance, acquire, improve, enlarge, extend, own, construct, operate, maintain, replace, and contract for public transportation service by means of one or more public transportation systems and public transportation facilities within the jurisdictional boundaries of the County of Clare. They may have resources useful for the transportation or evacuation of residents during emergency situations. Clare County Transit has an MOU with Clare County Emergency Management as the primary emergency transportation system.

City of Clare (2010 population: 3,071)
202 West 5th Street,
Clare, MI 48617
Phone: (989) 386-7541
Founded in the 19th Century, the City provides a diverse mixture of old and new. The City is one of two main population centers, transportation nodes, and urban focus within the County. The Public Works Department is the most relevant to emergency management and hazard mitigation considerations.

Clare Public Works
202 W. Fifth St
Clare, MI 48617
Phone: (989) 386-3064
The department oversees the provision of city services such as waste disposal, fresh water supply, storm drainage systems, road maintenance, and snow removal. They have important resources to help deal with disasters or emergencies involving debris removal, water, and drainage systems.

City of Harrison (2010 population: 2114)
229 E. Beach Street,
Harrison, MI 48625
Phone: (989) 539-7145

Founded in the 19th Century, the City is the seat of Clare County. It is the second of two main population centers within the County. Emergency management and hazard mitigation considerations are handled by the Clare County Emergency Management Department.

Harrison Department of Public Works/Water/Sewer
229 East Beech Street
Harrison, MI 48625
Phone (989) 539-7145
The department oversees the provision of city services such as waste disposal, fresh water supply, storm drainage systems, road maintenance, and snow removal. They have important resources to help deal with disasters or emergencies involving debris removal, water, and drainage systems.

Village of Farwell (2010 population: 871)
109 ½ S. Hall Street,
Farwell, MI 48622
Phone: (989) 588-9927
Farwell was founded in the late 19th Century and is located in south-central Clare County. The Village has limited resources and is reliant upon Clare County Emergency Management staff to handle emergency management and hazard mitigation matters.

Village of Farwell Department of Public Works
225 South Hall Street
Farwell, MI 48622
Phone (989) 588-9530
The department oversees the provision of city services such as waste disposal, fresh water supply, storm drainage systems, road maintenance, and snow removal. They have important resources to help deal with disasters or emergencies involving debris removal, water, and drainage systems.

AUTHORITIES, CENTERS, PROGRAMS, ETC. THAT ADDRESS VARIOUS HAZARDS

Sabotage/Terrorism/Weapons of Mass Destruction (WMD)
The federal Office of Homeland Security coordinates the many counter-terrorism functions scattered across numerous federal agencies and organizations, and works closely with state and local police and fire agencies, emergency response teams, and emergency management agencies in formulating and carrying out the National Homeland Security Strategy.

Metropolitan Medical Response System:
One of the key features of the federal response element is the formation of highly skilled and mobile Metropolitan Medical Response Systems (MMRS) to provide medical care in incidents involving nuclear, chemical or biological terrorism. The nearest MMRS facility is in Grand Rapids. In case of an incident that may involve nuclear, chemical or biological weapons, this MMRS would be mobilized to provide initial, on-site response, in addition to providing for patient transportation to hospital emergency rooms. The MMRS are self-contained and capable of providing both medical and mental health care to victims. Should local health care resources be overrun, they will assist in preparing to move victims to other regions. The U.S. Department of Health and Human Services (HHS) coordinates the MMRS program. The West Michigan Metropolitan Medical Response System in Grand Rapids has a goal of coordinating the efforts

of local law enforcement, fire, HAZMAT, EMS, hospital, public health, and other personnel to improve response capabilities in case of a terrorist attack.

51st (WMD)/Civil Support Team

The Michigan National Guard, 51st Western Military District (WMD)/Civil Support Team, provides additional support for the Regional Response Team Network (RRTN). Stationed at Fort Custer (Battle Creek), the 51st WMD/Civil Support Team deploys to a Weapon of Mass Destruction or suspected Weapon of Mass Destruction incident in support of the local incident commander to: assess a suspected nuclear, chemical, biological or radiological event; advise the Incident Commander on appropriate courses of action to protect the local population; assist with appropriate requests for state additional support. They also provide informational briefings, exercises, and cross training activities with state and local first responders.

The Strategic National Stockpile (SNS) Program:

Presidential Decision Directive (PDD) 62, issued by President Clinton in May 1998 ordered federal agencies to take significantly expanded and better-coordinated steps to protect against the consequences of biological and other unconventional attacks, especially potential bio-terrorism directed at civilian populations. One of the major bio- terrorism initiatives of the U.S. Department of Health and Human Services (HHS) in response to this PDD is the development of the Strategic National Stockpile – a national repository of lifesaving pharmaceuticals and medical materials that will be delivered to the site of a major medical emergency in order to reduce morbidity and mortality in civilian populations. The decision to send the SNS is a collaborative effort between local, state, and federal officials in a process whereby local health departments and emergency management officials contact the Michigan State police Emergency Management Division, and state health officials who recommend to the Governor that a formal request for the SNS is made to the CDC.

The stockpile is activated to support a local and or state response to an emergency within the US or its territories. The two major components of the stockpile are the 12 Hour Push Pack and the Vendor Managed Inventory (VMI). Push Packs contain 50 tons of medical materiel that will treat a variety of illnesses. The VMI will re-supply the Push Pack or supplies will be sent immediately to the emergency site if the biological agent is known.

Region 6 Homeland Security Governing Board:

The United States Department of Homeland Security (DHS) has identified a number of national priorities to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies, including expanded regional collaboration. Major events have a regional impact; therefore the benefit of regionalism will be most evident at the community level, when a community, as a whole, can prepare for and provide an integrated response to an incident.

The State of Michigan has been divided into seven Homeland Security Regions. The West Michigan Shoreline Regional Development Commission is the designated fiduciary and is responsible for management and administration of the Region 6 Homeland Security Program. The Region 6 Homeland Security Planning Board consists of voting representation from the thirteen West-Central counties of Clare, Ionia, Isabella, Kent, Lake, Mason, Mecosta, Montcalm, Muskegon, Newaygo, Oceana, Osceola, and Ottawa. It also consists of voting representation from the City of Ionia (small city) and the City of Grand Rapids (large city) as well as Public Health and Bio-Terrorism. Non-voting representation includes

membership from Citizen Corps, the State of Michigan, and the West Michigan Shoreline Regional Development Commission.

The Region 6 Board works to achieve the following goals through its four committees with funds from the Department of Homeland Security through the State Homeland Security Program and the Law Enforcement Terrorism Prevention Program.

Overarching Goals

- Maximize effectiveness and achieve collaboration in planning, training, equipment purchase, and exercises.
- Effectively manage and administer State and Federal funds, guidelines, and resources.
- Promote communications and information sharing in the Region.
- Achieve collaboration in professional and volunteer response and recovery.

Homeland Security Presidential Directive/ HSPD-8
Subject: National Preparedness
Purpose

This directive establishes policies to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a national domestic all-hazards preparedness goal, establishing mechanisms for improved The National Preparedness Guidelines are contained within four documents that correlate to establish a vision for national preparedness and provide a systematic approach for prioritizing preparedness efforts across the nation for local, state, and federal governments. These four documents address capabilities-based preparedness for the full range of homeland security missions, from mitigation through recovery, and include: *The National Preparedness Vision, the National Planning Scenarios, the Universal Task List,* and *Core Capabilities*.

The purposes of the *Guidelines* are to:

- Organize and synchronize national (including Federal, State, local, tribal, and territorial) efforts to strengthen national preparedness;
- Guide national investments in national preparedness;
- Incorporate lessons learned from past disasters into national preparedness priorities;
- Facilitate a capability-based and risk-based investment planning process; and
- Establish readiness metrics to measure progress and a system for assessing the Nation's overall preparedness capability to respond to major events, especially those involving acts of terrorism.

Using the Core Capabilities List, local jurisdictions measure their capabilities against the list, identifying shortfalls and making corrective actions. In addition, local exercises are designed around using the national planning scenarios which allows for local jurisdictions to determine required capabilities already identified using pre-developed scenarios.

School Safety Information Act: 102 P.A. 1999:

In response to the rash of school shootings that occurred in the late 1990s, the Michigan Legislature passed Act 102 in July 1999 – The Michigan School Safety Information Act – which requires local school districts to meet with law enforcement officials to develop emergency plans to handle violent situations. School superintendents are then required to educate local communities about the plans. The plans spell out, among other things, how to evacuate schools, bring first aid and emergency resources to the scene,

and handle parents that want to pick up their children. The law also requires the development and implementation of a statewide school safety information policy, the reporting and compiling of certain school safety information, and the expulsion of pupils for certain assaults.

H.B. 4713 – Act 12 of Public Acts of 2014 February 2014:
The bill amends the Fire Prevention Code to modify school drill requirements. The bill also requires the governing body of a school to adopt and implement a school cardiac emergency response plan. The bill takes effect on July 1, 2014. Currently, a school that operates any of grades kindergarten through 12 must hold at least six fire drills and two "lockdown" drills during each school year. The bill requires a K-12 school to hold a minimum of five fire drills and three lockdown drills, according to a schedule prescribed in the bill. The Code requires a K-12 school to hold at least two tornado safety drills for each school year. Under the bill, at least one tornado safety drill would have to be held in March.

The bill would require the governing body of a K-12 school to ensure that documentation of a completed school safety drill was posted on its website (or on its intermediate school district's website) within 30 days of completing the drill, and maintained for at least three years. By September 15, the chief administrator of a K-12 school would have to give a list of scheduled drill days to the county emergency management coordinator, who would have to provide the information to the local emergency management coordinator, if any, and certain local officials. This information would be exempt from disclosure under the Freedom of Information Act. If a drill were not conducted as scheduled, it would have to be rescheduled and the chief administrator would have to notify the county emergency management coordinator of the rescheduled date. The governing body of a school that operates any of grades kindergarten through 12 would have to adopt and implement a cardiac emergency response plan for the school. The plan would have to address all of the following: use and maintenance of automated external defibrillators (AEDs), if available; activation of a cardiac emergency response team during an identified emergency; effective and efficient communication throughout the school campus; a training plan for the use of an AED and CPR techniques, in a school with grades 9 to 12; integration of the local emergency response system and emergency response agencies with the school's plan; and an annual review and evaluation of the cardiac emergency response plan.

Michigan Office of Safe Schools:
In 1998 the Michigan Legislature established the Michigan Office of Safe Schools within the Michigan Department of Education. The Office of Safe Schools began operating in October of 1999. Its mission is to collect and distribute information about school safety. The Office of Safe Schools maintains a web site that serves as a one-stop clearinghouse for information on school safety, school bus safety, food safety and current and proposed school safety legislation.
In March 2001, the Michigan Office of Safe Schools established a toll-free School Violence Hotline to provide a means for students to anonymously report specific threats of imminent school violence or other suspicious or criminal conduct. The toll-free hotline is operational 24-hours per day, 365 days a year, at 1-800-815-TIPS.

Michigan State Agencies:
Sabotage/terrorism is being addressed on a variety of other fronts within Michigan State Government. The Michigan Department of State Police oversees and coordinates state agency actions related to homeland security and terrorism response – including the investigation of suspected or potential criminal enterprises and activities that might involve sabotage or terrorism. In addition, the State Police (in

conjunction with other state agencies as well as federal and local counterparts) continuously prepares for terrorist incidents through emergency planning, training, information sharing and exercising efforts.

Weather Hazards (General)

National Weather Service Doppler Radar:

The National Weather Service (NWS) has completed a major modernization program designed to improve the quality and reliability of weather forecasting. The keystone of this improvement is Doppler Weather Surveillance Radar, which can more easily detect severe weather events that threaten life and property. The lead-time and specificity of warnings for severe weather have improved significantly. Doppler technology calculates both the speed and the direction of motion of severe storms. By providing data on the wind patterns within developing storms, the new system allows forecasters to better identify the conditions leading to severe weather such as tornadoes, severe straight-line winds, lightning and damaging hail. This means early detection of the precursors to severe storms, as well as information on the direction and speed of storms once they form.

National Weather Service Watches/Warnings:

The National Weather Service issues severe thunderstorm watches for areas when the meteorological conditions are conducive to the development of severe thunderstorms. People in the watch area are instructed to stay tuned to National Oceanic and Atmospheric Administration (NOAA) weather radio and local radio or television stations for weather updates, and watch for developing storms. Once radar or a trained Skywarn spotter detects the existence of a severe thunderstorm, the National Weather Service will issue a severe thunderstorm warning. The warning will identify where the storm is located, the direction in which it is moving and the time frame during which the storm is expected to be in the area. Persons in the warning area are instructed to seek shelter immediately. The State and local government agencies are warned via the Law Enforcement Information Network (LEIN), NOAA weather radio and the Emergency Managers Weather Information Network (EMWIN), EMNET. Public warning is provided through the Emergency Alert System (EAS), (IPAWS) Integrated Public Alert Warning System. The National Weather Service stations in Michigan transmit information directly to radio and television stations, which in turn pass the warning on to the public. The National Weather Service also provides detailed warning information on the Internet through the Interactive Weather Information Network (IWIN).

National Weather Service Education:

The National Weather Service issues severe thunderstorm watches and warnings when there is a threat of severe thunderstorms. However, lightning, by itself, is not sufficient criteria for the issuance of a watch or warning (every storm would require a watch or warning). The National Weather Service has an extensive public information program aimed at educating citizens about the dangers of lightning and ways to prevent lightning-related deaths and injuries, which is facilitated by local Emergency Management Programs.

Severe Weather Awareness Week:

Each spring, the Emergency Management Division, Michigan Department of State Police, in conjunction with the Michigan Committee for Severe Weather Awareness, sponsors Severe Weather Awareness Week. This annual public information and education campaign focuses on such severe weather events as tornadoes, thunderstorms, hail, high winds, flooding and lightning. Informational materials on

lightning hazards are disseminated to schools, hospitals, nursing homes, other interested community groups, facilities, and the public and internet.

Tornado National Weather Service Watches/Warnings:
The National Weather Service issues tornado watches for areas when the meteorological conditions are conducive to the development of a tornado. People in the watch area are instructed to stay tuned to NOAA weather radio and local radio or television stations for weather updates, and watch for developing storms. Once a tornado has been sighted and its existence is confirmed and reported, or Doppler Radar shows strong probability of the development or occurrence of a tornado, the National Weather Service will issue a tornado warning. The warning will identify where the tornado was sighted, the direction in which it is moving and the time frame during which the tornado is expected to be in the area. Persons in the warning area are instructed to seek shelter immediately.

The State and local government agencies are warned via the Law Enforcement Information Network (LEIN), National Oceanic and Atmospheric Administration (NOAA) weather radio and the Emergency Managers Weather Information Network (EMWIN), and EMNET. Public warning is provided through the Emergency Alert System (EAS), (IPAWS), and (CMAS) Commercial Mobile Alert System Using wireless towers. The National Weather Service stations in Michigan transmit information directly to radio and television stations, which in turn pass the warning on to the public. The National Weather Service also provides detailed warning information on the Internet, through the Interactive Weather Information Network (IWIN).

Tornado Warning Systems:
Outdoor warning siren systems warn the public about impending tornadoes and other hazards. Most of these systems were originally purchased to warn residents of a nuclear attack, but that purpose was expanded to include severe weather hazards as well. These systems can be very effective at saving lives in densely populated areas where the siren warning tone is most audible. In more sparsely populated areas where warning sirens are not as effective, communities are turning to NOAA weather alert warning systems IPAWS and Nixle to supplement or supplant outdoor warning siren systems. Some rural areas of Clare County are still in poor NOAA radio reception areas and limited cellular network coverage, these areas are encouraged to supplant with monitoring of local TV and Radio Broadcasts.

Michigan Office of Fire Safety:
The Michigan Department of Licensing and Regulatory Affairs' Office of Fire Safety is responsible for conducting fire safety and prevention inspections in state-regulated facilities and certain other facilities. Specific services provided include: 1) fire safety inspections of adult foster care, correctional and health care facilities, and hotels/motels; 2) plan review and construction inspections of the regulated facilities in item (1), as well as schools, colleges, universities, and school dormitories; 3) coordination of fire inspector training programs; and 4) coordination of fire alarm and fire suppression system installation in regulated facilities. These activities are important mitigation activities designed to save lives and protect property from structural fire hazards. The State Fire Safety Board, also housed within the Michigan Department of Licensing and Regulatory Affairs, Bureau of Construction Codes and Fire Safety, promulgates rules covering the construction, operation and maintenance of schools, dormitories, health care facilities, and correctional facilities. These rules are designed to protect life and property at these facilities from fire, smoke, hazardous materials and fire-related panic.

Fire Safety Rules for Michigan Dormitories:
Even before the Seton Hall University dormitory fire in January, 2000, the State Fire Safety Board took action to enhance the fire and life safety protection of Michigan's college and university dormitories. On December 21, 1999 two new sets of rules took effect governing the construction, operation, and maintenance of school, college and university instructional facilities and dormitories. These sets of rules were updated to meet the most current nationally recognized standards from the National Fire Protection Association. The new rules adopted the 1997 edition of NFPA 101, Life Safety Code. NFPA standards provide the minimum requirements necessary to establish a reasonable level of fire and life safety and property protection from hazards created by fire and explosion.

The new rules require, among other things, that fire sprinklers be installed in newly constructed dormitories or those undergoing major renovations. However, existing dormitories don't fall under the new rules and therefore do not have to be retrofitted unless they are being renovated.

Wild Fires
Because the vast majority of wildfires are caused by human activity, the Michigan Department of Natural Resources established, in 1981, the Michigan Interagency Wildfire Prevention Group. It was the first such group in the nation (promoting wildfire prevention and awareness) that had the full involvement of the state's fire agencies. In 1993, the Michigan Interagency Wildfire Prevention Group was expanded to form the Michigan Interagency Wildland Fire Protection Association (MIWFPA). The MIWFPA promotes interagency cooperation in fire prevention, training, fire technology, and firefighting operations. Members of the MIWFPA include the: 1) MDNR Forest Management Division; 2) USDA Forest Service - Huron Manistee, Hiawatha, and Ottawa National Forests; 3) USDI National Park Service - Pictured Rocks and Sleeping Bear Dunes National Lakeshores; 4) USDI Fish and Wildlife Service – Seney National Wildlife Refuge; 5) USDI Bureau of Indian Affairs; 6) Michigan Department of State Police – fire investigation; 7) Michigan State Firemen's Association; and the 8) Michigan Fire Chief's Association. The risk of wildfires is moderate. Clare County can reduce its vulnerability to wildfires by: 1) participating in multi-state and interagency mitigation efforts. Clare County has a (Designated Zone 4) Wildfire potential area designated by the MDNR and both State and Local Agencies have specific plans in place addressing this zone which is located in the North West section of Clare County.

Riverine and Urban Flooding

National Flood Insurance Program
For many years, the response to reducing flood damages followed a structural approach of building dams, levees and making channel modifications. However, this approach did not slow the rising cost of flood damage, plus individuals could not purchase insurance to protect themselves from flood damage. It became apparent that a different approach was needed. The National Flood Insurance Program (NFIP) was instituted in 1968 to make flood insurance available in those communities agreeing to regulate future floodplain development. As a participant in the NFIP, a community must adopt regulations that: 1) require any new residential construction within the 100-year floodplain to have the lowest floor, including the basement, elevated above the 100-year flood elevation; 2) allow non-residential structures to be elevated or dry flood proofed (the flood proofing must be certified by a registered professional engineer or architect); and 3) require anchoring of manufactured homes in flood prone areas. The community must also maintain a record of all lowest floor elevations or the elevations to which buildings in flood hazard areas have been flood proofed. In return for adopting floodplain management regulations, the federal government makes flood insurance available to the citizens of the community. In 1973, the NFIP was amended to mandate the purchase of flood insurance as a condition of any federally regulated, supervised or insured loan on any construction or building within the 100-year floodplain.

The following communities within Clare County are recognized by FEMA as participants in the National Flood Insurance Program: the cities of Clare and Harrison, the Village of Farwell, the townships of Franklin, Freeman, Garfield, Greenwood, Hayes, Redding, Summerfield and Surrey townships are currently signed into the NFIP program within Clare County. These communities have all had their floodplain areas officially mapped and are in compliance with the NFIP. There are eight (8) townships in the county, however, that are not yet signed into NFIP. They are Arthur, Frost, Grant, Hamilton, Hatton, Lincoln, Sheridan and Winterfield Townships.

Michigan Flood Hazard Regulatory Authorities:

Land Division Act, 591 P.A. 1996, as amended by 87 P.A. 1997:
The Land Division Act governs the subdivision of land in Michigan. The Act requires review at the local, County and state levels to ensure the land being subdivided is suitable for development. From a flood hazards viewpoint, a proposed subdivision is reviewed by the County Drain Commissioner for proper drainage, and for floodplain impacts by the Department of Environmental Quality, Land and Water Management Division.

Provisions of the Act and its Administrative Rules require that the floodplain limits be defined and prescribe minimum standards for developments for residential purposes and occupancy, within or affected by the floodplain. Restrictive deed covenants are filed with the final plat which stipulates that any building used, or capable of being used, for residential purposes and occupancy within or affected by the floodplain shall meet the following conditions:

- Be located on a lot having a buildable site of 3,000 square feet of area at its natural grade above the floodplain limit. (Lots with less than 3,000 square feet of buildable area may be filled to achieve that area.)

- Be served by streets within the proposed subdivision having surfaces not lower than one foot below the elevation defining the floodplain limits. Have lower floors, excluding basements, not lower than the elevation defining the floodplain limits. Have openings into the basement not lower than the elevation defining the floodplain limits.

- Have basement walls and floors below the elevation defining the floodplain limits, watertight and designed to withstand hydrostatic pressures. Be equipped with a positive means of preventing sewer backup from sewer lines and drains serving the building. Be properly anchored to prevent flotation. Floodplain Regulatory Authority, found in Water Resources, Part 31 of the Natural Resources and Environmental Act, 451 P.A. 1994, as amended.

The floodplain regulatory portion of Act 451 restricts residential occupation of high-risk flood hazard areas and ensures that other occupations do not obstruct flood flows. A permit is required from the Department of Environmental Quality for any occupation or alteration of the 100-year floodplain. In general, construction and fill may be permitted in the portions of the floodplain that are not floodway, provided local ordinances and building standards are met. (Floodways are the channel of a river or stream and those portions of the floodplain adjoining the channel which are reasonably required to carry and discharge the 100-year flood. These are areas of moving water during floods.) New residential construction is specifically prohibited in the floodway. Non-residential construction may be permitted in the floodway, although a hydraulic analysis may be required to demonstrate that the proposed construction will not harmfully affect the stage-discharge characteristics of the watercourse. The Act does

not apply to watersheds that have a drainage area of less than two square miles. Those small watersheds are considered to be local drainage systems, and do not fall under the Floodplain Regulatory Authority.

Soil Erosion and Sedimentation Control, Part 91 of the Natural Resources and Environmental Protection Act, 451 P.A. 1994, as amended:
This portion of the Act seeks to control soil erosion and protect the waters of the state from sedimentation. A permit is required for all earth changes that disturb one or more acres of land, as well as those earth changes that are within 500 feet of a lake or stream. The Act itself does not address flood hazards, per se. However, if sedimentation is not controlled, it can clog streams, block culverts, and result in continual flooding and drain maintenance problems.

Inland Lakes and Streams, Part 301 of the Natural Resources and Environmental Protection Act, 451 P.A. 1994, as amended:
This portion of the Act regulates all construction, excavation and commercial marina operations on the State's inland waters. It ensures that proposed actions do not adversely affect inland lakes, streams, connecting waters and the uses of all such waters. Structures are prohibited that interfere with the navigation and/or natural flow of an inland lake or stream. Though reduction of flooding is not a specific goal of this Act, minimizing restrictions on a stream can help to reduce flooding conditions.

Wetlands Protection, Part 303 of the Natural Resources and Environmental Protection Act, 451 P.A. 1994, as amended:
This portion of the Act requires a permit from the Department of Environmental Quality for any dredging, filling, draining or alteration of a wetland. This permitting process helps preserve, manages, and protect wetlands and the public functions they provide – including flood and storm water runoff control. The hydrologic absorption and storage capacity of the wetland allows wetlands to serve as natural floodwater and sedimentation storage areas. The Act recognizes that the elimination of wetland areas can result in increased downstream flood discharges and an increase in flood damage. Permits for wetland alterations are generally not issued unless there is no feasible alternative and the applicant can demonstrate that the proposal would not have a detrimental impact upon the wetland functions.

Natural Rivers Program, Part 305 of the Natural Resources and Environmental Protection Act, 451 P.A. 1994, as amended:
The Natural Rivers Act was originally passed in 1970, and has been incorporated as Part 305 of the Natural Resources and Environmental Protection Act. The purpose of this program is to establish and maintain a system of outstanding rivers in Michigan, and to preserve, protect, and enhance their multi-faceted values. Through the natural rivers designation process, a Natural River District is established (typically 400 feet either side of the riverbank) and a zoning ordinance is adopted. Within the Natural River District, permits are required for building construction, land alteration, platting of lots, cutting of vegetation, and bridge construction. Not all of the zoning ordinances on the natural rivers have the same requirements, but they all have building setback and vegetative strip requirements. Although the purpose is not specifically to reduce flood losses, by requiring building setbacks (in many cases prohibiting construction in the 100-year floodplain), flood hazard mitigation benefits can be realized.

Dam Safety, Part 315 of the Natural Resources and Environmental Protection Act, 451 P.A. 1994, as amended:
The Dam Safety Unit within the Land and Water Management Division, Department of Environmental Quality, has the primary responsibility to ensure dam safety within the state. Following the September, 1986 flood in central Lower Michigan, the current Dam Safety Act was passed to ensure that dams are built and maintained with necessary engineering and inspections for safety of the public and the environment. The Department of Environmental Quality is required to review applications involving

construction, reconstruction, enlargement, alteration, abandonment and removal for dams that impound more than five acres of water and have a height of six feet or more.

Manufactured Housing Commission Act, 96 P.A. 1987, as amended:
The Michigan Manufactured Housing Commission Act and its implementing Administrative Rules provide regulation on the placement of manufactured homes and establishes construction criteria. Manufactured homes are prohibited from being placed within a floodway, as determined by the Department of Environmental Quality. In addition, manufactured homes sited within a floodplain must install an approved anchoring system to prevent the home from being moved from the site by floodwaters (or high winds), and be elevated above the 100 year flood elevation.

Local River Management Act, 253 P.A. 1964:
Enacted in 1964, the Local River Management Act provides for the coordination of planning between local units of government in order to carry out a coordinated water management program. Implementation of the water management program occurs via the establishment of watershed councils. These councils conduct studies on watershed problems, water quality and the types of land uses occurring within the watershed. Watershed councils have the authority to develop River Management Districts for the purpose of acquisition, construction, operation and the financing of water storage and other river control facilities necessary for river management. The provision to allow acquisition of land adjacent to the river for the purpose of management aids in regulating development of land prone to flooding.

Floodplain Service Program:
The need to identify a flood hazard area before construction is essential to the goal of flood hazard mitigation. The Department of Environmental Quality regularly provides floodplain information to public and private interests as part of its Floodplain Service Program under the Land and Water Management Division. The goal of the program is to provide 100-year floodplain information to interested parties so that informed purchase or development decisions can be made. In addition to providing floodplain information, the MDEQ will provide information on land and water “interface” permit requirements and on building requirements relating to construction in flood hazard areas.

Dam Failures
Both the MDEQ and the Federal Energy Regulatory Commission (FERC) classify and regulate dams in Michigan. Under state and federal legislation, certain dam owners are required to develop a survey of the downriver area, develop flood-prone area maps and develop emergency action plans (EAPs).
Furthermore, the FERC requires the owners of such dams to exercise these plans; the MDEQ has initiated an effort to encourage owners of state-regulated dams to voluntarily perform exercises of their EAPs. In Michigan, well over 100 dams are covered by Emergency Action Plans. Dams in Michigan are regulated by Part 315 of The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Part 315, Dam Safety provides for the inspection of dams. This statute requires the MDEQ to rate each dam as either "high," "significant," or "low" hazard potential, according to the potential downstream impact if the dam were to fail (not according to the physical condition of the dam). The MDEQ has identified and rated over 2,400 dams. Dams over 6 feet in height that create an impoundment with a surface area of 5 acres or more are regulated by this statute. Dam owners are required to maintain an EAP for "high" and "significant" hazard potential dams. Owners are also required to coordinate with local emergency management officials to assure consistency with local emergency operations plans. Dams regulated by FERC, such as hydroelectric power dams, are generally exempt from this statute. The FERC licenses water power projects (including dams) that are developed by non-federal entities, including individuals, private firms, states and municipalities. Under provisions of the Federal Power Act and federal regulations, the licensee of the project must prepare an EAP. This plan must include a description of actions to be taken by the licensee in case of an emergency. Inundation maps showing approximate expected inundation

areas must also be prepared. Licensees must conduct a functional exercise at certain projects, in cooperation with local emergency management officials. Clare County Emergency Management currently has (3) Identified High Hazard Dams within the county and maintains copies of specific site plans for these sites in conjunction and cooperation with the dam owners and the State of Michigan.

Shoreline Flooding and Erosion
Not Applicable to CLARE - No Great Lakes Boundaries.

Drought
U.S. Geological Survey:
The U.S. Geological Survey (USGS) is the primary federal agency that collects and analyzes stream flow data, another good index of the relative severity of drought. The agency provides a handy "Drought Watch" web site at http://waterwatch.usgs.gov/.

The site presents a map that is continually updated through an automated analysis of USGS stream gauging stations. Additional drought-related links can be accessed through the Michigan-specific web page: http://waterwatch.usgs.gov/new/index.php?m=dryw&r=mi) by clicking on the map (or proceeding directly to the specific web page at http://mi.water.usgs.gov/midroughtwatch.php).

Fixed Site Hazardous Material Incidents (including explosions and industrial accidents)

Resource Conservation and Recovery Act - 42 U.S.C. s/s 6901 et seq. (1976)
RCRA (pronounced "rick-rah") gave EPA the authority to control hazardous waste from the "cradle to grave". This includes the generation, transportation, treatment, storage and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes. The 1986 amendments to RCRA enabled EPA to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances. RCRA focuses only on active and future. The Federal Hazardous and Solid Waste Amendments are the 1984 amendments to RCRA that required phasing out land disposal of hazardous waste. Some of the other mandates of this strict law include increased enforcement authority for EPA, more stringent hazardous waste management standards and a comprehensive underground storage tank program.

Within Clare County, efforts are ongoing to enhance general awareness and specialized training for HAZMAT emergencies.

Hazardous Material Transportation Incidents

Superfund Amendments and Reauthorization Act (SARA), Title III:
As explained earlier, the Bhopal, India tragedy initiated a chain of events aimed at enhancing preparedness activities to minimize the potential for a similar event to occur in the United States. On October 17, 1986 the Superfund Amendments and Reauthorization Act (SARA) was signed into law. A major SARA provision is Title III (the Emergency Planning and Community Right-To-Know Act, also known as SARA Title III), which establishes hazardous material emergency planning, reporting, and training requirements for federal, state and local governments, and private industry. In Michigan, the SARA Title III program is jointly administered and implemented by two state departments—the Michigan State Police and the Michigan Department of Environmental Quality.

Local Emergency Planning Committees (LEPC) – LPT Local Planning Team
One of the major provisions of SARA Title III is the establishment of Local Emergency Planning Committees (LEPCs) for designated planning districts. The LEPCs are responsible for developing emergency response

plans for communities that have facilities in their jurisdiction subject to SARA Title III emergency planning requirements. The LEPC is the primary mechanism through which local SARA Title III planning, training and exercising activities are implemented. Michigan has 88 designated LEPCs – one for each of the 83 counties and 5 in major cities. Nearly 2,800 facilities across the state have been identified as being subject to Title III emergency planning provisions. A facility is subject to SARA Title III provisions if extremely hazardous substances (as determined by the U.S. Environmental Protection Agency) are present at the facility in quantities at or above the minimum threshold quantities established in Section 302 of the Act. The map at the end of this section provides a breakdown of Title III (Section 302) sites by county.

Note: Many of the programs and initiatives designed to mitigate, prepare for, respond to, and recover from fixed- site hazardous material incidents have the dual purpose of also protecting against hazardous material transportation incidents.

Federal Hazardous Material Transportation Regulations:

The transportation, manufacturing, storage and disposal processes for hazardous materials are highly regulated by federal and state agencies in order to reduce risk to the public. At the federal level, the U.S. Department of Transportation, Office of Hazardous Materials Safety (USDOT/OHMS), is the regulating agency for all modes of hazardous material transportation. In addition to enforcing federal hazardous material transportation regulations, the USDOT/OHMS is also involved in a number of other areas aimed at improving the safety of hazardous material shipping. Those areas include: 1) research and development of improved containment/packaging and other technological aspects of hazardous material shipping; 2) interagency coordination efforts in hazardous material transportation planning and standards setting; 3) management of data information systems pertaining to hazardous material transportation; and 4) development of hazardous material safety training policies and programs.

In Michigan, the Motor Carrier Division, Department of State Police, oversees, coordinates and implements the commercial truck safety aspects of the USDOT regulations. The Michigan Department of Transportation oversees programs aimed at enhancing railroad safety and improving the rail infrastructure (which helps reduce the likelihood of a hazardous material rail transportation accident).

Hazardous Materials Transportation Uniform Safety Act:

The federal Hazardous Materials Transportation Uniform Safety Act (HMTUSA), enacted in 1990, provides funding for the training of emergency responders and the development of emergency response plans for both fixed site facilities and transportation-related incidents. (This funding mechanism under the HMTUSA is referred to as Hazardous Material Emergency Preparedness [HMEP] grants.) In Michigan, the HMTUSA/HMEP program is coordinated and implemented by the Emergency Management Division, Department of State Police. Since the program's inception, over $326,000 in grants have been allocated to 80 Michigan communities for hazardous material planning and training activities.

Federal/State Hazardous Material Response Resources:

There are numerous groups at the federal, state and local levels and in private industry that are trained to deal with hazardous material fixed-site and transportation incidents. These groups include the National Response Team (NRT), Regional Response Teams (RRTs), and state and local hazardous material response teams. The Chemical Manufacturers Association established the Chemical Transportation Emergency Center (CHEMTREC) to provide 24-hour technical advice to emergency responders. The National Response Center (NRC), which operates much like CHEMTREC, was established to provide technical advice and coordinate federal response to a hazardous material incident.

In Michigan, a 24-hour statewide notification system called the Pollution Emergency Alerting System (PEAS) was established for reporting chemical spills to the Department of Environmental Quality. As a companion to the PEAS, the Michigan Department of Agriculture (MDA) has established a 24-hour Agriculture Pollution Emergency Hotline for use by agrichemical users to report fertilizer and pesticide spills. Callers to the MDA hotline gain immediate access to appropriate technical assistance, regulatory guidance for remediation, and common sense approaches for addressing the problem.

Oil and Natural Gas Well Accidents

Local Emergency Capability:
Communities that may be affected by oil or natural gas well accidents should have adequate procedures in their Emergency Operations Plans to address the unique types of problems associated with this hazard, including rescue and evacuation. Affected communities must work closely with company officials and surrounding jurisdictions to ensure compatibility of procedures for a fast, coordinated response. Mitigation possibilities include the use of community zoning regulations to provide suitable open, unoccupied "buffer" areas around refineries and compressor stations. Michigan Department of Environmental Quality regulations provide for buffer zones around wells and treatment and storage facilities.

Pipeline Accidents (Petroleum and Natural Gas)

MPSC Pipeline Safety Inspections:
Safety engineers from the MPSC are certified by the USDOT/OPS to conduct inspections on natural gas pipelines to ensure structural and operational integrity of the systems. If violations are found, the pipeline company can be ordered to take corrective actions; in addition, the pipeline operator may be fined. The MPSC safety engineers also respond to accidents involving natural gas pipelines (to ensure compliance with federal and state law and to offer technical assistance to emergency responders).

Protection of Underground Facilities Act / MISS DIG/ 811 Programs:
Michigan's first line of defense against pipeline and other utility line breaks from construction excavation is The "MISS DIG" / 811 Program established with the passage of Act 53 in 1974 – The Protection of Underground Facilities. MISS DIG/ 811 System, Inc., is a 24-hour utility communications system that helps contractors comply with the state law (Act 53) which requires notification of utilities at least three working (but not more than 21 calendar) days before commencing excavation, tunneling, demolishing, drilling or boring procedures, or discharging explosives for a project. When properly administered and followed, the MISS DIG/ 811 safety system does an excellent job of minimizing pipeline and utility line accidents.

Programs and Initiatives:
Pipeline jurisdiction and oversight in Michigan is complex, determined primarily by the type and function of a pipeline and its location. Agencies involved include 1) the MPSC Gas Safety Office; 2) the USDOT/OPS in Kansas City, Missouri; and 3) the Michigan Department of Environmental Quality, Geological Survey Division (MDEQ/GSD). The table below is a breakdown of jurisdictional and inspection responsibilities for the various types of pipelines present in Michigan:

Pipeline Safety Regulation in Michigan

TABLE 3.6

Pipeline Type	Jurisdiction	Applicable Code	Inspected by
Inter-state natural gas	USDOT/OPS	49 CFR Part 192	MPSC Gas Safety Intrastate
Inter-state natural gas	State of MI/MPSC	Michigan Gas Safety Standards	MPSC Gas Safety
Liquid Petroleum	USDOT/OPS	49 CFR Parts 193/195	USDOT/OPS
Gathering Lines*	MDEQ/GSD	Oil/Gas Administrative rules under Part 165, 1994 P.A. 451	
*Note: Gathering lines are run from a production facility (i.e., well) to a pre-processing plant (i.e., dehydration facility, separator, compression station). Source: Michigan Public Service Commission, Gas Safety Office			

Local Emergency Capability:
Procedures in the Emergency Operations Plans address the unique types of problems associated with this hazard, including specific functions such as rescue and evacuation. Communities work closely with company officials and surrounding jurisdictions to ensure a fast, coordinated response. Mitigation possibilities include the use of community zoning regulations to provide suitable open, unoccupied "buffer" areas around pipelines, storage fields, refineries and compressor stations.

Nuclear Power Plant Accidents
Mitigation of nuclear power plant hazards on the local County level is primarily limited to the detection of radiation, alerting the public, and providing directions for evacuation and/or housing – the latter three issues are addressed in other sections of this mitigation action item section of the mitigation plan.

Infrastructure Failures

Infrastructure Failures in Clare County
There have been no significant infrastructure failures in 3.6lare County. Typically the infrastructure failures occur when there are thunderstorms, ice storms, or wind storms and power lines are downed. In most cases the power is restored in a matter of hours but in some cases power has been out for a week at a time in parts of the County.

Most of Clare County's infrastructure failures are secondary hazards caused by other major events such as floods, windstorms, snow and ice storms. The main infrastructure failures are power outages, which are normally restored in a matter of hours. Clare County EMD maintains short term shelter agreements for multiple sites. However, if the power were out for a longer period of time, the local chapter of the American Red Cross would be called to set up temporary shelters.

Water/Electrical Infrastructure Failure
The Federal Clean Water Act regulates the discharge from community wastewater collection and treatment systems. The regulatory aspects of the Act that pertain to municipalities have been delegated to the MDEQ Surface Water Quality Division for surface water discharge facilities, and the MDEQ Waste Management Division for groundwater discharge facilities. Authority for the oversight of planning, facility

design review, and construction permitting of sewerage systems collection, transportation and treatment facilities, is derived from Part 41 of the Michigan Natural Resources and Environmental Protection Act (451 P.A. 1994) and Administrative Rules promulgated under authority of Part 41. The two MDEQ divisions assist communities with the development and maintenance of their wastewater collection and treatment systems. In addition, they monitor and regulate these systems to ensure pollution abatement and health conditions are met. Although the regulatory authority vested in the MDEQ is primarily aimed at preventing pollution of waters of the state, there are requirements in place under 451 P.A. 1994 regarding the design, construction, and operational integrity and reliability of wastewater collection and treatment systems. A collaboration between Clare County EMD and ITC Power Transmission Corporation continues and materials are updated annually and share with responders.

Electrical system

Disaster-related damage to electric power facilities and systems is a concern that is being actively addressed by utility companies across the state. Detroit Edison, Consumers Energy and other major electric utility companies have active, ongoing programs to improve system reliability and protect facilities from damage by wind, snow and ice, and other hazards. Typically, these programs focus on trimming trees to prevent encroachment of overhead lines, strengthening vulnerable system components, protecting equipment from lightning strikes, and placing new distribution systems underground. The Michigan Public Service Commission (MPSC) monitors power system reliability to help minimize the scope and duration of power outages.

Telecommunications System

Like electric utility companies, telecommunications companies are concerned with the issue of protecting facilities and systems from disaster-related damage. Major telecommunications companies have programs to improve system reliability and physically protect facilities and system components from wind, snow and ice, and other hazards, utilizing many of the same techniques as the electric utility companies.

Surface Drainage Systems:

Michigan's first drain laws appeared on the books as Territorial laws – years before Michigan achieved statehood. After attaining statehood in 1837, the State passed its first drain law in 1839. Since that time, there have been 45 separate acts passed regarding drainage, up to the most recent re-codification of drain law in 1956. Since 1956, the present drain code has been amended over 200 times – an indication of how important and dynamic the issue of drainage continues to be in Michigan. The Michigan Drain Code provides for the maintenance and improvement of the vast system of intra-County (County) and intercounty drainage facilities. Each drain has a corresponding special assessment district (watershed), a defined route and course, an established length, and is conferred the status of a public corporation with powers of taxation, condemnation, ability to contract, hold, manage and dispose of property, and to sue and be sued. Drainage districts and drains are established by petition of the affected landowners and/or municipalities. County drains, with a special assessment district entirely within the County, are administered by the locally elected County Drain Commissioner. Inter-County drains, with a special assessment district in more than one County, are administered by a drainage board that consists of the drain commissioners of the affected counties, and is chaired by the Director of the Michigan Department of Agriculture (MDA) or an MDA Deputy Director.

Water Distribution Systems:

Michigan's public water supplies are regulated under the Federal Safe Drinking Water Act. The Michigan Department of Environmental Quality (MDEQ), as a primary agency for the Federal government, provides supervision and control of Michigan's public water supplies (including their operation and physical improvements) under the Michigan Safe Drinking Water Act (399 P.A. 1976).

The MDEQ Drinking Water and Radiological Protection Division regulates, through a permit process, the design, construction and alteration of public water supply systems. Water supply construction must be conducted within the framework of the Michigan Safe Drinking Water Act, as well as the Architecture, Professional Engineering and Land Surveying Act (240 P.A. 1937, which requires professional engineering preparation of construction documents for water works construction costing over $15,000). Most communities in Michigan, including Clare have, in conjunction with the MDEQ, developed water system master plans that conform to the requirements of the Michigan Safe Drinking Water Act. From a hazard mitigation standpoint, that is important because it helps ensure that all new water system construction and alterations to existing systems will conform to the minimum standards set in the Act. While not making water infrastructure "disaster-proof", the standards provide at least a basic level of design, structural and operational integrity to new or renovated portions of a community's water supply system.

Public Health Emergencies

Michigan Department of Community Health:
The Director of the Department of Community Health, and local public health officers, have the authority (under the Michigan Public Health Code—1978 PA 368, as amended) to take those steps determined necessary and prudent to prevent epidemics and the spread of hazardous communicable diseases, or to effectively mitigate other conditions or practices that constitute a menace to public health. The Director and local public health officers can issue written orders to implement the required preventive steps and/or responses, and those orders can be enforced through the imposition of civil and criminal penalties for failure to comply. State and local health departments have detailed, written emergency operations plans that address public health emergencies.

U.S. Centers for Disease Control and Prevention:
At the national level, the U.S. Centers for Disease Control and Prevention (CDC), a branch of the Department of Health and Human Services, has the responsibility and authority to investigate public health emergencies to determine their cause, probable extent of impact, and appropriate mitigation measures. The CDC can also assist state and local public health officials in establishing health surveillance and monitoring systems/programs, and in disseminating information on prevention and treatment to the general public. The CDC announced dedicated funding for bioterrorism response, and Michigan has been strengthening its surveillance and intervention infrastructures with these funds. Since 2001, the CDC has also provided dedicated funding for public health emergency preparedness programs. In 2002, the MDCH Office of Public Health Preparedness was established to oversee these cooperative agreements. In the 2009 Influenza A (H1N1) event, CDC coordinated with numerous health departments across the country, tracked influenza cases, and provided information about outbreak trends. Tests were also performed, to verify whether flu cases were indeed of the correct type.

Michigan Pandemic Influenza Plan:
In October 2009, the Michigan Department of Community Health updated the "Michigan Pandemic Influenza Plan," to provide response guidelines for an influenza pandemic affecting Michigan. Although the plan cannot eliminate the disease, it will aid in reducing the impact by enabling state and local agencies to anticipate, prepare for, and respond efficiently and effectively to the disease. The plan, which is divided into pre-pandemic, pandemic, and post-pandemic phases, details necessary activities at the state and local level related to:

- command and management,
- crisis communications,
- surveillance,

- laboratory testing,
- community containment,
- infection control in health care facilities,
- vaccines and antivirals/medical management,
- data management,
- border/travel issues
- recovery

The Michigan Pandemic Influenza Plan is available for review and downloading at www.michigan.gov/flu.

Transportation Accidents

Air Transportation:
The Michigan Aeronautics Commission of the MDOT administers several programs aimed at improving aviation safety and promoting airport development. The Commission's safety programs include: 1) registering aircraft dealers, aircraft, and engine manufacturers; 2) licensing airports and flight schools; 3) inspecting surfaces and markings on airport runways; and 4) assisting in removal of airspace hazards at airports. The Commission's airport development program includes providing state funds for airport development and airport capital improvements – many of which contribute to overall air transportation safety. The Federal Aviation Administration (FAA) contracts with the MDOT for the inspection of the state's 238 public- use airports on an annual basis. The FAA has regulatory jurisdiction over operational safety and aircraft worthiness. The National Transportation Safety Board (NTSB) investigates all aircraft crashes that involve a fatality and publishes reports on its findings (see the NTSB section below).

Bus Safety:
School bus safety programs and initiatives generally fall into two categories: 1) driver skill enhancement, competency training and 2) physical inspections of bus mechanical and safety equipment. The Motor Carrier Division, Michigan Department of State Police, inspects all school buses and other school transportation vehicles (21,000 units) on an annual basis. In addition, all school bus drivers in Michigan must take and pass a bus driver education and training program, and then take regular refresher courses to maintain their certification to operate a school bus. School bus drivers must also pass an annual medical examination.

CHAPTER 4: HAZARD ANALYSIS

Natural Hazards-Summer Weather

HAIL

Condition where atmospheric water particles from thunderstorms form into rounded or irregular lumps of ice that falls to the earth.

Hazard Description

Hail is a product of strong thunderstorms. Hail is formed when strong updrafts within the storm carry water droplets above the freezing level, where they remain suspended and continue to grow larger until their weight can no longer be supported by the winds. They finally fall to the ground, battering crops, denting autos, and injuring wildlife and people. As one of these thunderstorms passes over, hail usually falls near the center of the storm, along with the heaviest rain. Most hailstones range in size from a pea to a golf ball, but hailstones larger than baseballs have been reported. Large hail is a characteristic of severe thunderstorms, and it may precede the occurrence of a tornado.

Hailstorms in Clare County

37 Hail events were reported by the National Climatic Data Center (NCDC) for Clare County, Michigan between 01/01/1950 and 12/31/2015. There were a total of 10 events that produced damages, with a total of $575,000 in damages being reported. No deaths or injuries were reported as a result of these storms. However, the data from these events is incomplete as not all damages that occurred have been reported.

Hail Overview

Clare County averages approximately 30 thunderstorms per year, but only about 5-6 storms per decade produce hail. However, there has been an increase in hail storms being reported with 30 of the 37 storms occurring within the past 25 years. Clare County is a moderate risk county for these events to be impactful and the event is considered to be a severe weather activity, which was given a high priority to address.

LIGHTNING

The discharge of electricity from within a thunderstorm.

Hazard Description

Most direct impacts from lightning are relatively site-specific in scope, and therefore do not have a tremendous impact on the community as a whole. With the temperature of a bolt of lightning approaching 50,000 degrees Fahrenheit in a split second, the most common direct damage from lightning is fire. The most common indirect effect of lightning is power outages. This indirect effect can have an impact on a much larger segment of the community, leaving hundreds and sometimes thousands of homes without electricity.

Globally, there are about 2,000 thunderstorms occurring at any given time, and those thunderstorms cause approximately 100 lightning strikes to earth each second. In the United States, approximately 100,000 thunderstorms occur each year, and every one of those storms generates lightning. It is

commonplace for a single thunderstorm to produce hundreds or even thousands of lightning strikes. However, to the majority of the public, lightning is perceived as a minor hazard. That perception lingers despite the fact that lightning damages many structures and kills and injures more people in the United States per year, on average, than tornadoes or hurricanes. Many lightning deaths and injuries could be avoided if people would have more respect for the threat lightning presents to their safety.

Statistics compiled by the National Oceanic and Atmospheric Administration (NOAA) and the National Lightning Safety Institute (NLSI) for the period 1959-1994 revealed the following about lightning fatalities, injuries and damage in the United States:

Location of Lightning Strikes:

- 40% are at unspecified locations
- 27% occur in open fields and recreation areas (not golf courses)
- 14% occur to someone under a tree (not on golf course)
- 8% are water-related (boating, fishing, swimming, etc.)
- 5% are golf related
- 3% are related to heavy equipment and machinery
- 2.4% are telephone-related
- 0.7% are radio, transmitter and antenna-related

The NLSI estimates that 85% of lightning victims are children and young men (ages 10-35) engaged in recreation or work-related activities. Approximately 20% of lightning strike victims die, and 70% of survivors suffer serious long-term after-effects such as memory and attention deficits, sleep disturbance, fatigue, dizziness and numbness.

Lightning Events in Clare County

Historically, the State of Michigan is near the top in the U. S. among states in both deaths and injuries resulting from lightning. A major reason for this is that Michigan is a destination location for outdoor activities during the summer months, the prime time for lightning strikes. However, Clare County has not had experienced a large number of these events in recent years. One (1) lightning event was reported by the National Climatic Data Center (NCDC) for Clare County, Michigan between 01/01/1950 and 12/31/2015. The estimated damages were in the amount of $5,000; however, the data from this event is incomplete as not all damages that occurred were reported.

On 7/30/1996 lightning struck a scrap yard igniting a fire at a scrapyard. The burning pile contained over 200,000 tires, which resulted in a noxious smell. A pole bard burned down as a result of the fire.

Thunderstorm Hazards – Lightning Overview

Only one (1) lightning event has been recorded in Clare County over the past 60 years. Clare County is a moderate risk area for lightning events even though Statewide Michigan is considered to be a high risk area for these events. Even though Clare County has not experienced many lightning strike events, it is possible that future events could still occur. Lightning strikes are considered to be a severe weather activity, which was given a high priority to address.

TORNADOS

A violently whirling column of air extending downward to the ground from a cumulonimbus cloud.

Hazard Description

Tornadoes in Michigan are most frequent in spring and early summer when warm, moist air from the Gulf of Mexico collides with cold air from the Polar Regions to generate severe thunderstorms. These thunderstorms often produce tornadoes. A tornado may have winds up to 300 miles per hour and an interior air pressure that is 10 to 20 percent below that of the surrounding atmosphere. The typical length of a tornado path is approximately 16 miles, but tracks up to 200 miles have been reported. Tornado path widths are generally less than one-quarter mile wide. Historically, tornadoes have resulted in tremendous loss of life, with a national average of 111 deaths per year. Property damage from tornadoes is in the hundreds of millions of dollars every year in the United States.

Tornado Intensity

Tornado intensity is measured on the Enhanced Fujita Scale, which examines the damage caused by a tornado on homes, commercial buildings, and other man-made structures. The Enhanced Fujita Scale rates the intensity of a tornado based on damage caused, not by its size. It is important to remember that the size of a tornado is not necessarily an indication of its intensity. Large tornadoes can be weak, and small tornadoes can be extremely strong. It is very difficult to judge the intensity and power of a tornado while it is occurring. Generally, that can only be done after the tornado has passed (see scale below).

The Enhanced Fujita Scale of Tornado Intensity

TABLE 4.1

EF-Scale Number	Intensity Description	Wind Speed (mph)	Type/Intensity of Damage
EF-0	Gale tornado	65-85 mph	**Light damage**. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF-1	Moderate Tornado	86-110 mph	**Moderate damage.** The lower limit is the beginning of hurricane wind speed; roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF-2	Strong Tornado	111-135 mph	**Considerable damage.** Roofs torn off well-constructed houses; foundation of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF-3	Severe Tornado	136-165 mph	**Severe damage.** Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; foundations blown away some distance.

EF-4	Devastating tornado	166-200 mph	**Devastating damage.** Whole frame houses, well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF-5	Incredible Tornado	200 mph+	**Incredible damage**. Strong frame houses lifted off foundations and carried considerable distances; automobile sized missiles fly through the air in excess of 100 meters; high-rise buildings have significant structural deformation; incredible phenomena will occur

Source: Storm Prediction Center

Tornado Events in Clare County

Eight (8) TORNADO(s) were reported in Clare County, Michigan between 01/01/1950 and 05/31/2015. Of these eight tornadoes, two had EF-1 ratings, and the remaining 6 had EF-0 ratings. Reported damages resulting from the 8 tornadoes totaled less than $300,000 with no injuries or deaths to report.

On 10/6/1998 low topped convection produced a tornado and wet microbursts along with bands of heavy rain and minor flooding. Damages were estimated in Clare County to be $200,000, with over $1.4 million in estimated damage throughout the State of Michigan.

Tornadoes Overview

Clare County has experienced eight tornadoes over the past 60+ years or about one (1) every eight years. However, this number has increased in recent years and tornadoes are becoming more prevalent in mid-Michigan. With the changing climate this trend is expected to continue if not increase at a greater rate. Tornadoes are considered to be a severe weather activity, which was given a high priority to address.

SEVERE WINDS

Non-tornadic winds 58 miles per hour (mph) or 50.4 knots per hour (kph) or greater.

Hazard Description

Severe winds, or straight-line winds sometimes occur during thunderstorms and other weather systems, and can be very damaging to communities. Often, when straight-line winds, occur, the presence of the forceful winds, with velocities over 58 mph (50.4 kph) may be confused with a tornado occurrence. Severe winds have the potential to cause loss of life, property damage, and flying debris, but tend not to cause as many deaths as tornadoes do. However, the property damage from straight-line winds can be more widespread than a tornado, usually affecting multiple counties at a time. In addition to property damage to buildings, there is a risk for infrastructure damage from downed power lines due to falling limbs and trees. Large scale power failures are common during straight-line wind events.

Severe winds spawned by thunderstorms and other weather events can have devastating effects in terms of loss of life, injuries, and property damage. According to data compiled by the National Weather Service Michigan has experienced over 9,000 severe wind events (not including tornadoes) that resulted in 122 deaths and millions of dollars in damage since 1970. Severe wind events are characterized by wind velocities of 58 mph or greater, with gusts sometimes exceeding 74 mph (hurricane velocity), but do not include tornadoes.

Wind Events in Clare County

89 severe wind events were reported by the National Climatic Data Center (NCDC) for Clare County, Michigan between 01/01/1950 and 012/31/2015. While many of these events occurred during thunderstorms, they were not limited to thunderstorm activity. There were two deaths and two injuries as a result of these storms. In addition over $50 million in property and crop damages were also reported.

On 6/17/1994 thunderstorm winds did damage in Hamilton Township damaging several buildings. One man was injured when a tree fell on his vehicle. Tornadoes were reported, but none were confirmed.

On 7/13/95 thunderstorm winds did widespread tree damage across all but extreme southeast Clare County, with well over 100 trees down. Most of the trees brought down were the largest and healthiest, as they had the highest tops and heaviest foliage. Widespread damage to residences, cottages, garages, and vehicles was caused by falling trees, while the winds damaged and destroyed docks and boats on the lee shores of county lakes. Consumers Power Company estimated over 100 miles of phone and power lines were downed in the County and electrical service remained out to thousands of homes and cottages for periods ranging from a few days to over a week. Average wind gusts in most areas were estimated to be in the 65-80 mph range. There was over $50 million in damages that resulted from this storm.

Two deaths also resulted from this storm. The first was an 11-year old female, accompanied by four family members was killed when the pontoon boat she was in flipped while returning to its dock. She became trapped under the boat and rescue efforts were delayed by blocked roads in the area. The second was a man riding the ORV trails of St. Helen with his wife when they were stranded by trees brought down by the winds. The man suffered a heart attack and as his wife sought assistance she was delayed due to the downed trees. He was found dead when she returned with assistance.

On 7/18/2010 a line of showers and thunderstorms moved through Central Lower Michigan early in the afternoon followed by sunshine, creating an unstable atmosphere. Thunderstorms redeveloped late in the afternoon. One home east of Prudenville was struck by a fallen tree, injuring a man on the porch. He suffered minor injuries from broken glass. There was also over $20,000 in damages as a result of the storm.

On 11/17/2013 Clare County was heavily damaged by a straight line wind event with numerous trees down. Roads were blocked and utility outages for as long as eight days. Shelters were opened and Clare County was under a local State of Emergency for two days until local needs were met. Local fire and law enforcement agencies were impacted by increased call and resource needs, outside county/region assistance was needed for such tasks as damage assessment. Total damages were estimated to be greater than $2.5 million dollars, as three homes were totally destroyed and twelve heavily damaged.

On 12/23 thru 12/29/2015 High Winds of 60MPH+ accompanied by heavy sleet, rain and snowfall caused numerous trees and subsequent utility failures throughout Clare County. Power outages lasted for up to 5 days in some areas and local public safety agencies were inundated with calls for assistance. Clare County Emergency Management assisted several shut-ins and specific needs requests. Several roads were blocked for short periods of time and utility crews from multiple states assisted. Although Clare County did not have to declare a disaster many agencies had their budgets impacted by additional overtime and resources used. Additionally many businesses were forced to close and a significant economic loss resulted. Damage estimates are $150,000.

Severe Winds Overview

Clare County has experienced 89 severe wind events in 60+ years, which is more than one event per year. Additionally, more than 66 percent of the events have occurred in the past 20 years, which may indicate a changing weather pattern and more severe wind events could be anticipated. Figures from the National Weather Service indicate that severe winds occur more frequently in the southern half of the Lower Peninsula than any other area in the State. On an average, severe wind events can be expected 3-4 times per year in the northern Lower Peninsula. These figures refer to winds from thunderstorms and other forms of severe weather not tornadoes.

The recent trend in weather conditions has been an increase annual severe winds in Clare County. Severe winds are considered to be a severe weather activity, which was given a high priority to address.

FOG

Condensed water vapor in cloudlike masses lying close to the ground and limiting visibility.

Hazard Description

Fog forms near the ground when water vapor condenses into tiny liquid water droplets that remain suspended in the air. Many different processes can lead to the formation of fog, but the main factor is saturated air. Two ways that air can become saturated are by cooling it to its dew point temperature or by evaporating moisture into it to increase its water vapor content. Although most fog, by itself, is not a hazard because it does not actually apply destructive forces, the interaction between humans and fog can be a dangerous situation, sometimes resulting in disastrous consequences.

Hazard Analysis

In considering severe and high-impact meteorological events, attention can easily become focused on the more dramatic storms. Tornadoes and hurricanes for example, are readily recognized by the general public and the meteorological community alike for their devastating consequences. Fog, on the other hand, does not lend itself as readily to this categorization.

Fog can be very dangerous because it reduces visibility. Although some forms of transport can penetrate fog using radar, road vehicles have to travel slowly and use more lights. Localized fog is especially dangerous, as drivers can be caught by surprise. Fog is particularly hazardous at airports, where some attempts have been made to develop methods (such as using heating or spraying salt particles) to aid fog dispersal. These methods have seen some success at temperatures below freezing.

Fog Overview

No major events have occurred in Clare County in recent years. One major fog event is estimated to occur in Michigan approximately every two years. Property damage can be significant for vehicles, although real property and structures are usually unaffected. Thus, while fog has not impacted the residents of Clare County in recent years, it is not unforeseeable that fogs could impact Clare County in the future. However, fog is not considered to be a severe weather event and was not given a high priority to address.

EXTREME TEMPERATURES (HEAT)

Prolonged periods of very high temperatures, often accompanied by exacerbating conditions such as high humidity and lack of rain.

Hazard Description

Extreme temperatures – whether it be extreme heat or extreme cold – share a commonality in that they both primarily affect the most vulnerable segments of society such as the elderly, children, impoverished individuals, and people in poor health. The major threats of extreme heat are heatstroke (a major medical emergency), and heat exhaustion. Extreme heat is a more serious problem in urban areas, where the combined effects of high temperature and high humidity are more intense.

Clare County is susceptible to extreme heat. The temperate climate of southern Michigan, combined with the unsettling effect of Lake Huron, make for extreme deviations in temperature. 50-degree swings in the temperature in a 24-hour period are not uncommon. These events occur regularly depending on the year. Prolonged periods of extreme heat can pose severe and often life-threatening problems for Clare County's citizens. Extreme summer weather is characterized by a combination of very high temperatures and humid conditions. When persisting over a long period of time, this phenomenon is commonly called a heat wave. The major threats of extreme summer heat are heatstroke (a major medical emergency), and heat exhaustion. Heatstroke often results in high body temperatures, and the victim may be delirious, stuporous, or comatose. Rapid cooling is critical to preventing permanent neurological damage or death. Heat exhaustion is a less severe condition than heatstroke, although it can still cause problems involving dizziness, weakness and fatigue. Heat exhaustion is often the result of fluid imbalance due to increased perspiration in response to the intense heat. Treatment generally consists of restoring fluids and staying indoors in a cooler environment until the body returns to normal. Other, less serious risks associated with extreme heat are often exercise-related and include heat syncope (a loss of consciousness by persons not acclimated to hot weather), and heat cramps (an imbalance of fluids that occurs when people unaccustomed to heat exercise outdoors).

Extreme Heat Events in Clare County

2 extreme heat events were reported by the National Climatic Data Center (NCDC) for Clare County, Michigan between 1/1/1950 and 12/31/2015.

On 6/18/95 temperatures across north-central Lower Michigan flirted with or exceeded the century mark for three consecutive days as a ridge of high pressure became firmly entrenched over the upper Midwest and Great Lakes Region. Houghton Lake set new record high temperatures with 95 degrees on June 18, 103 on June 19, and 100 on June 20. Officially, both record-breaking maximums on June 19 and 20 were the highest temperatures recorded at Houghton Lake since the summer of 1936, and it also represented the first time since July 13 and 14 of 1936 that the temperature hit 100 degrees or higher in two consecutive days.

Excessive Heat was also a problem the first two weeks in August across all of northern Michigan. Temperatures reach the mid to upper 90s, on average, a few days each year; however, for a 5 day (8/5 - 8/9) stretch overnight low temperatures failed to fall below the lower 70s in most areas. This very humid air mass was unusual for northern Michigan, an area that typically sees cool nighttime temperatures and for this reason has very few homes with air conditioners. No heat related deaths or injuries were reported; however, most outdoor events were modified due to the forecasts of hot and humid conditions. County fairs sent animals home, yet still there were livestock losses at fairs in Otsego and Alcona counties. Attendance at county fairs was well below normal and this was attributed to the heat

Extreme Heat Overview

There have been only two recorded events in the past 60+ years or about 1 every 30 years. While there have been minimal excessive heat conditions, high heat events occur annually in Clare County and are a risk to the resident and visitors. Air conditioning is probably the most effective measure for mitigating the effects of extreme summer heat on people. Unfortunately, many of those most vulnerable to this hazard (children, elderly, and homeless individuals, and the critically ill) do not have access to air-conditioned environments. Excessive heat is considered to be a severe weather event, which was given a high priority to address.

Natural Hazards-Winter Weather

ICE/SLEET STORMS

A storm that generates sufficient quantities of ice or sleet to result in hazardous conditions and/or property damage.

Hazard Description

Ice storms are sometimes incorrectly referred to as sleet storms. Sleet is similar to hail only smaller and can be easily identified as frozen rain drops (ice pellets) which bounce when hitting the ground or other objects. Sleet does not stick to trees and wires, but sleet in sufficient depth does cause hazardous driving conditions. Ice storms are the result of cold rain that freezes on contact with the surface, coating the ground, trees, buildings, overhead wires and other exposed objects with ice, sometimes causing extensive damage. When electric lines are downed, households may be without power for several days, resulting in significant economic loss and disruption of essential services in affected communities.

Ice and Sleet Storms in Clare County

A total of four ice/sleet storms were reported by the NCDC for Clare County, Michigan between 1/1/1950 and 12/31/2015. No damages were estimated as a result of these storms; however, the data from these events is incomplete as not all damages that may have occurred has been reported.

On 12/23 thru 12/29/2015 High Winds of 60MPH+ accompanied by heavy sleet, rain and snowfall caused numerous trees and subsequent utility failures throughout Clare County. Power outages lasted for up to 5 days in some areas and local public safety agencies were inundated with calls for assistance. Clare County Emergency Management assisted several shut-ins and specific needs requests. Several roads were blocked for short periods of time and utility crews from multiple states assisted. Although Clare County did not have to declare a disaster many agencies had their budgets impacted by additional overtime and resources used. Additionally many businesses were forced to close and a significant economic loss resulted. Damage estimates were $150,000.

Ice and Sleet Storms Overview

While there have been only four reported ice storms reported over the past 60+ years, all reported storms have occurred within past 15 years, which may indicate a changing weather pattern. This may make these storms more likely to occur in the future. One of the biggest problems resulting from ice and sleet storms is loss of power. The weight of the ice causes power lines to snap and break. Sometimes it can take days to restore power. If this happens temporary shelters may need to be set up. The local chapter of the American Red Cross would be called. Also with the power loss would come loss of heat, which could cause

death from hypothermia especially with the elderly population. Another problem caused by ice and sleet storms would be debris cleanup. The weight of the ice could cause tree limbs to snap and break.

Approximately 87% of ice storms occur during the months of January, February, March and April, when conditions are most conducive for the development of ice and sleet. Ice/sleet storms are considered to be severe weather events, which were given a high priority to address.

SNOWSTORMS

A period of rapid accumulation of snow often accompanied by high winds, cold temperatures, and low visibility.

Hazard Description

As a result of being surrounded by the Great Lakes, Michigan experiences large differences in snowfall in relatively short distances. The annual mean accumulation ranges from 30 to 170 inches of snow. The highest accumulations are in the northern and western parts of the Upper Peninsula. In Lower Michigan, the highest snowfall accumulations occur near Lake Michigan and in the higher elevations of northern Lower Michigan.

Blizzards are the most dramatic and perilous of all snowstorms, characterized by low temperatures and strong winds (35+ miles per hour) bearing enormous amounts of snow. Most of the snow accompanying a blizzard is in the form of fine, powdery particles that are wind-blown in such great quantities that, at times, visibility is reduced to only a few feet. Blizzards have the potential to result in property damage and loss of life. Just the cost of clearing the snow can be enormous.

The western Upper Peninsula experiences the most snowstorms in Michigan each year. The western half of the Lower Peninsula also experiences a relatively large number of snowstorms. One reason for this is the "lake effect", a process by which cold winter air moving across Lakes Michigan and Superior picks up moisture from the warmer lake waters, resulting in significant snowfall amounts in the western part of the state.

Snowstorms in Clare County

There have been a total of 51 events in the snowstorm category (blizzards, winter storms, winter weather, and heavy snows) from 1/1/1950 to 12/31/2015. No damages or human-related injuries were reported as a result of these storms; however, the data from these events is incomplete as not all damages that may have occurred were reported. Following are examples of the different types of snowstorms in this category that have affected the County.

On 2/27/1997 a surface low tracking across the lower Great Lakes and an upper low crossing northern lower Michigan combined to bring heavy snows to the region. Snow occasionally fell at the rate of 1 to 2 inches per hour. Strong winds combined with snow to cause significant blowing and drifting…with near whiteout conditions at times. Total snowfall across the county ranged from 6 to 10 inches.

On 1/2 to 1/3/1999 an intense winter storm which developed over the southern plains lifted northeastward across lower Michigan from the evening of the 2nd through the morning of the 3rd producing blizzard conditions across the region. Winds increased steadily during Saturday the 2nd…with heavy snow starting to lift across northern lower Michigan during the afternoon and early evening hours.

The snow reached eastern upper Michigan overnight. System snows tapered off during the morning of the 3rd. Snowfall totals generally ranged from 8 to 14 inches across Chippewa and Mackinac counties of eastern upper Michigan. Across northern lower Michigan…snowfall totals generally ranged from 10-to 18 inches…with localized totals around 20 inches. Wind gusts of around 35 mph were common during the peak of the storm…with some gusts of 40 to 50 mph reported along Lake Huron shoreline where winds were onshore. The strong winds caused extensive blowing and drifting of the snow and greatly limited visibilities. Drifts as high as 6 to 8 feet were reported across portions of the region. The heavy snow reduced visibilities and widespread blowing and drifting caused very hazardous driving conditions. Many side roads remained impassable into the 4th.

On 2/08/2001 south winds intersecting a warm front that extended across the southern Great Lakes region triggered an area of heavy snow across portions of northern lower Michigan. The snowfall began late in the evening on the 7th. However, the snowfall did not become heavy until the early morning hours of the 8th. By noon on the 8th, 12-hour snowfall amounts totaled greater than 6 inches across portions of northern lower Michigan. The heaviest snow fell across northern Roscommon, Ogemaw and Iosco Counties, where accumulations ranged from 12 to 15 inches.

On 11/10 to 11/11/2006 a potent upper level disturbance produced a period of intense snowfall across most of northern lower Michigan, centered on the evening of the 10th. Thunder and lightning accompanied the snow for several hours. The snow was very sloppy and wet, with snow-to-liquid ratios being around 6 to 1. Thus, though the precipitation was heavy, snowfall amounts were generally only 3 to 6 inches, or a bit under the warning criteria. However, the weight of the snow brought down a number of tree limbs and power lines across the region. Parts of Presque Isle, Wexford, and Missaukee Counties were without power for 48 hours.

On 2/1/2011 to 2/2/2011 a major storm brought 18 inches of snow to Farwell with blizzard conditions throughout Clare County and much of the southwest lower Michigan. Wind gusts in excess of 49 mph and drifts up to 5 feet were reported. The event was considered a 1 in 10 year event.

On 12/23 thru 12/29/2015 High Winds of 60MPH+ accompanied by heavy sleet, rain and snowfall caused numerous trees and subsequent utility failures throughout Clare County. Power outages lasted for up to 5 days in some areas and local public safety agencies were inundated with calls for assistance. Clare County Emergency Management assisted several shut-ins and specific needs requests. Several roads were blocked for short periods of time and utility crews from multiple states assisted. Although Clare County did not have to declare a disaster many agencies had their budgets impacted by additional overtime and resources used. Additionally many businesses were forced to close and a significant economic loss resulted. Damage estimates are $150,000.

Snowstorms Overview

Of the reported 51 snowstorms in Clare County, 90 percent have occurred in past 20 years or 2.5 storms per year. With the changing weather patterns, this trend of multiple annual events is expected to continue. Clare Severe snowstorms affect every Michigan community. While the number of events has not resulted in a large number of deaths/injuries in Clare County, due to the nature of these events snowstorms are considered to be severe weather events, which were given a high priority to address.

EXTREME TEMPERATURES (COLD)

Prolonged periods of very low temperatures, often accompanied by exacerbating conditions such as heavy snowfall and high winds.

Hazard Description

Extreme temperatures – whether it be extreme heat or extreme cold – share a commonality in that they both primarily affect the most vulnerable segments of society such as the elderly, children, impoverished individuals, and people in poor health. The major threats of extreme cold are hypothermia (also a major medical emergency) and frostbite.

Clare County is susceptible to extreme cold. The temperate climate of southern Michigan, combined with the unsettling effect of Lake Huron, make for extreme deviations in temperature. 50-degree swings in the temperature in a 24-hour period are not uncommon. These events occur regularly depending on the year.

Prolonged periods of extreme cold can pose severe and often life-threatening problems for Clare County's citizens. Like heat waves, periods of prolonged, unusually cold weather can result in a significant number of temperature-related deaths. Each year in the United States, approximately 700 people die as a result of severe cold temperature-related causes. This is substantially higher than the average of 170 heat related deaths each year. It should be noted that a significant number of cold-related deaths are not the direct result of "freezing" conditions. Rather, many deaths are the result of illnesses and diseases that are negatively impacted by severe cold weather, such as stroke, heart disease and pneumonia. It could be convincingly argued that, were it not for the extreme cold temperatures, death in many cases would not have occurred at the time it did from the illness or disease alone.

Hypothermia (the unintentional lowering of core body temperature), and frostbite (damage from tissue being frozen) are probably the two conditions most closely associated with cold temperature-related injury and death. Hypothermia is usually the result of over-exposure to the cold, and is generally thought to be clinically significant when core body temperature reaches 95 degrees or less. As body temperature drops, the victim may slip in and out of consciousness, and appear confused or disoriented. Treatment normally involves re-warming the victim, although there is some controversy in the medical community as to exactly how that should be done. Frostbite rarely results in death, but in extreme cases it can result in amputation of the affected body tissue.

Extreme Cold Events in Clare County

2 extreme cold events were reported by the National Climatic Data Center (NCDC) for Clare County, Michigan between 1/1/1950 and 12/31/2015.

On 2/4 to 2/5/2007 exceptionally old air surged into Northern Michigan. High temperatures on the 4th were around zero, with low temperatures that night from five to ten below zero. Gusty northwest winds produced hazardous wind chills of 20 to 30 below zero, along with blowing and drifting snow. Many area schools closed on the 5th, due to the extreme cold and poor road conditions.

On 1/6 to 1/7/2014 one of the most brutal cold air outbreaks in recent memory-the coldest since at least January 1994-plunged into the Great Lakes region. Near-to below-zero temperatures were accompanied by blustery northwest winds. Away from the warming influence of Lake Michigan, wind chills sunk to 30

below or colder. The coldest wind chills were observed were 44 below near Cedarville, 39 below near Engadine, 36 below at Sault Ste Marie, and 33 below at West Branch and Houghton Lake. All of these were reached in the morning hours of the 7th. As a result, school closings were widespread across northern Michigan on the 7th.

Extreme Cold Overview

Within the past 60+ years only two reported severe cold events have occurred; however, both have occurred in the past ten years, which is consistent with the changing weather patterns that have taken place. While these reported events have been minimal in nature, they can be expected to occur at a more frequent rate than 1 every 30 years. While there have been minimal conditions with excessive cold, cold events occur annually in Clare County and are a risk to the residents. Unfortunately, many of those most vulnerable to this hazard (children, elderly, and homeless individuals, and the critically ill) may not have access to sufficiently heated environments. Excessive cold is considered to be a severe weather event, which was given a high priority to address.

Hydrological Hazards

DAM FAILURES

The collapse or failure of an impoundment (water held back by a dam) resulting in downstream flooding.

Hazard Description

A dam failure can result in loss of life and extensive property or natural resource damage for miles downstream from the dam. Dam failures occur not only during flood events, which may cause overtopping of a dam, but also as a result of misoperation, lack of maintenance and repair, or vandalism. A common form of dam failure occurs when tree roots disrupt the integrity of an earthen dam. Water can pass through the dam where the soil has been broken apart by the roots. Such failures can be catastrophic because they occur unexpectedly, with no time for evacuation.

In Michigan, all dams over 6 feet high that create an impoundment with a surface area of more than 5 acres are regulated by Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act (451 P.A. 1994), as amended. This statute requires the Michigan Department of Environmental Quality (DEQ) to rate each dam as either a low, significant, or high hazard potential this rating system is based solely on the potential downstream impact if the dam were to fail, and is not according to the physical condition of the dam.

The National Inventory of Dams lists 15 dams within Clare County with three being identified as High Hazard Dams. The definition for this rating by Michigan Law (Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act) is as follows:

“High hazard potential dam” means a dam located in an area where a failure may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways, or class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life.

Dam Failures in Clare County

On 4/15/2014, the Wraco Lodge Dam collapsed causing water to flow into an already flooded Muskegon River. The dam was considered to be a low risk dam as this additional water caused the wash out of several roads, but did not cause any damage to property or harm to human life. As a result the Owl Lake earthen dam in Freeman Township Clare County failed causing lakeshore and road flooding that lasted for several days. During this same period Clare County was impacted along the Muskegon River basin in Redding Township and several cabins flooded and the roadways to access them total damages were estimated at $150,000.

Dam Failure Flooding Overview

According to the National Inventory of Dams Clare County has three dams that are rated as High Hazard Potential Dams. The three high hazard potential dams that are located in Clare County are: Shamrock Lake Dam, Surrey Lake Dam, and Lake 13 Dam. The Federal Emergency Response Commission (FERC) has emergency planning oversight of the dams. Dam owners are required to maintain an emergency action plan (EAP) for significant and high hazard potential dams. Owners are also required to coordinate with local emergency management officials to assure consistency with local emergency operations plans. Dam failures have been given a medium priority to address.

RIVERINE FLOODING

The overflow of rivers, streams, drains and lakes due to excessive rainfall, rapid snowmelt or ice jams and dam failures.

Hazard Description

Flooding of land adjoining the normal course of a stream or river has been a natural occurrence since the beginning of time. If these floodplain areas were left in their natural state, floods would not cause significant damage. Development has increased the potential for serious flooding because rainfall that used to soak into the ground or take several days to reach a river or stream via a natural drainage basin now quickly runs off streets, parking lots, and rooftops, and through man-made channels and pipes.

Floods can damage or destroy public and private property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and result in fatalities. People may be stranded in their homes for several days without power or heat, or they may be unable to reach their homes at all. Long-term collateral dangers include the outbreak of disease, widespread animal death, broken sewer lines causing water supply pollution, downed power lines, broken gas lines, fires, and the release of hazardous materials.

Most riverine flooding occurs in early spring and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Ice jams also cause flooding in winter and early spring. Severe thunderstorms may cause flooding during the summer or fall, although these are normally localized and have more impact on watercourses with smaller drainage areas. Oftentimes, flooding may not necessarily be directly attributable to a river, stream or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall and/or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. That type of flooding is becoming increasingly prevalent in Michigan, as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow. Flooding also occurs due to combined storm and sanitary sewers that cannot handle the tremendous flow of water that often accompanies storm

events. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns.

Ice Jams

Cold winters like those we experience in Clare County can produce thick river ice and the potential for ice jams. An ice jam develops when pieces of snow and ice buildup along a river. As the ice buildup increases, water passes slowly, and flooding develops behind the dam of ice. Water levels can also rise rapidly when temperatures rise and result in snowmelt runoff or rain, thus adding more water to the river behind an ice jam.

In the spring, or when temperatures rise, the ice buildup will thaw and break up, and may unleash all of the damned up water in a short period of time. When this occurs, flooding can rapidly result downstream from the ice jam. The combination of ice, debris, and water released from the ice jam can cause tremendous physical damage to homes, docks, and other structures.

Monthly Mean Precipitation (liquid equivalent in inches) in Clare County, 1929-2015

TABLE 4.2

Month	Clare County	
	1929-2000	2001-2015
January	1.86	1.88
February	1.33	1.64
March	2.21	1.82
April	2.76	3.82
May	3.00	3.98
June	3.38	3.58
July	2.95	3.12
August	3.38	3.06
September	3.53	2.80
October	2.88	3.18
November	2.67	2.46
December	1.97	2.21
Annual Average	31.90	33.55

Source: National Weather Service

Citing the information above, there is a slight increase in precipitation from the last fifteen years over the previous 70 years. However, there is not enough data to warrant a concern in the change in precipitation. (The usual time period for determining averages is 30 years.)

Riverine Flooding in Clare County

Three (3) flood incidents were reported by the NCDC for Clare County, Michigan between 1/1/1950 and 12/30/2015. Two of the three events were considered to be major events.

On 5/20/2004 persistent rain and embedded thunderstorms produced heavy rain in part of central and lower Michigan causing numerous floods through 6/3/2004. While there were no injuries or deaths reported as a result of the flooding, the NCDC reported an estimated $1 million in personal property losses.

In April 2013 rain fell throughout lower Michigan. An estimated 5 inches of rainfall fell from April 17-18th. While no personal injuries were recorded, many streams and rivers flooded throughout the County and over $3 million in personal property damages were estimated by the NCDC. The Owl Lake earthen dam in Freeman Township failed causing lakeshore and road flooding that lasted for several days. During this same time period Clare County was impacted along the Muskegon River Basin in Redding Township and several cabins flooded along with the roadways to access them. Total damages were estimated at $150,000.

Riverine and Urban Flooding Overview

Currently there are eight townships, two cities, and one village in Clare County that are participating in the National Flood Insurance Program (NFIP). In order to maintain their participation in the NFIP ordinances have been adopted that prohibit new construction within floodplains and modifications to existing buildings within floodplains have to be approved by a certified floodplain manager within the County.

Flooding was given a moderate priority by the County, but was identified as a major hazard by the City of Clare, which has experienced numerous floods from Tobacco River, which has resulted in a high priority project to mitigate the flooding in downtown Clare. According to information received from FEMA, Clare County has no repetitive loss properties.

DROUGHTS

"A water shortage caused by a deficiency of rainfall, generally lasting for an extended period of time."

Hazard Description

Drought is the consequence of a reduction in the amount of precipitation that was expected over an extended period of time, usually a season or more in length. The severity of a drought depends not only on its location, duration, and geographical extent, but also on the water supply demands made by human activities and vegetation.

A drought can cause many severe hardships for communities and regions. Probably one of the most common and severe impacts to a community like Clare County would be the threat of wildfires as sixty-three percent of the County is forests. Also there would be a drop in the quantity and quality of agricultural crops. Other negative impacts that can be attributed to a drought include water shortages for human consumption, industrial, business and agricultural uses, recreation and navigation, declines in water quality in lakes, streams and other natural bodies of water, malnourishment of wildlife and livestock,

increases in fires and wildfire related losses to timber, homes, and other property, increases in wind erosion, and declines in tourism in areas dependent on water-related activities.

These direct impacts can further result in indirect impacts to a community, such as reduced revenue due to income losses in agriculture, retail, tourism and other economic sectors; declines in land values due to physical damage from the drought conditions and decreased functional use of the property, and possible loss of human life due to extreme heat, fire, and other heat-related problems.

Two common measurement tools of dry weather conditions are the Palmer Drought Indices (including the Palmer Drought Severity Index and the Palmer Hydrological Drought Index) and the Crop Moisture Index. The Palmer Drought Severity Index is a good long-term drought monitoring tool. It is a monthly index that indicates the severity of a wet or dry spell. This index is based on average temperature and rainfall information for a particular location in a formula to determine dryness. It uses a value of 0 for the normal amount of rainfall in a particular location, and drought is shown in terms of negative numbers, for example, minus 2 is moderate drought, minus 3 is severe drought, and minus 4 is extreme drought. Any value above 0 demonstrates that there has been above normal amounts of precipitation. This index can be used for indicating lake levels and surface water supply abnormalities but is not all that good for monitoring climatic impacts on vegetation, especially crops.

The Crop Moisture Index (CMI) evaluates short-term moisture conditions across crop producing regions. The CMI measures how much moisture is in the plant root zone of the soil. This index is based on the mean temperature and total precipitation that occurs each week, as well as the CMI from the previous week. The CMI changes as quickly as the weather changes. A heavy rainstorm can dramatically change the CMI for a region. Since this index changes so quickly and in response to a single weather event, the CMI is not considered a good long-term drought measurement tool.

Droughts/Drought Related Events in Clare County

While drought occurs periodically, in Clare County, the Palmer Drought Index indicated drought conditions reached extreme severity only 2% of the time. There were no drought events reported in Clare County between 1/1/1950 and 12/31/ 2015.

Drought Overview

Even though there were no reported droughts in the 65 year reporting period, the changing weather patterns increase the chances of future droughts to exist. The changing patterns have more extreme weather conditions that may include drier summer seasons. As 70 percent of Clare County consists of forested lands, the biggest problem drought presents is the increased threat of wildfire. A drought impacted landscape could quickly turn a small fire into a raging out of control blaze. Wildfires could destroy homes, businesses, and other property located in the County's rural residential areas.

A drought could also impact the agricultural areas of the County, alter the quantity and quality of crops, livestock and other agricultural activities, resulting in severe economic and social hardships throughout the County.

Transportation Hazards

TRANSPORTATION ACCIDENTS: AIR, LAND, AND WATER

A crash or accident involving an air, land or water-based commercial passenger carrier resulting in death or serious injury.

Hazard Description-Air Transportation Accidents

There are four circumstances that can result in an air transportation accident:

1. An airliner colliding with another aircraft in the air.
2. An airliner crashing while in the cruise phase of a flight due to mechanical problems, sabotage, or other cause.
3. An airliner crashing while in the takeoff or landing phases of a flight.
4. Two or more airliners colliding with one another on the ground during staging or taxi operations.

The Michigan Aeronautics Commission of the Michigan Department of Transportation administers several programs aimed at improving aviation safety and promoting airport development. The Commission's safety programs include:

1. Registering aircraft dealers, aircraft, and engine manufacturers.
2. Licensing airports and flight schools.
3. Inspecting surfaces and markings on airport runways.
4. Assisting in removal of airspace hazards at airports.

The Commission's airport development program includes providing state funds for airport development and airport capital improvements – many of which contribute to overall air transportation safety.

The Federal Aviation Administration (FAA) contracts with the Michigan Department of Transportation for the inspection of the state's 238 public-use airports on an annual basis. The FAA has regulatory jurisdiction over operational safety and aircraft worthiness. The National Transportation Safety Board (NTSB) investigates all aircraft crashes that involve a fatality and publishes reports on its findings. (See the NTSB section below).

When responding to any of these types of air transportation accidents, emergency personnel may be confronted with a number of problems, including:

1. Suppressing fires.
2. Rescuing and providing emergency first aid for survivors.
3. Establishing mortuary facilities for victims.
4. Detecting the presence of explosive or radioactive materials.
5. Providing crash site security, crowd and traffic control, and protection of evidence.

Hazard Description-Land Transportation Accidents

A land transportation accident in Michigan could involve a commercial intercity passenger bus, a local public transit bus, a school bus, passenger vehicles, or an intercity passenger train. Although these modes of land transportation have a good safety record, accidents do occur. Typically, the bus slipping off a roadway in inclement weather, or colliding with another vehicle causes bus accidents. Intercity passenger train accidents usually involve a collision with a vehicle attempting to cross the railroad tracks before the

train arrives at the crossing. Unless the train accident results in a major derailment, serious injuries are usually kept to a minimum. Bus accidents, on the other hand, can be quite serious – especially if the bus has tipped over. Numerous injuries are a very real possibility in those types of situations.

School bus safety programs and initiatives generally fall into two categories:

1. Driver skill enhancement and competency training.
2. Physical inspections of bus mechanical and safety equipment.

The Motor Carrier Division, Michigan Department of State Police, inspects all school buses and other school transportation vehicles (21,000 units) on an annual basis. In addition, all school bus drivers in Michigan must a take and pass a bus driver education and training program, and then take regular refresher courses to maintain their certification to operate a school bus. School bus drivers must also pass an annual medical examination.

Local transit and intercity bus safety falls under the purview of the Michigan Department of Transportation's Bureau of Urban and Public Transportation. Generally, the issue of intercity and transit bus safety is handled on a partnership basis with the service providers, with MDOT providing oversight of the initiatives undertaken by the providers to ensure mechanical and operational safety.

The Michigan Department of Transportation is the state regulatory agency for railroad-highway grade crossing safety issues. In this role, MDOT conducts biennial, on-site crossing reviews for Michigan's 5,535 public crossings, and reports observed crossing maintenance deficiencies to the responsible railroad or roadway authority. In addition, MDOT conducts diagnostic study team reviews at selected crossings to determine whether the current level of warning device requires enhancement. At the present time, 42% of Michigan's public crossings have at least automatic side-of-street flashing light signals, and 16% have automatic gates.

In January 2001 an amendment (367 P.A. 2000) to the Michigan Vehicle Code went into effect allowing the MSP, MDOT, or specified local officials to install video cameras at railroad crossings to serve as a deterrent to motorists who might attempt to go around or through activated railroad crossing lights and gates. Although the ultimate purpose of this law is to reduce pedestrian and vehicular deaths and injuries at railroad crossings, the law will also likely reduce passenger train accidents caused by collisions with vehicles on the tracks – a major cause of many passenger train derailments.

Michigan's "Operation Lifesaver" Coalition – part of a national, non-profit education and awareness program dedicated to ending tragic collisions, fatalities and injuries at highway-rail grade crossings and on railroad rights of way- has helped reduce the number of serious crashes at railroad crossing in the state. The Operation Lifesaver coalition in Michigan is spearheaded by the MSP and MDOT and is comprised of state and local government officials, law enforcement, and employees of the railroad companies operating in Michigan. The Operation Lifesaver program emphasizes education and enforcement and its efforts appear to be working. Since 1996, the number of crashes, injuries, and fatalities at railroad crossing in Michigan has shown a steady decline. Any reduction in vehicle-train crashes at railroad crossings helps reduce the likelihood of a passenger transportation accident involving a train, school bus, local transit bus, or commercial intercity passenger bus.

Another MDOT program that can help improve rail safety is the Michigan Rail Loan Assistance Program. Established under Act 117, P.A. 1997, this program was initiated to help finance capital improvements on Michigan's rail infrastructure. Although the program is designed primarily to help preserve and improve

rail freight service, any improvements made to the rail infrastructure that serves passenger rail service can only help improve passenger rail safety. Track rehabilitation is one of the eligible projects that can be funded under this program, and the safety value of a project is one of the primary selection criteria. (The Clare County transportation map is included in Chapter 3.)

Hazardous Material Incidents

HAZARDOUS MATERIAL INCIDENTS - TRANSPORTATION

An uncontrolled release of hazardous materials during transport, capable of posing a risk to health, safety, property or the environment.

Hazard Description

As a result of the extensive use of chemicals in our society, all modes of transportation – highway, rail, air, marine, and pipeline – are carrying thousands of hazardous materials shipments on a daily basis through local communities. A transportation accident involving any one of those hazardous material shipments could cause a local emergency affecting many people.

Michigan has had numerous hazardous material transportation incidents that affected the immediate vicinity of an accident site or a small portion of the surrounding community. Those types of incidents, while problematic for the affected community, are fairly commonplace. They are effectively dealt with by local and state emergency responders and hazardous material response teams. Larger incidents, however, pose a whole new set of problems and concerns for the affected community. Large-scale or serious hazardous material transportation incidents that involve a widespread release of harmful material (or have the potential for such a release) can adversely impact the life safety and/or health and well-being of those in the immediate vicinity of the accident site, as well as those who come in contact with the spill or airborne plume. In addition, damage to property and the environment can be severe as well. Statistics show almost all hazardous material transportation incidents are the result of an accident or other human error. Rarely are they caused simply by mechanical failure of the carrying vessel.

Hazardous Material Incidents: Transportation Overview

Although there have not been any significant hazardous materials transportation incidents, there have been many minor petroleum and hazardous materials spills throughout the years. Most major highways within the county are primarily two lanes and interstates. These routes are heavily congested in the summer months and often icy or impassible in the winter. It is certainly only a matter of time before a serious hazardous materials incident occurs on a county roadway, railway, or waterway.

OIL/GAS WELL INCIDENT

An uncontrolled release of oil or gas, or the poisonous by-product hydrogen sulfide, from wells.

Hazard Description

Oil and natural gas are produced from fields scattered across 63 counties in the Lower Peninsula. Since 1925 over 44,000 oil and natural gas wells have been drilled in Michigan, of which roughly half have produced oil and gas. To date, Michigan wells have produced approximately 1.4 billion barrels of crude oil and 4 trillion cubic feet of gas.

The petroleum and natural gas industry is highly regulated and has a fine safety record, but the threat of accidental releases, fires and explosions still exists. In addition to these hazards, many of Michigan's oil and gas wells contain extremely poisonous hydrogen sulfide (H2S) gas. Hydrogen sulfide is a naturally occurring gas mixed with natural gas or dissolved in the oil or brine and released upon exposure to atmospheric conditions. Over 1,300 wells in Michigan have been identified as having H2S levels exceeding 300 parts per million (ppm).

As the table below indicates, at concentrations of 700 ppm, as little as one breath of hydrogen sulfide can kill. Although hydrogen sulfide can be detected by a "rotten egg" odor in concentrations from .03 ppm to 150ppm, larger concentrations paralyze a person's olfactory nerves so that odor is no longer an indicator of the hazard. Within humans, small concentrations can cause coughing, nausea, severe headaches, irritation of mucous membranes, vertigo, and loss of consciousness. Hydrogen sulfide forms explosive mixtures with air at temperatures of 500 degrees Fahrenheit or above, and is dangerously reactive with powerful oxidizing materials. Hydrogen sulfide can also cause the failure of high-strength steels and other metals. This requires that all company and government responders be familiar not only with emergency procedures for the well site, but also with the kinds of materials that are safe for use in sour gas well response.

Physiological Response to H2S

TABLE 4.3

10ppm	Beginning eye irritation
50-100 ppm	Slight conjunctivitis and respiratory tract irritation after 1 hour exposure
100 ppm	Coughing, eye irritation, loss of sense of smell after 2-15 minutes. Altered respiration, pain in the eyes and drowsiness after 15-30 minutes followed by throat irritation after 1 hour. Several hours of exposure results in gradual increase in severity of these symptoms and death may occur within the next 48 hours.
200-300 ppm	Marked conjunctivitis and respiratory tract irritation after 1 hour of exposure.
500-700 ppm	Loss of consciousness and possibly death in 30 minutes to 1 hour.
700-1000 ppm	Rapid unconsciousness, cessation of respiration and death.
1000-2000 ppm	Unconsciousness at once, with early cessation of respiration and death in a few minutes. Death may occur even if the individual is removed to fresh air at once.

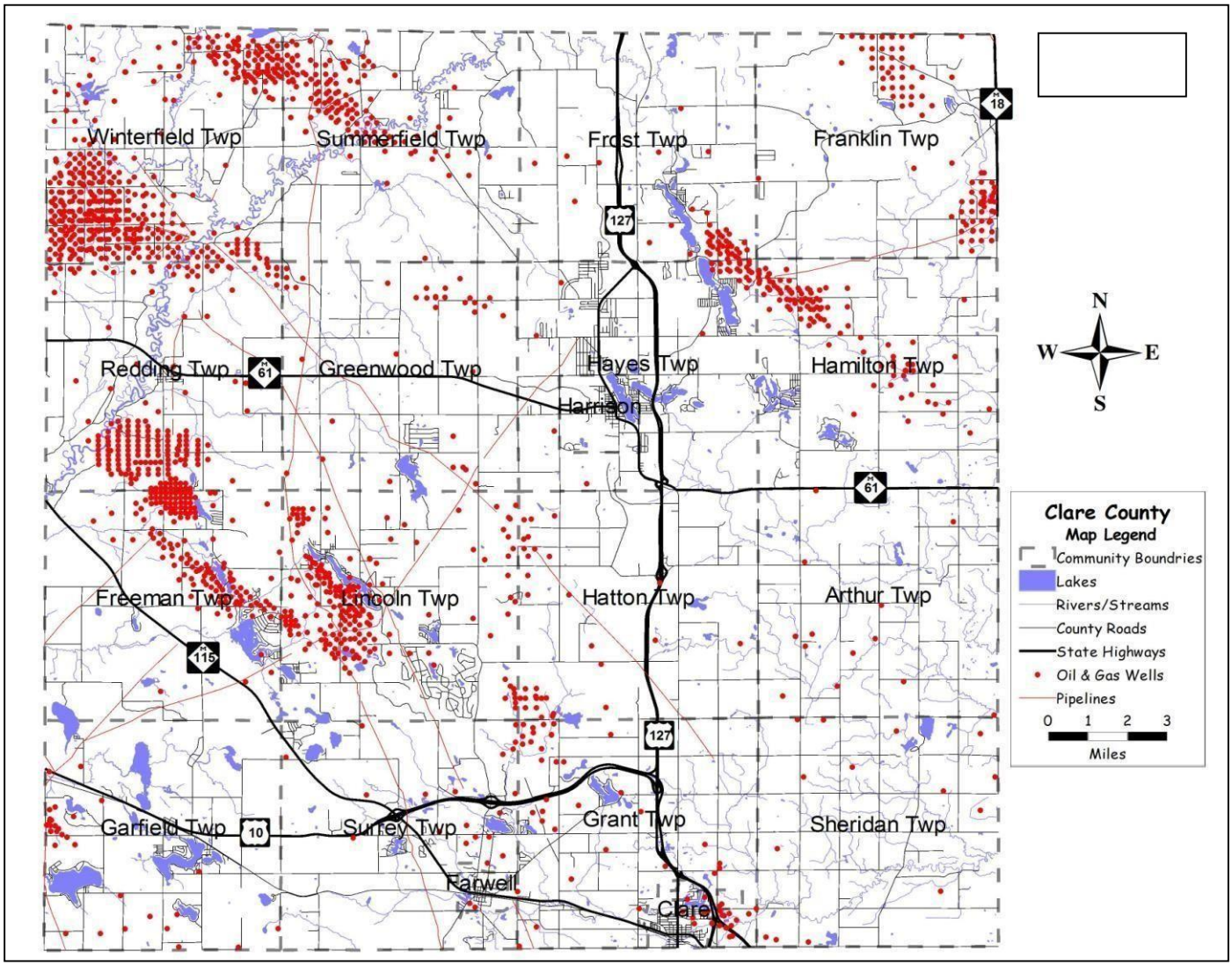
Oil and Gas Well Accidents Overview

There are 443 oil and natural gas wells in Clare County along with 35.2 miles of gas pipeline. This is a relatively small quantity when compared with state leader, Otsego County, with over 5700 wells. Of almost as great a concern is the fact that a combination of multiple organizations and individuals own the wells. As a general rule, most gas companies prefer to respond to incidents involving their wells themselves – and in the vast majority of cases that is what happens. Because gas companies often have controlled burns, and deal with wells on a daily basis, it is impossible to ascertain how many incidents have actually occurred in the county. However, there is still the possibility that an emergency response agency could find themselves in the situation of responding to an incident at a gas well. Responders must

understand the dangers associated with HS2 and must have a working knowledge of these wells that are in their areas of responsibility.

Clare County Oil and Gas Wells

MAP 4.1



Petroleum and Natural Gas Pipeline Accidents

An uncontrolled release of petroleum or natural gas, or the poisonous by-product hydrogen sulfide, from a pipeline.

Hazard Description

Though often overlooked, petroleum and natural gas pipelines pose a real threat in many Michigan communities. Petroleum and natural gas pipelines can leak or fracture and cause property damage, environmental, contamination, injuries, and even loss of life. The vast majority of pipeline accidents that

occur in Michigan are caused by third party damage to the pipeline, often due to construction or some other activity that involves trenching or digging operations.

Michigan is both a major consumer and producer of natural gas and petroleum products. According to the Michigan Public Service Commission (MPSC), approximately 25% of the natural gas consumed in Michigan is produced within the state. The remaining 75% is imported by five interstate pipeline companies that have access to the major natural gas producing regions in North America. Michigan cycles more natural gas through its storage system than any other state. Michigan ranks 11th in the nation in production of natural gas, and ranks 6th in consumption at 937.2 billion cubic feet. Michigan's petroleum product consumption in 1997 was 189 million barrels, ranking it 10th nationally. These figures underscore the fact that vast quantities of petroleum and natural gas are extracted from, transported through, and stored in the state, making many areas vulnerable to petroleum and natural gas emergencies. Michigan's gas and petroleum networks are highly developed and extensive, representing every sector of the two industries – from wells and production facilities, to cross-country transmission pipelines that bring the products to market, to storage facilities, and finally to local distribution systems.

While it is true that the petroleum and natural gas industries have historically had a fine safety record, and that pipelines are by far the safest form of transportation for these products, the threat of fires, explosions, ruptures, and spills nevertheless exists. In addition to these hazards, there is the danger of hydrogen sulfide (H2S) release. These dangers (fully explained in the Oil and Natural Gas Well Accidents section) can be found around oil and gas wells, pipeline terminals, storage facilities, and transportation facilities where the gas or oil has a high sulfur content. Hydrogen sulfide is not only an extremely poisonous gas, but is also explosive when mixed with air at temperatures of 500 degrees Fahrenheit or above.

Petroleum and Natural Gas Pipeline Accidents in Clare County

On 2/17/2010 an oil and saltwater spill of 1680 gallons took place in northern Clare County from a Dart Oil line. The spill was contained in a 250 yard area. Clean-up was completed by 2/19/2010.

Petroleum and Natural Gas Pipeline Accidents Overview

There are several petroleum and natural gas pipelines running throughout the County. Clare County has several compressor stations and storage fields in the area. In the Emergency Service Office are plans and emergency contact numbers for these locations. One point that is stressed in most of these plans is for local emergency crews not to do anything on scene until a representative from the company arrives.

Because petroleum and natural gas pipeline accidents are an inevitable occurrence, affected local communities must be prepared to respond to the accident, institute necessary protective actions, and coordinate with federal and state officials and the pipeline company emergency crews to effectively manage and recover from the accident. That can best be accomplished through collaborative planning, training, and exercising of emergency procedures with all potentially involved parties.

HAZARDOUS MATERIAL INCIDENTS - FIXED SITE AND PROPANE STORAGE SITES

Hazardous Material Incident-An uncontrolled release of hazardous materials from a fixed site, capable of posing a risk to health, safety, property, and the environment.

Industrial Accidents-A fire, explosion, or other severe accident (especially if it involves hazardous materials) at an industrial facility that results in serious property damage, injury, or loss of life.

Hazard Description (Hazardous Material Incidents)

Hazardous materials are present in quantities of concern in business and industry, agriculture, universities, hospitals, utilities, and other community facilities. Hazardous materials are materials or substances which, because of their chemical, physical, or biological nature, pose a potential threat to life, health, property and the environment if they are released. Examples of hazardous materials include corrosives, explosives, flammable materials, radioactive materials, poisons, oxidizers, and dangerous gases.

Hazardous materials are highly regulated by the government to reduce risk to the general public, property and the environment. Despite precautions taken to ensure careful handling during the manufacture, transport, storage, use and disposal of these materials, accidental releases are bound to occur. Areas at most risk are within a 1-5 mile radius of identified hazardous material sites. Many communities have detailed plans and procedures in place for responding to incidents at these sites, but release can still cause severe harm to people, property, and the environment if proper mitigative action is not taken in a timely manner.

Hazard Description-Industrial Accidents

Industrial accidents differ from hazardous material incidents in the scope and magnitude of offsite impacts. Whereas hazardous material incidents typically involve an uncontrolled release of material into the surrounding community and environment that may require evacuations or in-place sheltering of the affected population, the impacts from industrial accidents are often confined to the site or facility itself, with minimal physical outside impacts. Nonetheless, industrial accidents, such as fires, explosions, and excessive exposure to hazardous materials, may cause injury or loss of life to workers at the facility, and significant property damage. In addition, industrial accidents can cause severe economic disruption to the facility and surrounding community, as well as significant long-term impacts on the families of the workers injured or killed.

Hazardous Material Incidents/Industrial Accidents in Clare County

There have not been any hazardous material/industrial accidents in Clare County to report in recent years.

Hazardous Material Incidents/Industrial Accidents Overview

Like all heavily industrialized states, Michigan will always be concerned with the risk of accidental hazardous material releases. However, the threat of accidental hazardous material releases that can affect life, health, property or the environment can be greatly reduced by: 1) developing and maintaining adequate community hazardous material response plans and procedures; 2) adequately training hazardous material workers and off-site emergency responders; 3) educating the public about hazardous materials safety; 4) enforcing basic hazardous material safety regulations; and 5) mitigating, wherever possible, the threat of accidental hazardous material releases. Fortunately, many Michigan communities are making great strides in these important areas.

NOTE: Nuclear research facilities can produce/use radioactive materials, as well as other hazardous substances, and therefore need to be dealt with by specially trained personnel. Caution should be exercised at these facilities, and proper radiological survey equipment should be used during a response.

As a major manufacturing and industrial center, Michigan has had its share of industrial explosions and/or fires that resulted in deaths or injuries. Fortunately, industrial and fire safety regulations enacted over the years have kept these types of accidents to a minimum. Although industrial accidents occur with regularity in Michigan, major incidents with mass casualties, such as the four deadly explosions that occurred in 1998 and 1999, are relatively rare.

Superfund Amendments and Reauthorization Act (SARA), Title II

There are currently 5 Sites in Clare County designated SARA Title III, Section "302 Sites". These sites are required to have an emergency plan on file with the Local Emergency Planning Commission, Fire Department, and their facility. All 5 "302 Sites" in Clare County have an emergency plan on file with the Local Emergency Planning Committee and their individual Fire Departments.

The meetings that were held in the county, attendees and the emergency manager expressed some concern for the safety and security of propane storage sites. The county would like to improve security and inventory the sites for the future safety of the residents. 302 Sites maps are located at the end of this section. (Buffer Zones for 302 Sites are half-mile radius.)

Nuclear Power Plant Accidents

An actual or potential release of radioactive material at a commercial nuclear power plant or other nuclear facility, in sufficient quantity to constitute a threat to the health and safety of the off-site population.

Hazard Description

Such an occurrence, though not probable, could affect the short and long-term health and safety of the public living near the nuclear power plant, and cause long-term environmental contamination around the plant. As a result, the construction and operation of nuclear power plants are closely monitored and regulated by the Federal government.

Nuclear Power Plant Failures Overview

Communities with a nuclear power plant must develop detailed plans for responding to and recovering from such an incident, focusing on the 10 mile Emergency Planning Zone (EPZ) around the plant, and a 50 mile Secondary EPZ that exists to prevent the introduction of radioactive contamination into the food chain. Michigan has 3 active and 1 in-active commercial nuclear power plants, in addition to 4 small nuclear testing/research facilities located at 3 state universities and within the City of Midland. Clare County does not have a nuclear power plant.

Clare County does not have a nuclear power plant located within 50 miles and is not within the Secondary EPZ or ingestion pathway zone. Thus, they are not required to have a plans in place for that zone. The closest active Nuclear Power Plant is located within the US is 142 miles, which is the Point Beach Nuclear Plant in Wisconsin, and the closest nuclear plant in Michigan is 169 miles, which is the Palisades Nuclear Generating Station.

Technological Failures

INFRASTRUCTURE FAILURES

A failure of critical public or private utility infrastructure resulting in a temporary loss of essential functions and/or services.

Hazard Description

Michigan's citizens are dependent on the public and private utility infrastructure to provide essential life supporting services such as electric power, heating and air conditioning, water, sewage disposal and treatment, storm drainage, communications, and transportation. When one or more of these independent, yet interrelated systems fail due to disaster or other cause – even for a short period of time – it can have devastating consequences. For example, when power is lost during periods of extreme heat or cold, people can literally die in their homes if immediate mitigative action is not taken. When the water or waste treatment systems in a community are inoperable, serious public health problems arise that must be addressed immediately to prevent outbreaks of disease. When storm drainage systems fail due to damage or an overload of capacity, serious flooding can occur.

These are just some examples of the types of infrastructure failures that can occur, and all of these situations can lead to disastrous public health and safety consequences if immediate mitigative actions are not taken. Typically, it is the most vulnerable members of society (i.e., the elderly, children, impoverished individuals, and people in poor health) that are the most heavily impacted by an infrastructure failure. If the failure involves more than one system, or is large enough in scope and magnitude, whole communities and possibly even regions can be severely impacted.

Communication Loss

Communication loss can be catastrophic in emergency situations in the county. Power outages or direct damage to communication equipment could mean life or death in certain situations. The population is dependent on emergency services getting to the incident site in a timely manner, and if there is damage to the equipment, the services may not reach their destination at all. The elderly population in the county is especially vulnerable to power outages and times of extreme weather, and these times are the most important to get services to them. In that case, there needs to be an alternative way of communication for the emergency services to reach their destination.

The county has come up with a few ideas to help solve this problem. They suggested that Mutual aid assistance for failures in utility and communications systems (including 9-1-1) could help alleviate the problem. Alternative 9-1-1 access could be done through radio operators whose homes are identified through special markings. Also, they could use generators for backup power at critical facilities. Finally, the replacement or renovation of aging structures and equipment (to make as hazard-resistant as economically possible).

Infrastructure Failures in Clare County

On June 26, 2001 there was a disruption of telephone service in Clare County. Each individual phone exchange was isolated unto itself. No community was able to make telephone calls outside of their local exchange. It was discovered that a construction project in the Saginaw area had caused damage to a fiber optic communication line.

This problem also affected the 911 and LEIN lines for the Clare County Dispatch. Communications to the areas outside of Clare County were done via radio. Local Fire Departments manned their stations to take emergency calls from their communities. The Amateur Radio Operators Group (RACES) was activated. They provided communications between the hospitals, nursing homes, and on-call doctors in the area. This event lasted approximately 5 ½ hours.

Infrastructure Failures Overview

Most of Clare County's infrastructure failures are secondary hazards caused by other major events such as floods, windstorms, snow and ice storms. The main infrastructure failures are power outages, which are normally restored in a matter of hours. Clare County EMD maintains short term shelter agreements with multiple agencies. However, if the power were out for a longer period of time, the local chapter of the American Red Cross would be called to set up temporary shelters.

Fraud

A deliberate deception to secure unfair or unlawful gain.

Hazard Description

In law, fraud is deliberate deception to secure unfair or unlawful gain, or to deprive a victim of a legal right. Fraud itself can be a civil wrong (i.e., a fraud victim may sue the fraud perpetrator to avoid the fraud and/or recover monetary compensation), a criminal wrong (i.e., a fraud perpetrator may be prosecuted and imprisoned by governmental authorities) or it may cause no loss of money, property or legal right but still be an element of another civil or criminal wrong.[1] The purpose of fraud may be monetary gain or other benefits, such as obtaining a driver's license or qualifying for a mortgage by way of false statements

Fraud Overview

While some forms of fraud occur every day the main concern at the County Level is a large scale fraud that can be inflicted on local banking or other financial/ economic institution causing widespread hardship in our population. As Clare Counties demographic includes a large population of lower income and retired a disruption in monthly payment or replenishment would have severe financial hardships and could result in civil disobedience that could quickly overwhelm local resources. With most banking and financial transactions done electronically and web based this is a threat that we have identified as known hazard.

Recent examples that have occurred have been IRS Tax Fraud Schemes via email and telephone, Gas Credit Card and ATM Skimmer operations that have resulted in fraudulent charges lost funds and customer confidence issues that have resulted in lost revenue to local businesses. Clare County Law Enforcement, and Emergency management and Homeland Security Division continue to monitor critical infrastructure sites, Government facilities for fraud attempts or cyber intrusions. Clare County Emergency management and Homeland Security continue to educate Business, Community Leaders, and General populations to all aspects of fraud and cyber related activities, this also includes a recent grant award to further target educate the Senior population.

Fire Hazards

WILDFIRES

An uncontrolled fire in grass or brushlands, or forested areas.

Hazard Description

Contrary to popular belief, lightning strikes are not a leading cause of wildfires in Michigan. Today, lightning causes only 2 percent of all wildfires, and the rest are caused by human activity. Outdoor burning is the leading cause of wildfires in Michigan. Debris burning was responsible for 32 percent of the wildfires in Michigan in 1999. Incendiary, or intentional, fires accounted for another 12 percent of the total wildfires.

Upon examination of the causes of fire, it becomes apparent that most Michigan wildfires occur close to where people live and recreate, which puts both people and property at risk. The immediate danger from uncontrolled wildfires is the destruction of timber, structures, other property, wildlife, and injury or loss of life to people who live in the affected area or who are using recreational facilities in the area.

Wildfires in Clare County

Although there have been no significant wildfires in Clare County in recent years, each year there are hundreds of small fires. (Please refer to the Wildfires Overview section for more information on the annual number of wildfires in Clare County.) Given the appropriate weather, fuels (dry and dead grasses, tree debris, etc.) and topography, any fire can develop into a significant wildfire. Clare County contains a designated Michigan DNR Zone 4 wildfire danger area in the Winterfield and Summerfield Township area. This area is heavily forested with Jack pine and limited access due to additional gas pipeline right of ways. This area requires a special plan that is maintained by the offices of Clare County Emergency management, The Michigan DNR, and Local Fire agencies.

In the spring of 1977, a forest fire raged in Summerfield Township, which burnt approximately 1400 acres before it was contained. This caused an evacuation of homes in the potential path of the fire.

Wildfire Overview

From the tables below the main cause for Clare County's wildfires was from debris burning. For a ten year period (1991-2000) a total of 256.2 acres were burned during ninety fire events. The worst year for acreage burned in Clare County was 2000 with a total of 103 acres. The least amount of acreage burned was in 1991 with a total of 16.5 acres. The year 1991 was also the year with the least amount of fires (5) for the County, with 1998 being the worst year with 32 fires. The totals from the charts below average out to be 57 acres burned per year with 20 fires per year. (These totals are averaged to the nearest whole number.)

For a twenty year period (1981-2000) Clare County had a total of 447 fires with 1,731 acres being burned.

Clare County Fire Stats (1991-2000)

Acres Burned by Cause (1991-2000)

TABLE 4.4

Report Year	Lightning	Campfire	Smoking	Debris Burning	Incendiary	Equipment	Railroad	Children	Misc.	Unknown	Yearly Total
1991			6.5	4.0	1.0	5.0					16.5
1992			1.5	18.6	17.5	27.0		0.6			65.2
1993		1.1		33.0	3.0	3.0					40.1
1994		3.4		49.6	6.0	6.5		37.3			102.8
1995				26.6	3.1	8.0		7.7			45.4
1996			2.0	28.8	3.3	1.0		0.2			35.3
1997				23.9	4.8	5.7		0.6			35.0
1998	0.1	0.2	25.0	1.6	28.7	4.6		0.7			60.9
1999		3.0	24.0	27.2	3.6	6.0		0.2			64.0
2000			0.5	42.9	40.1	9.5		1.5		8.5	103.0
10-yr. Total	0.1	7.7	59.5	256.2	111.1	76.3	0.0	48.8	0.0	8.5	568.2

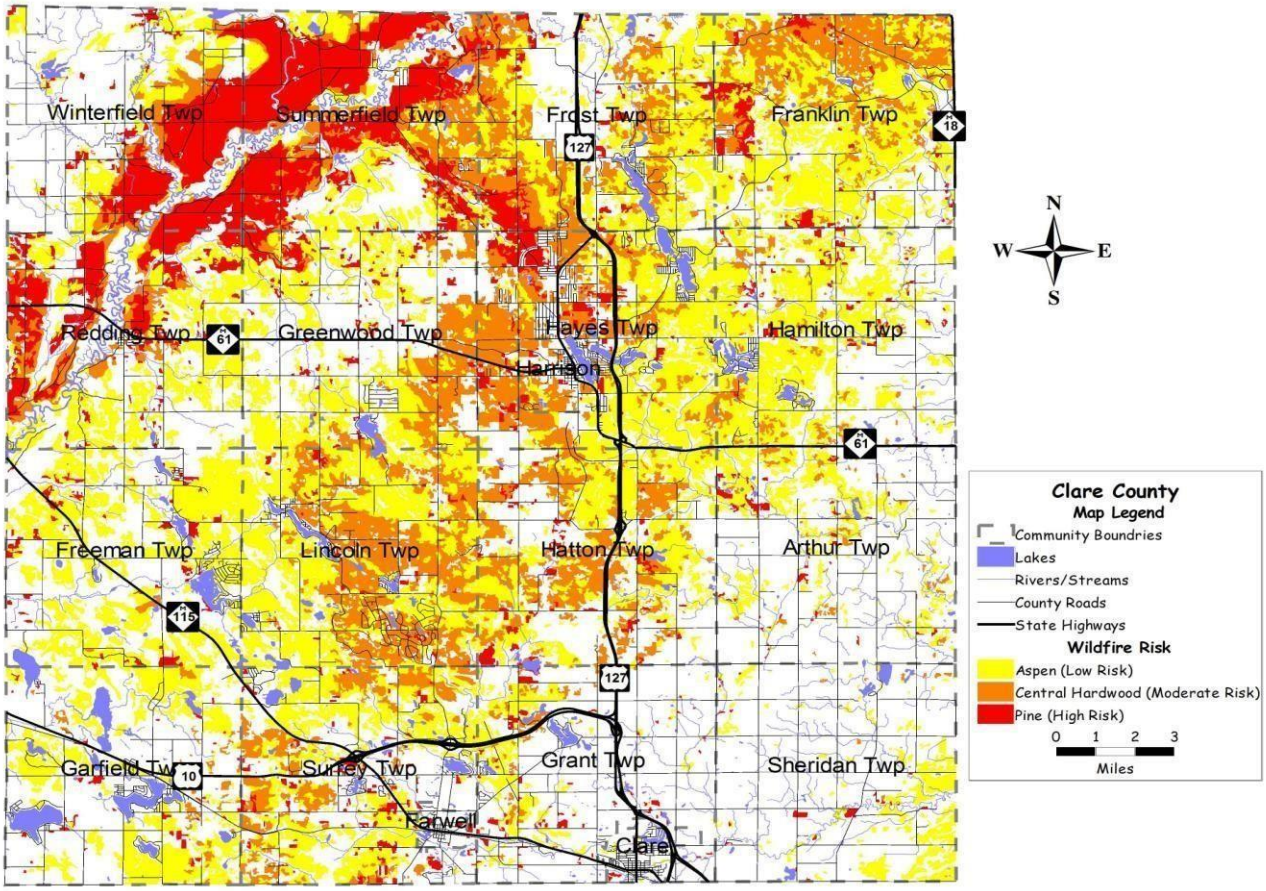
Fires by Cause (1991-2000)

TABLE 4.5

Report Year	Lightning	Campfire	Smoking	Debris Burning	Incendiary	Equipment	Railroad	Children	Misc.	Unknown	Yearly Total
1991			2	1	1	1					5
1992			1	12	5	3		1			22
1993		2		8	2	1					13
1994		2		12	2	2		2			20
1995				13	2	3		2			20
1996			1	8	4	1		1			15
1997				8	4	3		2			17
1998	1	2	2	6	11	6		4			32
1999		3	1	15	4	2		2			27
2000			1	7	10	2		1		3	24
10 yr. Total	1	9	8	90	45	24	0	15	0	3	195

Clare County Wildfire Risk Map

MAP 4.2



STRUCTURAL FIRES

A fire, of any origin that ignites one or more structures, causing loss of life and/or property.

Hazard Description

In terms of average annual loss of life and property, structural fires – often referred to as the "universal hazard" because they occur in virtually every community – are by far the biggest hazard facing most communities in Michigan and across the country. Each year in the United States, fires result in approximately 5,000 deaths and 25,000 injuries requiring medical treatment. According to some sources, structural fires cause more loss of life and property damage than all types of natural disasters combined. Direct property losses due to fire exceed $9 billion per year – and much of that figure is the result of structural fire.

According to the Federal Emergency Management Agency's National Fire Data Center, residential fires represent 74% of all structural fires and cause 80% of all fire fatalities. Approximately 85% of those fatalities occur in single- family homes and duplexes. Perhaps the most tragic statistic of all is that over 40% of residential fires and 60% of residential fatalities occur in homes with no smoke alarms.

According to statistics compiled by the Fire Marshal Division, Michigan Department of State Police for 2003 (the last year for which statewide statistics are available), nearly 19,000 structural fires occurred in Michigan, resulting in 161 deaths and 624 injuries. Dollar losses for structural fires were estimated at nearly $230 million. The Fire Marshal Division estimated that a structural fire occurred in Michigan every 28 minutes in 2003. Nationally, Michigan's fire death rates in 2007 of 15.4 persons per million (population) puts it in the upper third of all states in the nation.

A major challenge facing the Michigan fire service is the lack of a state-mandated fire safety code and code enforcement program for all occupancies.

Structural Fires in Clare County

There are numerous structural fires annually in Clare County. Often these fires result in the loss of a home or a business. However, in 2014, three separate single home fires resulted in deaths of individuals. The three fires took place in February (Lake George in Lincoln Township), November (Hamilton Township), and December (Hayes Township).

Structural Fires Overview

Major impacts occur every year, beyond the ordinary single-home fires that happen in every community. Since historic areas are less well-fireproofed and tend to have greater densities, the risk of major fire impacts appears to be higher.

SCRAP TIRE FIRES

A large fire that burns scrap tires being stored for recycling/re-use.

Hazard Description

Michigan generates some 7.5 to 9 million scrap tires each year. Although responsible means of disposal have become more common, tire dumps of the last forty years present environmental and safety hazards that will last into the foreseeable future. By 2001, the State of Michigan had identified a total in excess of 24 million scrap tires in disposal sites scattered around the state. By 2010, these were all reported as removed from the county.

The Scrap Tire Regulatory Program is implemented by the Waste Management Division of the Michigan Department of Environmental Quality, under the authority of Part 169 of the Natural Resources and Environmental Protection Act (451 P.A. 1994), as amended. Policies and regulations established under this law provide the basis for the MDEQ to implement and administer an effective scrap tire management program per the following initiatives: 1) a compliance and enforcement program was implemented; 2) a scrap tire policy recycling hierarchy was established; 3) special uses of scrap tires were approved; and 4) a grant program was established to address abandoned tires.

In 1997, Part 169 was amended to require that a statewide emergency response plan be put into place to address response to fires at collection sites.

Scrap Tire Fires in Clare County

Clare County has not had a significant tire fire in recent memory. The two scrap tires were located at Stockwell Road and Kirby Avenue in Redding Township, in 1996 and in 2000.

On 06/28/2003 lightning struck a pine tree igniting a fire. Approximately 150,000 tires burned as it took over 28 hours to extinguish and created noxious fumes. Cost was over $100,000 and remaining tires were buried on site.

Scrap Tire Overview

With the elimination of scrap tire sites within Clare County, this hazard has been greatly reduced. As there are old tires located at car dealerships and other sites, this hazard has not been completely eliminated.

Seasonal Population Increase

SEASONAL POPULATION INCREASE

A population, in the county, beyond the normal level of people to which resources are allocated.

Hazard Description

As more and more people vacation to the northern portions of Michigan, local communities in northern Michigan are going to find it harder to maintain levels of safety and resources to keep the population in the jurisdictions comfortable and safe. The trend of people buying summer homes or cottages is growing, and with the advent of Baby-Boomers reaching retirement age, the seasonal and permanent populations of the northern counties will continue to slowly grow.

Many stresses are put on local governmental agencies such as fire departments, police departments, as well as hospitals, the road commission, and ambulance services to maintain the status quo of service for their county. With more people relocating to the northern counties for extended periods of time, the level of staff and resources may not suffice to the needs of the population.

Clare County is no exception to seasonal population spikes in the summer, deer season, and to a lesser extent, the winter months.

Seasonal Population Increases in Clare County

With the power outages across the country in the summer of 2003, Clare County experienced a high influx of people from the Detroit area going to their seasonal homes. The emergency management office reported that there were low supplies of food and stresses on emergency services in Clare County.

Seasonal Population Increase Overview

Seasonal population increase will continue to be a problem in Clare County and the northern portion of the State of Michigan unless there are preventative measures taken to solve it. The population of Clare County is projected to steadily increase and with budget cuts, Clare County is finding it hard to maintain the status quo for emergency services. The seasonal population influx will only make the situation harder to manage. Also, infrastructure problems in southern Michigan can be a factor that directly affects Clare County. During the summer months many Clare County local communities have festivals, concerts and special events. This brings in many hundreds and sometimes thousands of visitors into confined areas. Due to the lack of overall resources it strains the local emergency services. More comprehensive planning including the use of Michigan State Police Large Venue Planning is administered by the MSP/EMHSD Local Emergency Management and Homeland Security Division. This planning process encompasses both local and external threat matrices, local emergency services, weather related and evacuation planning.

Population Increases Due To Large Venue Planned Event

Clare County communities experience large population increases during summer seasonal months due to "Snowbirds" that winter in warmer climates however the county also has large population influxes due to Holidays and Large Venue Events.

The following communities and events occur on an annual basis;

1. Farwell Labor Day and Lumberjack Festival, Held each year over the Labor Day weekend at the Farwell Fairgrounds. Draws crowds to venues such as amusement rides, concerts and demolition derby's and Logging expositions and demonstrations and a large parade.
2. Clare/Harrison/Farwell 4th of July Celebrations, These events include large parades, Demolition Derby's and Fireworks demonstrations. Held each year during the 3rd thru the 4th of July.
3. Clare County Fair/Concerts, Held the last week of July and the first week of August each year includes midway rides and events, exhibits, Grandstand events. A large concert is held each year on the first Monday featuring a popular music star that draws large crowds.
4. Clare Irish Festival, This occurs during the week of St. Patrick's celebrations in March, Parades, Bed Races, and special events throughout the downtown area drawing large populations into the City of Clare.

All of these events draw large crowds of people into smaller community venues and taxing local resources and also making them vulnerable to unexpected occurrences such as Severe Weather, Civil Disturbance, or Acts of Terrorism.

Civil Disturbances

CIVIL DISTURBANCES

Collective behavior that results in a significant level of law-breaking, perceived threat to public order, or disruption of essential functions and quality of life.

Hazard Description

Civil disturbances can be classified within the following four types: (1) acts or demonstrations of protest, (2) hooliganism, (3) riots, or (4) insurrection. Since most of these types of disturbance share similarities with each other, and the classifications presented here are not absolute and mutually exclusive, it is recommended that this entire section be studied as a whole. The descriptions that follow, while roughly organized by type of disturbance, provide information of interest in evaluating and understanding all types of civil disturbance, and therefore should not be treated as independent subsections or read in isolation from each other.

The first type, demonstrations of protest, usually contains some level of formal organization or shared discontent that allows goal oriented activities to be collectively pursued. This first category includes political protests and labor disputes. Many protest actions and demonstrations are orderly, lawful, and peaceful, but some may become threatening, disruptive, and even deliberately malicious (on the part of at least some of those involved either in the protest itself or in reaction to the protest). It is only the latter type of event that should properly be classified as a civil disturbance. The destruction of property, interruption of services, interference with lawful behaviors of ordinary citizens and/or emergency

responders, the use of intimidation or civil rights violations, and threats or actual acts of physical violence may all occur during civil disturbance events. Actual Michigan events have included the willful destruction of property and impeded property access during labor strikes, and heated conflicts between opposing participants at political rallies or issue-driven demonstrations. Different risks and forms of disturbance are connected with the nature and perceived importance of the cause, the degree of organization among those who are active in the protest, and the amount of group cohesion among those who are involved.

The second category of civil disturbance, hooliganism, is relatively unorganized and involves individual or collective acts of deviance inspired by the presence of crowds, in which the means (and responsibility) for ordinary levels of social control are perceived to have slackened or broken down. Certain types of events, such as sporting events, "block parties," or concerts, become widely publicized and, in addition to normal citizens who merely seek entertainment, tend to also attract certain types of persons who seek situations in which anonymity, confusion, and a degree of social disorder may allow them to behave in unlawful, victimizing, or unusually expressive ways that would normally be considered unacceptable by most ordinary people. An Example includes the disorder that has followed various championship sporting events. Although the majority of persons present are ordinary citizens (although many may have some level of intoxication), a minority of persons begin making itself known through unlawful or extreme acts of deviance, and it is from this part of the crowd that the hazard primarily stems.

Common problems include the widespread destruction of property, numerous types of assault and disorderly conduct, and criminal victimization. It should also be noted that many persons who are normally law-abiding may temporarily behave in unusually aggressive ways during these events, often prompted by an understandably defensive anxiety about the disorder and behavior exhibited by the deviant minority, but also possibly exacerbated by a level of alcoholic intoxication as well as the temptation by some to engage in appealing deviant behaviors that under normal circumstances of social control would not be selected. Many citizens remain law-abiding, but may remain in the area of a civil disturbance either because they live in the area, have activities (including social and recreational ones) that they wish to continue engaging in, have legitimate business to conduct, or because they are curious or concerned and wish to observe or witness the situation as it occurs. The majority of such law-abiding citizens will leave the area in an orderly way when given clear instructions by a legally-recognized authority to do so. There are cases in which hooliganism may become combined with protest, and thus complicate the situation for law enforcement personnel. In some circumstances, elements of protest are added only by a small minority of participants after the disturbances have already begun, but in other circumstances, protest activity may arise out of concerns regarding the extent and nature of pre-emptive law enforcement activities that were intended to prevent a civil disturbance.

The third type, riots, may stem from motivations of protest, but lacks the organization that formal protests include. Although legitimate and peaceful protests may spontaneously form when people gather publicly with the perception that they already share certain values and beliefs, riots tend to involve violent gatherings of persons whose level of shared values and goals is not sufficiently similar to allow their collective concerns or efforts to coalesce in a relatively organized manner. Instead, there tends to be a diffuse sense of shared discontent, but relatively few norms to shape these strivings into clearly coherent action. For example, widespread discontent within a community that is sufficiently cohesive may quickly take on a set of shared leaders and clear organization, such as a march or chant that is clearly in the form of a protest or demonstration, but in an area that doesn't have the same cohesiveness and shared norms and values, a relatively chaotic form of expression may take place instead, involving assaults, intimidation, and unlawfully destructive expressions of discontent, possibly including the victimization of innocent

citizens or businesses who have been selected by part of the crowd to function as scapegoats during their expression of discontent. In addition to the sentiments of discontent that may have sparked the initial activities, however, elements of hooliganism may emerge and even come to predominate, as certain persons may attempt to exploit the social disorder for their own individual ends. In other cases, elements of legitimate protest may also form within this type of civil disturbance, and pockets of organized protest may help to channel and contain the negative elements of hooliganism, looting, etc. that might otherwise threaten all area residents. The complexity of these events for law enforcement can be very great, demanding carefully calculated efforts to analyze the nature of the disturbance, and difficult decisions about how to approach and possibly involve the numerous types of persons, gatherings, groups, and behaviors that may have the potential to either mitigate or exacerbate the situation.

The fourth type of civil disturbance, insurrection, involves a deliberate collective effort to disrupt or replace the established authority of a government or its representatives, by persons within a society or under its authority. Some prison uprisings may fall into this category, although others may more properly be classified as riots or protests, depending upon the presence and extent of specific goals and organization, and the type of action used in achieving such goals. An insurrection has the deliberate goal of either replacing established authorities with a new distribution of power, or with the destruction of established power structures in favor of (usually temporary) anarchy or a smaller-scale set of recognized criminal (gang), ethnic, or other group networks and power structures. The latter circumstances tend to involve disturbances that exist on a relatively small scale, such as in a single local area or involving a prison network or "cult compound" (or any other similarly self-aware group or subculture with identified collective interests and a network that allows rapid communication). However, larger-scale insurrections are also possible, involving issues of class conflict or other widespread social inequalities, highly divisive political issues, or other important large-scale events that disrupt the social equilibrium because they illuminate areas in which cultural values are not sufficiently shared throughout the society or region that is experiencing the conflict, disruption, or strain. In many cases, this kind of large-scale social strain has developed gradually over time, and involves an entire series of compromises, concessions, and migrations that may temporarily relieve the disruptive social and value conflicts, only to reemerge after another period of changes and population growth has caused a breakdown in previous arrangements. This description of the causes of social discontent applies to many protests and riots, as well as insurrection. In cases involving the formation or emergence of significant subcultures or counterculture, such as during the Vietnam era, or when dominant values break down or fail to be established on important key issues or mores, there is the potential for insurrection on a larger scale. The Civil War of 1861-1865 was one such instance, in which the authority of the federal government was either accepted or rejected by various states which then aligned themselves in opposition to each other. Between these two extremes (of a purely localized civil disturbance and a national civil war) are numerous other possibilities for regional, political, class, or ethnic conflicts that may involve one or more categories of citizen in conflict with others. Examples could include prisoners versus law enforcement personnel, a countercultural group versus the establishment, or a violent political activist group in conflict with selected representatives of a contrary viewpoint. (Some such actions may overlap with those of terrorism, q.v.)

Civil Disturbance In Clare County Overview

Civil disturbances occur rarely in Clare County. However, with the ever increasing threats throughout society, this is a growing problem that cannot be resolved at the local level. Should a major event occur, the Michigan State Police, and possibly other law enforcement details will have to be called in to assist the local public safety personnel.

NUCLEAR ATTACK

A hostile action taken against the United States which involves nuclear weapons and results in destruction of property and/or loss of life.

Hazard Description

Any hostile attack against the United States, using nuclear weapons, which results in destruction of military and/or civilian targets. All areas of the United States are conceivably subject to the threat of nuclear attack. However, the strategic importance of military bases, population centers and certain types of industries place these areas at greater risk than others. The nature of the nuclear attack threat against the U.S. has changed dramatically with the end of the "Cold War" and the conversion of previous adversaries to more democratic forms of government. Even so, the threat still exists for a nuclear attack against this country. Despite the dismantling of thousands of nuclear warheads aimed at U.S. targets, there still exists in the world a large number of nuclear weapons capable of destroying multiple locations simultaneously. In addition, the number of countries capable of developing nuclear weapons continues to grow despite the ratification of an international nuclear non-proliferation treaty. It seems highly plausible that the threat of nuclear attack will continue to be a hazard in this country for some time in the future.

At this point, attack-planning guidance prepared by the Federal government in the late 1980s still provides the best basis for a population protection strategy for Michigan. That guidance has identified 25 potential target areas in Michigan, and 4 in Ohio and Indiana that would impact Michigan communities, classified as follows: 1) commercial power plants; 2) chemical facilities; 3) counterforce military installations; 4) other military bases; 5) military support industries; 6) refineries; and 7) political targets. For each of these target areas, detailed plans have been developed for evacuating and sheltering the impacted population, protecting critical resources, and resuming vital governmental functions in the post-attack environment. Even though Iosco County has an airbase; the threat of a nuclear attack has been lowered due to the end of the "Cold War" and the closure of the base. There still may be a small threat to the former base because it could still be reused for B-52 MStratfortress bomber operations in case the current Stratfortress base is destroyed. The airfield could also have the potential for terrorism/sabotage and is being looked at under that category.

Nuclear weapons are explosive devices that manipulate atoms to release enormous amounts of energy. Compared to normal chemical explosives such as TNT or gunpowder, nuclear weapons are far more powerful and create harmful effects not seen with conventional bombs. A single nuclear weapon is able to devastate an area several miles across and inflict thousands of casualties. Although nuclear attack is an unlikely threat, the severe damage that would be caused by even one weapon requires the danger to be taken seriously.

The threat of nuclear attack has primarily been associated with the Cold War between the United States and the Soviet Union in the last half of the 20th Century. Although the Cold War is over, there remains a threat of nuclear attack. More nations have developed nuclear weapons and there is also the possibility that terrorists could use a nuclear weapon against the United States.

Hazard Analysis/Understanding Nuclear Weapons

The following information about nuclear weapons is important for understanding the threat of nuclear attack: (1) types of nuclear weapons, (2) measures of weapon power, (3) forms of attack, and (4) types of delivery systems.

Nuclear weapons have been built in a wide variety of types for several different purposes. The first weapons relied on nuclear fission, or the splitting of heavy atoms to release energy and create an explosion. Later, new weapons were invented that used a combination of fission and fusion, which involves the creation of heavier atoms from lighter ones. Fusion bombs are also referred to as hydrogen bombs or H-bombs. For emergency planning purposes, the important differences are that (1) fusion bombs are more difficult to build and (2) that they can be much more powerful. Otherwise, all types of nuclear weapons create the same types of effects.

The power of nuclear weapons is measured by comparing the energy released by the weapon to the energy released by large amounts of conventional high explosive. The strengths of smaller weapons are measured in kilotons (or thousands of tons) of TNT explosive. A twenty-kiloton bomb produces as much energy as twenty thousand tons of TNT exploded all at once. The strength of larger weapons is measured in megatons, or millions of tons of TNT. A two-megaton bomb produces as much energy as two million tons of high explosive.

Smaller nuclear weapons are generally designed to be used against military targets on the battlefield. These are called tactical nuclear weapons. Larger devices designed to attack cities, infrastructure, and military bases are called strategic nuclear weapons.

Bombs can be set off at varying heights above the target. If the bomb is set off high in the air, its effects are spread out over a wider area and generally more damage is done. This is called an air burst. A bomb that is set off at or near the Earth's surface level wastes much of its energy against the ground. This is called a ground burst. Ground bursts have some specific military uses and terrorists may use ground bursts because they are unable to lift their weapons high enough to create an air burst.

Like any weapon, a nuclear device must be carried to its target by a delivery system. The first nuclear weapons were bombs dropped out of aircraft. Later, tactical weapons were made small enough to fire out of cannons or carry in large backpacks. Intercontinental ballistic missiles (ICBMs) are rockets that can carry one or more nuclear weapons across thousands of miles in less than an hour. Terrorists may lack sophisticated missiles, but they could create effective delivery systems by transporting a nuclear weapon in the back of a truck, aboard a cargo plane, or within a shipping container.

Effects of Nuclear Weapons

The effects of nuclear weapons are more complicated than those of conventional explosives. Nuclear devices cause damage through six major effects: (1) thermal pulse, (2) blast, (3) prompt radiation, (4) electromagnetic effects, (5) mass fire, and (6) residual radiation.

THERMAL PULSE is an intense flash of light and heat released within the first few seconds of a nuclear explosion. The damage from thermal pulse is almost instantaneous and covers a wide area. People and animals exposed to the pulse can be badly burned. Flammable objects such as buildings, vehicles, and trees may be set on fire. The flash is strongest close to the bomb and becomes weaker with distance. Even people located far away from the explosion may still be blinded by the intense light of the pulse.

BLAST is a powerful wave of force that moves out from the center of the explosion through the air and the ground. The farther the blast travels, the weaker it becomes. Very close to the bomb, the blast will destroy even the most strongly built buildings and will kill everyone not hidden deep underground. Farther away, buildings may survive, but with severe damage, and people will be injured by being picked up and smashed against objects. At still greater ranges, buildings will be less damaged and injuries will largely result from shattered glass and thrown debris. At all distances, a powerful wind follows the initial blast wave and adds to the destruction. The blast from a ground burst will dig a large crater into the ground, but this cratering will not occur with an air burst.

PROMPT RADIATION is the harmful blast of high energy radiation given off at the same time as the thermal pulse. Prompt radiation includes gamma rays and neutron radiation. This radiation is capable of killing or injuring living beings by damaging tissues and organs. Prompt radiation is quickly absorbed by the atmosphere and does not impact as wide an area as other nuclear weapons effects. In most instances, a person close enough to receive a harmful dose of prompt radiation is also close enough to be immediately killed by the explosion's thermal pulse or blast. However in unusual cases, some people who survive the immediate effects of the bomb may sicken or die days later, from radiation poisoning.

ELECTROMAGNETIC EFFECTS occur immediately after a nuclear explosion and may damage communications equipment, computers, and electronics. Radios, cell phones, and power lines are especially vulnerable. In most cases, the effects are limited to an area near to the explosion. Some equipment may recover after a period of time, while other devices will need to be replaced. One special type of nuclear attack might cause more widespread electromagnetic effects: a very large nuclear weapon carried high into the atmosphere by a missile is capable of damaging communications and electronics over a very large area.

MASS FIRE results from the ignition of thousands of individual fires by a bomb's thermal pulse, combined with widespread destruction from its blast. Over a period of hours, small fires merge and feed on damaged buildings and debris. Controlling these fires would be very difficult, due to damaged water mains, destroyed fire-fighting equipment, and blocked roads. The result is an extremely intense fire that can spread quickly and reach very high temperatures. Mass fire may significantly expand the area devastated by a bomb, destroying areas that might otherwise be only lightly damaged by other types of effects.

RESIDUAL RADIATION is unlike prompt radiation in that it lasts well after the nuclear explosion has ended. The ground immediately underneath the center of the explosion will be dangerously radioactive for several days due to "induced radiation." There will also be some radioactive dust and debris that will drift downwind of the explosion. This radioactive dust is called "fallout." Fallout will be a minor problem in the case of an air burst explosion, but will be very intense in the case of a ground burst attack. Regardless of the type of attack, the danger from fallout will tend to be greatest close to the site of the attack. The cloud of fallout will weaken the longer it lasts and the farther it travels.

Note that the effects of a nuclear attack will depend on the size of the weapon. A larger bomb will cause damage over a wider area. The importance of different types of damage will also vary with the weapon. Large strategic nuclear weapons will create most of their damage though thermal pulse and mass fires, while with small tactical bombs the blast effect and prompt radiation will be relatively more important.

Nuclear Attack Overview

Nuclear attack is an unlikely hazard, but even a single weapon could cause death and destruction on a massive scale. Nuclear weapons inflict damage over a wide area and through a variety of effects, including thermal pulse, blast, fire, and radiation. Despite the end of the Cold War, nuclear attack by foreign nations remains a real possibility, and this danger has been joined by the threat of terrorist nuclear attack. It makes sense to continue to prepare for the nuclear attack hazard as part of an overall emergency management strategy.

Hazard Mitigation Alternatives for Nuclear Attack

- Designated fallout shelters and public warning systems.
- Construction of concrete safe rooms (or shelters) in houses, trailer parks, community facilities, and business districts.
- Using laminated glass, metal shutters, structural bracing, and other hazard-resistant, durable construction techniques in public buildings and critical facilities.
- Increased coverage and use of NOAA Weather Radio (which can provide notification to the **c**ommunity during any period of emergency, including enemy attack).

(Note: Should a nuclear attack occur, the emergency management will be taken over by the Department of Homeland Security.)

SABOTAGE (TERRORISM)

An intentional, unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political, social, or religious objectives.

Hazard Description

Sabotage/terrorism can take many forms or have many vehicles for delivery, including: 1) bombings; 2) assassinations; 3) organized extortion; 4) use of nuclear, chemical, radiological, and biological weapons; 5) information warfare; 6) ethnic/religious/gender intimidation (hate crimes); 7) state and local militia groups that advocate overthrowing the U.S. Government; 8) eco-extremism, designed to destroy or disrupt specific research or resource-related activities; and 9) widespread and organized narcotics smuggling and distribution organizations. Because sabotage/terrorism objectives are so widely varied, so too are the potential targets of such actions. Virtually any public facility or infrastructure, or place of public assembly, can be considered a potential target. In addition, certain types of businesses engaged in controversial activities are also potential targets, as are large computer systems operated by government agencies, banks, financial institutions, large businesses, health care facilities, and colleges/universities.

One of the first acts of domestic sabotage/terrorism ever carried out occurred in Michigan on May 18, 1927, in Bath. A disgruntled taxpayer and farmer detonated 1,000 pounds of explosives under the newly constructed Bath Consolidated School killing 38 students and 3 teachers and injuring 58 others. The perpetrator then blew himself up, along with the school superintendent. As tragic as that event was, it could have been worse were it not for the fact that half of the explosives failed to detonate as planned, which certainly would have killed many more students and teachers. Concentrated activities to prevent terrorist activities have become even more vital with the passage of time and in the wake of the 9/11

events of destruction in New York City and Washington D.C. Many more resources may anticipate to be mobilized to prevent terrorist activities in the near future.

Although at first it might appear Clare County is an unlikely target for terrorism, it cannot be totally discounted. Potential targets include the dams, the water treatment plant, the runways at the airports, and all industrial sites in the area. Furthermore, any government building, school, or individual can become a target of domestic terrorism.

Sabotage and Terrorism include a broad range of potential hazards that affect a community from a variety of perspectives. This hazard is defined as an intentional, unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political, social, or religious objectives. Sabotage/terrorism can take many forms or have many vehicles for delivery, including: 1) bombings; 2) assassinations; 3) organized extortion; 4) use of nuclear, chemical, radiological, and biological weapons; 5) information warfare; 6) ethnic/religious/ gender intimidation (hate crimes); 7) state and local militia groups that advocate overthrowing the U.S. Government; 8) eco-extremism, designed to destroy or disrupt specific research or resource-related activities; and 9) widespread and organized narcotics smuggling and distribution organizations.

Sabotage Overview

Even though there have not been any recently recorded sabotage/terrorism events occurring recently in Clare County, the Emergency Management staff has regularly scheduled training events to address these circumstances. With the ever-growing threat of local acts, the County is working to prepare their personnel should an event occur.

Public Health Emergencies

PUBLIC HEALTH EMERGENCIES

A widespread and/or severe epidemic, incident of contamination, or other situation that presents a danger to or otherwise negatively impacts the general health and well-being of the public.

Hazard Description

Public health emergencies can take many forms: 1) disease epidemics; 2) large-scale incidents of food or water contamination; 3) extended periods without adequate water and sewer services; 4) harmful exposure to chemical, radiological, or biological agents; 5) large scale infestations of disease-carrying insects or rodents. Public health emergencies can occur as primary events by themselves, or they may be secondary events another disaster or emergency, such as flood, tornado, or hazardous material incident. The common characteristic of most public health emergencies is that they adversely impact, or have the potential to adversely impact, a large number of people. Public health emergencies can be statewide, regional, or localized in scope and magnitude.

Perhaps the greatest emerging public health threat would be the intentional release of a radiological, chemical, or biological agent with the potential to adversely impact a large number of people. Such a release would most likely be an act of sabotage aimed at the government or at a specific organization or

segment of the population. Fortunately, Michigan has not yet experienced such a release aimed at mass destruction.

Public Health Emergencies in Clare County

The most common type of public health emergency involves influenza that spreads through educational institutions, the workplace and other entities that experience a large volume of public traffic. Influenza typically kills between 200 and 500 individuals in Michigan alone and has the potential to change its structure and rapidly affect large populations.

Occurrences of influenza and disease are common to residents, students and visitors to Clare County and typically impact only a small portion of the population. Although most of public health related events occur in schools and are quickly managed, the potential does exist for these events to rapidly spread to adjacent populations.

Most public health emergencies in Clare County impact only a small number of individuals and occur more than once annually. The potential for these events to continue is high and can be effectively managed. However, increased public awareness to potential outbreaks of influenza or other disease has also raised the real possibility that a large scale event could occur. For this reason, development and testing of surveillance systems and integrated planning between local, state and federal sources continues to receive much needed attention.

Public Health Emergency Overview

Michigan has had several large-scale public health emergencies in recent history, but fortunately nothing that caused widespread severe injury or death. One of Michigan's most serious emergencies to hit Michigan occurred in 1973 when a local farmer fed polybrominated biphenyls (PBB) laced feed to his dairy herd. Michigan Chemical Corporation had accidentally supplied the Michigan Farm Bureau Services with sacks of fire-proofing chemical PBB, which is known to cause cancer, genetic mutation, and birth defects, and the PBB was inadvertently substituted for magnesium oxide (commonly used in antacid tablets used for human consumption) in a custom dairy feed # 402. During the crucial eight-month period between the farmer's first observations and the discovery of the accident, serious contamination had already occurred. By 1975 the state had quarantined more than 500 farms. Condemned for slaughter were more than 17,000 cattle; 3,415 hogs; 1.5 million chickens and 4.8 million eggs. The 1973 PBB contamination incident is unprecedented in U.S. history, but the long-term implications of contamination may be less than was feared.

In the 1980s, the state health department confirmed that 95 percent of Michigan's population had PBB in their bodies from eating beef, drinking milk or consuming other products from contaminated farms. A cancer epidemic was feared. Although one has not occurred, so far anyway, studies do show the most exposed families have increased breast and digestive cancer, and lymphoma. Among the effects observed in the exposed populations the daughters of the most highly exposed women began menstruation, on average, before they reached their twelfth birthdays.

Similarly, the northern Michigan water and sewer infrastructure disaster of 1994 is also unprecedented in scope, magnitude, and public health and safety implications for the affected communities. These events, though unusual, have heightened awareness of the broad nature of threats that can result in a public health emergency. Such emergencies no longer simply involve the spread of disease, but rather can arise out of a variety of situations and circumstances.

In 2001, Michigan health officials were introduced to the emerging health threats posed by foot-and-mouth disease and the West Nile encephalitis virus. Although foot-and-mouth disease is a highly contagious disease that only affects animals, a widespread outbreak such as that which occurred in parts of the United Kingdom in the spring of 2001 could have significant public health implications for humans as well, due to the potentially large numbers of dead animal carcasses that would have to be disposed of to prevent disease outbreaks. The Michigan Department of Agriculture and Rural Development, in conjunction with numerous other federal, state and local agencies and the agriculture industry, continues to monitor the foot-and-mouth disease situation and take the necessary steps to prevent the introduction and spread of the disease in the United States.

Geological Hazards

EARTHQUAKES

A shaking or trembling of the crust of the earth caused by the breaking and shifting of rock beneath the surface.

Hazard Description

Earthquakes range in intensity from slight tremors to great shocks. They may last from a few seconds to several minutes, or come as a series of tremors over a period of several days. The energy of an earthquake is released in seismic waves. Earthquakes usually occur without warning. In some instances, advance warnings of unusual geophysical events may be issued. However, scientists cannot yet predict exactly when or where an earthquake will occur. Earthquakes tend to strike repeatedly along fault lines, which are formed where large plates of the earth's crust below the surface constantly push and move against one another. Risk maps have been produced which show areas where an earthquake is more likely to occur. Earthquake monitoring is conducted by the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, and universities throughout the country.

The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Most casualties result from falling objects and debris. Disruption of communications systems, electric power lines, gas, sewer and water mains can be expected. Water supplies can become contaminated by seepage around water mains. Damage to roadways and other transportation systems may create food and other resource shortages if transportation is interrupted. In addition, earthquakes may trigger other emergencies such as fires and hazardous material spills, thereby compounding the situation.

Earthquake Overview

No severely destructive earthquake has ever been documented in Michigan. However, several mildly damaging earthquakes have been felt since the early 1800s. The exact number is difficult to determine, as scientific opinion on the matter varies. With most of these earthquakes, damage (if any) was limited to cracked plaster, broken dishes, damaged chimneys, and broken windows. (Biggest Michigan threats would be to pipelines, buildings that are poorly designed and constructed, and shelving, furniture, mirrors, gas cylinders, etc. within structures that could fall and cause injury or personal property damage)

The greatest impact on Clare County would probably come from damage to natural gas and petroleum pipelines. If the earthquake occurs in the winter, areas of the state could be severely impacted by fuel shortages - which could translate into temporary shortages in Clare County. Being on the I-127 corridor, the Cities of Harrison and Clare are in a good position to receive shipments from major suppliers to the South.

Damage would probably be negligible in well-designed and constructed buildings. However, poorly designed and constructed buildings could suffer considerable damage under the right circumstances.

In January 1990, Executive Order (EO) 12699, Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction, was signed into law. This EO requires that appropriate seismic design and construction standards and practices be adopted for any new construction or replacement of a federal building or federally building during or after an earthquake.

Clare County is not in an area designated as high risk to ground movement; yet by encouraging awareness of the hazards of poor construction practices and/or routine evaluations of existing structures for deficiencies, vulnerabilities can be identified and repaired before loss is sustained.

There is some chance of a moderate earthquake over the next few decades, which might be strong enough to damage some property and underground infrastructure.

SUBSIDENCE

The lowering or collapse of the land surface caused by natural or human-induced activities that erode or remove subsurface support.

Hazard Description

Subsidence is the lowering or collapse of the land surface due to loss of subsurface support. It can be caused by a variety of natural or human-induced activities. Natural subsidence occurs when the ground collapses into underground cavities produced by the solution of limestone or other soluble materials by groundwater. Human- induced subsidence is caused principally by groundwater withdrawal, drainage of organic soils, and underground mining. In the United States, these activities have caused nearly 17,000 square miles of surface subsidence, with groundwater withdrawal (10,000 square miles of subsidence) being the primary culprit. In addition, approximately 18% of the United States land surface is underlain by cavernous limestone, gypsum, salt, or marble, making the surface of these areas susceptible to collapse into sinkholes.

Generally, subsidence poses a greater risk to property than to life. Nationally, the average annual damage from all types of subsidence is conservatively estimated to be at least $125 million.

Mine Subsidence

In Michigan, the primary cause of subsidence is underground mining. Although mine subsidence is not as significant a hazard in Michigan as in other parts of the country, many areas in Michigan are potentially vulnerable to mine subsidence hazards. Mine subsidence is a geologic hazard that can strike with little or no warning and can result in very costly damage. Mine subsidence occurs when the ground surface collapses into underground mined areas. In addition, the collapse of improperly stabilized mine openings is also a form of subsidence. About the only good thing about mine subsidence is that it generally affects

very few people, unlike other natural hazards that may impact a large number of people. Mine subsidence can cause damage to buildings, disrupt underground utilities, and be a potential threat to human life. In extreme cases, mine subsidence can literally swallow whole buildings or sections of ground into sinkholes, endangering anyone that may be present at that site. Mine subsidence may take years to manifest. Examples of collapses occurring decades after mines were abandoned have been documented in several areas of the country.

Michigan's Mining Experience

Michigan's rich mining heritage has played a significant role in the State's development into a world economic power. Due to its diverse geology, Michigan has a wide variety of mineral resources, most notable of which are copper ore, iron ore, coal, sand, gravel, gypsum, salt, oil and gas. It is not surprising then that underground mining has occurred on a significant scale throughout Michigan's history. The principal types of underground mining that occurs, or has occurred in Michigan, include coal mining, metallic mineral mining, salt mining, gypsum mining, and solution mining.

Copper Mining

Copper mining, in particular, put Michigan on the map as a major mining area. Although native copper ore occurs in other parts of the world, at one time the quantity of Michigan's native ore was unsurpassed. From the mid to late 1800s, Michigan's Keweenaw Peninsula mines produced more native copper ore than any other mining area in North America. As those resources became depleted, copper mining began near White Pine in Ontonagon County. The target strata in the White Pine mining operations were on an anticline that was mined both at depths as shallow as 100 feet and as deep as 2900 feet. Over-mining of pillars in shallow parts of the mine caused collapse and subsidence at the surface, on mine property, during the 1980s. The "Copper County" area generally crosses Ontonagon, Houghton, and Keweenaw Counties.

Salt/Solution Mining

Michigan also has one of the world's largest underground salt accumulations. The thickest salt beds lie under most of the Lower Peninsula. These formations are, in some places, over 3,000 feet thick and composed of layers of salt and other minerals. Michigan ranked first or second in national salt production from 1880 to the late 1920s. The bulk of the salt production was from natural brines pumped from six salt formations. Salt was also produced from artificial brines that were derived by injecting freshwater into salt formations and retrieving the resulting brines (called solution mining). The old Detroit salt mine produced rock salt using the "room and pillar" method until 1983. (The room and pillar method involves creating large underground expanses [rooms] in which to mine, supported by pillars [natural or artificial structural members] that held in place the roofs of these rooms.) The Detroit salt mine was approximately 1,100 feet below ground, and encompassed approximately 1,100 acres of subsurface land. The room and pillar method is being used only in the single salt mine that is still operating in Michigan, by the Detroit Salt Company, which has an excellent safety record. Salt is also being produced from brines extracted at various locations within the state.

Gypsum Mining

Gypsum has been mined in Michigan since 1841. In the Grand Rapids area, gypsum is mined by the "room and pillar" method. Open pit mining is used in the Alabaster region (Iosco County). In both of these areas, gypsum beds directly underlie thin layers of glacial drift. Closed topographic lows observed in both areas are believed to be due to groundwater solution of the gypsum and subsequent collapse of the overlying material.

Coal Mining

Michigan also once supported a thriving coal mining industry. Records indicate that over 165 different coal mines operated in Michigan's coal-bearing region, which includes 31 counties in the south-central portion of the lower Peninsula. Over 100 of the 165 known coal mines in the state were located in the Saginaw Bay area. Coal was first discovered in Michigan in 1835 in Jackson County. From that discovery, several small underground and surface coal mines were opened in that area of the state. In 1861, coal was discovered near Bay City, and in 1897 commercial coal mining began in Bay County. That led to the establishment of numerous additional mines in Saginaw, Tuscola and Genesee counties, which tended to be larger, deeper and more extensive mines. That was the start of Michigan's coal mining industry.

The state's underground coal mines were an average of 110 feet deep, and were worked by the "room and pillar" method. Michigan had continuous coal mining from 1897 to 1952, when the last underground coal mine near St. Charles, Saginaw County, closed. From 1860 (the year mine records were first kept) until 1975 (the year the last surface coal mine closed), the 165 commercial coal mines produced a total output of over 46 million tons of coal. The maximum coal output was achieved in 1907, when Michigan's 37 operating coal mines produced two million tons per year - enough to supply 16% of Michigan's total demand for coal.

Mine Subsidence Problem in Michigan

The legacy of underground mining can be felt in numerous locations across the state. Many of the underground mining areas, whether active or abandoned, are vulnerable to subsidence in some form. The map on the previous page indicates the areas in the state that are potentially vulnerable to mine subsidence. Unfortunately, records of abandoned mines are often sketchy and sometimes non-existent. Therefore, it is often difficult to determine exactly where the mines were located. Many areas of Michigan may have developed over abandoned mines and may not even be aware of it. Oftentimes, the only way a community or home / business owner becomes aware of a potential hazard is when subsidence actually occurs and damage or destruction results.

Subsidence Overview

Clare County has not experienced any cases of subsidence on record. However, with the number of mines that exist and have been abandoned, it could be possible for a future occurrence(s) of subsidence to occur in the County. This was identified as a low priority.

CHAPTER 5: ANALYSIS OF ALTERNATIVE ACTIONS

Prior to the development of the mitigation strategies, the Clare County Hazard Mitigation Advisory Committee (CCMHAC) developed goals and objectives. Upon the development of the goals and objectives, mitigation actions were then determined, based on the six categories of mitigation actions. Below are the goals and objectives, and the mitigation action categories as determined for the 2007 Hazard Mitigation Plan. Revised goals and objectives for the 2015 Plan, as determined by the CCHMAC members will appear in Chapter 5: Action Plan.

Goals are general guidelines that explain what a community wants to accomplish. Goals are often long term and represent broad visions. **Objectives** define strategies or implementation steps to attain the identified goals. They are specific, measurable and may have completion dates.

GOAL 1: Protect Public Health and Safety

OBJECTIVES

- Provide community wide hazard warning systems (natural, health and terrorism)
- Provide information and resources to increase hazard awareness and education
- Maintain existing resources and provide necessary training
- Identify and obtain necessary resources and equipment to prevent or minimize hazard effects

GOAL 2: Minimize damage to public and private property

OBJECTIVES

- Adopt policies to make property less vulnerable
- Apply proactive mitigation measures to prevent hazard damage
- Obtain necessary equipment, resources and training to protect property if hazard occurs
- Conduct training sessions and exercises to prepare for possible hazards

GOAL 3: Maintain essential services

OBJECTIVES

- Identify, inspect and maintain all critical infrastructure and facilities
- Repair or replace critical infrastructure and facilities that are damaged or degraded
- Protect critical infrastructure and facilities from hazard damage
- Obtain necessary resources and equipment to insure essential services are maintained in the event of a hazard

GOAL 4: Manage growth/development

OBJECTIVES

- Develop hazard resistant growth policies
- Discourage development in high hazard areas
- Integrate hazard mitigation planning into land use planning
- Encourage sustainable development
- Protect and conserve natural resources

The next steps in the 2007 hazard mitigation planning process were to identify mitigation actions suitable to the community, evaluate the effect the action will have on the specified mitigation objective and

prioritize actions to decide what sequence or order these actions should be pursued. This step will also be utilized in the 2015 Plan and will be located in Chapter 5: Action Plan.

2007 Mitigation Strategies

1. **Prevention**-government administrative or regulatory actions or processes that influence the way land and buildings are developed and built.
2. **Property Protection**-actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from a hazard area.
3. **Public Education and Awareness**-actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
4. **Natural Resource Protection**-actions that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems.
5. **Emergency Services**-actions that protect people and property during and immediately after a disaster or hazard event.
6. **Structural Projects**-actions that involve the construction of structures to reduce the impact of a hazard.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
A. Multi-Hazard Actions			
Ensure that the County and individual communities have adequate equipment, staff, and training to respond to transportation related accidents specific to their needs.	High	Ongoing	Grant obtained for dive team, new dive trailer, training exercises conducted annually
Conduct workshops at community gatherings to encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	High	Ongoing	Workshops conducted annually using Emergency Management Performance Grant (EMPG) funds. Workshops provided to municipalities, senior centers, and civic organizations.
Produce and distribute family emergency preparedness information relating to all natural hazards affecting the County.	High	Ongoing	Workshops conducted annually using Emergency Management Performance Grant (EMPG) funds. Workshops provided to municipalities, senior centers, and civic organizations.
Enforce a balanced system of ordinances that protect the community as-a-whole while respecting the rights of individuals.	Med.	Ongoing	Municipalities responsible for upgrading local codes and issuance of tickets for code violations/building violations.
Individual communities should prepare future land use plans and capital improvement programs to plan for their future needs.	Med.	Ongoing	Local planning commissions and zoning board of appeals have adopted updated plans. Master plans have to be updated every five years, zoning ordinances as often as necessary to reflect changes in planning/ building issues.
Communities will acquire and maintain an adequate level of emergency power generators to supply emergency water needs, wastewater processing, emergency communications, emergency health care, and shelters.	Med.	Ongoing	Clare, Harrison, and Farwell, all have generators for back up for their water systems. Fire stations have generators as do the radio towers.
Ensure key gasoline stations have the capacity to pump gasoline during power outages.	Med.	Not Started	Fueling stations have not shown interest. Road Commission has a tank with minimal storage capacity that can be used for emergencies.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Develop plans to identify and inform persons of "Safe Areas" during festivals/events. (include signs and directions to shelters)	Med.	Not Started	This activity not identified in the State Emergency Plan. Item will not be completed.
Work with power companies to inventory condition of power line right-of-ways, and identify priority sections to clear branches and trees from power lines. The end goal is to create and maintain a disaster resistant landscape in public rights-of-way.	Low	Ongoing	Consumers Energy works with local governments to trim branches/ remove trees located in the utility's right-of-way.
Where feasible and cost effective (more densely populated areas) bury and protect power and utility lines.	Low	Not Started	Project too costly. Population density not sufficient for this activity.
Continue to develop Emergency Response Team program to help prepare for all hazard events in the county.	Low	In Process	Dive/Containment Team formed and grants obtained to secure training and equipment.
Increase usage of NOAA Weather Radio by subsidizing purchase and distribution of radios to county residents, organizations and businesses. Use NOAA radios as a community emergency alert system to information on hazard events.	Low	Ongoing	NOAA Weather Radios with strobe lights and amplified speakers distributed countywide through Agency of Aging.
Identify optimal staffing levels for County and community needs – seek funding to meet optimal levels	Low	In Process	Part-time Emergency Management Director position was expanded to full-time position. Salary survey being completed.
Acquire portable/changeable message signs to direct crowds and provide information.	Low	In Process	MDOT sign at Rte. 127 rest area near Clare has sign. City of Harrison getting quotes to purchase signs.
Enhance and expand a public education program for all natural hazards that threaten the community.	Low	Ongoing	EMPG requirement for County, Harrison School District and Harrison Fire Departments have programs as well.
Organize outreach program to vulnerable populations during and after hazard events, including wildfires, extreme winter and summer weather events, periods of extreme temperatures, public health emergencies, and other hazards that can impact the community.	Low	Ongoing	Long-term Care Facilities (LTC) contacted regardless of size. State requires facilities with 6 or more people to be contacted, County contacts all facilities.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Build the capabilities of the county GIS program to function as a tool to address multiple hazards. This effort would require the creation/updating of datasets such as parcels/ownership, location of all structures, driveways with ingress/egress conditions, roads, forest types, ownership types, floodplains, utilities (power lines, gas lines and water lines), wetlands, water features, bridges and culverts, (SARA III sites)	Low	In Process	City of Harrison received SAW grant of $500,000 to begin GIS program.
B. Structural Fire			
Education: Public education and school programs (especially about the use of stoves, heaters, fireworks, matches/lighters, etc.)	High	Ongoing	All fire departments participate in this program. Fire Prevention Week (usually the first full week in October) provides many opportunities for educational programs throughout the County. Fire Departments also offer training throughout the year.
Proper workplace procedures, training and exercising, and handling of explosive and flammable materials and substances.	High	Ongoing	All fire departments receive annual training on these matters.
Elimination of clandestine methamphetamine laboratories through law enforcement and public education.	High	Ongoing	The Drug Strike Team handles this matter.
Landlords and families can install and maintain smoke detectors and fire extinguishers. Install a smoke alarm on each level of homes (to be tested monthly, with the batteries changed twice each year). Family members and residents should know how to use a fire extinguisher.	Med.	Ongoing	Fire departments work with the residents during Fire Prevention Week. In addition, appointments can be made to provide instruction throughout the year.
Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, and recreation areas, and other appropriate sites.	Med.	Ongoing	The Emergency Management Office develops plans. This is ongoing as the plans are modified to comply with changes in both statutes and planning.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Improved and continuing training for emergency responders, and provision of equipment for them.	Med.	Ongoing	Clare County Fire Chief's Assn, the Local Emergency Planning Commission, and the Local Planning Team all receive and/or provide training opportunities. Grants for training are also made available through the Homeland Security Grant Program (HSGP).
Posting of fire emergency telephone numbers in accessible places.	Med.	Complete	This has been completed through the 9-1-1 process.
Pre-planned escape routes and fire alert responses.	Low	Ongoing	All fire departments participate in this program. Fire Prevention Week (usually the first full week in October) provides many opportunities for educational programs throughout the County. Fire Departments also offer training throughout the year.
Transportation planning that provides roads, overpasses, etc. to maximize access and improve emergency response times, and evacuation potential, for all inhabited or developed areas of a community (not just designing for the minimum amount of road capacity to handle normal traffic volumes in the community.) This includes transportation access within developed sites (shopping malls, stadiums, office & commercial parking lots, etc.)	Low	Ongoing	Michigan Department of Transportation (MDOT) representative sits on the LEPC to assist in local planning. New state-wide rerouting transportation plan was completed in 2014.
Defensible space around structures in fire-prone wildland areas.	Low	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Proper maintenance of power lines, and efficient response to fallen power lines.	Low	Ongoing	Consumers Energy is responsible for this activity.
Enforced fireworks regulations.	Low	Ongoing	This is enforced by the state.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	Low	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Education and practice of safe cigarette handling and disposal (also candles, fireworks, campfires, holiday lights)	Low	Ongoing	There is information and educational programs offered during Fire Prevention Week.
Code existence and enforcement.	Low	Ongoing	Local governments are responsible for enforcement of local codes.
Control of civil disturbances and criminal activities that could lead to arson.	Low	Ongoing	Local public safety departments are responsible for this activity.
C. Severe Summer Weather			
Maintaining adequate road and debris clearing capabilities.	High	Ongoing	Road Commission, local governments are responsible for this activity. The Emergency Action Guidelines (EAG) Disaster Plan is followed.
Installing lightning protection devices on the community's communications infrastructure.	High	Complete	Completed in 2012.
Pre-arranging for shelters for stranded motorists/travelers, and others.	High	Complete	County-shelter plan completed, shelters are available throughout the County.
Education: Public education and awareness of thunderstorm dangers.	Med.	Ongoing	Information is available on the Emergency Management Website, presentations are made by the Emergency Management Director at the beginning of each summer, press releases are issued annually, and weather spotting classes are offered.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Public early warning systems and networks.	Med.	Complete	Sirens have been installed throughout the county, NOAA radios are available, and Nixle services are available throughout the County.
Increased coverage and use of NOAA Weather Radio	Med.	Complete	NOAA Weather Radios with strobe lights and amplified speakers distributed countywide through Agency of Aging. NOAA tower installed in Mt. Pleasant.
Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)	Med.	Complete	Consumers Energy is responsible for this activity.
Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	Med.	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Organizing outreach to isolated, vulnerable, or special-needs populations.	Low	Ongoing	Long-term Care Facilities (LTC) contacted regardless of size. State requires facilities with 6 or more people to be contacted, County contacts all facilities.
Buried/protected power and utility lines.	Low	Not Started	Project too costly. Population density not sufficient for this activity.
Using surge protectors on critical electronic equipment.	Low	Complete	All county-wide facilities are using surge protectors. This include both public and private facilities.
Proper anchoring of manufactured homes and exterior structures such as carports and porches.	Low	Complete	Per local building codes.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Establishing safe and appropriate locations for temporary debris disposal sites.	Low	Complete	This was completed through the EAG.
Pre-planning for debris management staging and storage areas. (Debris could be rubble, vehicles, objects from destroyed/damaged structures, vegetation or other items knocked down or blown by winds, or broken power or phone lines that had frozen or been weighted down by fallen branches and trees.)	Low	Complete	Road Commission, local governments are responsible for this activity. The Emergency Action Guidelines (EAG) Disaster Plan is followed.
Farmer preparedness to address livestock needs/problems.	Low	Ongoing	The agriculture agencies are represented on the LEPC/LPT. Any concerns or issues are brought to these meetings.
Training and increased use of weather spotters.	Low	Ongoing	Annual classes provided by local fire departments.
Organizing outreach to vulnerable populations during periods of severe weather events, including establishing and building awareness of accessible heating and/or cooling centers in the community, and other public information campaigns about this hazard.	Low	Ongoing	Long-term Care Facilities (LTC) contacted regardless of size. State requires facilities with 6 or more people to be contacted, County contacts all facilities. The American Red Cross addresses long-term matters.
D. Wildfire			
Public Education on Wildfires, FIREWISE Program, School Education, ETC.	High	Ongoing	Firewise program completed in 2013. Public education is ongoing and offered by the local fire departments.
Safe use and maintenance/cleaning of fireplaces and chimneys (with the use of spark arresters and emphasis on proper storage of flammable items). Residents and Businesses should be encouraged to inspect chimneys at least twice a year and clean them at least once a year.	High	Ongoing	Fire Departments provide information on this during National Fire Prevention Week as well as throughout the year.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Keeping roads and driveways accessible to vehicles and fire equipment—driveways should be relatively straight and flat, with at least some open spaces to turn, bridges that can support emergency vehicles, and clearance wide and high enough for two-way traffic and emergency vehicle access (spare keys to gates around property should be provided to the local fire department, and an address should be visible from the road so homes can be located quickly).	High	Ongoing	Troublesome bridges rebuilt in 2008. Local Fire Departments are provided spare keys for access to buildings in case of an emergency.
Organizing neighborhood wildfire safety coalitions (to plan how the neighborhood could work together to prevent a wildfire).	Med.	Complete	Included as part of the Firewise Program in 2013.
Proper storage and use of flammables, including the use of flammable substances (such as when fueling machinery). Store gasoline, oily rags and other flammable materials in approved safety cans. Stack firewood at least 100 feet away and uphill from homes.	Med.	Complete	Included as part of the Firewise Program in 2013.
Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	Med.	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Arson prevention activities, including reduction of blight (cleaning up areas of abandoned or collapsed structures, accumulated junk or debris, and with any history of flammable substances stored, spilled, or dumped on them).	Med.	Ongoing	With the elimination of vacant buildings, and through education, arson opportunities are diminishing.
Proper maintenance and separation of power lines. Ask the power company to clear branches from power lines.	Med.	Ongoing	Consumers Energy is responsible for this activity.
Efficient response to fallen power lines.	Med.	Ongoing	Consumers Energy is responsible for this activity.
Training and exercises for response personnel.	Med.	Ongoing	All fire departments receive annual training on these matters.
Post fire emergency telephone numbers.	Low	Ongoing	This has been completed through the 9-1-1 process. In addition, local businesses and public buildings have posters with emergency numbers.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Have adequate water supplies for emergency firefighting (in accordance with NFPA Standards). For residents, identify and maintain an adequate outside water source such as a small pond, cistern, well, swimming pool or hydrant; have a garden hose that is long enough to reach any area of the home and other structures on the property; install freeze proof exterior water outlets on at least two sides of the home and near other structures on the property. Install additional outlets at least 50 feet from the home; consider obtaining a portable gasoline powered pump in case electrical power is cut off.	Low	In Process	Emergency firefighting water system was complete in 2008. Dry hydrants installed in waterways. Other items not applicable.
Public education on smoking hazards and recreational fires.	Low	Ongoing	All fire departments participate in this program. Fire Prevention Week (usually the first full week in October) provides many opportunities for educational programs throughout the County. Fire Departments also offer training throughout the year.
Media broadcasts of fire weather and fire warnings.	Low	Ongoing	Sirens have been installed throughout the county, NOAA radios are available, and Nixle services are available throughout the County.
Create and enforce local ordinances that require burn permits and restrict campfires and outdoor burning.	Low	Ongoing	Department of Natural Resources (DNR) is responsible for these actions.
Mutual aid pacts with neighboring communities.	Low	Complete	A memorandum of understanding (MOU) was signed in 2013.
The creation of fuel breaks (areas where the spread of wildfires will be slowed or stopped due to removal of fuels, or the use of fire retardant materials/vegetation) in high-risk forest or other areas.	Low	Complete	Completed through the Firewise Program in 2013.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
GIS mapping of vegetative coverage, for use in planning decisions and analyses through comparison with topography, zoning, developments, infrastructure, etc.	Low	Not Started	City of Harrison recently received SAW grant of $500,000 to begin GIS program.
Proper maintenance and storage of motorized equipment that could catch on fire.	Low	Complete	Each Fire Department is responsible for its own equipment. They are provided training for the maintenance of the equipment.
Prescribed burns and fuel management (thinning of flammable vegetation, possibly including selective logging to thin out some areas. Fuels cleared can be given away as firewood or chipped into wood chips for distribution.)	Low	Complete	Completed annually by DNR.
Enclosing the foundations of homes and buildings rather than leaving them open and the underside exposed to blown embers or materials.	Low	Complete	Completed through the Firewise Program in 2013.
Avoid building structures on hilltop locations, where they will be at greater risk from wildfires (in addition, hillsides facing south or west are more vulnerable to increased dryness and heat from sun exposure) and use of proper setbacks from slopes (outside of the "convection cone" of intense heat which would be projected up the slope of the hill as a wildfire "climbs" it).	Low	Complete	Completed through the Firewise Program in 2013.
E. Population Increase (Seasonal/Other)			
Provide personnel, on a temporary basis, to handle greater loads on public services.	High	Ongoing	Reserve officers are utilized as needed.
Provide for emergency equipment to deal with higher call rates.	Med.	Ongoing	All fire departments receive annual training on these matters.
Develop plans for excessive traffic patterns.	Low	Complete	Plan was completed in per state requirements.
F. Infrastructure Failure			
Use of generators for backup power at critical facilities.	High	Complete	Clare, Harrison, and Farwell, all have generators, fire stations have generators, as do the radio towers.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Programs/networks for contacting elderly or homebound persons during periods of infrastructure failure, to assess whether they have unmet needs.	High	Ongoing	EAG requires that plan be in place, NOAA and Nixle are both in place and utilized for emergency purposes.
Mutual aid assistance for failures in utility and communication systems (including 9-1-1).	High	Complete	MOU between municipalities signed in 2013.
Replacement or renovation of aging structures and equipment (to be made as hazard-resistant as economically possible).	Med.	Ongoing	Each municipality, through its Capital Improvement Plans (CIPs), identifies the replacement of infrastructure.
Increasing public awareness and widespread use of the "MISS DIG" utility damage prevention service (1-800-482-7171). Education for the public on Infrastructure Hazards.	Med.	Ongoing	The public has been notified of the use of Miss Dig and 8-11, through public awareness programs, website postings, and through the local media.
Tree-trimming programs to protect utility wires from falling branches. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)	Med.	Ongoing	Consumers Energy is responsible for this activity.
Protecting electrical and communications systems from lightning strikes.	Low	Complete	The County took steps to complete this activity.
Regular maintenance and equipment checks.	Low	Ongoing	All fire departments are responsible for these matters.
Alternative 9-1-1 access through radio operators whose homes are identified through special markings.	Low	Not Started	Radio operators group in no longer practical. Alternative site has been established in the Clare Police Station.
Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	Low	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Separation and/or expansion of sewer system to handle anticipated stormwater volumes.	Low	In Process	Grants were awarded in 2014 to Harrison to complete the process.
Proper location, design, and maintenance of water and sewer systems (to include insulation of critical components to prevent damage from ground freeze).	Low	In Process	Grants were awarded in 2014 to Harrison to complete the process.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
G. Transportation Accidents			
Improved design, routing, and traffic control at problem roadway areas.	High	Ongoing	MDOT plan in 2014. Local Plan Commissions look at annually as well.
Trained, equipped, and prepared search and rescue teams.	High	Ongoing	All fire departments' specialty squads receive annual training on these matters.
Marine safety and general boater awareness programs.	High	Ongoing	Programs are provided by public safety departments. Information is also provided through local media and on websites.
Long-term planning that provides more connector roads for reduced congestion of arterial roads.	Med.	Ongoing	Local planning commissions annually look at road systems.
Use of designated truck routes.	Med.	Complete	Weight restrictions limit truck on local roads, thereby creating truck routes on arterial roads.
Training, planning, and preparedness for mass casualty incidents involving all modes of public transportation.	Med.	Ongoing	EAG provides for annual training for these types of disaster.
Enforcement of weight and travel restrictions.	Low	Complete	Road Commission establishes weight restrictions, local police, sheriff's department and state police enforce the weight restrictions.
H. Winter Weather Hazards			
Including safety strategies for severe weather events in driver education classes and materials. Note: Most driver education training is now provided by private businesses.	High	Complete	Driving instruction is now done by private businesses, but is included in the testing for driving licenses by the state
Maintaining adequate road and debris clearing capabilities.	High	Ongoing	The County Road Commission and local department of public works personnel are responsible for this activity.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Pre-planning for debris management staging and storage areas. (Debris is usually the sleet and ice itself being cleared from roads and roofs, or vegetation such as tree branches that have fallen under the impact of winds or the weight of ice. Broken power or phone lines that had frozen or been weighted down by ice or fallen branches could be part of the problem. In some cases, roofs may collapse under the weight of ice and snow. Some storage areas will definitely be needed for snow removal during blizzards.)	High	Complete	Road Commission, local governments are responsible for this activity. The Emergency Action Guidelines (EAG) Disaster Plan is followed.
Pre-arranging for shelters for stranded motorists/travelers, and others.	Med.	Complete	County-shelter plan completed, shelters are available throughout the County.
Organizing outreach to isolated, vulnerable, or special-needs populations.	Med.	Ongoing	Long-term Care Facilities (LTC) contacted regardless of size. State requires facilities with 6 or more people to be contacted, County contacts all facilities. American Red Cross will also assist for long-term care.
Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	Med.	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Using snow fences or "living snow fences" (rows of trees or vegetation) to limit blowing and drifting of snow over critical roadway segments.	Med.	Ongoing	Snow fences installed throughout the county. Living snow fences have been planted and used by county residents.
Increased coverage and use of NOAA Weather Radio	Med.	Ongoing	NOAA Weather Radios with strobe lights and amplified speakers distributed countywide through Senior Services Agency.
Producing and distributing family emergency preparedness information relating to severe winter weather hazards	Med.	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)	Med.	Ongoing	Consumers Energy is responsible for this activity.
Establishing heating centers/shelters for vulnerable populations.	Low	Ongoing	Long-term Care Facilities (LTC) contacted regardless of size. State requires facilities with 6 or more people to be contacted, County contacts all facilities. American Red Cross will also assist for long-term care.
Using surge protectors on critical electronic equipment.	Low	Complete	All county-wide facilities are using surge protectors. This include both public and private facilities.
Home and public building maintenance to prevent roof and wall damage from "ice dams."	Low	Complete	Included in the outreach program provided by the County.
Buried/protected power and utility lines.	Low	Ongoing	Power lines will be protected by Consumers Energy. Due to the excessive costs to bury the lines, they will not be buried.
Special arrangements for payment of heating bills.	Low	Complete	State legislation prohibits the shutting off of heat during the winter months. Agencies (United Way, Catholic Charities, etc) will assist in the payment of delinquent utility bills.
Proper building/site design and code enforcement relating to snow loads, roof slope, snow removal and storage, etc.	Low	Complete	This is addressed by local building codes.
Farmer preparedness to address livestock needs/problems.	Low	Ongoing	The agriculture agencies are represented on the LEPC/LPT. Any concerns or issues are brought to these meetings.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Housing/landlord codes enforcing heating requirements	Low	Complete	Addressed in local building and property maintenance codes.
I. HazMat Transportation			
Improvements in driver education, traffic law enforcement, and transportation planning that balance the needs of hazardous material transporters with the safety of the general public.	High	Complete	Hazmat drivers receive training from their companies as well as MDOT.
Improved design, routing, and traffic control at problem roadway areas.	High	Ongoing	MDOT plan in 2014. Local Plan Commissions look at annually as well.
Long-term planning that provides more connector roads for reduced congestion of arterial roads.	High	Ongoing	Local planning commissions annually look at road systems.
Public warning systems and networks.	Med.	Ongoing	Message boards on highways to warn public, cameras on highways for public safety personnel to review
Training, planning, and preparedness for hazardous material incidents along roadways and railways (in addition to fixed site emergencies).	Med.	Ongoing	LEPC and fire department personnel involved in planning and training.
Trained, equipped and prepared local hazardous materials emergency response teams.	Med.	Ongoing	EAG provides for annual training for these types of disaster.
Road closures and traffic control in accident areas.	Med.	Complete	Emergency Action Plan (EAP) addresses the road closure and traffic control protocol.
Evacuation plans and community awareness of them.	Med.	Complete	EAG addresses the promotion of these plans and their usage.
Proper planning, design, maintenance of, and enhancements to designated truck routes.	Low	Ongoing	The Road Commission and local department of public works personnel handle the maintenance and enhancements of the routes as determined by the EAG.

CLARE COUNTY IMPLEMENTATION STRATEGY TABLE: 2007-2015			
Mitigation	**Priority**	**Status**	**Outcomes**
Locating schools, nursing homes, and other special facilities away from major hazardous material transportation routes.	Low	Ongoing	Addressed by the local planning Commissions.
Enforcement of weight and travel restrictions for truck traffic.	Low	Complete	Road Commission establishes weight restrictions, local police, sheriff's department and state police enforce the weight restrictions.
Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents).	Low	Ongoing	NOAA Weather Radios with strobe lights and amplified speakers distributed countywide through Agency of Aging.
Compliance with and enforcement of USDOT and MDOT regulations regarding hazardous materials transport.	Low	Ongoing	Law enforcement personnel are responsible for enforcement of USDOT and MDOT regulations.
Trained, equipped, and prepared search and rescue teams.	Low	Ongoing	All fire departments' specialty squads receive annual training on these matters.
Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.	Low	Ongoing	Community-wide Public Education Program completed with Firewise grant in 2013.
Use of ITS (intelligent transportation systems) technology.	Low	In Process	Utilizing the state electronic message boards on the highways. Harrison in the process of purchasing movable message boards.

CHAPTER 6: ACTION PLAN

Through a systematic process, that included the review of all action items identified in the Clare County 2007 Hazard Mitigation Plan (2007 Plan) and the possible mitigation strategies as identified in the 2007 Local Hazard Mitigation Planning Workbook (Workbook), the Clare County Hazard Mitigation Advisory Committee (CCHMAC) was able to identify the following actions to be the most effective strategies for hazard mitigation for 2016 Hazard Mitigation Plan for Clare County. The actions include mitigation actions identified in the 2007 Plan that are ongoing, or have not been completed and are still considered to be relevant, as well as new strategies that have been identified by the CCHMAC.

The CCHMAC initiated the selection process with a review of the goals and objectives as identified in the 2007 Plan and modified them to fit the needs of Clare County in 2016 and beyond. These goals and objectives are identified below.

GOAL 1: Protect Public Health and Safety

OBJECTIVES

- Provide community wide hazard warning systems (natural, health and terrorism)
- Provide information and resources to increase hazard awareness and education
- Maintain existing resources and provide necessary training
- Identify and obtain necessary resources and equipment to prevent or minimize hazard effects

GOAL 2: Minimize damage to public and private property OBJECTIVES

- Adopt policies to make property less vulnerable
- Apply proactive mitigation measures to prevent hazard damage
- Obtain necessary equipment, resources and training to protect property if hazard occurs
- Conduct training sessions and exercises to prepare for possible hazards

GOAL 3: Maintain essential services

OBJECTIVES

- Identify, inspect and maintain all critical infrastructure and facilities
- Repair or replace critical infrastructure and facilities that are damaged or degraded
- Protect critical infrastructure and facilities from hazard damage
- Obtain necessary resources and equipment to insure essential services are maintained in the event of a hazard

GOAL 4: Manage growth/development

OBJECTIVES

- Develop hazard resistant growth policies
- Discourage development in high hazard areas
- Integrate hazard mitigation planning into land use planning
- Encourage sustainable development
- Protect and conserve natural resources

The action plan items from the 2007 Plan were then evaluated and those items that were deemed complete or no longer applicable were eliminated from this plan (see review of all 2007 items in Chapter 5). The CCHMAC then began review of the possible mitigation strategies as identified in the Workbook. After reviewing and identifying over 250 possible mitigation strategies (many of them duplicate strategies for multiple hazards) the Clare County Emergency Management Director and Regional Planner from EMCOG were able to eliminate duplicate strategies to reduce the number of possible strategies to 23. The revised list was reviewed and approved by the CCHMAC. The final list of 23 strategies is found in Appendix C. The list of original strategies is found in Appendix D.

The CCHMAC was then asked to identify hazard mitigation projects/processes that address the items on the list. The projects/processes that address hazards that occur on an annual basis have been given a high priority. Projects/processes items that occur less than annually were given a lesser importance and have been identified as a medium priority. Projects/processes that occur infrequently or provide less of an impact were identified as moderate priorities and are identified in Appendix E. All projects that were identified are included in Appendix E. It should be noted that those projects that met the high or medium priority criteria, but were identified as not being as cost effective as other projects, were ranked lower in the priority or were given a lower priority.

The list of action items (projects) has been greatly reduced from the 2007 Plan, which had approximately 125 actions. This reduction was per the suggestion of the MSP/EMHSD staff. The 2007 prioritization process was based on the number of mitigation activities found for each hazard, votes or the action item in that hazard. Therefore, each hazard had high, medium, and low priority projects. The prioritization of the proposed action list is based on frequency of the events and their cost effectiveness. There is not specifically a high priority project for each hazard, as was done in the 2007 Plan.

Multiple actions identified in the 2016 Plan have been purposely re-worded to be less specific than in the 2007 Plan, which allows those items to address multi-hazard actions, rather than the hazard-by-hazard approach in the previous plan. New items not identified in the 2007 Plan have been labeled as “NEW” in their descriptions.

HIGH PRIORITY HAZARD MITIGATION ACTIONS

Item 1 (NEW)

Deepening, widening, clearing of Tobacco Creek/Drain through Downtown Clare.

Action: A multi-phased project that will include the replacement of bridges, retaining walls, associated structures, and dredging of Tobacco Creek in Downtown Clare. These actions will allow the Creek to have a larger capacity to carry water through the downtown area.

- Location: City of Clare.
- Lead Agency: Clare County Drain Commission
- Participating Agencies: City of Clare, MDOT, Grant Township
- Hazards Addressed: Flooding.
- Potential Funding Source(s): Special Assessment Millage, Loans (Drain Commission)
- Project Costs: $4.6 million.

- Schedule: Project is being phased due to project costs. The engineering is complete and the first phase will begin in 2016.
- Priority: High
- Benefit(s): Project has been designed to reduce flooding along Tobacco Creek and specifically in Downtown Clare.

Item 2 (NEW) Remove Existing Structures from Flood Hazard Areas

Action: Purchase and remove four (4) buildings within the Tobacco Creek floodway.

- Location: Grant Township
- Lead Agency: Clare County Drain Commission
- Participating Agencies: City of Clare, Grant Township, MDOT, Isabella County
- Hazards Addressed: flooding and erosion
- Potential Funding Source(s): Loan from local bank
- Project Cost: $2 million
- Schedule: 2017
- Priority: High
- Benefit(s): Project has been designed to reduce flooding along Tobacco Creek and specifically in Downtown Clare and vicinity.

Item 3 (NEW) Conduct Regular Maintenance of Drainage System/Flood Control Structures

Action: Annual maintenance of creek right-of-way, which includes the removal of debris, trees, and branches, culvert and pipe replacement.

- Location: Grant Township/City of Clare
- Lead Agency: Clare County Drain Commission
- Participating Agencies: City of Clare, Grant Township, MDOT, Isabella County
- Hazards Addressed: flooding and erosion
- Potential Funding Source(s): special assessment/municipal bonds
- Project Cost: $10,000/mile of waterway
- Schedule: 2019/2020
- Priority: High
- Benefit(s): Project has been designed to reduce flooding along Tobacco Creek and specifically in Downtown Clare.

Item 4 (NEW)

Public Education on Underground Water Supply and Wellhead Protection Programs.

Action: Public education campaign to inform the residents of the threat of water contamination. Campaign will include public access cable, handouts/flyers at events within the County, and social media.

- Location: City of Harrison
- Lead Agency: City of Harrison
- Participating Agencies: NA
- Hazards Addressed: Public Health Emergencies (contamination of public drinking water)
- Potential Funding Source(s): General fund
- Project Cost: TBD
- Schedule: Ongoing
- Priority: High

- Benefit(s): Public health is maintained by drinking potable water.

Item 5

Tower Site Improvements for Public Safety Communications.

Action: Seek additional tower site for radio communications in Clare County.

- Location: Clare County
- Lead Agency: Clare County Emergency Management /911
- Participating Agencies: Garfield Township Fire Department, Lincoln Township Fire Department, Surrey Township Fire Department, Harrison Fire Department, Clare Fire Department, Marion Fire Department
- Hazards Addressed: Structural fires, wildfires, civil disturbances, terrorism/sabotage
- Potential Funding Source(s): Grants, participating municipalities
- Project Cost: $60,000
- Schedule: TBD
- Priority: High
- Benefit(s): Improved public safety radio communications in southwest Clare County.

Item 6 (NEW) Maintenance and Sustainability of Warning Sirens

Action: Purchase back-up battery packs, operation radio controls as needed.
Location: County-wide

- Lead Agency: Clare County Office of Emergency Management (OEM)
- Participating Agencies: City of Clare, City of Harrison, Freeman Township, Garfield Township, Greenwood Township, Hayes Township, Lincoln Township, Redding Township, Summerfield Township, and Surrey Township
- Hazards Addressed: All hazards
- Potential Funding Source(s): grants, local municipalities
- Project Cost: $4,500/annually
- Schedule: ongoing
- Priority: High
- Benefit(s): Public continues to be notified of hazards by the County's warning sirens.

Item 7

Purchase of generators to be utilized at critical facilities throughout the County.

Action: Purchase of gas-powered generators for backup power at all critical facilities in the County that do not have them. Potential sites include, but are not limited to: township halls, shelters, and the County Courthouse.

- Location: Countywide.
- Lead Agency: OEM
- Participating Agencies: Clare County, Arthur Township, Franklin Township, Freeman Township, Frost Township, Garfield Township, Grant Township, Hamilton Township, Hatton Township, Lincoln Township, Redding Township, Sheridan Township, Summerfield Township, Surrey Township, and Winterfield Township
- Hazards Addressed: severe weather conditions.
- Potential Funding Source(s): grants, Arthur Township, Franklin Township, Freeman Township, Frost Township, Garfield Township, Grant Township, Hamilton Township, Hatton Township,

Lincoln Township, Redding Township, Sheridan Township, Summerfield Township, Surrey Township, and Winterfield Township.

- Project Costs: $250,000.
- Schedule: TBD
- Priority: High
- Benefit(s): Mitigate the loss of life/injuries during power failures. Generators would provide these facilities with power that is needed to handle special needs population that need power to sustain life (oxygen, dialysis machines, etc.).

Item 8

Obtain Geographical Information Systems (GIS) service to create maps that can be used by Emergency Management staff for hazard mitigation purposes.

Action: Complete a Request for Proposal (RFP) packet and distribute to local GIS companies to determine which company, if any, would be able to provide GIS services to the County for Emergency Management purposes in conjunction with hazard mitigation.

- Location: County Offices
- Lead Agency: OEM
- Participating Agencies: Clare County, Clare County 911 Center
- Hazards Addressed: All hazards.
- Potential Funding Source(s): Clare County 911 Center General funds, Grants
- Project Costs: $70,000.
- Schedule: Ongoing
- Priority: High
- Benefit(s): Mitigation of property loss and human loss with additional software/mapping capabilities that identify problematic areas of weather and man-made hazardous conditions.

Item 9 Purchase and Distribute Smoke Detectors and Carbon Monoxide Detectors

Action: Acquire/distribute smoke detectors and carbon monoxide detectors to households throughout the County

- Location: County-wide
- Lead Agency: Clare County Fire Chiefs Association
- Participating Agencies: Garfield Township Fire Department, Lincoln Township Fire Department, Surrey Township Fire Department, Harrison Fire Department, Clare Fire Department, Marion Fire Department
- Hazards Addressed: Fires, public health emergencies (carbon monoxide poisoning
- Potential Funding Source(s): grants, local municipalities
- Project Cost: $10,000/year
- Schedule: TBD
- Priority: High
- Benefit(s): Household members are warned of high carbon monoxide levels in house, and warned of smoke/fires.

Item 10 (NEW) Seek Grant Funds to Complete Community Wildfire Protection Plan

Action: Secure a grant to complete the Community Wildfire Protection Plan

- Location: County-wide

- Lead Agency: OEM
- Participating Agencies: Clare County Fire Chiefs Association, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., Michigan Department of Natural Resources (MDNR),
- Hazards Addressed: Wildfires
- Potential Funding Source(s): MDNR grant, Clare County Fire Chiefs Association, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept.
- Project Cost: $30,000
- Schedule: TBD
- Priority: High
- Benefit(s): Reduction of damages to personal property along with a potential reduction of injury/loss of life due to wildfires.

Item 11
Public Education on Chimney Fires.
Action: Educate the local firefighters on how to address chimney fires. Educate the general public on the maintaining a clean, safe chimney.

- Location: County-wide
- Lead Agency: Clare County Fire Chiefs Association
- Participating Agencies: OEM, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept.
- Hazards Addressed: structural fires
- Potential Funding Source(s): Grants, Clare County, Fire Chiefs Association
- Project Cost: $10,000
- Schedule: ongoing
- Priority: High
- Benefit(s): Chimney properly checked/maintained as well as more knowledgeable firefighters. This would also result in a reduction of chimney fires that could cause injuries/lost lives or loss of personal property.

Item 12 (NEW) Senior Internet Security Program
Action: The Senior Internet Security Program offers senior citizens and their respective caregivers essential senior cyber security and fraud education. The campaign currently involves a focus group approach at Senior Meal and other gathering sites to provide a one-on-one enhanced education to reach the most vulnerable age group for fraud and cybersecurity crimes. Program facilitation is provided through the Clare County Emergency Management office with assistance from the Clare County Sheriff's Office.

- Location: Countywide.
- Lead Agency: Office of Emergency Management (OEM)
- Participating Agencies: Clare County Sheriff's Office
- Hazards Addressed: Fraud
- Potential Funding Source(s): Grants
- Project Cost: $20,000
- Schedule: Ongoing

- Priority: High
- Benefit(s): Senior citizen population will be better educated in cyber security matters and less likely to be susceptible to scams and fraud.

Item 13 (NEW) Purchase of Mobile Generators for Special Needs Population Facilities

Action: Purchase of temporary generators that could be transported to group homes (special needs facilities).

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County Senior Services, Red Cross, Clare County Hazards Addressed: all hazards
- Potential Funding Source(s): grants, local municipalities and agencies
- Project Cost: $50,000
- Schedule: TBD
- Priority: High
- Benefit(s): Group homes (special needs facilities) able to keep their clients in home environment during power failures.

Item 14 (NEW) Prepare Special Needs Population Facilities for Generator Use

Action: Modify residences to allow the use of a generator during power failures.

- Location: County-wide
- Lead Agency OEM:
- Participating Agencies: Clare County Senior Services, Red Cross, Clare County
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, OEM Budget
- Project Cost: $25,000
- Schedule: TBD
- Priority: High
- Benefit(s): Many group homes are not set up to allow a generator to be used to supply power. These modifications would allow the generators to be hooked up to the homes and utilized during power outages.

Item 15

Purchase and Distribute National Oceanic Atmospheric Administration (NOAA) Weather Radios

Action: Purchase NOAA weather radios for all households/businesses in Clare County.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Red Cross, Clare County Senior Services, Mid-Michigan Community Action Agency
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept. Fire Chief's Association
- Project Cost: $150,000
- Schedule: TBD

- Priority: High
  Benefit(s): All households/business are given an opportunity to listen to the radio and provided early warnings of emergency situations.

Item 16 (NEW) Educate Public of Shelters and Warning Systems
Action: Educate the general public on the location of public shelters and the use of warning systems through the distribution of flyers and the use of Public Service Announcements (PSAs).

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., and Red Cross
- Hazards Addressed: all hazards
- Potential Funding Source(s): General fund budgets from fire departments, OEM Budget
- Project Cost: $5000/annually
- Schedule: 2017
- Priority: High
- Benefit(s): General public is better informed of shelter locations and how to respond to the different emergencies identified by the warning systems.

Item 17 (NEW) Encourage the inclusion of hazard mitigation into other planning documents
Action: Encourage municipal agencies to include hazard mitigation into master plans/comprehensive land use plans and other planning documents.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County, all townships as appropriate
- Hazards Addressed: all hazards
- Potential Funding Source(s): NA
- Project Cost: NA
- Schedule: 2016
- Priority: High
- Benefit(s): Hazard Mitigation is identified in the local municipal planning documents, thereby increasing community awareness of hazard mitigation and increasing the opportunity for community resiliency.

MEDIUM PRIORITY HAZARD MITIGATION ACTIONS

Item 1 (NEW) Replace older damaged Culverts throughout the County as needed Action: Replace damaged/rusted out culverts throughout the Clare County.

- Location: County-wide
- Lead Agency: Road Commission
- Participating Agencies: City of Clare, City of Harrison, Village of Farwell, and all townships (should funding become available)

- Hazards Addressed: infrastructure failure, flooding
- Potential Funding Source(s): local general funds
- Project Cost: $300,000
- Schedule: ongoing
- Priority: Medium
- Benefit(s): By replacing the culverts, storm water will be better directed to the intended source, resulting in less flooding and accessibility being improved with passable roads during high rain periods.

Item 2 (NEW) Monitor/Repair/Replace all High Risk Dams

Action: Clare County has three high risk dams. Should any of these dams fail, property and possibly lives could be lost, as well as the lakes themselves. These dams vary in their state of repair and Shamrock Dam has been identified as a concern by the local governments. Complete a study to determine needed repairs/complete repairs/replace as necessary.

- Location: City of Clare, Surrey Township
- Lead Agency: City of Clare
- Participating Agencies: Grant Township. MDOT, Surrey Township, Clare County Drain Commission, and Lake 13 Property Association
- Hazards Addressed: flooding, infrastructure failure
- Potential Funding Source(s): Grants, special assessments, general funds
- Project Cost: TBD
- Schedule: TBD
- Priority: Medium
- Benefit(s): Dams should be properly maintained/enhanced to avail failure, which should failure occur, flooding would result not only potentially damaging properties within the dam's shadow, but could also result in the loss of one or more lakes.

Item 3

Continue to Develop Emergency Plans for Businesses, Schools, Governmental Facilities, and Special Events.

Action: Continue to do all inclusive whole community planning.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., local businesses, Farwell, Clare, and Harrison Chambers of Commerce, all educational facilities, event coordinators, special event facilities
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, local match, OEM Budget
- Project Cost: NA
- Schedule: ongoing
- Priority: Medium
- Benefit(s): Buildings and events would have a plan for emergencies, thereby having an informed workforce in the event of an emergency.

Item 4

Continue to Develop Evacuation Plans for Businesses, Schools, Governmental Facilities, and Special Events.

Action: Continue to do all inclusive whole community planning.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., local businesses, Farwell, Clare, and Harrison Chambers of Commerce, all educational facilities, event coordinators, special event facilities
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, local match, OEM Budget
- Project Cost: NA
- Schedule: ongoing
- Priority: Medium
- Benefit(s): Buildings and events would have a plan for evacuation situations, thereby having an informed workforce in the event of an emergency.

Item 5

Plant Live Snow Fence along US127/Old US127 corridors.

Action: Identify the potential locations of live snow fences, plant accordingly.

- Location: Along Rte. 127/ old Rte. 127 corridors
- Lead Agency: Clare County Road Commission
- Participating Agencies: Clare County Parks and Recreation, MDOT
- Hazards Addressed: infrastructure failure, severe weather conditions
- Potential Funding Source(s): grants, Clare County Road Commission, local municipalities
- Project Cost: $25,000
- Schedule: 2018
- Priority: Medium
- Benefit(s): With the installation of the snow fence/wind block, the highways can remain open during times of inclement weather, including high winds during the spring planting.

Item 6 Trimming of Tree Branches around Power Lines

Action: Consumers Energy and Tri Count Electric have ongoing tree trimming initiatives along the power line right-of-way.

- Location: County-wide
- Lead Agency: Consumers Energy,
- Participating Agencies: Tri-County Electric Cooperative
- Hazards Addressed: all hazards
- Potential Funding Source(s): Annual Budget
- Project Cost: TBD
- Schedule: Ongoing
- Priority: Medium
- Benefit(s): Trimming trees along power lines, roads and streets mitigates damages that occur from summer and winter storm events. Fallen trees and limbs can obstruct passage on streets

and roads impeding the passage of emergency vehicles. Fallen trees and limbs that damage power lines can leave vulnerable populations, particularly the elderly and disabled, without heat, air conditioning and electrical power for home medical devices, and leaves residents with residential wells without a source of water. Critical facilities such as urgent care clinics, pharmacies and gas stations can be shut down from a loss of electrical power.

Item 7 Protect Critical Facilities/Structures from Lightning Damage and other hazards

Action: Protect critical facilities/structures from lightning strike damage and other hazards with the installation of lightning rods and proper grounding and install/maintain surge protection on critical electronic equipment.

- Location: County-wide
- Lead Agency: Clare County OEM
- Participating Agencies: NA
  Hazards Addressed: all hazards
- Potential Funding Source(s): OEM Budget, grants
- Project Cost: TBD
- Schedule: Ongoing
- Priority: Medium
- Benefit(s): Facilities and critical equipment will be protected from effects of lightning strikes, thereby keeping the facilities operational during hazard events.

CHAPTER 7: FOLLOW-UP

The follow-up for Clare County is an important part of the planning process. Follow-up is the process in which the plan will be monitored, evaluated, and updated within a five-year cycle. When updated, the plan will be reviewed, revised, and resubmitted to the Michigan State Police, Emergency Management and Homeland Security Division for approval by Federal Emergency Management Agency (FEMA). As appropriate, the plan will also be evaluated after a disaster, or after unexpected changes in land use or demographics in or near hazard areas. The Clare County Hazard Mitigation Advisory Committee (CCHMAC) will also be kept apprised of a change in federal regulations, programs and policies, such as a change in the allocation of FEMA's funding for mitigation grant programs. These evaluations will be addressed in the plan and may affect the action items for mitigation goals and activities. The hazard mitigation plan should be considered by community planners within Clare County, when future updates of their comprehensive plans are taking place.

The CCHMAC will continue to monitor the status and track the progress of the plan elements on an annual basis. The CCHMAC will oversee the progress made on the implementation of the identified action items and update the plan as needed to reflect changing conditions. Representatives will also meet annually to evaluate plan progress and recommend updates. The Clare County Emergency Management Director will facilitate the meetings.

Evaluation of the plan will not only include checking the implementation status of mitigation action items, but also assessing their degree of effectiveness and assessing whether other natural hazards needs to be addressed and added to the plan. This will be accomplished by reviewing the benefits (or avoided losses) of the mitigation activities that were in place within each jurisdiction and the County. These will be compared to the goals the Plan has set to achieve. The CCHMAC will also evaluate whether mitigation action items need to be discontinued or modified in light of new developments or changes within the County.

As required, this plan will be updated within five (5) years of the date of FEMA's approval of the plan. The plan may be updated earlier, at the discretion of the CCHMAC and its jurisdictions. The CCHMAC's ability to update the mitigation process by adding new data and incorporating it into the mitigation plan will allow for the efficient use of available resources, staff, and programs. They will meet to discuss the plan and document data collected including hazard events, completed mitigation activities, new mitigation activities, and FEMA grant application efforts. The information will be used for the five (5) year update. The Clare County Emergency Management Director will coordinate the annual meeting and keep records of the participants and information received.

In order to have continued public support of the mitigation process, it is important that the public be involved not only in the preparation of the initial plan, but also in any modifications or updates to the plan. The public is invited to the annual meetings, in compliance with the Public Meetings Act.

To ensure that public support is maintained, the following actions may be taken by CCHMAC:

- Updates to the plan.

- The Clare County plan has been web posted along with contact information that allows any citizen to read it and provide feedback.
- Develop informational mailings to be distributed to the public about mitigation efforts in the county and updates made to the plan.
- Develop mitigation flyers or mailings that contain mitigation activities and action items that promote reducing damages and risks of natural hazards.

APPENDIX A –
CLARE COUNTY HAZARD MITIGATION ADVISORY COMMITTEE
SIGN-IN SHEETS

CLARE COUNTY

Date 3-21-16

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVE (Round Trip)
Bill Ernat	Bill Ernat	EMCOG	—
Mary Jo Beal	Mary Beal	MidMichigan Clare	61
Tim Brubaker	[illegible]	Dispatch	37
Marlana Terrian	Marlana Terrian	Dispatch	37
TERESA LANE	Teresa Lane	CCSD	32
CARL PARKS	Carl Parks	Clare Co Drain Comm.	12
Jerry Becker	[illegible]	CCFAD	
James Chapman	James Chapman	Clare F.D.	3
Ed Williams	Ed Williams	Clare County Sheriff Dept	32
Dave Sunday	Dave Sunday	CCRC	20
DAVID SAAD	[illegible]	CPD	
TERRY ACTON	Terry Acton	HAYES Township	30

Clare County Hazard Mitigation Meeting Sign in Sheet - Mtg. Date: 12/8/2015

Printed Name	Signature	Organization	Miles Driven R/T	
TERESA LANE	Teresa Lane	CCSD	3	
Tom Brubaker		CCSD	3	
Marlana Terrian	Marlana Terrian	MSD	3	
[illegible]	[illegible]	CCEMD	3	
ALAN JESSUP	[illegible]	CLARE DPW	10	
James Chapman	[illegible]	Clare FD	10	
Tracey Beadle	Tracey Beadle	Harrison - City	2	
TOM PIENNISILL	[illegible]	CCTC	0	
Patrick Agla	[illegible]	HCFA	4	
BILL ERNAT	[illegible]	EMCOG	—	

CLARE COUNTY

Date 10-27-15

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVE (Round Trip)
Bill Ernst	[illegible]	EMCOG	—
Patrick Agin	[illegible]	WCFD	4
Dote Majewski		C.C.	24
Dwayne Wetzel	[illegible]	CCSD	24
Nick Oster	[illegible]	CCSD - HCS	—
Tracey Beadle	Tracey Beadle	City of Harrison	4
LARRY SCHLOETEL	[illegible]	MSP	60
DOUG FITZGERALD	[illegible]	CMDHD	4
Nadium Ward	[illegible]	Lear Corporation	40
Tracy Byard	Tracy Byard	Clare CO	80
Kevin Tubbs	[illegible]	GTFD	80
Brett Hansen	[illegible]	MMR	20
Marlana Terrian	Marlana Terrian	CCCD	—
Tom Brubaker		CCCD	—
Dave Sunday	Dave Sunday	CCRC	10
Jerry Becker	[illegible]	CCEMD	4

CLARE COUNTY

Date Aug 17, 2015

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVE (Round Trip)
Bill Ernat	Bill Ernat	East Michigan Council of Governments	—
Jerry Becker		Clare County Emergency Services	—
Kathryn Decker	Kathryn M. Decker	Winterfield Township	50
Mandy Martin		Winterfield Township	50
Mary Rottiers	Mary Rottiers	Garfield Twp	49
Harold Becker	Harold Becker	Frost Twp	8 / 12
Emerson Davis	Emerson Davis	Frost	8 12
Marion Coon	Marion Coon	Frost Twp	12
Jennie Pagel	Jennie Pagel	Frost Twp	12
James Korman	Jim Korman	Greenwood	10
Lester Vida	Lester Vida	Greenwood	12
Linda Barlow	Linda Barlow	Greenwood Twp	8
Barbara Perrott	Barbara Perrott	Greenwood Twp	6
Pamela Mayfield	Pamela Mayfield	County Clerk / Register	11
Jenny Beemer-Fitzinger	Jenny Beemer-Fitzinger	County Treasurer	8
Mary Borgula	Mary Borgula	Redding Township Clerk	24
Diane + Nicole Blackburn	Diane Blackburn	Franklin Twp	20
Therese Haley	Therese Haley	Franklin Twp	24

CLARE COUNTY

Date 7-28-15

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVE (Round Trip)
Bill Ernst	[illegible]	EMCOG	—
LARRY SCHLOEGL	[illegible]	MSP	—
Ed Williams	[illegible]	CCSD	
DICK JOHNSON	[illegible]	AMATEUR RADIO	
Cindy Havens	Cindy Havens	Red Cross	100
Kevin Wilkes	[illegible]	GTFD	
Tracey Beadle	Tracey Beadle	City of Harrison	[illegible]
Rebecca Smith	Rebecca Smith	Medilodge of Clare	32
Mark Fitzpatrick	[illegible]	Community Devel + Senior Serv.	29
[illegible]	[illegible]	Lear Corp	20
Dale Majewski	[illegible]		14
Martana Terrian	[illegible]	Clare Co. Central Dispatch	2
[illegible]	[illegible]	↓	2
TERESA [illegible]	[illegible]	CCSD	2
Steve Schummer	[illegible]	DNR	—
PAUL SPATTA	[illegible]	RC	90
Patrick Agin	[illegible]	HCFD	4
[illegible]	[illegible]	C [illegible]	
Jim Osborn	[illegible]	[illegible] - Clare	15
David Saad	[illegible]	Clare Police Dept.	15
Mary Jo Beal	Mary Jo Beal	Clare County MCA / Clare Hosp.	15

Clare County Meeting 7-15-15

Bill Ervast
Jerry Becker

EMCOG
CCEMD

Sign in Sheet for Hazard Mitigation Group Meeting 05/19/2015 1:00PM Harrison City Hall

Name	Agency	Date	Discipline	
[illegible]	CCEMD	5-19-2015		
Tracey Beadle	Harrison	5-19-15		
[illegible]	CCSD	" "		
Dave [illegible]	CCRC	5-19-15		
Terry [illegible]	Hayes	5-19-15		
TERESA LANE	CCSD	5-19-15		
James Chapman	CFD	5-19-15	30 miles	
ALAN JESSOP	D.P.W	5-19-15	30 mile	
Patrick Agin	HCFD	5-19-15	2 miles	
Bill ERNST	EMCOG	"	—	

CLARE COUNTY

MITIGATION PLAN UPDATE SIGN-IN SHEET Date: 04/21/2015

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVEN (Round Trip)
Terry Beckett		CCEMA	
TERESA LANE		CCSD	
TERRY HUTTON		HAYES TWP	
Dwayne Miedzianowski		CCSD	"
Patrick Agin		HCFD	
Bill Ernst		EMCOG	—
Tracey Beadle	Tracey Beadle	City of Harrison	"

CLARE COUNTY

MITIGATION PLAN UPDATE SIGN-IN SHEET **Date:** 3-17-15

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVEN (Round Trip)
Bill Ernst	Bill Ernst	EMCOG	—
Jay Beck		CCF-D	
Tracey Beadle	Tracey Beadle	City of Harrison	1

CLARE COUNTY

MITIGATION PLAN UPDATE SIGN-IN SHEET **Date:** Feb 24, 2015

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVEN (Round Trip)
Tom Brubaker	[illegible]	CCCD	0
Mike Bashaw	[illegible]	CCSD	0
Tracei Beadle	[illegible]	City of Harrison	1
Roderick Adams	[illegible]	LLEPD	1
Bill Erwin	[illegible]	EMCOG	
Jenny Beeler	[illegible]	ACEMD	

Clare County 1-27-15

Name	Organization	Miles Driven
Bill Grant	EMCOG	—
Mary Jo Bogl	MMMC	15
Cindy Havens	Red Cross	55
Tracey Bradle	Harrison	4
Steve Schummer	DNR	3
Jerry [illegible]		
Tom Bruebaker	CCEM	
Dave Will	94 SFD	24
James Chapman	CFD	14
Kevin Tubbs	Garfield fire	30
[illegible] Agator	WMFD	45
TERESA LANE	CCSD	3

CLARE COUNTY **December 15, 2014**

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVE (Round Trip)
Bill Ernst	Bill Ernst	EMCOG	—
Dave Sunday	Dave Sunday	CCRC	20
Russ Hamilton	Russ Hamilton	Village of Farwell / Surrey Twp	—
Terry Acton	Terry Acton	Hayes Township	30
Mike Bailey	Mike Bailey	CCSD	30
Jim Barbier	Jim Barbier	Dismiss	30
Dave Williams	Dave Williams	Surrey Fire	0
James Chapman	James Chapman	Clare Fire Dept.	7
Luke Potter	Luke Potter	Clare DPW	7
Jerry Beck	Jerry Beck	CCEMD	—
Melissa DeRoche	Melissa DeRoche	CMDHD	—

CLARE [redacted] COUNTY

November 12, 2014

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVEN (Roundtrip)
Bill Ernat	Bill Ernat	EMCOG	—
Jennifer Becker	[signature]	CCEMA	2
TERESA LANE	[signature]	CCSD	2
TOM BARBALICH	[signature]	DISPATCH	—
Dwayne Miedzianowski	[signature]	CCSD	2
Dave Williams	Dave Williams	STFD	—
James Chapman	James Chapman	CFD	.12
Patrick Agin	[signature]	HCFD	5
DAN JESSON	[signature]	CLARE D.P.W.	—
Ed Williams	Ed Williams	Clare County S.D.	2.6
Melissa DeRoche	Melissa DeRoche	CMDHD	—
TERRY ACTON	[signature]	HARRISTOWNSHIP	5

7-22-14

MITIGATION PLAN UPDATE SIGN-IN SHEET

PRINTED NAME	SIGNATURE	ORGANIZATION	MILES DRIVEN
Tony Becker		CCEMS	3
TERESA LANE	Teresa Lane	CCSD	3
Mary Jo Boal	Mary Jo Boal	MMC-CLGRC/CLGRC MCH	30
Jim Brubaker		CCCD	3
Patrick Agin		HCFD	3
Ed Williams		CCSD	2.64
JOSH LATOR	LT Joshua M. Lator	MSP	44.7
Brian David		Clare PD	20.0
MARK Irland		Northwood Nursing Home	25.0
Jim Osborn		Tendercare - Clare	14.0
Steve King		CMDHD	3
Richard Johnson	Richard Winston	AMATEUR Rad. 13	1
Cindy Havens	Cindy Havens	American Red Cross	46
Dave Sunday		Clare County Road Comm.	6
Mark Fitzpatrick		Clare Comm. Devel.	4
Tracey Beadle	Tracey Beadle	City of Harrison	4
Dave Williams		Surrey twp fire Dept	24
James Chapman	James Chapman	Clare Fire Dept	24

EMCOG Hazard Mitgation 2013-14 Sign-in Sheet

	Meeting Date	5-10-13		(Round Trip)
	Meeting Location	Clare Co.		
	Name	Agency Represented	E-mail address/phone #	Total Miles Driven
23	Kimberly K Halis	CLARE County Coordinator	halisk@clareco.net 989-539-7874	0
24	Michael S. Bailey	Clare County Sheriff	baileym@clareco.net	0
25	[illegible]	City of Clare	[illegible]	28
26	Patrick Agin	Harrison Community Fire Dept.	firechief@cityofharrison-mi.gov	0
27	Edward Erskine	Franklin township	[illegible] 539-9468	14
28	Tracey Beadle	City of Harrison	clerk@cityofharrison-mi.gov 539-7445	1
29	Lynn Grim	Clare County	lynngrim@hotmail.com	40
30	Steven Grim	Village of Farwell	sjgrim@hotmail.com	40
31	Terry Becker	Clare County EMD	BeckerT@Clareco.net	—
32	James Chapman	Clare Fire Department	jchapman@cityofclare.org	12
33	Richard Peterson	EM MANAGEMENT / AMATEUR RADIO	KA8daj@CHARTER.NET	—
34	Tom PURNSTILL	CLARE COUNTY TRANSIT	DIRECTOR@CLARECOUNTYTRANSIT	UBO 10
35	JENNIFER TILSON	CLARE COUNTY SHERIFF OFC.	tilsonj@clareco.net	—
36				
37				
38				
39				
40				
41				
42				
43				
44				

APPENDIX B – CLARE COUNTY LOCAL COMMUNITY SUBSECTIONS

All local communities were encouraged to participate in the update of the Hazard Mitigation Plan ("Plan") update. Their input was requested on two different levels, participation in the Plan itself, and the submittal of a survey that addressed the issues of that particular community.

Participation in the Plan update included attending any of a number of meetings of the Clare County Hazard Mitigation Advisory Committee (CCHMAC), which was used in advisory capacity for the Clare County data. The CCHMAC have regularly scheduled quarterly meetings and additional meetings were held during the off months in order to complete the Plan in a timely manner. The second means to participate was the completion of a community survey. The results of the survey are found below and provide feedback on the issues facing each community. As a follow-up to the survey, the Emergency Management Director (EMD) and the East Michigan Council of Governments (EMCOG) staff met with the survey participants to secure supplemental information not included in the survey.

Below is a list of the participating communities and their local representatives.

Clare County: Jerry Becker, Emergency Management Director, Dwayne Miedzianowski, Clare County Sheriff's Office, Teresa Lane, 01221, Tom Pirnstill, Clare County Transit Corporation
City of Clare: Ken Hibl, City Manager, Al Jessup, James Chapman
City of Harrison: Tracey Beadle, City Manager/Clerk, Pat Agin, Fire Chief
Village of Farwell: Janet Conlay
Arthur Township: Lee Shunk, Supervisor
Franklin Township: Diane Blackburn, Township Clerk Freeman Township:
Frost Township: Emerson Davis, Township Clerk; Marion Coon, Township Supervisor Garfield Township: Martha Rottiers, Township Clerk Grant Township:
Greenwood Township: Linda Bailow, Township Clerk
Hamilton Township: Dave Cooper, Township Supervisor
Hatton Township: William Hileman, Township Supervisor
Hayes Township: Terry Acton, Township Supervisor
Lincoln Township: Dennis Zimmerman, Township Supervisor, Dale Majewski
Redding Township: Mary Borgula, Township Clerk
Sheridan Township: Bill Strouse, Township Supervisor
Summerfield Township: Brice Bond, Township Supervisor
Surrey Township: Russ Hamilton, Township Supervisor
Winterfield Township: Kathryn Decker, Clerk, Mark Hammar, Township Supervisor

It should be noted that the language within this Appendix was shaped by the EMD and EMCOG staff, in order to better reflect FEMA planning requirements, and thus was not a verbatim response provided by these local representatives. Inquiries about this may be directed to the Clare OEM as well as local community representatives.

1. **Does your community have large seasonal shifts in population? Are there a significant number of seasonal homes in the community? What is the reason for the large influx of population? Does the influx of population create a threat to your community, and if so why?**

City of Clare: No. No. NA. No.
City of Harrison: Yes. Yes. Snowbirds. No.
Arthur Township: No. No. NA. No.
Franklin Township: Yes. Yes. Snowbirds. No.
Frost Township: Yes. Yes. No. No.
Garfield Township: Yes. Yes. Second Homes. No.
Greenwood Township: No. Yes. NA. No.
Hamilton Township: Yes. Yes. Recreational use in the summer. Seasonal population may not be aware of local emergency regulations and response procedures.
Hatton Township: No. No. NA. No.
Hayes Township: Yes. Yes. Summer camping, tourists. Additional police presence required.
Lincoln Township: Yes. Yes. Summer and deer hunting season that can increase population fourfold. No threat, but a strain on local services.
Redding Township: Yes. Yes. Summer/seasonal vacations. No.
Sheridan Township: No. No. NA. No.
Summerfield Township: No. Yes. NA. No.
Surrey Township: Moderate. Moderate. Seasonal changes, snowbirds. No.
Winterfield Township: Yes. No. Hunting season. No.

2. **Are there any annual events held in the community that attract large numbers of people? If so, describe the event(s), location, dates and approximate attendance.**

City of Clare: Yes. St. Patrick's Day, Summer Fest, US-27 Auto Tour, Brewfest, and Christmas Event.
City of Harrison: Yes. Frostbite event in February-500 people, 4th of July-1000 people, County Fairgrounds in 1st week of August-5000 people, Street Fair 3rd weekend in August-2000 people.
Arthur Township: No. NA
Franklin Township: No. NA.
Frost Township: No. NA.
Garfield Township: No. NA.
Greenwood Township: No. NA
Hamilton Township: Yes. Hamilton Township Hall is rented out on occasion and the summer holidays of Memorial Day, July 4th, Labor Day bring in large crowds to the lakes.
Hatton Township: No. NA.
Hayes Township: Yes. 4th of July Parade, County Fair-Tractor Pull, concerts, bicycle races, tractor show, street fair.
Lincoln Township: Yes. Father's Day Weekend, and NHW Expo.
Redding Township: No. NA.
Sheridan Township: Yes. Amish auction in spring and fall.
Summerfield Township: No. NA.
Surrey Township: Yes. Lumberjack Days, Labor Day/
Winterfield Township: No. NA.

3. Please rate the following natural hazards 1-10, with 1 being a low threat to your community and 10 a high threat. Hazards are considered events that can cause death or injury, damage property or the environment, or disrupt business or services.

	Severe Weather	Flooding	Earthquake	Wildfire	Subsidence
City of Clare	8	6	5	3	2
City of Harrison	9	1	1	1	1
Arthur Township	7	4		5	
Franklin Township	7	1		4	
Frost Township	4	1		1	
Garfield Township	7	1	1	5	1
Greenwood Township	5	5		5	
Hamilton Township	5	1	1	5	1
Hatton Township	5	1	0	4	1
Hayes Township	10	1		2	1
Lincoln Township	10	11		5	
Redding Township	3	2		5	
Sheridan Township	10	5		5	
Summerfield Township		5		5	
Surrey Township	10	7	1	7	4
Winterfield Township	7	4	1	7	

4. Please rate the following technological hazards 1-10, with 1 being a low threat to your community and 10 a high threat.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
City of Clare	2	8	5	1	5	2	1	1	9	7	3	0	8	6	6
City of Harrison	3	1	5	2	2	9	3	7	9	5	6	1	6	8	4
Arthur Township	2	2	8	10	8		8		8	8	8	3	8		
Franklin Township	1	1	1	1	1		1		2	1	1	1	1		
Frost Township	1	1	1	1	1		2		2	1	2	1	1		
Garfield Township	2	4	2	1	1	2	5	5	5	3	3	1	5	5	5
Greenwood Township	1	1	1	1	1		4		1	1	4	1	1		
Hamilton Township	2	1	4	1	1	3	2	2	2	5	3	1	2	2	5
Hatton Township	1	1	1	1	1	2	3	1	2	4	2	1	3	2	1
Hayes Township	1	1	1	0	1	5	2	10	4	4	1	0	1	1	1
Lincoln Township	1	1	1	1	4		5		5	5	5	1	5		
Redding Township	2	3	1	1	1		7		5	7	7	1	7		
Sheridan Township	1	10	1	10	1		1		1	1	1	10	1		
Summerfield Township							5				5				
Surrey Township	3	8	7	5	6	10	7	3	10	8	6	6	9	8	9
Winterfield Township	1	1	5	2	3	4	6	1	6	5	7	1	1	1	1

A-Civil Disturbance; B-Dam Failure; C-Infrastructure Failure; D-Nuclear Attack; E-Terrorism/Sabotage; F-Fraud; G-Pipeline Accidents; H-Seasonal/ Major Population Change; I Transportation Accident; J-Fixed Site HazMAT Incident; K-Oil/Gas Well Accidents; L-Nuclear Power Plant Failure; M-Transportation HazMAT Accident; N-Public Health Emergency; O-Structural or Scrap Tire Fire

5. What type of hazard (natural or technological) do you feel your community is best prepared for? Why?

City of Clare: Structural fires, severe weather, infrastructure failures-well-trained highly responsive public safety team (police-fire-DPW)
City of Harrison: Public health emergency, transportation accident, HazMat accident, and severe weather the City has an emergency plan in place for these events.
Arthur Township: Snow and Ice
Franklin Township: None.
Frost Township: None.
Garfield Township: Township has their own fire department and extra sheriff patrol. Resident in community can operate heavy equipment and has when necessary. Township has an emergency medical team.
Greenwood Township: Weather-related matters.
Hamilton Township: Infrastructure failure, transportation accident, HazMat incident, scrap tire/structural fire, and civil disturbance are all handled by fire and police departments.
Hatton Township: Structural Fires-Harrison Fire Department
Hayes Township: Severe Weather-emergency shelter available, good response from Clare County Emergency personnel.
Lincoln Township: Oil/gas well/pipelines, transportation and HazMat matters are addressed with local and regional response teams.
Redding Township: None.
Sheridan Township: Unknown
Summerfield Township: None.
Surrey Township: Traffic Accidents-Training.
Winterfield Township: Oil/gas well accidents-experience in dealing with these accidents.

6. What type of hazard (natural or technological) do you feel your community is least prepared for? Why?

City of Clare: HazMat incident-have to rely on regional response team.
City of Harrison: Dam failure, nuclear attack, terrorism, and earthquake-the likelihood of them occurring is slim and no plan has been put in place to address them.
Arthur Township: Nuclear and Civil Disorder.
Franklin Township: Infrastructure failure (power outages) due to inclement weather
Frost Township: Technological hazards-nuclear attack, oil-gas well/pipeline accidents, and transportation accidents
Garfield Township: Nuclear or terrorist attack.
Greenwood Township: Nuclear attack.
Hamilton Township: Oil & gas well accidents, terrorism, nuclear accidents/attack, fraud, anything out of the ordinary.
Hatton Township: Nuclear Attack.
Hayes Township: Fraud-aging population susceptible to these schemes.

Lincoln Township: Terrorism, gas storage fields.
Redding Township: None.
Sheridan Township: Unknown.
Summerfield Township: None.
Surrey Township: HazMAT occurrences.
Winterfield Township: Weather.

7. What types of initiatives, improvements or efforts do you think could be implemented that would help reduce your community's vulnerability to specific hazards?

City of Clare: Better education of the public.
City of Harrison: Better educated public.
Arthur Township: Better educated public on what may happen.
Franklin Township: Generator for township hall to be used for sheltering purposes
Frost Township: (Check with representatives for clarification)
Garfield Township: Not sure.
Greenwood Township: HazMat equipment.
Hamilton Township: Posting in paper and on County website specifics for emergencies.
Hatton Township: None.
Hayes Township: More public awareness.
Lincoln Township: None at this time.
Redding Township: Development of an emergency action plan and citizen involvement.
Sheridan Township: Unknown.
Summerfield Township: Better warning systems.
Surrey Township: Better public awareness.
Winterfield Township: Money for training and awareness.

8. Are you aware of any properties that have experienced flood damage to their homes on multiple occasions as a result of flood waters?

City of Clare: No.
City of Harrison: No.
Arthur Township: No.
Franklin Township: No.
Frost Township: No.
Garfield Township: No.
Greenwood Township: No.
Hamilton Township: Dodge City has several homes that were built in a low areas and flood during the spring thaw.
Hatton Township: No.
Hayes Township: No.
Lincoln Township: No.
Redding Township: No.
Sheridan Township: No.
Summerfield Township: No.
Surrey Township:

Winterfield Township: No.

After the initial questionnaire was filled out, follow-up questionnaires were sent to the municipalities to expand on their needs. Unfortunately, not all the municipalities responded to the second questionnaire despite multiple mailings and phone calls.

City of Clare No response to the second questionnaire was provided.

City of Harrison No response to the second questionnaire was provided.

Village of Farwell No response to the second questionnaire was provided.

Arthur Township No response to the second questionnaire was provided.

Franklin Township No response to the second questionnaire was provided.

Frost Township

A general prioritization of hazards was as follows:

1. Most significant hazard for Frost Township: severe weather.
2. Second most significant hazard: wildfires.
3. Third most significant hazards: nuclear attack.

This hazard was list as a high priority by the CCHMAC and identified the following to address the hazard: purchase and distribute NOAA weather radios, maintaining and upgrading of warning sirens, the purchase of generators for critical facilities throughout the County, and educate the public on warning sirens and emergency shelters.

This hazard was list as a high priority by the CCHMAC and identified the following to address the hazard: support the County's effort to secure a Community Wildfire Protection Grant, and obtain geographical information system (GIS) service to assist in the identification of hazard locations.

This hazard was list as a moderate priority by the CCHMAC and identified the following to address the hazard: purchase of warning sirens/educate the public on the use of warning sirens and emergency shelters.

Implementation of hazard mitigation actions would generally involve authorized Township officials, the Township's relevant departments, some coordination with Clare County OEM, and federal hazard mitigation funds where possible.

Garfield Township No response to the second questionnaire was provided.

Greenwood Township No response to the second questionnaire was provided.

Hamilton Township No response to the second questionnaire was provided.

Hatton Township

A general prioritization of hazards was as follows:
The most significant hazard for the Hatton Township: Severe weather conditions (summer and winter severe weather)

This hazard was list as a high priority by the CCHMAC and identified the following to address the hazard: purchase and distribute NOAA weather radios, maintaining and upgrading of warning sirens, the purchase of generators for critical facilities throughout the County, and educate the public on warning sirens and emergency shelters.

Implementation of hazard mitigation actions would generally involve authorized Township officials, the Township's relevant departments, some coordination with Clare County OEM, and federal hazard mitigation funds where possible.

Hayes Township

A general prioritization of hazards was as follows:

1. Most significant hazard for Hayes Township: severe weather.
2. Second most significant hazard: population changes.
3. Third most significant hazard: fraud.

This hazard was list as a high priority by the CCHMAC and identified the following to address the hazard: purchase and distribute NOAA weather radios, maintaining and upgrading of warning sirens, the purchase of generators for critical facilities throughout the County, and educate the public on warning sirens and emergency shelters.

This hazard was list as a medium priority by the CCHMAC and identified the following to address the hazard: purchase of electronic message boards to assist in rerouting traffic. (Hayes Township has to hire additional public safety personnel during the high tourist season. This is specific to Hayes Township and while it was identified in the Plan, the hiring of seasonal personnel was not included as an action item.)

This hazard was list as a medium priority by the CCHMAC and identified the following to address the hazard: develop a senior internet security program.

Implementation of hazard mitigation actions would generally involve authorized Township officials, the Township's relevant departments, some coordination with Clare County OEM, and federal hazard mitigation funds where possible.

Lincoln Township No response to the second questionnaire was provided.

Redding Township No response to the second questionnaire was provided.

Sheridan Township No response to the second questionnaire was provided.

Summerfield Township No response to the second questionnaire was provided.

Surrey Township

A general prioritization of hazards was as follows:

1. Most significant hazard for the Surrey Township: HazMAT incident and transportation HazMAT accidents.
2. Second most significant hazard: Dam Failure.
3. Third tier of most significant hazards: severe weather, infrastructure failure, and transportation accidents.

This hazard was list as a medium priority by the CCHMAC and identified the following to address the hazard: purchase of electronic message boards to assist in rerouting traffic.

This hazard was list as a medium priority by the CCHMAC and identified the following to address the hazard: Monitor/repair/replace all high risk dams in Clare County. Two of the three high risk dams Surrey Lake Dam and Lake 13 Dam are located in Surrey Township.

These hazards were list as high priority by the CCHMAC and identified the following to address the hazard: purchase and distribute NOAA weather radios, maintaining and upgrading of warning sirens, the purchase of generators for critical facilities throughout the County, purchase of electronic message boards to assist in rerouting traffic, and educate the public on warning sirens and emergency shelters.

Implementation of hazard mitigation actions would generally involve authorized Township officials, the Township's relevant departments, some coordination with Clare County OEM, and federal hazard mitigation funds where possible.

Winterfield Township

A general prioritization of hazards was as follows:

1. Most significant hazard for the Winterfield Township: severe weather.
2. Second most significant hazard: wildfires.
3. Third tier of most significant hazards: oil and gas well accidents and pipeline ruptures.

This hazard was list as a high priority by the CCHMAC and identified the following to address the hazard: purchase and distribute NOAA weather radios, maintaining and upgrading of warning sirens, the purchase of generators for critical facilities throughout the County, and educate the public on warning sirens and emergency shelters.

This hazard was list as a high priority by the CCHMAC and identified the following to address the hazard: support the County's effort to secure a Community Wildfire Protection Grant, and obtain geographical information system (GIS) service to assist in the identification of hazard locations.

This hazard was list as a moderate priority by the CCHMAC and identified the following to address the hazard: obtain geographical information system (GIS) service to assist in the identification of hazard

locations and maintaining and upgrading of warning sirens, which can be used to warn the public in these immediate areas.

Implementation of hazard mitigation actions would generally involve authorized Township officials, the Township's relevant departments, some coordination with Clare County OEM, and federal hazard mitigation funds where possible.

CLARE COUNTY COMMUNITY QUESTIONNAIRE

Municipality _____ **Person Completing Form _____**
Title _____

1. Does your community have large seasonal population shifts?
_____

2. Are there a significant number of seasonal homes in your community?
_____

3. If you are aware, do you know the primary reason for the large influx of population?
_____
_____

4. Does the influx of population create a threat to your community, and if so, why?
_____
_____

5. Are there annual events held in the community that attract large numbers of people? _____

6. If so, please describe the event(s), location, dates, attendance, and targeted population.
_____
_____

7. Please rate the following natural hazards 1-10, with 1 being a low threat to your community and 10 being a high threat to your community. Hazards are considered events that can cause death or injury, property damage, environmental damage, or disrupt business or services.

Severe Weather	_____	Wildfires	_____
Flooding	_____	Subsidence	_____
Earthquake	_____		

8. Please rate the following technological hazards 1-10, with 1 being a low threat to your community and 10 being a high threat to your community.

Civil Disturbance	_____	Transportation Accident	_____
Dam Failure	_____	Fixed Site HazMat Incident	_____
Infrastructure Failure	_____	Oil & Gas Well Accidents	_____
Nuclear Attack	_____	Nuclear Power Plant Failure	_____
Terrorism/Sabotage	_____	Transportation Hazmat Accident	_____
Fraud	_____	Public Health Emergency	_____
Pipeline Accident	_____	Scrap Tire and Structural Fire	_____
Seasonal/Major Population Change	_____		

9. Which hazard(s), natural or technological, are your community best prepared to deal with? Why?

_____
_____
_____
_____

10. Which hazard(s), natural or technological, are your community least prepared to deal with? Why?

_____
_____
_____
_____

11. What types of initiatives, improvements, or efforts do you think could be implemented that would help reduce your community's vulnerability to specific hazards?

_____
_____
_____
_____

12. Are you aware of any properties that have experienced flood damage to their homes on multiple times as a result of flood waters? If so, what is the address?

_____
_____
_____

13. When was your land use plan last updated? Is there any reference to the Hazard Mitigation Plan? If so, how? If not, why?

_____
_____
_____

For the purposes of consistency between the County and the municipalities in determining hazards, the following definitions were used by the County.

CLARE COUNTY HAZARD MITIGATION PLAN HAZARD DEFINITIONS

Civil Disturbance-Collective behavior that results in a significant level of law breaking, perceived threat to public order, or disruptive essential functions and quality of life.

Dam Failure-The collapse or failure of a structure that results in downstream flooding.

Drought-A water shortage caused by a deficiency of rainfall, generally lasting for an extended period of time.

Earthquake-A shaking or trembling of the crust of the earth, caused by the breaking and shifting of the rock beneath the surface.

Extreme Temperatures-Prolonged periods of very high or very low temperatures, often accompanied by other extreme meteorological conditions.

Fog-Condensed water vapor in cloudlike masses lying close to the ground and limiting visibility.

Fraud-Intentional perversion of truth in order to induce another to part with something of value or to surrender a legal right.

Hail-Atmospheric water particles from thunderstorms form into rounded or irregular lumps of ice that fall to the earth.

Hazardous Material Incident- Fixed Site-An uncontrolled release of hazardous materials from a fixed site capable of posing a risk to life, health, safety, property, or the environment.

Hazardous Material Incident-Transportation-An uncontrolled release of hazardous materials during transport, capable of posing a risk of life, health, safety, property or the environment.

Ice and Sleet Storm-A storm that generates sufficient quantities of ice and sleet to result in hazardous conditions and/or damage of property.

Industrial Accident-A fire, explosion or other severe accident (especially if it involves hazardous materials) at an industrial facility that results in serious property damage, injury, or loss of life.

Infrastructure Failure-The failure of critical public or private utility infrastructure that results in a temporary loss of essential functions and/or services.

Lightning-The discharge of electricity from within a thunderstorm.

Major Population Change-An increase in the population due to a special event or time of year that causes the population of the area to increase twofold or greater.

Nuclear Attack-A hostile action taken against the United States, which involves nuclear weapons and results in destruction or property and/or loss of life.

Nuclear Power Plant Failure-An actual or potential release of radioactive material at a commercial nuclear power plant, in sufficient quantity to constitute a threat to the health and safety of the off-site population.

Oil and Gas Well Accident- An uncontrolled release of oil or natural gas, or the poisonous by-product hydrogen sulfide from production wells.

Pipeline Accident-An uncontrolled release of petroleum or natural gas, or the poisonous by-product hydrogen sulfide from a pipeline.

Public Health Emergency-A widespread and/or severe epidemic, incident of contamination, or other situation that presents a danger to or otherwise negatively impacts the general health and well-being of the public.

Riverine Flooding-The overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snow or ice melt.

Sabotage- the act of destroying or damaging something deliberately so that it does not work correctly.

Scrap Tire Fire-A large fire that burns scrap tires being stored for recycling or re-use.

Severe Weather-Summer or winter weather events that include one or more of the following events: drought, fog, hail, ice and sleet storm, lightning, severe wind, snowstorm, thunderstorm, and/or tornado.

Severe Wind-Non-tornadic winds of 58 miles per hour (mph).

Shoreline Hazard-High or low levels that cause flooding or erosion, and other wave and current action that threatens life, health, and property in shoreline areas, including storm surges, rip currents, and the recession of shoreline areas.

Snowstorm-A period of rapid accumulation of snow often accompanied by high winds, cold temperatures, and low visibility.

Structural Fire-A fire of any origin that ignites one or more structures causing the loss of life and/or property,

Subsidence-The lowering or collapsing of a land surface, caused by natural or human-induced activities that erode or remove subsurface support.

Terrorism-"…activities that involve violent…or life-threatening acts…that are a violation of the criminal laws of the United States or any State and appear to be intended (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the

conduct of a government by mass destruction, assassination, or kidnapping" Federal Criminal Code. 18 U.S.C.←2331

Thunderstorm-Weather systems accompanied by strong winds, lightning, heavy rain, hail, or tornadoes.

Tornado-An intense rotating column of wind (greater than 58 mph) that extends from the base of a severe thunderstorm to the ground.

Transportation Accident-A cause or accident involving an air, land, or water-based commercial passenger carrier. These accidents may also include automotive crashes when they involve a large number of vehicles or in some manner cause the shut-down of a major road for a significant period of time.

Wildfire-An uncontrolled fire in grasslands, brushlands, or forested areas.

MUNICIPALITY _____

PERSON COMPLETING FORM _____

CLARE COUNTY
FOLLOW-UP QUESTIONNAIRE

1. Please identify the hazards that have the most impact on your municipality and what action(s) could be used to help mitigate their impact. Please rank the impacts in order of impact to the municipality. Please use the following hazards for your responses:

Severe Weather	Pipeline Accidents	Transportation Accidents
Wildfires	Earthquakes	Scrap Tire and Structural Fires
Major Population Changes	Infrastructure Failure	Dam Failures
Fraud	Fixed Site Hazmat Incident	Nuclear Attack
Public Health Emergencies	Terrorism/Sabotage	Riverine Flooding
Oil & Gas Well Accidents	Civil Disturbances	Nuclear Power Plant Accident
Subsidence	Transportation Hazmat Incident	

A. Hazard _____

Mitigation measure_____

B. Hazard _____

Mitigation measure_____

C. Hazard _____

Mitigation measure_____

D. Hazard _____

Mitigation measure_____

E. Hazard _____

Mitigation measure_____

APPENDIX C – CLARE COUNTY FINAL MITIGATION STRATEGIES

1. Using laminated glass and other hazard-resistant, durable construction techniques in public buildings and critical facilities.
2. Railroad inspections and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing).
3. Use of structural fire mitigation systems such as interior and exterior sprinklers, smoke detectors, and fire extinguishers.
4. Enclosing the foundations of homes and buildings rather than leaving them open and the underside exposed to blown embers or materials.
5. Floodplain management to include prohibition of new construction within 100 year flood levels, floodproofing (wet and dry) existing structures within 100 year flood levels, and relocating existing mechanical and utility devices from 100 year flood level areas.
6. Flood plain/coastal zone management-managing acceptable use for areas prone to flooding through regulations, zoning, comprehensive planning, development policies and procedures, and the monitoring of water levels.
7. Monitor vacant commercial/residential sites, as well as their demolition/cleanup for hazardous waste and rodent Infestation.
8. Protecting watershed by utilization of erosion control techniques and protecting wetlands and natural water retention areas.
9. Using buffer strips to segregate wells, storage tanks and other production facilities from transportation routes and adjacent land uses, in accordance with state regulations, and consistent with the level of risk.
10. Individual communities should prepare future land use plans and capital improvement programs to plan for their future needs.
11. Communities will acquire and maintain an adequate level of emergency power generators to supply emergency water needs, wastewater processing, emergency communications, emergency health care, and shelters.
12. Ensure key gasoline stations have the capacity to pump gasoline during power outages.
13. Work with power companies to inventory condition of power line right-of-ways, and identify priority sections to clear branches and trees from power lines. The end goal is to create and maintain a disaster resistant landscape in public rights-of-way.
14. Acquire portable/changeable message signs to direct crowds and provide information.
15. Build the capabilities of the county GIS program to function as a tool to address multiple hazards. This effort would require the creation/updating of datasets such as parcels/ownership, location of all structures, driveways with ingress/egress conditions, roads, forest types, ownership types, floodplains, utilities (power lines, gas lines and water lines), wetlands, water features, bridges and culverts, (SARA III sites)
16. Transportation planning that provides roads, overpasses, etc. to maximize access and improve emergency response times, and evacuation potential, for all inhabited or developed areas of a community (not just designing for the minimum amount of road capacity to handle normal traffic

volumes in the community.) This includes transportation access within developed sites (shopping malls, stadiums, office & commercial parking lots, etc.)

17. Defensible space around structures in fire-prone wildland areas.
18. Installing lightning protection devices on the community's communications infrastructure.
19. Public early warning systems and networks and NOAA Weather Radio.
20. Proper anchoring of manufactured homes and exterior structures such as carports and porches.
21. Using snow fences or "living snow fences" (rows of trees or vegetation) to limit blowing and drifting of snow over critical roadway segments.
22. Locating schools, nursing homes, and other special facilities away from major hazardous material transportation routes.
23. Use of ITS (intelligent transportation systems) technology.

APPENDIX D – CLARE COUNTY POSSIBLE MITIGATION STRATEGIES

Summer Weather Hazards

1. Increased coverage and use of NOAA Weather Radio.
2. Producing and distributing family emergency preparedness information relating to thunderstorm hazards.
3. Public education and awareness of summer weather dangers.
4. Training and increased use of weather spotters.
5. Public early warning systems and networks.
6. Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)
7. Buried/protected power and utility lines.
8. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.
9. Pre-planning for debris management staging and storage areas. (Debris could be rubble, vehicles, objects from destroyed/damaged structures, vegetation or other items knocked down or blown by winds.)
10. Pre-planning for debris management staging and storage areas. (Debris is usually vegetation such as tree branches that have fallen under the impact of hail, or broken power or phone lines that had frozen or been weighted down by ice or fallen branches.)
11. Using surge protectors on critical electronic equipment.
12. Installing lightning protection devices on the community's communications infrastructure.
13. Proper anchoring of manufactured homes and exterior structures such as carports and porches.
14. Establishing safe and appropriate locations for temporary debris disposal sites.
15. Securing loose materials, yard, and patio items indoors or where winds cannot blow them about.
16. Pre-planning for debris management staging and storage areas. (Debris could be rubble, vehicles, objects from destroyed/damaged structures, vegetation or other items knocked down or blown by winds, or broken power or phone lines that had frozen or been weighted down by fallen branches and trees.)

Drought

17. Anticipation of potential drought conditions, and preparation of drought contingency plans.
18. Obtaining agricultural insurance.

Winter Weather Hazards

19. Increased coverage and use of NOAA Weather Radio.
20. Producing and distributing family emergency preparedness information relating to severe winter weather hazards.
21. Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)
22. Buried/protected power and utility lines.
23. Establishing heating centers/shelters for vulnerable populations.

24. Organizing outreach to isolated, vulnerable, or special-needs populations.
25. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.
26. Pre-planning for debris management staging and storage areas. (Debris is usually the snow and ice itself, or vegetation such as tree branches that have fallen under the impact of winds or the weight of ice. Broken power or phone lines that had frozen or been weighted down by ice or fallen branches could be part of the problem. Some storage areas will definitely be needed for snow removal during blizzards.)
27. Home and public building maintenance to prevent roof and wall damage from "ice dams."
28. Pre-planning for debris management staging and storage areas. (Debris is usually the sleet and ice itself being cleared from roads and roofs, or vegetation such as tree branches that have fallen under the impact of winds or the weight of ice. Broken power or phone lines that had frozen or been weighted down by ice or fallen branches could be part of the problem. In some cases, roofs may collapse under the weight of ice and snow.)
29. Proper building/site design and code enforcement relating to snow loads, roof slope, snow removal and storage, etc.
30. Farmer preparedness to address livestock needs/problems.
31. Pre-arranging for shelters for stranded motorists/travelers, and others.
32. Maintaining adequate road and debris clearing capabilities.
33. Pre-planning for debris management staging and storage areas. (Debris is usually the sleet and ice itself being cleared from roads and roofs, or vegetation such as tree branches that have fallen under the impact of winds or the weight of ice. Broken power or phone lines that had frozen or been weighted down by ice or fallen branches could be part of the problem. In some cases, roofs may collapse under the weight of ice and snow. Some storage areas will definitely be needed for snow removal during blizzards.)

Extreme Temperatures

34. Organizing outreach to vulnerable populations during periods of extreme temperatures, including establishing and building awareness of accessible heating and/or cooling centers in the community, and other public information campaigns about this hazard.
35. Increased coverage and use of NOAA Weather Radio.
36. Special arrangements for payment of heating bills.

Wildfires

37. Proper maintenance of property in or near wildland areas (including short grass; thinned trees and removal of low hanging branches; selection of fire-resistant vegetation; use of fire resistant roofing and building materials; use of functional shutters on windows; keeping flammables such as curtains securely away from windows or using heavy fire-resistant drapes; creating and maintaining a buffer zone (defensible space) between structures and adjacent wild lands; use of the fire department's home safety inspections; sweeping/ cleaning dead or dry leaves, needles, twigs, and combustibles from roofs, decks, eaves, porches, and yards; keeping woodpiles and other combustibles away from structures; use of boxed or enclosed eaves on house; thorough cleaning-up of spilled flammable fluids; and keeping garage areas protected from blowing embers).
38. Safe disposal of yard and house waste rather than through open burning.
39. Use of fire spotters, towers, planes.

40. Keep handy household items that can be used as fire tools; a rake, axe, hand/chainsaw, bucket and shovel. Install and maintain smoke detectors and fire extinguishers. Install a smoke alarm on each floor of buildings and homes. Test monthly and change the batteries two times each year. Teach family members how to use the fire extinguisher.
41. Post fire emergency telephone numbers.
42. Organizing neighborhood wildfire safety coalitions (to plan how the neighborhood could work together to prevent a wildfire).
43. Residents should plan several escape routes away from their homes - by car and by foot.
44. Use of structural fire mitigation systems such as interior and exterior sprinklers, smoke detectors, and fire extinguishers.
45. Arson prevention activities, including reduction of blight (cleaning up areas of abandoned or collapsed structures, accumulated junk or debris, and with any history of flammable substances stored, spilled, or dumped on them).
46. Public education on smoking hazards and recreational fires.
47. Proper maintenance and separation of power lines. Ask the power company to clear branches from power lines.
48. Efficient response to fallen power lines.
49. Training and exercises for response personnel.
50. GIS mapping of vegetative coverage, for use in planning decisions and analyses through comparison with topography, zoning, developments, infrastructure, etc.
51. Media broadcasts of fire weather and fire warnings.
52. Create and enforce local ordinances that require burn permits and restrict campfires and outdoor burning.
53. Mutual aid pacts with neighboring communities.
54. Prescribed burns and fuel management (thinning of flammable vegetation, possibly including selective logging to thin out some areas. Fuels cleared can be given away as firewood or chipped into wood chips for distribution.)
55. The creation of fuel breaks (areas where the spread of wildfires will be slowed or stopped due to removal of fuels, or the use of fire-retardant materials/vegetation) in high-risk forest or other areas.
56. Keeping roads and driveways accessible to vehicles and fire equipment—driveways should be relatively straight and flat, with at least some open spaces to turn, bridges that can support emergency vehicles, and clearance wide and high enough for two-way traffic and emergency vehicle access (spare keys to gates around property should be provided to the local fire department, and an address should be visible from the road so homes can be located quickly).
57. Enclosing the foundations of homes and buildings rather than leaving them open and the underside exposed to blown embers or materials.
58. Safe use and maintenance/cleaning of fireplaces and chimneys (with the use of spark arresters and emphasis on proper storage of flammable items). Residents should be encouraged to inspect chimneys at least twice a year and clean them at least once a year.
59. Proper maintenance and storage of motorized equipment that could catch on fire.
60. Proper storage and use of flammables, including the use of flammable substances (such as when fueling machinery). Store gasoline, oily rags and other flammable materials in approved safety cans. Stack firewood at least 100 feet away and uphill from homes.

61. Obtaining insurance.
62. Including wildfire safety information in materials provided by insurance companies to area residents.
63. Residents should be instructed on proper evacuation procedures, such as wearing protective clothing (sturdy shoes, cotton or woolen clothing, long pants, a long-sleeved shirt, gloves and a handkerchief to protect the face); taking a Disaster Supplies Kit; and choosing a route away from fire hazards.
64. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Dam Failures

65. Ensuring consistency of dam Emergency Action Plan (EAP) with the local Emergency Operations Plan (EOP).
66. Regulate development in the dam's hydraulic shadow (where flooding would occur if there was a severe dam failure).
67. Public awareness and warning systems.
68. Obtaining insurance.
69. Increased coverage and use of NOAA Weather Radio.
70. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
71. Constructing emergency access roads to dams.
72. Real estate disclosure laws that identify a home's location within a dam's hydraulic shadow.
73. Trained, equipped, and prepared search and rescue teams.
74. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Riverine and Urban Flooding/Shoreline Flooding and Erosion

75. Accurate identification and mapping of flood-prone areas.
76. Floodplain/coastal zone management – planning acceptable uses for areas prone to flooding (through comprehensive planning, code enforcement, zoning, open space requirements, subdivision regulations, land use and capital improvements planning) and involving drain commissioners, hydrologic studies, etc. in these analyses and decisions.
77. Acceptable land use densities, coverage and planning for particular soil types and topography (decreasing amount of impermeable ground coverage in upland and drainage areas, zoning and open space requirements suited to the capacity of soils and drainage systems to absorb rainwater runoff, appropriate land use and capital improvements planning) and involving drain commissioners, hydrologic studies, etc. in these analyses and decisions.
78. Dry floodproofing of structures within known flood areas (strengthening walls, sealing openings, use of waterproof compounds or plastic sheeting on walls).
79. Wet floodproofing of structures (controlled flooding of structures to balance water forces and discourage structural collapse during floods).
80. Elevation of flood-prone structures above the 100-year flood level.
81. Government acquisition, relocation, or condemnation of structures within floodplain or floodway areas.
82. Public awareness of the need for permits (MDEQ Part 31) for building in floodplain areas.

83. Employing techniques of erosion control within the watershed area (proper bank stabilization, techniques such as planting of vegetation on slopes, creation of terraces on hillsides, use of riprap boulders and geotextile fabric, etc.).
84. Dredging and clearance of sediment and debris from drainage channels.
85. Protection (or restoration) of wetlands and natural water retention areas.
86. Enforcement of basic building code requirements related to flood mitigation.
87. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
88. Obtaining insurance.
89. Joining the National Flood Insurance Program.
90. Participating in the Community Rating System (CRS).
91. Drainage easements (allowing the planned and regulated public use of privately owned land for temporary water retention and drainage).
92. Farmland and open space preservation.
93. Elevating mechanical and utility devices above expected flood levels.
94. Improved/updated floodplain mapping.
95. Real estate disclosure laws.
96. Public education and flood warning systems.
97. Monitoring of water levels with stream gauges and trained monitors.
98. Increased coverage and use of NOAA Weather Radio.
99. Training for local officials on flood fighting, floodplain management, floodproofing, etc.
100. Anchoring of manufactured homes to a permanent foundation, but preferably these structures would be readily movable if necessary or else permanently relocated outside of flood-prone areas.
101. Road closures and traffic control in flooded areas.
102. Trained, equipped, and prepared search and rescue teams.
103. Control and securing of debris, yard items, or stored objects (including oil, gasoline, and propane tanks, and paint and chemical barrels) in floodplains that may be swept away, damaged, or pose a hazard when flooding occurs.
104. Back-up generators for pumping and lift stations in sanitary sewer systems, and other measures (alarms, meters, remote controls, switchgear upgrades) to ensure that drainage infrastructure is not impeded.
105. Employing techniques of erosion control in the area (bank stabilization, planting of vegetation on slopes, creation of terraces on hillsides).
106. Purchase or transfer of development rights – to discourage development in floodplain areas.
107. Stormwater management ordinances or amendments.
108. Wetlands protection regulations and policies.
109. Regional/watershed cooperation.
110. Use of check valves, sump pumps and backflow preventers in homes and buildings.
111. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Fixed Site Hazardous Material Incidents (including explosions and industrial accidents)

112. Maintaining an active and viable Local Emergency Planning Committee (LEPC).

113. Developing and exercising site emergency plans and community response plans as required under

SARA Title III.

114. Development of Risk Management Plans for sites that manufacture, store, or handle hazardous materials, to comply with EPA regulations. (For guidance, see the EPA's CEPPO web site at http://www.epa.gov/swercepp/acc-pre.html .)
115. Training in and compliance with all safety procedures and systems related to the manufacture, storage, transport, use, and disposal of hazardous materials.
116. Policies stressing the importance of safety above other considerations.
117. Trained, equipped, and prepared site and local hazardous material emergency response teams.
118. Compliance with/enforcement of Resource Conservation and Recovery Act (RCRA) standards.
119. Elimination of clandestine methamphetamine laboratories through law enforcement and public education.
120. Hazardous material public awareness and worker education programs.
121. Facility and community training and exercise programs.
122. Brownfield cleanup activities.
123. Proper separation and buffering between industrial areas and other land uses.
124. Location of industrial areas away from schools, nursing homes, etc.
125. Evacuation plans and community awareness of them.
126. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
127. Public warning systems and networks for hazardous material releases.
128. Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents).
129. Road closures and traffic control in accident areas.
130. Trained, equipped, and prepared search and rescue teams.
131. Compliance with all industrial, fire, and safety regulations.
132. Insurance coverage.
133. Enhanced security and anti-terrorist/sabotage/civil disturbance measures.
134. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Hazardous Material Transportation Incidents

135. Improvements in driver education, traffic law enforcement, and transportation planning that balance the needs of hazardous material transporters with the safety of the general public.
136. Improved design, routing, and traffic control at problem roadway areas.
137. Long-term planning that provides more connector roads for reduced congestion of arterial roads.
138. Railroad inspections and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing).
139. Proper planning, design, maintenance of, and enhancements to designated truck routes.
140. Enforcement of weight and travel restrictions for truck traffic.
141. Training, planning, and preparedness for hazardous material incidents along roadways and railways (in addition to fixed site emergencies).
142. Public warning systems and networks.

143. Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including large scale hazardous material incidents).
144. Use of ITS (intelligent transportation systems) technology.
145. Compliance with and enforcement of USDOT and MDOT regulations regarding hazardous materials transport.
146. Locating schools, nursing homes, and other special facilities away from major hazardous material transportation routes.
147. Road closures and traffic control in accident areas.
148. Trained, equipped and prepared local hazardous materials emergency response teams.
149. Trained, equipped, and prepared search and rescue teams.
150. Evacuation plans and community awareness of them.
151. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Infrastructure Failures

152. Proper location, design, and maintenance of water and sewer systems (to include insulation of critical components to prevent damage from ground freeze).
153. Burying electrical and phone lines, where possible, to resist damage from severe winds, lightning, ice, and other hazards.
154. Redundancies in utility and communications systems, especially "lifeline" systems.
155. Mutual aid assistance for failures in utility and communications systems (including 9-1-1).
156. Programs/networks for contacting elderly or homebound persons during periods of infrastructure failure, to assess whether they have unmet needs.
157. Use of generators for backup power at critical facilities.
158. Regular maintenance and equipment checks.
159. Replacement or renovation of aging structures and equipment (to be made as hazard-resistant as economically possible).
160. Protecting electrical and communications systems from lightning strikes.
161. Tree-trimming programs to protect utility wires from falling branches. (Ideal: Establishment of a community forestry program with a main goal of creating and maintaining a disaster-resistant landscape in public rights-of-way.)
162. Increasing public awareness and widespread use of the "MISS DIG" utility damage prevention service (1-800-482-7171).
163. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Oil and Natural Gas Well Accidents

164. Community and operator compliance with industry safety regulations and standards.
165. Awareness of hydrogen sulfide gas dangers and personal protection actions for these dangers.
166. Using buffer strips to segregate wells, storage tanks, and other production facilities from transportation routes and adjacent land uses, in accordance with state regulations, and consistent with the level of risk.
167. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.

168. Contingency plans for worker and public protection, including the inclusion of rescue and evacuation procedures for well hazard areas in the local emergency operations plan.
169. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Public Health Emergencies

170. Encouraging residents to receive immunizations against communicable diseases.
171. Maintaining community water and sewer infrastructure at acceptable operating standards.
172. Providing back-up generators for water and wastewater treatment facilities to maintain acceptable operating levels during power failures.
173. Demolition and clearance of vacant condemned structures to prevent rodent infestations.
174. Maintaining a community public health system with sufficient disease monitoring and surveillance capabilities to adequately protect the population from large-scale outbreaks.
175. Increasing public awareness of the causes, symptoms, and protective actions for disease outbreaks and other potential public health emergencies.
176. Community support of free or reduced-expense clinics and school health services.
177. Preventing public contact with contaminated sites or waters (including floodwaters).
178. Brownfield and urban blight clean-up activities.
179. Pollution control, enforcement, and cleanup; proper disposal of chemicals and scrap materials.
180. Proper location, installation, cleaning, monitoring, and maintenance of septic tanks.
181. Separation of storm and sanitary sewer systems.

Sabotage/Terrorism/Weapons of Mass Destruction (WMD)

182. Development of a thorough community risk and threat assessment that identifies potential vulnerabilities and targets for a sabotage/terrorism/WMD attack.
183. Alertness, awareness, and monitoring of organizations and activities that may threaten the community.
184. Implementing school safety and violence prevention programs.
185. Providing legitimate channels of political and public expression.
186. Heightening security at public gatherings, special events, and critical community facilities and industries.
187. Using laminated glass and other hazard-resistant, durable construction techniques in public buildings and critical facilities.
188. Greater awareness of, and provision for, mental health services in schools, workplaces, and institutional settings.
189. Training, planning, and preparedness by local law enforcement and other responders for terrorist/ sabotage/WMD attacks.
190. The development and testing of internal emergency plans and procedures by businesses and organizations.
191. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
192. Establishing avenues of reporting (and rewards) for information preventing terrorist incidents and sabotage.
193. Consistent use of computer data back-up systems and anti-virus software.
194. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

195. Pre-planning for debris management staging and storage areas. (Debris could be rubble, vehicles, etc. that would get in the way or be left over following an attack or incident. The area may simultaneously need to be treated as a crime scene, site of urban search and rescue, area of hazardous materials, and/or a public health threat.

Population Increase (Seasonal/Event)

196. Provide personnel on a temporary basis to handle greater loads on public services.
197. Provide for emergency equipment to deal with higher call rates.
198. Develop plans for excessive traffic patterns.

Civil Disturbances (prison or institutional rebellions, disruptive political gatherings, violent labor disputes, urban protests or riots, or large-scale uncontrolled festivities)

199. Law enforcement training, staffing, and resource provision.
200. Incident anticipation and planning, and video documentation of events for later study and use.
201. Local law enforcement mutual aid, and support from the Michigan State Police and National Guard.
202. It is possible that design, management, integration, and lowered density of poor or blighted areas may reduce vandalism, crime, and some types of riot events. Crime Prevention Through Environmental Design (CPTED) is a field of planning that deals with this.
203. Insure structures and property in risky areas.
204. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
205. Design requirements for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, etc. that take into consideration emergency and security needs.

Earthquakes (biggest Michigan threats would be to pipelines, buildings that are poorly designed and constructed, and shelving, furniture, mirrors, gas cylinders, etc. within structures that could fall and cause injury or personal property damage)

206. Adopt and enforce appropriate building codes.
207. Use of safe interior designs and furniture arrangements.
208. Obtain insurance.
209. "Harden" critical infrastructure systems to meet seismic design standards for "lifelines."
210. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Scrap Tire Fires

211. Policies for regulated disposal and management of scrap tires, and enforcement of regulations related to them (separation of stored scrap tires from other materials; limits on the size of each pile; minimum distances between piles and property lines; covering, chemically treating, or shredding tires to limit mosquito breeding; providing for fire vehicle access to scrap tire piles; training employees in emergency response operations; installation of earthen berms around storage areas; prevention of pools of standing water in the area; control of nearby vegetation; an

emergency plan posted on the property; storing only the permitted volume of tires authorized for that site).

212. Proper siting of tire storage and processing facilities (land use planning that recognizes scrap tire sites as a real hazard and environmental threat).
213. Local awareness of scrap tire risk, training and preparedness of responders.
214. Law enforcement to prevent illegal dumping of tires at the site.
215. Pest-control measures for mosquitoes and other nuisances around scrap tire yards.

Structural Fires

216. Code existence and enforcement.
217. Designs that include the use of firewalls and sprinkler systems (especially in tall buildings, dormitories, attached structures, and special facilities).
218. Public education and school programs (especially about the use of stoves, heaters, fireworks, matches/ lighters, etc.)
219. Landlords and families can install and maintain smoke detectors and fire extinguishers. Install a smoke alarm on each level of homes (to be tested monthly, with the batteries changed twice each year).
220. Family members and residents should know how to use a fire extinguisher.
221. Proper installation and maintenance of heating systems (especially those requiring regular cleaning, those using hand-loaded fuels such as wood, or using concentrated fuels such as liquid propane).
222. Safe and responsible use of electric and "space" heaters (placed at least 3 feet from objects, with space near hot elements free of combustibles).
223. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
224. Safe use and maintenance/cleaning of fireplaces and chimneys (with the use of spark arresters and emphasis on proper storage of flammable items). Residents should be encouraged to inspect chimneys at least twice a year and clean them at least once a year.
225. Post fire emergency telephone numbers.
226. Education and practice of safe cigarette handling and disposal (also candles, fireworks, campfires, holiday lights)
227. Measures to reduce urban blight and associated arson (including CPTED?).
228. Proper workplace procedures, training and exercising, and handling of explosive and flammable materials and substances.
229. Pre-planned escape routes and fire alert responses.
230. Improved and continuing training for emergency responders, and provision of equipment for them.
231. Defensible space around structures in fire-prone wildland areas.
232. Proper maintenance of power lines, and efficient response to fallen power lines.
233. Transportation planning that provides roads, overpasses, etc. to maximize access and improve emergency response times, and evacuation potential, for all inhabited or developed areas of a community (not just designing for the minimum amount of road capacity to handle normal traffic volumes in the community.) This includes transportation access <u>within</u> developed sites (shopping malls, stadiums, office & commercial parking lots, etc.)
234. Control of civil disturbances and criminal activities that could lead to arson.
235. Enforced fireworks regulations.

236. Elimination of clandestine methamphetamine laboratories through law enforcement and public education.
237. Condominium-type associations for maintaining safety in attached housing/building units or multi-unit structures.
238. Obtain insurance.
239. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Nuclear Attack

240. Community awareness of designated fallout shelters and attack warning systems.
241. Developing and promoting workable population protection plans (evacuation and in-place sheltering plans, as appropriate).
242. Construction of concrete safe rooms (or shelters) in houses, trailer parks, community facilities, and business districts.
243. Using laminated glass and other hazard-resistant, durable construction techniques in public buildings and critical facilities.
244. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
245. Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including enemy attack).
246. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Nuclear Power Plant Accidents

247. Proper awareness of, training on, and implementation of radiological emergency procedures (to include both primary and secondary Emergency Planning Zones, as appropriate).
248. Community awareness of designated shelters and accident warning systems.
249. Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency, including enemy attack).
250. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
251. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Pipeline Accidents (Petroleum and Natural Gas)

252. Locating pipelines away from dense development, critical facilities, special needs populations, and environmentally vulnerable areas whenever possible.
253. Increasing public awareness of pipeline locations and appropriate emergency procedures.
254. Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.
255. Increasing public awareness and widespread use of the “MISS DIG” utility damage prevention service (800=482-7171).
256. Proper pipeline design, construction, maintenance and inspection.

257. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Subsidence

258. Identification, mapping, and preventing or limiting development in old mining areas or geologically unstable terrain.
259. Filling or buttressing subterranean open spaces (such as abandoned mines) to discourage their collapse.
260. Hydrological monitoring of groundwater levels in subsidence-prone areas.
261. Obtain insurance for subsidence hazards.
262. Real estate disclosure laws.
263. Community awareness of subsidence risks and effects.
264. Encourage residents to develop a Family Disaster Plan which includes the preparation of a Disaster Supplies Kit.

Transportation Accidents

265. Improvements in driver education, traffic law enforcement, and transportation planning that balance the needs of hazardous material transporters with the safety of the general public.
266. Improved design, routing, and traffic control at problem roadway areas.
267. Long-term planning that provides more connector roads for reduced congestion of arterial roads.
268. Railroad inspections and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing).
269. Enforcement of weight and travel restrictions for truck traffic.
270. Use of ITS (intelligent transportation systems) technology.
271. Use of designated truck routes.
272. Marine safety and general boater awareness programs.
273. Commercial operator training and skill enhancement programs.
274. Training, planning, and preparedness for mass-casualty incidents involving all modes of public transportation.
275. Trained, equipped, and prepared search and rescue teams.

APPENDIX E -
PROPOSED CLARE COUNTY ACTION ITEMS

Item 1 (NEW)

Deepening, widening, clearing of Tobacco Creek/Drain through Downtown Clare.

Action: A multi-phased project that will include the replacement of bridges, retaining walls, associated structures, and dredging of Tobacco Creek in Downtown Clare. These actions will allow the Creek to have a larger capacity to carry water through the downtown area.

- Location: City of Clare.
- Lead Agency: Clare County Drain Commission
- Participating Agencies: City of Clare, MDOT, Grant Township
- Hazards Addressed: Flooding.
- Potential Funding Source(s): Special Assessment Millage, Loans (Drain Commission)
- Project Costs: $4.6 million.
- Schedule: Project is being phased due to project costs. The engineering is complete and the first phase will begin in 2016.
- Priority: High
- Benefit(s): Project has been designed to reduce flooding along Tobacco Creek and specifically in Downtown Clare.

Item 2 (NEW) Remove Existing Structures from Flood Hazard Areas

Action: Purchase and remove four (4) buildings within the Tobacco Creek floodway.

- Location: Grant Township
- Lead Agency: Clare County Drain Commission
- Participating Agencies: City of Clare, Grant Township, MDOT, Isabella County
- Hazards Addressed: flooding and erosion
- Potential Funding Source(s): Loan from local bank
- Project Cost: $2 million
- Schedule: 2017
- Priority: High
- Benefit(s): Project has been designed to reduce flooding along Tobacco Creek and specifically in Downtown Clare and vicinity.

Item 3 (NEW) Conduct Regular Maintenance of Drainage System/Flood Control Structures

Action: Annual maintenance of creek right-of-way, which includes the removal of debris, trees, and branches, culvert and pipe replacement.

- Location: Grant Township
- Lead Agency: Clare County Drain Commission
- Participating Agencies: City of Clare, Grant Township, MDOT, Isabella County
- Hazards Addressed: flooding and erosion
- Potential Funding Source(s): special assessment/municipal bonds
- Project Cost: $10,000/mile of waterway
- Schedule: 2019/2020
- Priority: High

- Benefit(s): Project has been designed to reduce flooding along Tobacco Creek and specifically in Downtown Clare.

Item 4 (NEW)
Public Education on Underground Water Supply and Wellhead Protection Programs.
Action: Public education campaign to inform the residents of the threat of water contamination. Campaign will include public access cable, handouts/flyers at events within the County, and social media.

- Location: City of Harrison
- Lead Agency: City of Harrison
- Participating Agencies: NA
- Hazards Addressed: Public Health Emergencies (contamination of public drinking water)
- Potential Funding Source(s): General fund
- Project Cost: TBD
- Schedule: Ongoing
- Priority: High
- Benefit(s): Public health is maintained by drinking potable water.

Item 5
Tower Site Improvements for Public Safety Communications.
Action: Seek additional tower site for radio communications in Clare County.

- Location: Clare County
- Lead Agency: Clare County Emergency Management /911
- Participating Agencies: Garfield Township Fire Department, Lincoln Township Fire Department, Surrey Township Fire Department, Harrison Fire Department, Clare Fire Department, Marion Fire Department
- Hazards Addressed: Structural fires, wildfires, civil disturbances, terrorism/sabotage
- Potential Funding Source(s): Grants, participating municipalities
- Project Cost: $60,000
- Schedule: TBD
- Priority: High
- Benefit(s): Improved public safety radio communications in southwest Clare County.

Item 6 (NEW) Maintenance and Sustainability of Warning Sirens
Action: Purchase back-up battery packs, operation radio controls as needed.

- Location: County-wide
- Lead Agency: Clare County Office of Emergency Management (OEM)
- Participating Agencies: City of Clare, City of Harrison, Freeman Township, Garfield Township, Greenwood Township, Hayes Township, Lincoln Township, Redding Township, Summerfield Township, and Surrey Township
- Hazards Addressed: All hazards
- Potential Funding Source(s): grants, local municipalities
- Project Cost: $4,500/annually
- Schedule: ongoing
- Priority: High
- Benefit(s): Public continues to be notified of hazards by the County's warning sirens.

Item 7

Purchase of generators to be utilized at critical facilities throughout the County.

Action: Purchase of gas-powered generators for backup power at all critical facilities in the County that do not have them. Potential sites include, but are not limited to: township halls, shelters, and the County Courthouse.

- Location: Countywide.
- Lead Agency: OEM
- Participating Agencies: Clare County, Arthur Township, Franklin Township, Freeman Township, Frost Township, Garfield Township, Grant Township, Hamilton Township, Hatton Township, Lincoln Township, Redding Township, Sheridan Township, Summerfield Township, Surrey Township, and Winterfield Township
- Hazards Addressed: severe weather conditions.
- Potential Funding Source(s): grants, Arthur Township, Franklin Township, Freeman Township, Frost Township, Garfield Township, Grant Township, Hamilton Township, Hatton Township, Lincoln Township, Redding Township, Sheridan Township, Summerfield Township, Surrey Township, and Winterfield Township
- Project Costs: $250,000.
- Schedule: TBD
- Priority: High
- Benefit(s): Mitigate the loss of life/injuries during power failures. Generators would provide these facilities with power that is needed to handle special needs population that need power to sustain life (oxygen, dialysis machines, etc.).

Item 8

Obtain Geographical Information Systems (GIS) service to create maps that can be used by Emergency Management staff for hazard mitigation purposes.

Action: Complete a Request for Proposal (RFP) packet and distribute to local GIS companies to determine which company, if any, would be able to provide GIS services to the County for Emergency Management purposes in conjunction with hazard mitigation.

- Location: County Offices
- Lead Agency: OEM
- Participating Agencies: Clare County, Clare County 911 Center
- Hazards Addressed: All hazards.
- Potential Funding Source(s): Clare County 911 Center General funds, Grants
- Project Costs: $70,000.
- Schedule: Ongoing
- Priority: High
- Benefit(s): Mitigation of property loss and human loss with additional software/mapping capabilities that identify problematic areas of weather and man-made hazardous conditions.

Item 9 Purchase and Distribute Smoke Detectors and Carbon Monoxide Detectors

Action: Acquire/distribute smoke detectors and carbon monoxide detectors to households throughout the County

- Location: County-wide

- Lead Agency: Clare County Fire Chiefs Association
- Participating Agencies: Garfield Township Fire Department, Lincoln Township Fire Department, Surrey Township Fire Department, Harrison Fire Department, Clare Fire Department, Marion Fire Department
- Hazards Addressed: Fires, public health emergencies (carbon monoxide poisoning
- Potential Funding Source(s): grants, local municipalities
- Project Cost: $10,000/year
- Schedule: TBD
- Priority: High
- Benefit(s): Household members are warned of high carbon monoxide levels in house, and warned of smoke/fires.

Item 10 (NEW) Seek Grant Funds to Complete Community Wildfire Protection Plan Action: Secure a grant to complete the Community Wildfire Protection Plan

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County Fire Chiefs Association, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., Michigan Department of Natural Resources (MDNR),
- Hazards Addressed: Wildfires
- Potential Funding Source(s): MDNR grant, Clare County Fire Chiefs Association, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept.
- Project Cost: $30,000
- Schedule: TBD
- Priority: High
- Benefit(s): Reduction of damages to personal property along with a potential reduction of injury/loss of life due to wildfires.

Item 11

Public Education on Chimney Fires.

Action: Educate the local firefighters on how to address chimney fires. Educate the general public on the maintaining a clean, safe chimney.

- Location: County-wide
- Lead Agency: Clare County Fire Chiefs Association
- Participating Agencies: OEM, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept.
- Hazards Addressed: structural fires
- Potential Funding Source(s): Grants, Clare County, Fire Chiefs Association
- Project Cost: $10,000
- Schedule: ongoing
- Priority: High
- Benefit(s): Chimney properly checked/maintained as well as more knowledgeable firefighters. This would also result in a reduction of chimney fires that could cause injuries/lost lives or loss of personal property.

Item 12 (NEW) Senior Internet Security Program

Action: The Senior Internet Security Program offers senior citizens and their respective caregivers essential senior cyber security and fraud education. The campaign currently involves a focus group approach at Senior Meal and other gathering sites to provide a one-on-one enhanced education to reach the most vulnerable age group for fraud and cybersecurity crimes. Program facilitation is provided through the Clare County Emergency Management office with assistance from the Clare County Sheriff's Office.

- Location: Countywide.
- Lead Agency: Office of Emergency Management (OEM)
- Participating Agencies: Clare County Sheriff's Office
- Hazards Addressed: Fraud
- Potential Funding Source(s): Grants
- Project Cost: $20,000
- Schedule: Ongoing
- Priority: High
- Benefit(s): Senior citizen population will be better educated in cyber security matters and less likely to be susceptible to scams and fraud.

Item 13 (NEW) Purchase of Mobile Generators for Special Needs Population Facilities

Action: Purchase of temporary generators that could be transported to group homes (special needs facilities).

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County Senior Services, Red Cross, Clare County
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, local municipalities and agencies
- Project Cost: $50,000
- Schedule: TBD
- Priority: High
- Benefit(s): Group homes (special needs facilities) able to keep their clients in home environment during power failures.

Item 14 (NEW) Prepare Special Needs Population Facilities for Generator Use

Action: Modify residences to allow the use of a generator during power failures.

- Location: County-wide
- Lead Agency OEM:
- Participating Agencies: Clare County Senior Services, Red Cross, Clare County
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, OEM Budget
- Project Cost: $25,000
- Schedule: TBD
- Priority: High

- Benefit(s): Many group homes are not set up to allow a generator to be used to supply power. These modifications would allow the generators to be hooked up to the homes and utilized during power outages.

Item 15

Purchase and Distribute National Oceanic Atmospheric Administration (NOAA) Weather Radios

Action: Purchase NOAA weather radios for all households/businesses in Clare County.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Red Cross, Clare County Senior Services, Mid-Michigan Community Action Agency
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept. Fire Chief's Association
- Project Cost: $150,000
- Schedule: TBD
- Priority: High
- Benefit(s): All households/business are given an opportunity to listen to the radio and provided early warnings of emergency situations.

Item 16 (NEW) Educate Public of Shelters and Warning Systems

Action: Educate the general public on the location of public shelters and the use of warning systems through the distribution of flyers and the use of Public Service Announcements (PSAs).

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., and Red Cross
- Hazards Addressed: all hazards
- Potential Funding Source(s): General fund budgets from fire departments, OEM Budget
- Project Cost: $5000/annually
- Schedule: 2017
- Priority: High
- Benefit(s): General public is better informed of shelter locations and how to respond to the different emergencies identified by the warning systems.

Item 17 (NEW) Encourage the inclusion of hazard mitigation into other planning documents

Action: Encourage municipal agencies to include hazard mitigation into master plans/comprehensive land use plans and other planning documents.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Clare County, all townships as appropriate
- Hazards Addressed: all hazards
- Potential Funding Source(s): NA
- Project Cost: NA

- Schedule: 2016
- Priority: High
- Benefit(s): Hazard Mitigation is identified in the local municipal planning documents, thereby increasing community awareness of hazard mitigation and increasing the opportunity for community resiliency.

Item 18 (NEW) Replace older damaged Culverts throughout the County as needed

Action: Replace damaged/rusted out culverts throughout the Clare County.

- Location: County-wide
- Lead Agency: Road Commission
- Participating Agencies: City of Clare, City of Harrison, Village of Farwell, and all townships (should funding become available)
- Hazards Addressed: infrastructure failure, flooding
- Potential Funding Source(s): local general funds
- Project Cost: $300,000
- Schedule: ongoing
- Priority: Medium
- Benefit(s): By replacing the culverts, storm water will be better directed to the intended source, resulting in less flooding and accessibility being improved with passable roads during high rain periods.

Item 19 (NEW) Monitor/Repair/Replace all High Risk Dams

Action: Clare County has three high risk dams. Should any of these dams fail, property and possibly lives could be lost, as well as the lakes themselves. These dams vary in their state of repair and Shamrock Dam has been identified as a concern by the local governments. Complete a study to determine needed repairs/complete repairs/replace as necessary.

- Location: City of Clare, Surrey Township
- Lead Agency: City of Clare
- Participating Agencies: Grant Township. MDOT, Surrey Township, Clare County Drain Commission, and Lake 13 Property Association
- Hazards Addressed: flooding, infrastructure failure
- Potential Funding Source(s): Grants, special assessments, general funds
- Project Cost: TBD
- Schedule: TBD
- Priority: Medium
- Benefit(s): Dams should be properly maintained/enhanced to avail failure, which should failure occur, flooding would result not only potentially damaging properties within the dam's shadow, but could also result in the loss of one or more lakes.

Item 20 Continue to Develop Emergency Plans for Businesses, Schools, Governmental Facilities, and Special Events.

Action: Continue to do all inclusive whole community planning.

- Location: County-wide
- Lead Agency: OEM

- Participating Agencies: Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., local businesses, Farwell, Clare, and Harrison Chambers of Commerce, all educational facilities, event coordinators, special event facilities
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, local match, OEM Budget
- Project Cost: NA
- Schedule: ongoing
- Priority: Medium
- Benefit(s): Buildings and events would have a plan for emergencies, thereby having an informed workforce in the event of an emergency.

Item 21 Continue to Develop Evacuation Plans for Businesses, Schools, Governmental Facilities, and Special Events

Action: Continue to do all inclusive whole community planning.

- Location: County-wide
- Lead Agency: OEM
- Participating Agencies: Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., local businesses, Farwell, Clare, and Harrison Chambers of Commerce, all educational facilities, event coordinators, special event facilities
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, local match, OEM Budget
- Project Cost: NA
- Schedule: ongoing
- Priority: Medium
- Benefit(s): Buildings and events would have a plan for evacuation situations, thereby having an informed workforce in the event of an emergency.

Item 22 Plant Live Snow Fence along US127/Old US127 corridors

Action: Identify the potential locations of live snow fences, plant accordingly.

- Location: Along Rte. 127/ old Rte. 127 corridors
- Lead Agency: Clare County Road Commission
- Participating Agencies: Clare County Parks and Recreation, MDOT
- Hazards Addressed: infrastructure failure, severe weather conditions
- Potential Funding Source(s): grants, Clare County Road Commission, local municipalities
- Project Cost: $25,000
- Schedule: 2018
- Priority: Medium
- Benefit(s): With the installation of the snow fence/wind block, the highways can remain open during times of inclement weather, including high winds during the spring planting.

Item 23 Trimming of Tree Branches around Power Lines

Action: Consumers Energy and Tri Count Electric have ongoing tree trimming initiatives along the power line right-of-way.

- Location: County-wide

- Lead Agency: Consumers Energy,
- Participating Agencies: Tri-County Electric Cooperative
- Hazards Addressed: all hazards
- Potential Funding Source(s): Annual Budget
- Project Cost: TBD
- Schedule: Ongoing
- Priority: Medium
- Benefit(s): Trimming trees along power lines, roads and streets mitigates damages that occur from summer and winter storm events. Fallen trees and limbs can obstruct passage on streets and roads impeding the passage of emergency vehicles. Fallen trees and limbs that damage power lines can leave vulnerable populations, particularly the elderly and disabled, without heat, air conditioning and electrical power for home medical devices, and leaves residents with residential wells without a source of water. Critical facilities such as urgent care clinics, pharmacies and gas stations can be shut down from a loss of electrical power.

Item 24 Protect Critical Facilities/Structures from Lightning Damage and other hazards

Action: Protect critical facilities/structures from lightning strike damage and other hazards with the installation of lightning rods and proper grounding and install/maintain surge protection on critical electronic equipment.

- Location: County-wide
- Lead Agency: Clare County OEM
- Participating Agencies: NA
- Hazards Addressed: all hazards
- Potential Funding Source(s): OEM Budget, grants
- Project Cost: TBD
- Schedule: Ongoing
- Priority: Medium
- Benefit(s): Facilities and critical equipment will be protected from effects of lightning strikes, thereby keeping the facilities operational during hazard events.

Item 25 (NEW) Enhance the security system for the Clare County Courthouse.

Action: Replace entrance/exit doors with security doors, add exit alarm system, ballistic glass, card readers access installed on all doors, install security camera system, replace existing x-ray security system with upgraded system.

- Location: County Courthouse, City of Harrison.
- Lead Agency: OEM
- Participating Agencies: Clare County Sheriff's Department, Clare County Community Development
- Hazards Addressed: Civil Disturbances, Terrorism and Sabotage.
- Potential Funding Source(s):
- Project Costs: $100,000.
- Schedule: TBD
- Priority: Moderate
- Benefit(s): Project will provide a safer working environment for County employees, and visitors utilizing the Clare County Courthouse.

Item 26 Purchase of Portable Electronic Message Boards

Action: four (4) portable electronic message boards that can be utilized by multiple agencies throughout the County.

- Location: County-wide
- Lead Agency: Road Commission
- Participating Agencies: OEM, Harrison Community Fire Dept., Lincoln Township Fire Dept., Garfield Township Fire Dept., Surrey Township Fire Dept., Clare Fire Dept., and Marion Fire Dept., Clare County Sheriff's Department, Clare, Harrison, and Farwell Department of Public Works Depts., Clare County Road Commission
- Hazards Addressed: all hazards
- Potential Funding Source(s): grants, Clare County, local municipal governments
- Project Cost: $80,000
- Schedule: TBD
- Priority: Moderate
- Benefit(s): Enhance public safety with advance notice of hazardous conditions and/or traffic accidents