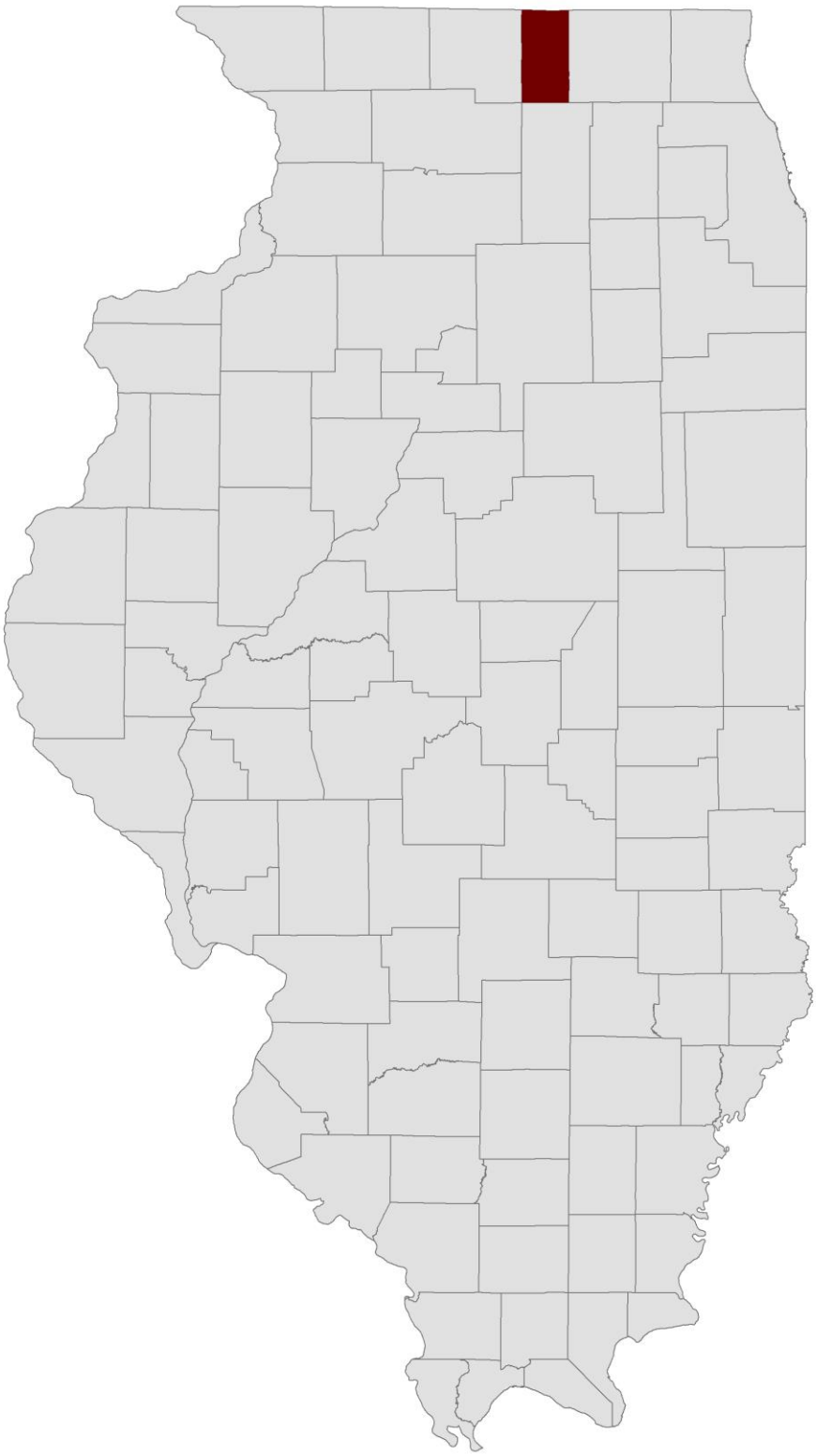
Multi-Hazard Mitigation Plan

Boone County, IL



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Multi-Hazard Mitigation Plan

Boone County, Illinois

Adoption Date: -- _____ --

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Section 1 Introduction

Hazard mitigation is any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) makes reducing hazards one of its primary goals; hazard-mitigation planning and the subsequent implementation of mitigation projects, measures, and policies is a primary mechanism in achieving FEMA's goal.

The Multi-Hazard Mitigation Plan (MHMP) is a requirement of the Federal Disaster Mitigation Act of 2000 (DMA 2000). The development of a local government plan is required in order to maintain eligibility for certain federal disaster assistance and hazard mitigation funding programs. In order for the National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt an MHMP.

In recognition of the importance of planning in mitigation activities, FEMA created Hazus Multi-Hazard (Hazus-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to estimate losses from floods, hurricanes, earthquakes, and other natural hazards and to measure the impact of various mitigation practices that might help reduce those losses.

Southern Illinois University Carbondale (SIU) and The Polis Center (Polis) at Indiana University - Purdue University Indianapolis (IUPUI) are assisting Boone County in developing their MHMP. SIU and Polis are guiding the planning process, performing the hazard risk assessment, and assisting in identifying sound mitigation activities.

Section 2 Planning Process

2.1 Timeline

The MHMP process is broken into a series of five meetings. These meetings are organized by SIU and hosted by the Boone County Emergency Management Agency. At these five meetings, various tasks are completed by SIU and the Boone County multi-hazard mitigation planning team:

Meeting 1: The purpose of Meeting 1 is to introduce the MHMP process and organize resources. SIU gathers local resources that contribute to the detailed county risk assessment.

Meeting 2: SIU presents the county's historical hazards. Based on this information, the planning team identifies natural hazards to include in the plan, and ranks hazards by potential damages and occurrences. The planning team also provides SIU with disaster scenarios for the county risk assessment.

Meeting 3: SIU and Polis present the draft risk assessment, derived from the Hazus-MH and GIS modeling of the identified disasters, to the planning team. The general public is also invited to this meeting through a series of newspaper articles and/or radio spots. At the end of the meeting, SIU encourages the general public to ask questions and provide input to the planning process, fulfilling one of FEMA's requirements for public input.

Meeting 4: This meeting consists of a "brainstorming session." The planning team lends local knowledge to identify and prioritize mitigation strategies and projects that can address the threats identified in the risk assessment. FEMA requires the plan to contain mitigation strategies specific to each hazard and for each incorporated area within the county.

Meeting 5: The planning team reviews the draft plan, proposes revisions, and accepts the plan after SIU incorporates the necessary changes. Subsequently, SIU will forward the county MHMP to the mitigation staff at the Illinois Emergency Management Agency (IEMA) for review prior to submitting it to FEMA.

2.2 Planning Team Information

Bard Bartell, the county EMA coordinator, heads the planning team. The planning team includes representatives from various county departments, municipalities, and public and private utilities. Table 2-1 identifies the planning team individuals and the organizations they represent.

Table 2-1: Mitigation Planning Team Members

Name	Title	Organization	Jurisdiction
Brad Bartell	Coordinator	Boone County EMA	Boone County
Butch Falkenstein	Deputy Chief of Police	Belvidere Police Department	Belvidere
Roland Wood	Chief of Public Safety	Candlewick Lake Association	Poplar Grove
Ellen Genrich	Emergency Response Coordinator	Boone County Health Department	Boone County
Heather Walsh	Assistant Principal	North Boone High School	Poplar Grove
Clayton Stevens	Alderman	Belvidere	Belvidere
David Worrell	Fire Chief	Belvidere Fire Department	Belvidere
Ken Terrinoni	County Administrator	Boone County	Timberlane
Duane Wirth	Sheriff	Boone County Sheriff's Department	Boone County

Name	Title	Organization	Jurisdiction
Bill Purvis	Captain	Boone County Sheriff's Department	Boone County
Ken Jaeger	Fire Captain	Belvidere Fire Department	Belvidere
Richard Lundin	County Engineer	Boone County	Boone County
Greg Holmes	Fire Chief	Capron Fire Department	Capron
Jerry Ashens	Lieutenant	Boone County Sheriff's Department	Boone County
Bob Walberg	County Board Chairman	Boone County	Boone County
Steven Kirschbaum	EMS Educator	SwedishAmerican Medical Center of Belvidere	Belvidere
Perry Gay	Lieutenant	Boone County Sheriff's Department	Boone County
Brent Anderson	Public Works Director	Belvidere Department of Public Works	Belvidere

The DMA 2000 planning regulations require that planning team members from each jurisdiction actively participate in the MHMP process. The planning team was actively involved on the following components:

- Attending the MHMP meetings
- Providing available assessment and parcel data and historical hazard information
- Reviewing and providing comments on the draft plans
- Coordinating and participating in the public input process
- Coordinating the formal adoption of the plan by the county

A MHMP kickoff meeting was held in Belvidere on 11/08/2012. Representatives from SIU explained the rationale behind the MHMP program and answered questions from the participants. SIU representatives provided an overview of Hazus-MH, described the timeline and the process of the mitigation planning project, and presented Boone County with a Memorandum of Understanding (MOU) for sharing data and information.

The planning team met with SIU and the Polis Center on 11/08/2012, 04/20/2013, 07/09/2013, 01/21/2014, 03/12/2014, and 03/25/2014. Each meeting was approximately two hours in length. Separate meetings were held with various planning attendees (EMA volunteers, County Board members, etc.) to discuss the plan and its progress on 01/13/2014, 01/23/2014, 01/29/2014, 01/31/2014, 02/07/2014, 02/10/2014, 02/20/2014., 03/10/2014, 03/10/2014, 03/12/2014, and 03/27/2014. Appendix A includes the minutes for each meeting. During these meetings, the planning team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects, and assisted with preparation of the public participation information.

2.3 Public Involvement

The Boone County EMA solicited public input during the planning process, and two public meetings (Meeting 3) were held on 07/09/2013 and 03/25/2014 to review the county's risk assessment. Appendix A contains the minutes from the public meeting. Appendix B contains press releases and/or articles sent to local newspapers throughout the public input process.

2.4 Neighboring Community Involvement

The planning team invited participation from various representatives of county government, local city and town governments, community groups, local businesses, and universities. The planning team also invited participation from adjacent counties to obtain their involvement in the planning process. Table 2-2 summarizes details of neighboring stakeholders' involvement.

Table 2-2: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Title/Organization	Participation Description
Don Krizan	Winnebago County	Civil Engineer Senior	Reviewed plan; offered comments

2.5 Review of Technical and Fiscal Resources

The planning team identified representatives from key agencies to assist in the planning process. SIU obtained technical data, reports, and studies from these agencies. Table 2-3 summarizes these organizations and their contributions.

Table 2-3: Key Agency Resources Provided

Agency Name	Resources Provided
Illinois Environmental Protection Agency	Illinois 2008 Section 303(d) Listed Waters and watershed maps
U.S. Census	County Profile Information, e.g., Population and Physical Characteristics
Department of Commerce and Economic Opportunity	Community Profiles
Illinois Department of Employment Security	Industrial Employment by Sector
NOAA National Climatic Data Center	Climate Data
Illinois Emergency Management Agency	2010 Illinois Natural Hazard Mitigation Plan
Illinois Water Survey (State Climatologist Office)	Climate Data
Headwaters Economics & The Bureau of Land Management	A Socioeconomic Profile – Boone County, IL

2.6 Review of Existing Plans

Boone County and its local communities utilized a variety of planning documents to direct community development. These documents include land use plans, comprehensive plans, emergency response plans, municipal ordinances, and building codes. The planning process incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 2-4 lists the plans, studies, reports, and ordinances used to develop of the plan.

Table 2-4: Planning Documents Used for MHMP Planning Processes

Author(s)	Year	Title	Description	Where Used
FEMA	2011	Boone County Flood Insurance Study	Describes the NFIP program, which communities participate; provide flood maps.	Sections 4 and 5
Supervisor of Assessments	2013	GIS Database	Parcel and Assessor Data For Boone County.	Section 4
State of Illinois Emergency Management Agency	2010	2010 Illinois Natural Hazard Mitigation Plan	This plan provides an overview of the process for identifying and mitigating natural hazards in Illinois as required by the Disaster Mitigation Act of 2000.	Guidance on hazards and mitigation measures and background on historical disasters in Illinois.

2.7 Jurisdiction Participation information

SIU intends this plan to meet the requirements of the DMA 2000 and for each incorporated jurisdiction to adopt it. Table 2-5 lists the incorporated communities included in this multi-jurisdictional plan.

Table 2-5: Participating Jurisdictions

Jurisdiction Name
Boone County
Belvidere
Caledonia
Capron
Poplar Grove
Timberlane

2.8 Adoption by Local Governing Body

SIU delivered the draft plan to the Boone County multi-hazard mitigation planning team for review on February 28, 2014. SIU subsequently incorporated any comments from the planning team into the plan. Upon FEMA approval, the planning team will present and recommend the plan to the County Commissioners for adoption, who adopted it on <date adopted>. The planning team will work with the county and it's jurisdictions to ensure all parties adopt the plan. Appendix C includes resolution adoptions of this plan.

2.9 Jurisdiction Participation

DMA 2000 regulations require that each jurisdiction participate in the planning process. Table 2-6 lists each jurisdiction and describes its participation in the construction of this plan.

Table 2-6: Description of Participation for Each Jurisdiction

Jurisdiction Name	Participating Member	Participation Description
Boone County	Brad Bartell	Reviewed plan; offered comments
Belvidere	Dave Worrell	Reviewed plan; offered comments
Caledonia	Owen Castansa	Reviewed plan; offered comments
Capron	Greg Holmes	Reviewed plan; offered comments
Poplar Grove	Roland Wood	Reviewed plan; offered comments
Timberlane	Ken Terrinoni	Reviewed plan; offered comments

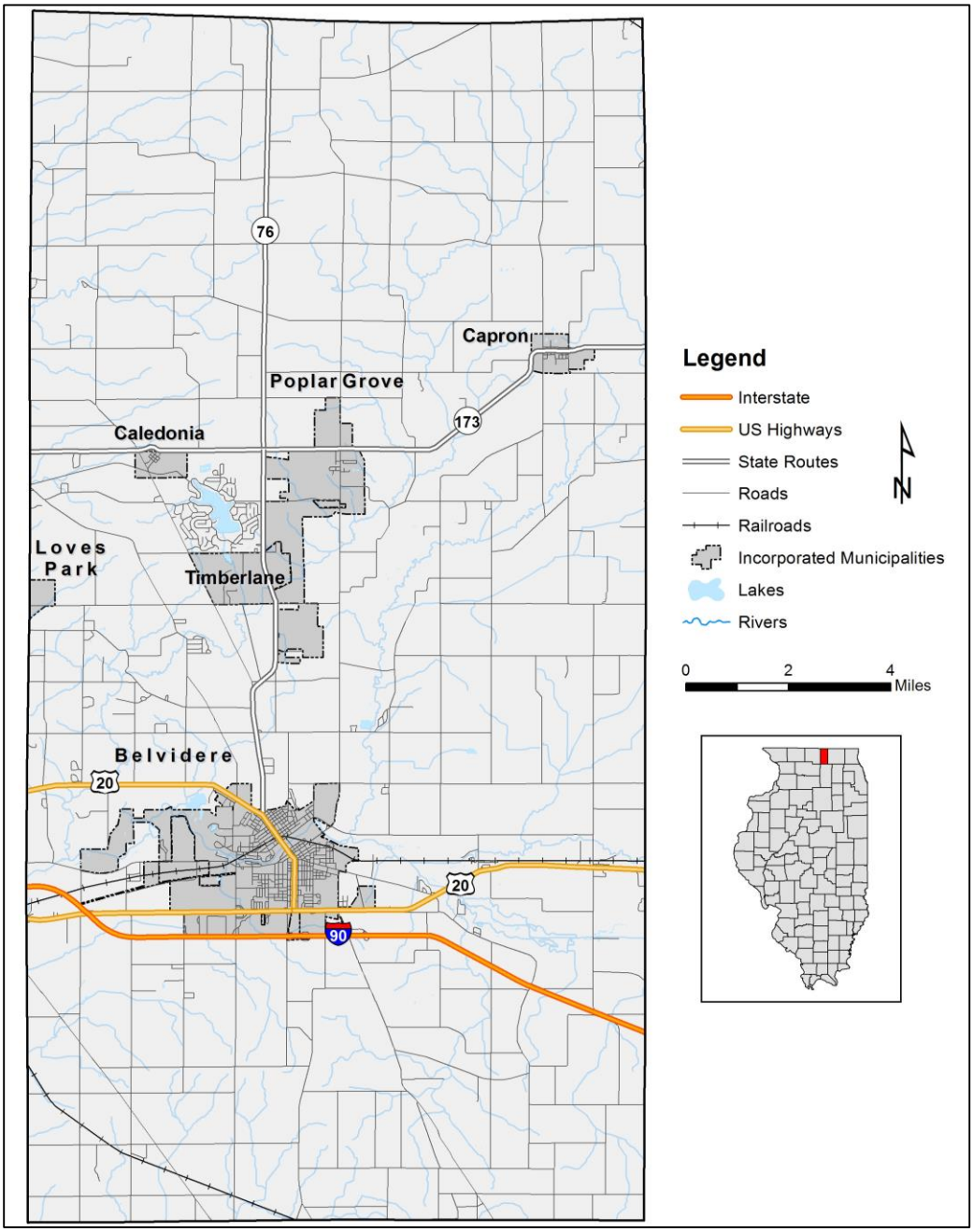
All members of the planning team actively participated in the MHMP meetings, provided available GIS data and historical hazard information, reviewed and provided comments on the draft plans, coordinated and participated in the public input process, and coordinating the county's formal adoption of the plan.

Section 3 County Profile

3.1 County Background

Boone County is located in northern Illinois along the Illinois-Wisconsin boarder. Boone County is surrounded by McHenry County to the east, Winnebago County to the west and DeKalb County to the south. Boone County was formed out of Winnebago County in 1837. The county is named after the famous American pioneer, Daniel Boone. Figure 3-1 displays the geographical location of Boone County and its incorporated municipalities.

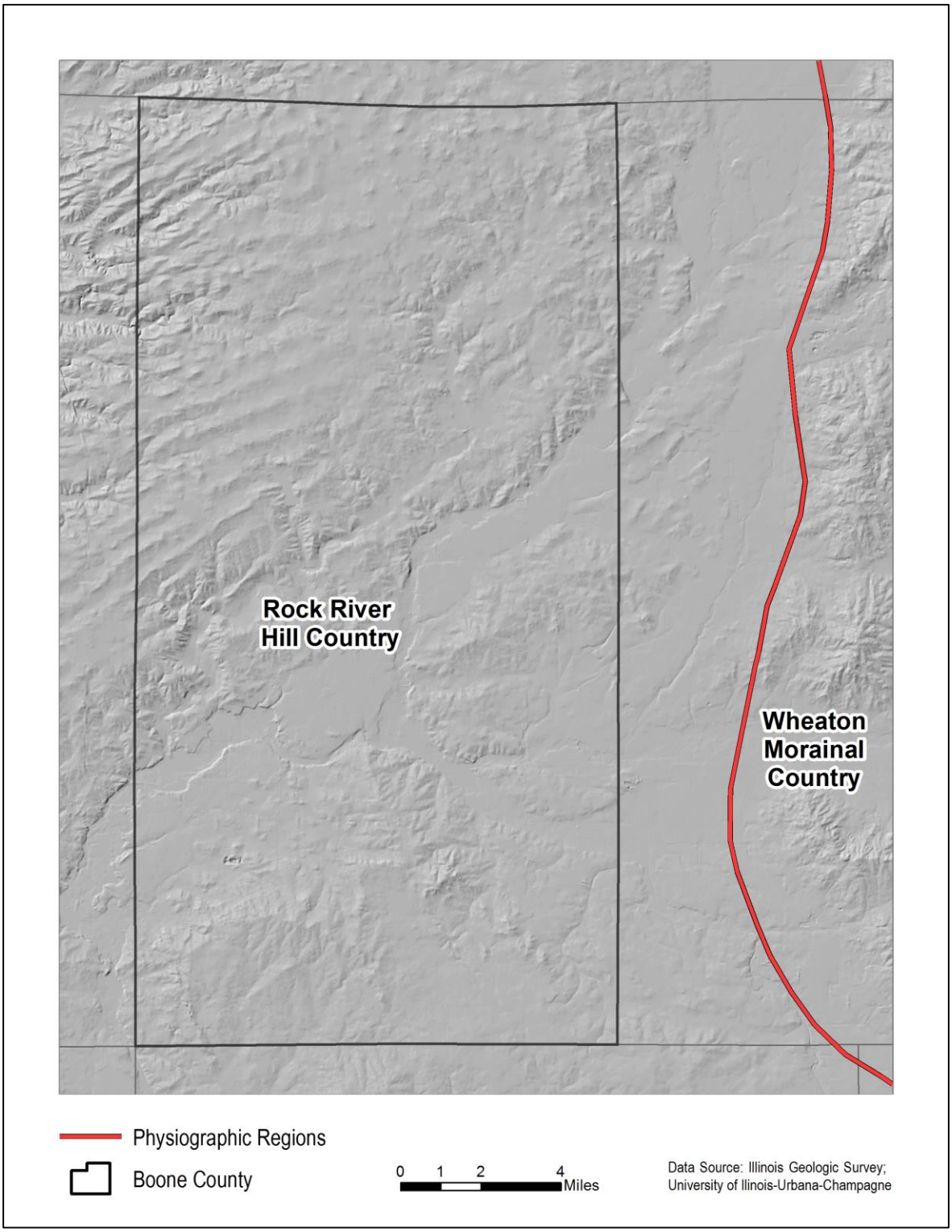
Figure 3-1: Boone County's Geographical Location



3.2 Topography

Boone County is situated in the Rock River Hill County physiographic regions. Figure 3-2 depicts the physiographic regions of Boone County.

Figure 3-2: Physiographic Divisions of Boone County and Surrounding Region



3.3 Climate

Boone County climate is humid continental with warm summers and cold winters. Average annual temperature is 47.7 ºF. The highest temperature on record is 109 ºF and the lowest is -29 ºF. Average annual precipitation is 35.48 inches, with most precipitation occurring in spring and summer months. Average annual snowfall is approximately 34.38 inches. Average annual humidity is 74.73%. Average annual wind speed is 19.53 mph.

3.4 Demographics

Boone County's population is 54,165, an increase of 29.6% from 2000 to 2010 (U.S. Census Bureau, 2010 Census). The population is spread through nine townships: Belvidere; Bonus; Boone; Caledonia; Flora; Leroy; Manchester; Poplar Grove; and Spring. Boone County has six incorporated jurisdictions, including: Belvidere; Caledonia; Capron; Garden Prairie; Poplar Grove; and Timberlane. The largest incorporated jurisdiction in Boone County is Belvidere, which has a population of approximately 30,109 (U.S. Census Bureau, 2010 Census). Table 3-1 includes the breakdown of population by township.

Table 3-1: Population by Township

Township	2010 Population	Percent of County
Belvidere	30,109	55.6%
Bonus	4,340	8.0%
Boone	1,968	3.6%
Caledonia	7,439	13.7%
Flora	2,981	5.5%
Leroy	485	0.9%
Manchester	895	1.7%
Poplar Grove	5,054	9.3%
Spring	894	1.7%

3.5 Economy

The American Community Survey (2008-2012) reported that the civilian labor force comprised 67.6% of the workforce in Boone County. Table 3-2 includes the employment distribution by industrial sector. Manufacturing, retail trade, and education represent the largest sectors, employing 51.5% of the workforce. The annual per capita income in Boone County is $26,559 (American Community Survey, 2008-2012).

Table 3-2: Industrial Employment Sector

Industrial Sector	2008-2012 County Distribution
Agriculture, forestry, fishing, hunting, and mining	1.3%
Construction	8.3%
Manufacturing	22.5%
Wholesale trade	3.6%
Retail trade	11.9%
Transportation, warehousing and utilities	6.4%
Information	2.0%
Finance, insurance, real estate, and rental/leasing	5.7%
Professional, technical services	8.3%
Educational, health, and social services	17.1%
Arts, entertainment, recreation	6.4%
Other services	3.8%
Public administration	2.7%

3.6 Industry

Boone County's largest employers include Chrysler Belvidere Assembly Plant, Belvidere School District 100, General Mills-Green Giant, and Syncreon. Table 3-3 lists other major employers in Boone County.

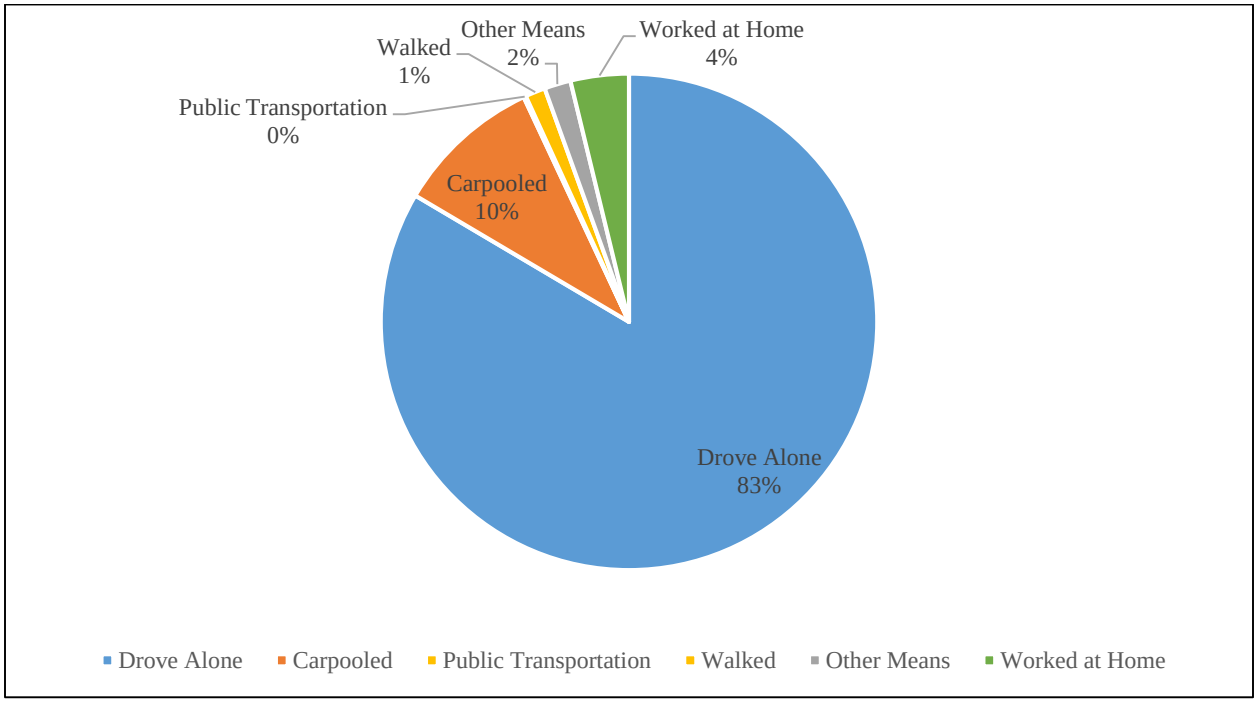
Table 3-3: Boone County's Major Employers

Employer	Industry
Americold	Warehousing/Logistics
Belvidere School District 100	Education
Capron Manufacturing	Manufacturing
Cassens Transport	Transportation
Chrysler Belvidere Assembly Plant	Manufacturing
Dean Foods	Food & Beverage
General Mills-Green Giant	Food & Beverage
Ispen USA	Manufacturing
K.K.O., Inc.	Manufacturing
North Boone CUSD 200	Education
Syncreon	Logistics

3.7 Commuter Patterns

According to the American Community Survey (2008-2012), approximately 67.6% of Boone County's population is in the work force. The average travel time from home to work is 31.9 minutes. Figure 3-3 depicts the commuting patterns for Boone County's labor force.

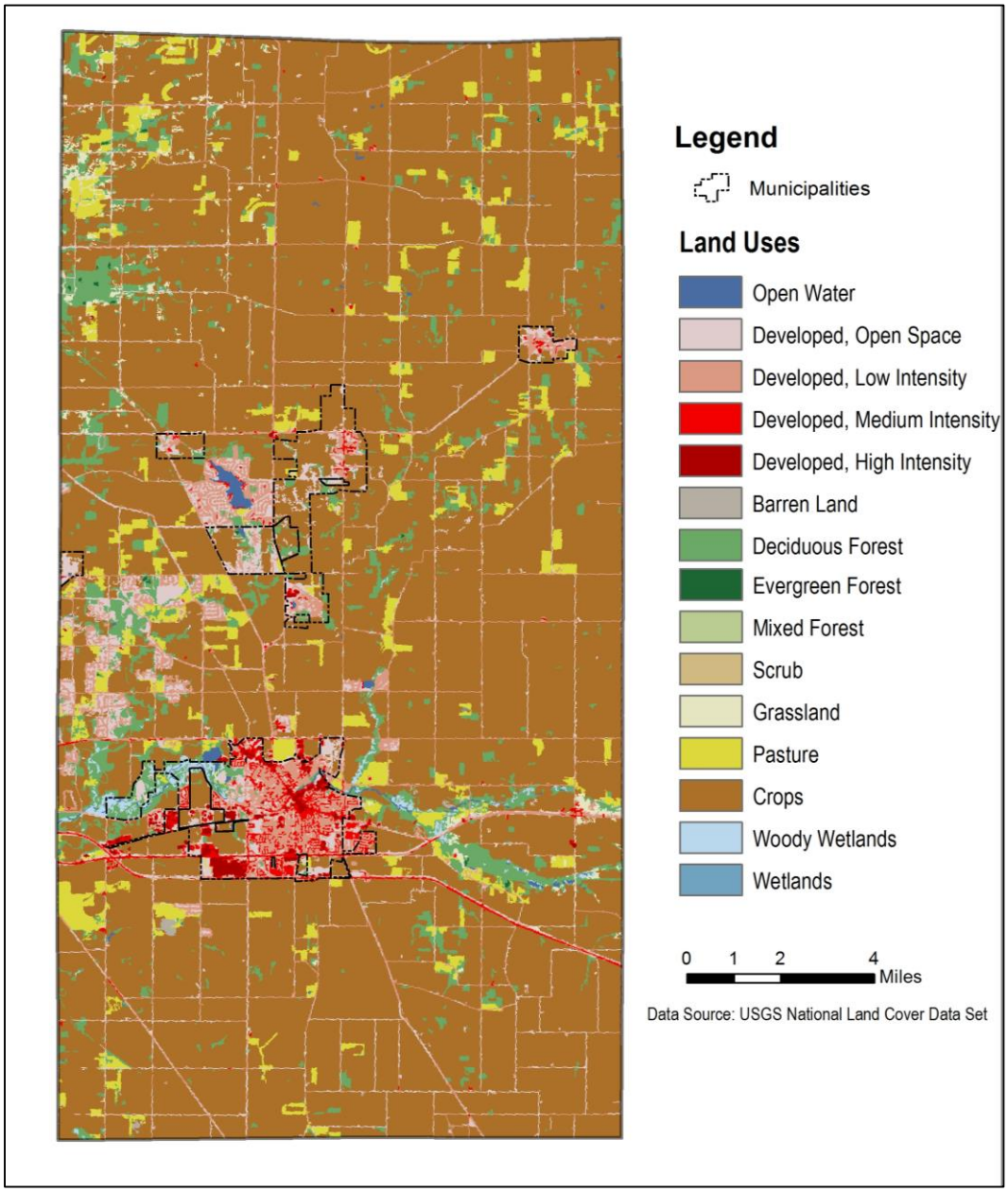
Figure 3-3: Commuter Patterns for Boone County



3.8 Land Use and Development Trends

Figure 3-4 depicts the land use within Boone County. The predominant land cover in Boone County is crops, followed by medium and low intensity urban development, pasture, and deciduous forest. Crops and pastures are distributed throughout the county, while areas of deciduous forest are usually found along rivers or around water bodies. Urban development is predominantly located within the triangle formed by US Business 20, Beloit Road, and the County Line. The city of Belvidere is the area of most significant urban development. Suburban development is located within the City of Belvidere, and to an extent, in the Villages of Capron and Poplar Grove and Candlewick. Small village-character development is located within Caledonia, Capron, Poplar Grove, Garden Prairie, and to some extent, Herbert. There are no state parks in Boone County. Boone County has six structures in the National Register of Historic Places, including the Pettit Memorial Chapel designed by famous architect Frank Lloyd Wright.

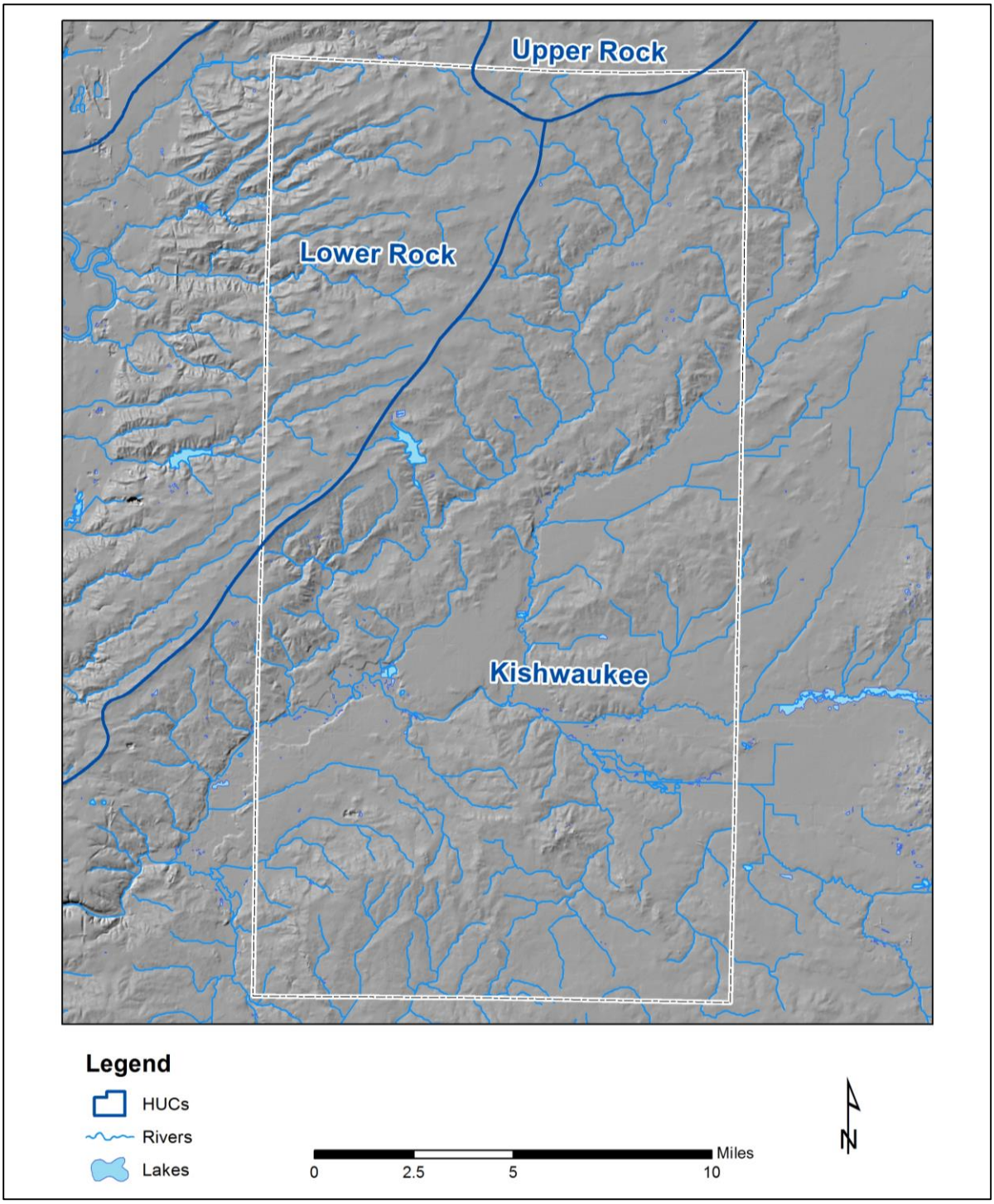
Figure 3-4: Land Use in Boone County



3.9 Major Lakes, Rivers and Watersheds

Boone County has several water bodies, the most prominent of which is Candlewick Lake. The only major river in Boone County is the Kishwaukee River, which runs through the center of Belvidere. According to the USGS, Boone County consists of three drainage basins: Upper Rock; Lower Rock; and Kishwaukee. Figure 3-5 depicts the hydrologic units within Boone County.

Figure 3-5: Major Lakes and Rivers in Boone County



Section 4 Risk Assessment

The goal of mitigation is to reduce future hazard impacts including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation requires rigorous risk assessment. A risk assessment involves quantifying the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people. This assessment identifies the characteristics and potential consequences of a disaster, how much the disaster could affect the community, and the impact on community assets. A risk assessment consists of three components—hazard identification, vulnerability analysis, and risk analysis.

4.1 Hazard Identification

4.1.1 Existing Plans

The plans identified in Table 2-4 did not contain a detailed risk analysis specifically for Boone County. SIU and the planning team reviewed these local planning documents to identify historical hazards and help identify risk.

4.1.2 National Hazard Records

4.1.2.1 National Climatic Data Center (NCDC) Records

To assist the planning team, SIU compiled historical storm event data from the National Climatic Data Center (NCDC). NCDC records are estimates of damage reported to the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses.

The NCDC data included 205 reported events in Boone County from 1959-Feb 2014 (the most updated information as of the date of this plan). The following hazard-profile sections each include a summary table of events related to each hazard type. Table 4-1 summarizes meteorological hazards reported by NCDC for Boone County. Figures 4-1 and 4-2 summarize the relative frequency of NCDC reported meteorological hazards and the percent of total damage associated with each hazard for Boone County. Full details of individual hazard events are on the NCDC website. In addition to NCDC data, SIU mapped Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail using SPC-recorded latitudes and longitudes. Appendix D includes a map of these events.

Table 4-1: Summary of Meteorological Hazards Reported by NCDC for Boone County

Hazards	Time Period		Number of Events	Property Damage *(Millions of Dollars)*	Deaths	Injuries
	Start	*End*				
Flooding	1993	2014	19	0.11	0	0
Severe Thunderstorm	1963	2014	134	0.75	7	10
Tornado	1959	2014	8	2.35	24	414
Winter Storm	1994	2014	33	0.001	11	0
Extreme Heat	1995	2014	11	0	583	0

Figure 4-1: Number of Meteorological Events Reported by NCDC for Boone County

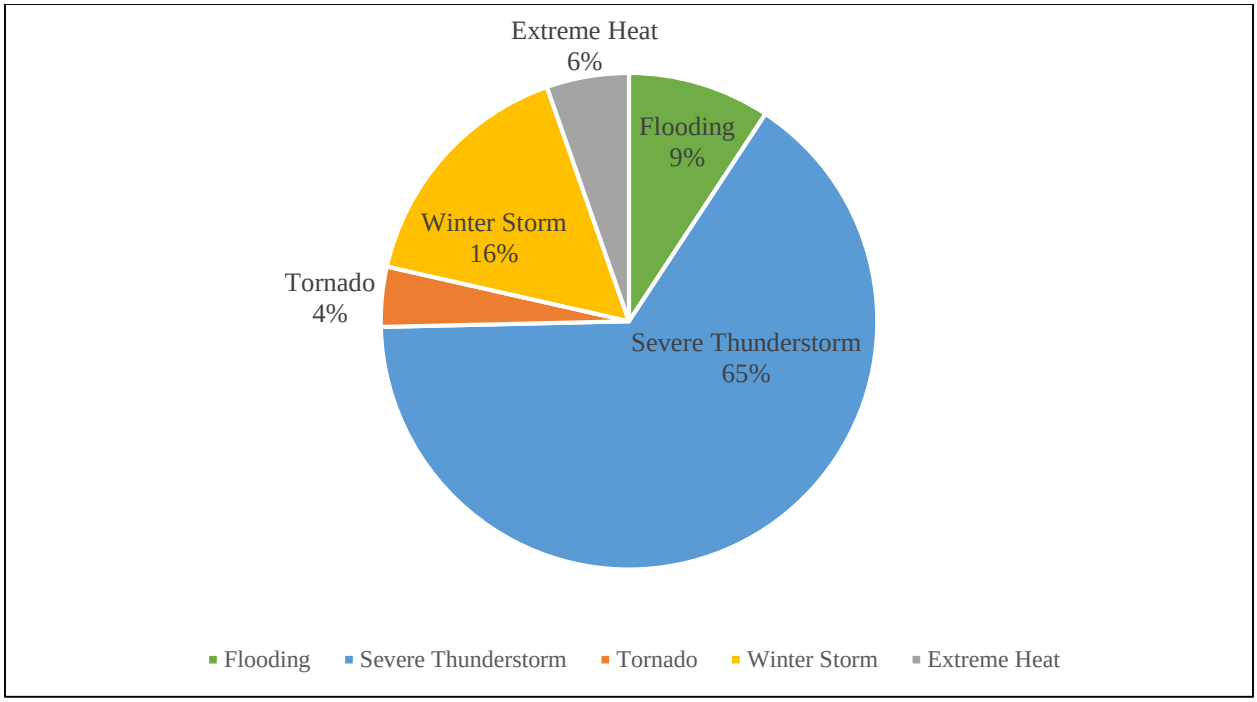
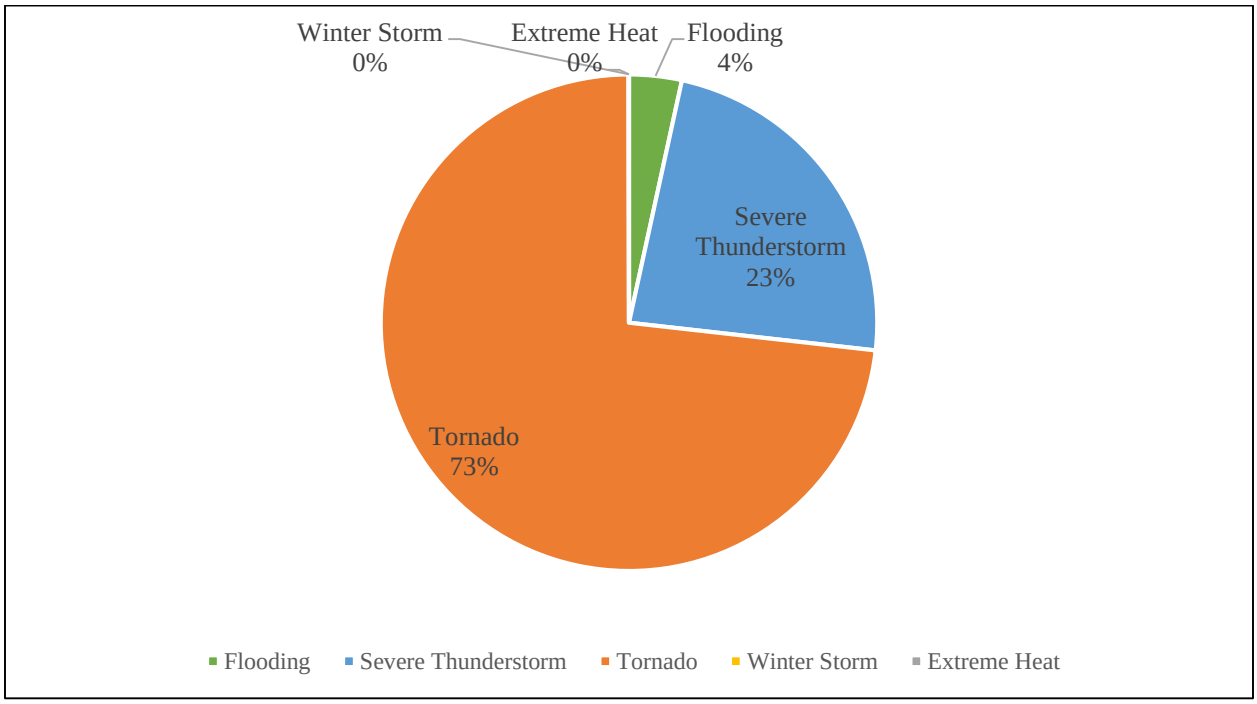


Figure 4-2: Percent Total Damage by Meteorological Hazard Reported by NCDC for Boone County



4.1.2.2 FEMA Disaster Information

Since 1957, FEMA has declared 53 major disasters and 7 emergencies for the state of Illinois. Emergency declarations allow states to access FEMA funds for Public Assistance (PA); disaster declarations allow for even more PA funding, including Individual Assistance (IA) and the Hazard Mitigation Grant Program (HMGP). Boone County has received federal aid for nine declared disasters since 1965. Figure 4-3 depicts the disasters and emergencies that have been declared for the state of Illinois and Boone County since 1965. Table 4-2 lists specific information for each disaster declaration in Boone County.

Figure 4-3: FEMA-Declared Emergencies and Disasters in Illinois and Boone County (1965-2013)

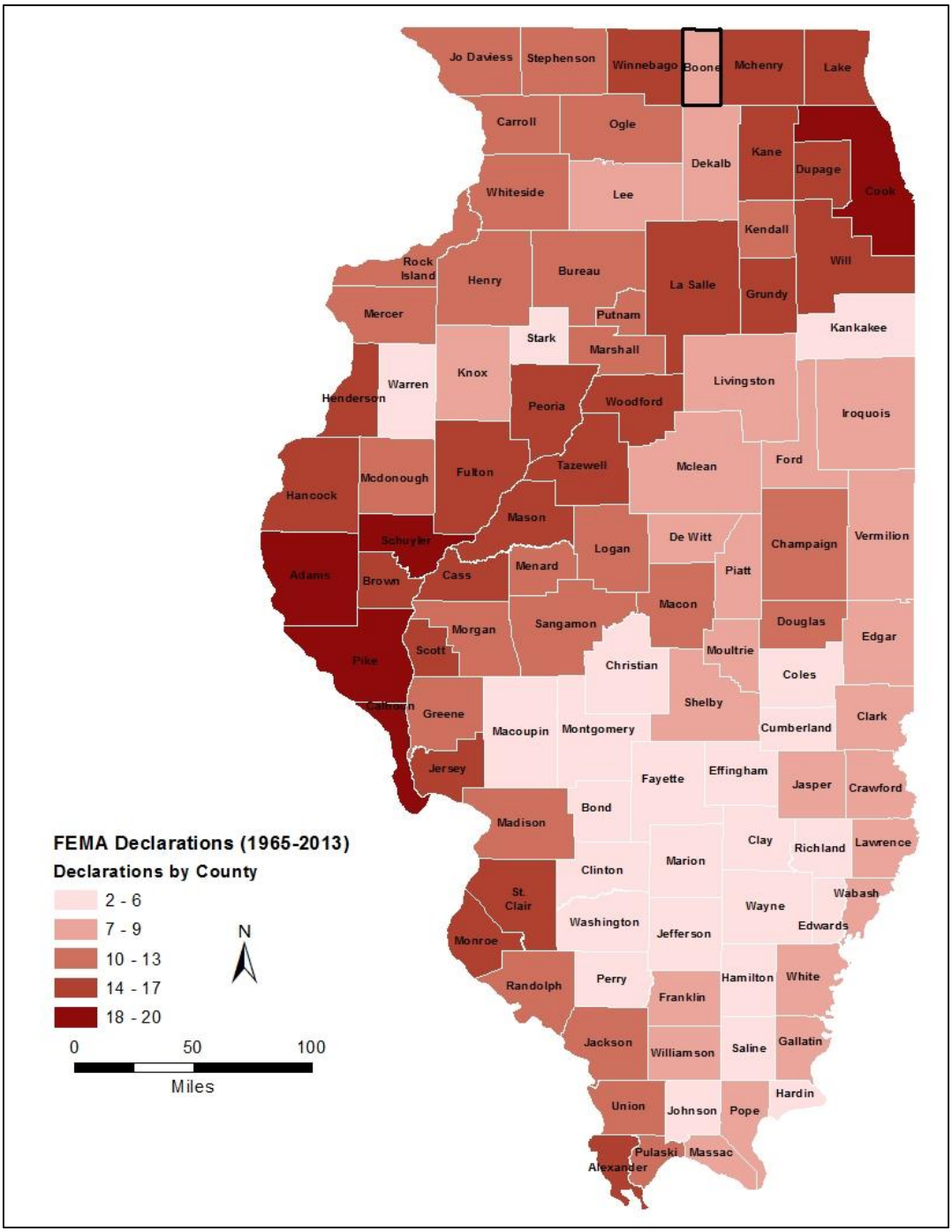


Table 4-2: Detail of FEMA-Declared Emergencies and Disasters in Boone County (1965-present)

Declaration Number	Date of Declaration	Description
227	04/25/1967	Tornado
373	04/26/1973	Flooding, Severe Storms
997	07/09/1993	Flooding
1112	05/06/1996	Severe Storms. Severe Winds, Torrential Rain
3161	01/17/2001	Snow Emergency
3230	09/07/2005	Hurricane Sheltering
3269	12/29/2006	Snow Emergency
3283	03/13/2008	Snow Emergency
1960	03/17/2011	Severe Winter Storm

4.1.3 Hazard Ranking Methodology

Based on planning team input, national datasets, and existing plans, Table 4-3 lists the hazards Boone County will address in the MHMP. In addition, these hazards ranked the highest based on the Risk Priority Index (RPI) discussed in section 4.1.4.

Table 4-3: Planning Team Hazard List

Hazard
Tornado
Thunderstorms
Winter Storms
Flooding
Hazardous Materials Release
Fire
Dam or Levee Failure
Extreme Heat and Drought
Earthquakes

4.1.4 Calculating the Risk Priority Index

The RPI quantifies risk as the product of hazard probability and magnitude so planning team members can prioritize mitigation strategies for high-risk-priority hazards. Planning team members use historical hazard data to determine probability and knowledge of local conditions to determine the possible severity of a hazard. Tables 4-4 and 4-5 display the criteria the planning team used to quantify hazard probability and magnitude.

Table 4-4: Future Occurrence Ranking

Probability	Characteristics
4 - Highly Likely	Event is probable within the calendar year. Event has up to 1 in 1 year chance of occurring. (1/1=100%) History of events is greater than 33% likely per year.

Probability	Characteristics
3 - Likely	Event is probable within the next three years. Event has up to 1 in 3 years chance of occurring. (1/3=33%) History of events is greater than 20% but less than or equal to 33% likely per year.
2 - Possible	Event is probable within the next five years. Event has up to 1 in 5 years chance of occurring. (1/5=20%) History of events is greater than 10% but less than or equal to 20% likely per year.
1 - Unlikely	Event is possible within the next ten years. Event has up to 1 in 10 years chance of occurring. (1/10=10%) History of events is less than or equal to 10% likely per year.

Table 4-5: Hazard Magnitude

Magnitude/Severity	Characteristics
8 - Catastrophic	Multiple deaths. Complete shutdown of facilities for 30 or more days. More than 50% of property is severely damaged.
4 - Critical	Injuries and/or illnesses result in permanent disability. Complete shutdown of critical facilities for at least 14 days. More than 25% of property is severely damaged.
2 - Limited	Injuries and/or illnesses do not result in permanent disability. Complete shutdown of critical facilities for more than seven days. More than 10% of property is severely damaged.
1 - Negligible	Injuries and/or illnesses are treatable with first aid. Minor quality of life lost. Shutdown of critical facilities and services for 24 hours or less. Less than 10% of property is severely damaged.

The product of hazard probability and magnitude is the RPI. The planning team members ranked specified hazards based on the RPI, with larger numbers corresponding to greater risk. Table 4-6 identifies the RPI and ranking for each hazard specified by the planning team.

Table 4-6: Boone County Hazard Risk Priority Index and Ranking

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornado	3	6	18	1
Thunderstorms	4	3	12	2
Winter Storms	3	2	6	3
Flooding	3	2	6	4
Hazardous Materials Release	1	3	3	5
Fire	1	2	2	6
Dam or Levee Failure	1	4	4	7
Extreme Heat & Drought	2	1	2	8
Earthquakes	1	4	4	9

4.1.5 Jurisdictional Hazard Ranking

Each jurisdiction was asked to create its own RPI because hazard susceptibility may differ by jurisdiction. However, the hazard ranking for Boone County and participating jurisdictions was done as a group. Table 4-7 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern). The jurisdictions made these rankings at Meeting 2 and approved the rankings at Meeting 3. It is important to note that community perceptions may change throughout the planning process. During the five-year review of the plan, the planning team will update this table to ensure these jurisdictional rankings accurately reflect each community's assessment of these hazards.

Table 4-7: Hazard Ranking by Jurisdiction

Jurisdiction	Hazard								
	Tornado	**HAZMAT**	**Earthquake**	**T-storms**	**Flooding**	**Drought/ Heat**	**Winter Storms**	**Dam/ Levee Failure**	**Fire**
Boone County	1	5	9	2	4	8	3	7	6
Belvidere	1	5	9	2	4	8	3	7	6
Caledonia	1	5	9	2	4	8	3	7	6
Capron	1	5	9	2	4	8	3	7	6
Garden Prairie	1	5	9	2	4	8	3	7	6
Poplar Grove	1	5	9	2	4	8	3	7	6
Timberlane	1	5	9	2	4	8	3	7	6

4.1.6 GIS and Hazus-MH

The third step in this risk assessment is the risk analysis, which quantifies the risk to the population, infrastructure, and economy of the community. SIU quantified the hazards using GIS analyses and Hazus-MH where possible. This process reflects a Level 2 Hazus-MH analysis. A level 2 Hazus-MH analysis involves substituting selected Hazus-MH default data with local data and improving the accuracy of model predictions.

Depending upon the analysis options and the quality of data the user inputs, Hazus-MH generates a combination of site-specific and aggregated loss estimates. Hazus-MH is not intended as a substitute for detailed engineering studies; it is intended to serve as a planning aid for communities interested in assessing their risk to flood-, earthquake-, and hurricane-related hazards. This plan does not fully document the processes and procedures completed in its development, but this documentation is available upon request.

Table 4-8 indicates the analysis type (i.e. GIS, Hazus-MH, or historical records) used for each hazard assessment.

Table 4-8: Risk Assessment Tool Used for Each Hazard

Hazard	Risk Assessment Tool(s)
Tornado	GIS-based
Winter Storms	Historical Records
Severe Thunderstorm	Historical Records
Flooding	Hazus-MH
Fire	Historical Records
Hazmat	GIS-based
Earthquakes	Hazus-MH

4.2 Vulnerability Assessment

4.2.1 Asset Inventory

4.2.1.1 Processes and Sources for Identifying Assets

SIU first updated the Hazus-MH default critical facilities data using state resources. At meeting one, the planning team used their resources to further update this information. SIU and the county used local GIS data to verify the locations of all critical facilities. SIU GIS analysts incorporated these updates and corrections to the Hazus-MH data tables prior to performing the risk assessment. The updated Hazus-MH inventory contributed to a Level 2 analysis, which improved the accuracy of the risk assessment.

Updates to the default Hazus-MH data include:

- Updating the Hazus-MH defaults, critical facilities, and essential facilities based on the most recent available data sources.
- Reviewing, revising, and verifying locations of critical and essential point facilities with local input.
- Applying the essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) to the Hazus-MH model data.
- Updating Hazus-MH reports of essential facility losses.

SIU made the following assumptions during analysis:

- SIU used Hazus-MH aggregate data to model the building exposure for all earthquake and flood analysis. SIU assumes that the aggregate data is an accurate representation of Boone County.
- SIU restricts the analysis to the county boundaries. Events that occur near the county boundaries do not contain damage assessments from adjacent counties.

4.2.1.2 Essential Facilities List

Table 4-9 identifies the number of essential facilities identified in Boone County. Essential facilities are a subset of critical facilities. Appendices E and F include a list and map of all critical facilities in Boone County.

Table 4-9: Essential Facilities

Facility	Number of Facilities
Emergency Operations Center	1
Fire Station	7
Government	2
Medical Care Facility*	8
Police Station	1
School	21

*Medical Care Facilities include hospitals with 50 beds or greater and medical clinics (clinics, labs, blood banks)

4.2.1.3 Facility Replacement Costs

Table 4-10 identifies facility replacement costs and total building exposure. Boone County provided local assessment data for updates to replacement costs. Table 4-10 also includes the estimated number of buildings within each occupancy class.

Table 4-10: Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure (x $1000)
Residential	14442	3,512,617
Agriculture	1333	509,278
Commercial	679	409,109
Education	21	216,683
Government	17	3,180
Religion	6	3,751
Industrial	214	503,436
Total:	**16692**	**$5,158,054**

4.3 Future Development

As the county's population grows, the residential and urban areas will extend further into the county, placing more pressure on existing transportation and utility infrastructure while increasing the rate of farmland conversion. Boone County will address specific mitigation strategies in Section 5 to alleviate such issues.

Boone County is vulnerable to a variety of natural hazards, therefore the county government—in partnership with state government—must make a commitment to hazard mitigation. Boone County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management in mitigation, preparedness, response, and recovery.

4.4 Hazard Profiles

4.4.1 Tornado Hazard

Hazard Definition

Tornadoes are violently rotating columns of air extending from thunderstorms to the ground. Funnel clouds are rotating columns of air not in contact with the ground; however, the violently rotating column of air can

reach the ground quickly and become a tornado. If the funnel cloud picks up and blows debris, it has reached the ground and is a tornado.

Tornadoes are a significant risk to Illinois and its citizens. Tornadoes can occur at any time on any day. The unpredictability of tornadoes makes them one of Illinois' most dangerous hazards. Tornado winds are violently destructive in developed and populated areas. Current estimates place maximum wind velocity at about 300 miles per hour, but higher values can occur. A wind velocity of 200 miles per hour results in a pressure of 102.4 pounds per square foot—a load that exceeds the tolerance limits of most buildings. Thus, it is easy to understand why tornadoes can devastate the communities they hit.

Tornadoes are classified according to the Enhanced Fujita tornado intensity scale. The Enhanced Fujita scale ranges from intensity EF0, with effective wind speeds of 40 to 70 miles per hour, to EF5 tornadoes, with effective wind speeds of over 260 miles per hour. Table 4-11 outlines the Enhanced Fujita intensity scale.

Table 4-11: Enhanced Fujita Tornado Rating

Enhanced Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
0 *Gale*	40-72 mph	6-17 yards	0.3-0.9 miles	Light damage, some damage to chimneys, branches broken, signboards damaged, shallow-rooted trees blown over.
1 *Moderate*	73-112 mph	18-55 yards	1.0-3.1 miles	Moderate damage, roof surfaces peeled off, mobile homes pushed off foundations, attached garages damaged.
2 *Significant*	113-157 mph	56-175 yards	3.2-9.9 miles	Considerable damage, entire roofs torn from frame houses, mobile homes demolished, boxcars pushed over, large trees snapped or uprooted.
3 *Severe*	158-206 mph	176-566 yards	10-31 miles	Severe damage, walls torn from well-constructed houses, trains overturned, most trees in forests uprooted, heavy cars thrown about.
4 *Devastating*	207-260 mph	0.3-0.9 miles	32-99 miles	Complete damage, well-constructed houses leveled, structures with weak foundations blown off for some distance, large missiles generated.
5 *Incredible*	261-318 mph	1.0-3.1 miles	100-315 miles	Foundations swept clean, automobiles become missiles and thrown for 100 yards or more, steel-reinforced concrete structures badly damaged.

Previous Occurrences of Tornadoes

The NCDC database reported 8 tornadoes/funnel clouds in Boone County since 1959. The most recent recorded event occurred on 6/30/2009, when a brief F0 tornado was reported near Capron and Boone School Roads in Capron.

Table 4-12 identifies NCDC-recorded tornadoes that caused damage, death, or injury in Boone County. Additional details of individual hazard events are on the NCDC website.

Table 4-12: NCDC-Recorded Tornadoes That Caused Damage, Death, or Injury in Boone County

Location or County*	Date	EF-Scale	Deaths	Injuries	Property Damage (x $1000)	Crop Damage (x $1000)
Boone	05/15/1986	0	0	0	2.5	0
Boone	09/26/1959	1	0	0	25	0
Boone	06/22/1984	1	0	0	25	0
Boone	04/29/1991	0	0	0	25	0
Irene	06/12/2008	1	0	0	25	0
Poplar Grove	01/07/2008	3	0	4	2000	0
Boone	04/21/1967	4	24	410	250	0
		Total:	**24**	**414**	**$2352.5**	**$0**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Tornado Hazard

The entire county has the same risk of tornado occurrence. Tornadoes can occur at any location within the county.

Hazard Extent for Tornado Hazard

Historical tornadoes generally moved from southwest to northeast across the county. The extent of the hazard varies in terms of the size of the tornado, its path, and its wind speed.

Risk Identification for Tornado Hazard

Based on historical information, the probability of future tornadoes in Boone County is likely. The county should expect tornadoes with varying magnitudes to occur in the future. Tornadoes ranked as the number one hazard according to the RPI.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
1	x	4	=	4

Vulnerability Analysis for Tornado Hazard

Tornadoes can occur within any area in the county; therefore, the entire county population and all buildings are vulnerable to tornadoes. To accommodate this risk, this plan considers all buildings located within the county as vulnerable. Table 4-9 and 4-10 display the existing buildings and infrastructure in Boone County.

Critical Facilities

All critical facilities are vulnerable to tornadoes. A critical facility is susceptible to many of the same impacts as any other building within the jurisdiction. These impacts vary based on the magnitude of the tornado but can include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). Table 4-9 lists the types and numbers of all of the essential facilities in the area. Appendices E and F include a list and map of all critical facilities in Boone County.

Building Inventory

Table 4-10 lists the building exposure in terms of types and numbers of buildings for the entire county. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows

broken by hail or high winds, and loss of building function (e.g., damaged home will no longer be habitable, causing residents to seek shelter).

Infrastructure

The types of infrastructure that could be impacted during a tornado include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is vulnerable, it is important to emphasize that any number of these structures could become damaged during a tornado. The impacts to these structures include broken, failed, or impassable roadways, broken or failed utility lines (e.g., loss of power or gas to community), and railway failure from broken or impassable rail lines. Bridges could fail or become impassable, causing risk to motorists.

GIS-based Tornado Analysis

SIU conducted two tornado scenarios for Boone County, a historical scenario through Belvidere and a hypothetical scenario through Poplar Grove and Capron. The planning team selected these scenarios. The following analysis quantifies the anticipated impacts of tornadoes in the county in terms of number and types of buildings and infrastructure damaged.

SIU used GIS-overlay modeling to determine the potential impacts of an F4 tornado. The analysis used a paths based upon the F4 tornado event that runs for 11.7 miles through Belvidere and nine miles through Poplar Grove and Capron. Table 4-13 depicts tornado damage curves and path widths (*source*: NOAA) utilized for the modeled scenario. The damage curve is based conceptual wind speeds, path winds, and path lengths from the Enhanced-Fujita Scale guidelines.

Table 4-13: Tornado Path Widths and Damage Curves

Fujita Scale	Path Width (feet)	Maximum Expected Damage
5	2,400	100%
4	1,800	100%
3	1,200	80%
2	600	50%
1	300	10%
0	150	0%

Degrees of damage depend on proximity to the path centerline within a given tornado path. The most intense damage occurs within the center of the damage path, with decreasing amounts of damage away from the center. To model the F4 tornado, SIU used GIS to create the desired tornado path and subsequently add buffers (damage zones) around the tornado path. Figure 4-4 and Table 4-14 illustrate the zone analysis. Figure 4-5 depicts the selected hypothetical tornado paths, Figure 4-6 shows the damage curve buffers for each path, and Figure 4-7 shows the building inventory affected by the EF4 Tornado in Belvidere, Poplar Grove, and Capron.

Figure 4-4: Tornado Analysis (Damage Curves) Using GIS Buffers

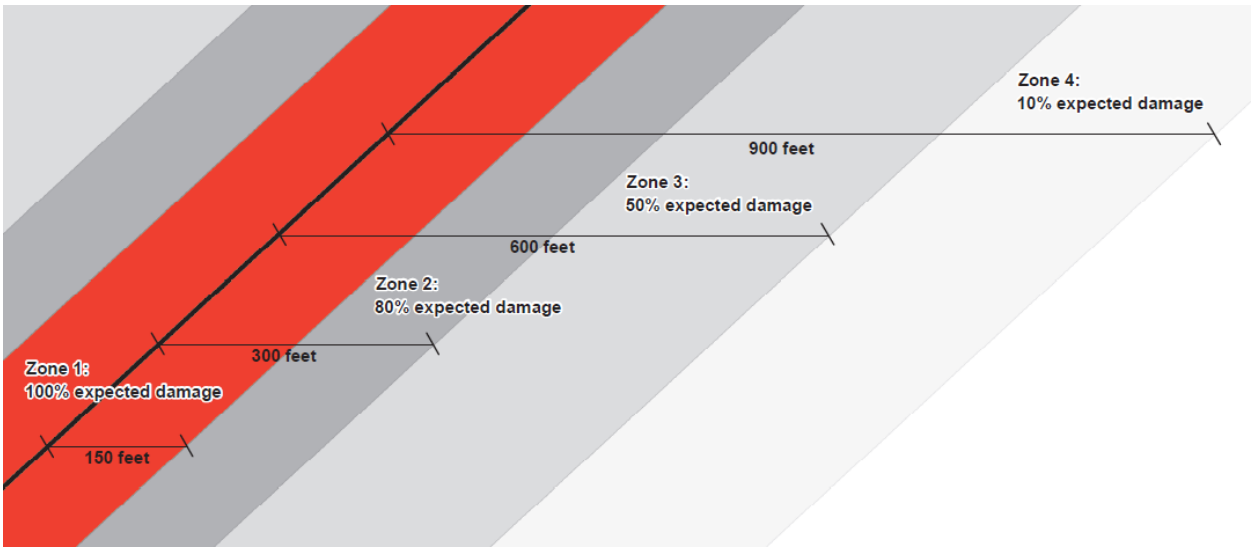


Table 4-14: F4 Tornado Analysis Using GIS Buffers

Zone	Buffer (feet)	Damage Curve
1	0-150	100%
2	150-300	80%
3	300-600	50%
4	600-900	10%

Figure 4-5: Tornado Tracks Through Belvidere, Poplar Grove, and Capron

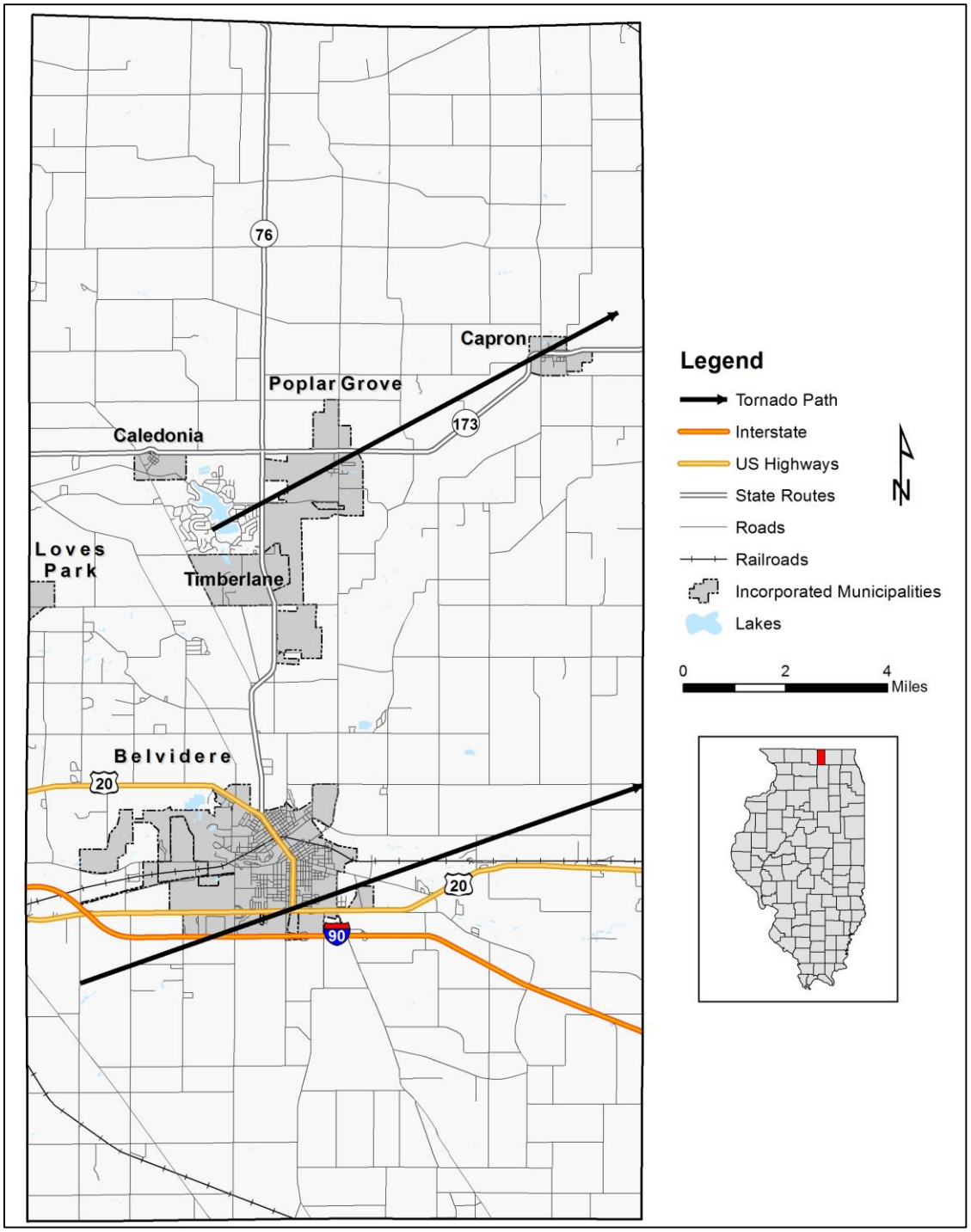


Figure 4-6: Modeled F4 Damage Buffers in Belvidere, Poplar Grove, and Capron

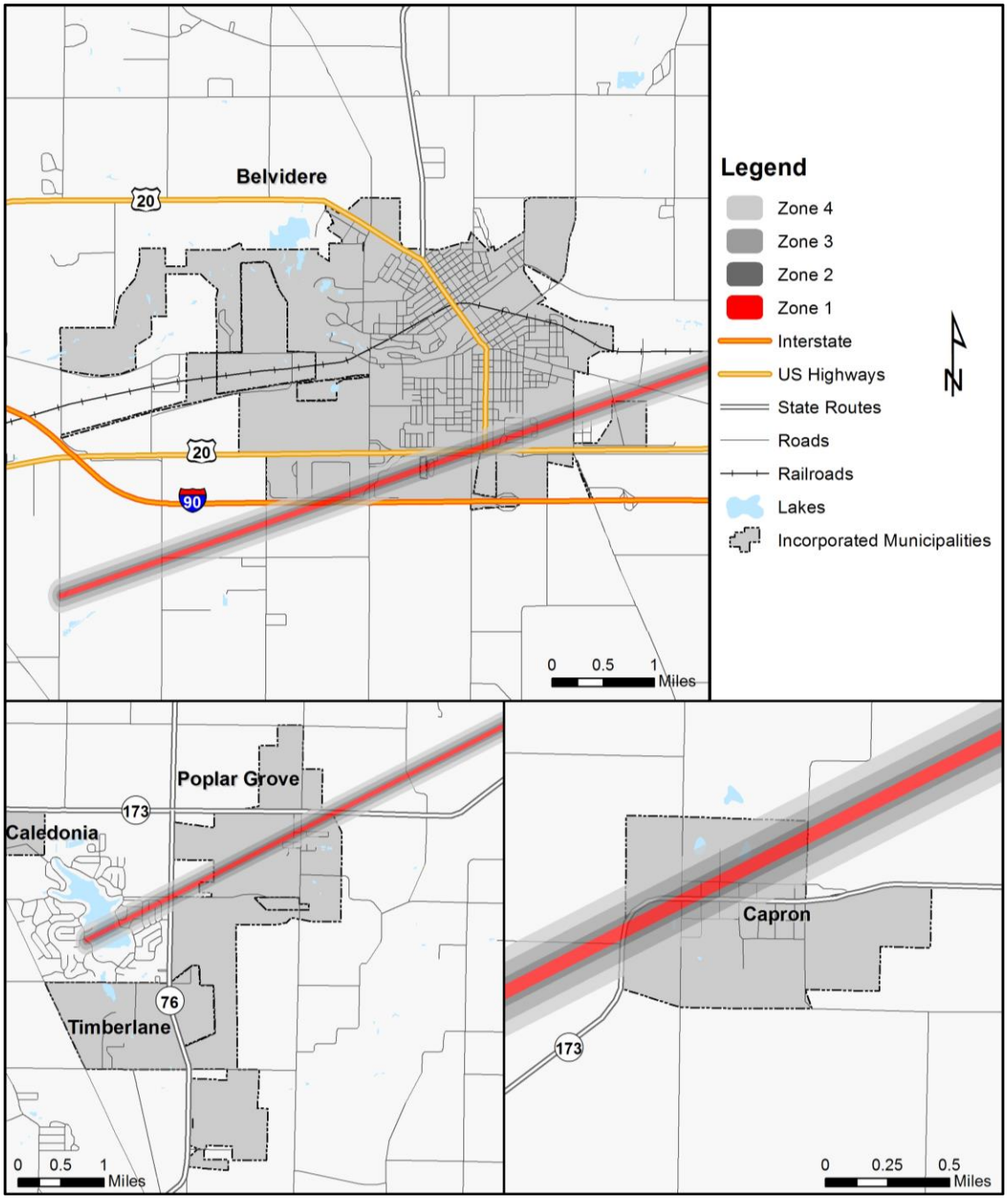
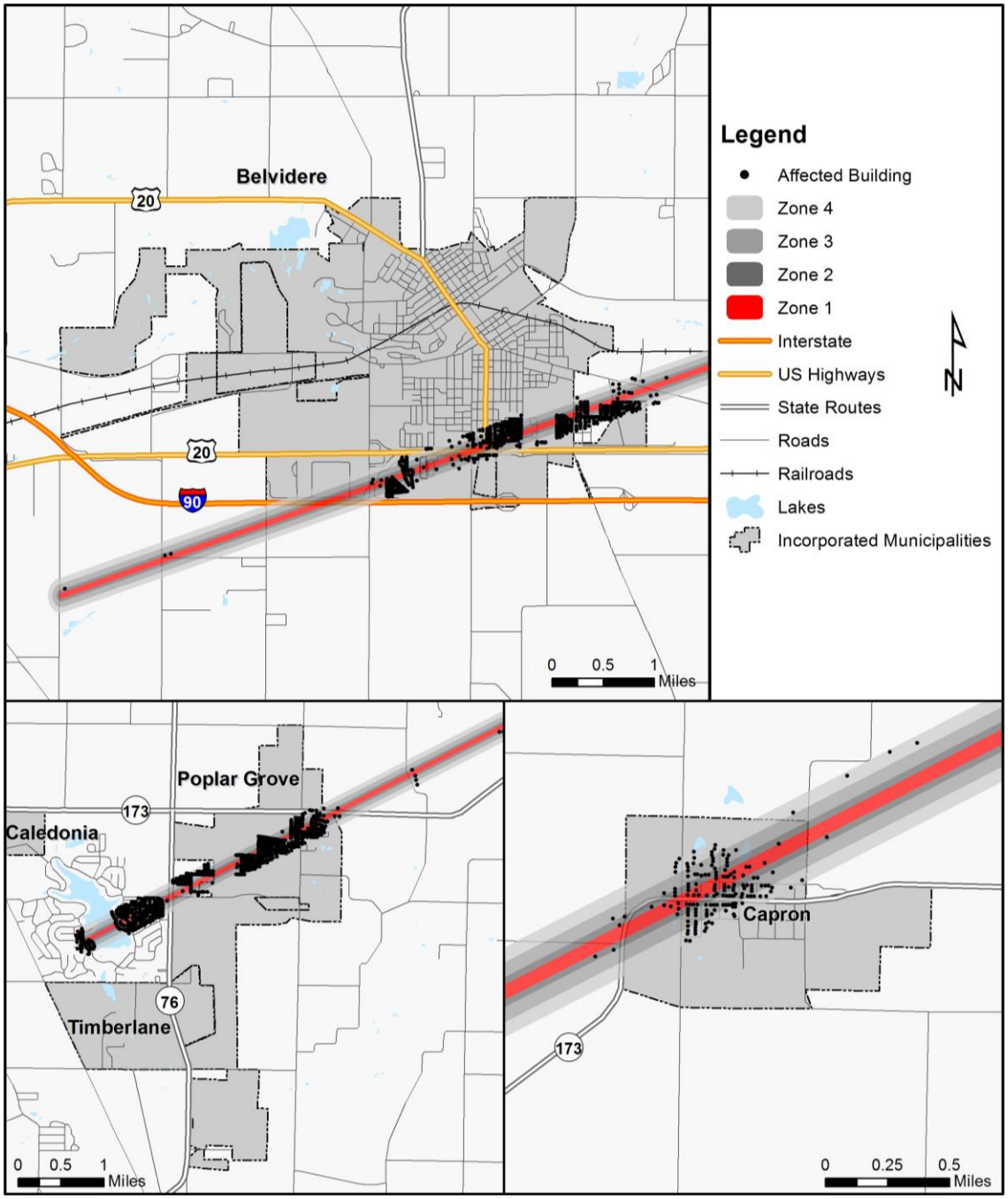


Figure 4-7: Building Inventory Affected by the EF4 Tornado in Belvidere, Poplar Grove, and Capron



Modeled Impacts of a F4 Tornado in Belvidere, IL

Table 4-15 and Figure 4-7 show the results of the tornado analysis for Belvidere, IL. The GIS analysis estimates that the modeled tornado would damage 617 buildings, which is approximately 10% of the total buildings in Belvidere. The estimated building losses are over $95 million. The building losses are an estimate of building replacement costs multiplied by the damage percent.

Table 4-15: Estimated Building Losses by Occupancy Type (x $1000) in Belvidere

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$18,188	$16,312	$19,893	$4,272
Commercial	$11,902	$5,356	$13,621	$1,212
Industrial	$917	$0	$0	$0
Agriculture	$1,614	$1,677	$74	$143
Religious	$0	$0	$0	$0
Government	$0	$0	$0	$0
Education	$0	$0	$0	$0
Total:	**$32,620**	**$23,345**	**$33,588**	**$5,627**

Modeled Impacts of a F4 Tornado in Poplar Grove and Capron, IL

Table 4-16 and Figure 4-7 show the results of the tornado analysis for Poplar Grove and Capron, IL. The GIS analysis estimates that the modeled tornado would damage 724 buildings, which is approximately 54% of the total buildings in Poplar Grove and Capron. The estimated building losses are over $92 million. The building losses are an estimate of building replacement costs multiplied by the damage percent.

Table 4-16: Estimated Building Losses by Occupancy Type (x $1000) in Capron and Poplar Grove

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$30,573	$25,498	$23,335	$4,379
Commercial	$223	$1,748	$66	$66
Industrial	$0	$0	$0	$0
Agriculture	$0	$6,356	$0	$0
Religious	$0	$0	$0	$0
Government	$0	$0	$0	$0
Education	$277	$0	$0	$0
Total:	**$31,072**	**$33,601**	**$23,400**	**$4,445**

Essential Facilities Damage

There are four essential facility located within 900 feet of the hypothetical tornado path in Belvidere and three essential facilities located within 900 feet of the hypothetical path in Polar Grove and Capron. Tables 4-17 and 4-18 identifies the affected facilities, and Figure 4-8 shows their geographic locations.

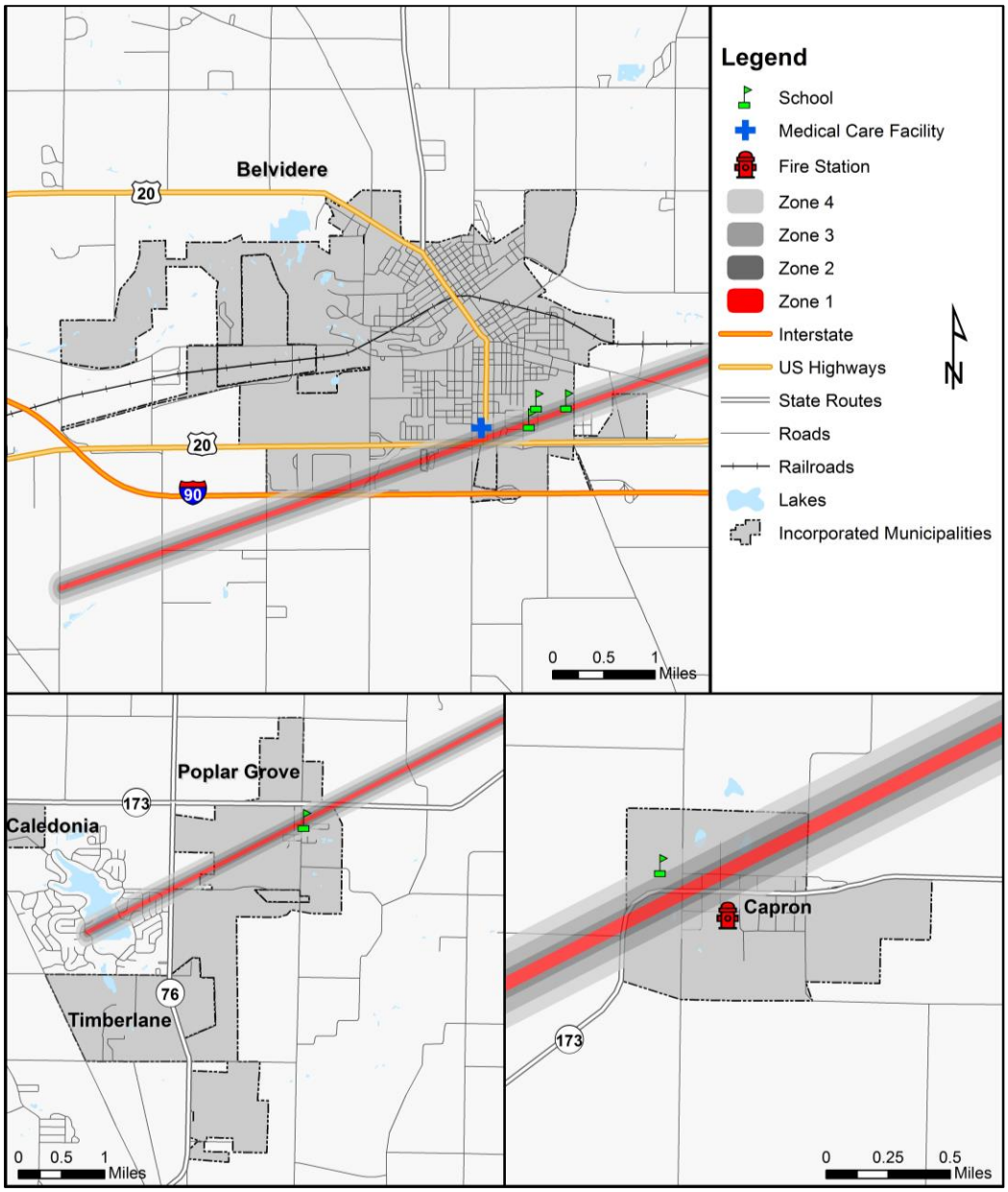
Table 4-17: Essential Facilities Affected by the F4 Tornado in Belvidere, IL

Essential Facility	Facility Name
Medical Care Facility	SwedishAmerican Medical Center of Belvidere
School	Belvidere High School
	Belvidere South Middle School
	Meehan Elementary School

Table 4-18: Essential Facilities Affected by the F4 Tornado in Poplar Grove and Capron, IL

Essential Facility	Facility Name
Fire Station	Boone County Fire Protection District 1
School	Capron Elementary School
	Poplar Grove Elementary School

Figure 4-8: Essential Facilities Affected by the EF4 Tornado in Belvidere, Poplar Grove, and Capron



Vulnerability to Future Assets/Infrastructure for Tornado Hazard

The entire population and all buildings are at risk because tornadoes can occur anywhere within the state, at any time. Furthermore, any future development in terms of new construction within the county is at risk. Table 4-10 includes the building exposure for Boone County. For example, the 1967 tornado reported $22 million in damages. However, the modeling here using 2013 data indicates an estimated $96 million, a 336% increase in potential losses.

All critical facilities in the county are at risk. Appendices E and F include a list and map of all critical facilities in Boone County.

Suggestions for Community Development Trends

Local officials will enhance severe storm preparedness if they sponsor a wide range of programs and initiatives to address the overall safety of county residents. The county needs to build new structures with more sturdy construction, and harden existing structures to lessen the potential impacts of severe weather. Building more warning sirens will warn the community of approaching storms to ensure the safety of Boone County residents.

4.4.2 Flood Hazard

Hazard Definition for Flooding

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the magnitude and distribution of precipitation over a given area, the rate at which precipitation infiltrates the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. SIU classifies floods as one of two types in this plan: upstream floods or downstream floods. Both types of floods are common in Illinois.

Upstream floods, also called flash floods, occur in the upper parts of drainage basins and are generally characterized by periods of intense rainfall over a short duration. These floods arise with very little warning and often result in locally intense damage, and sometimes loss of life, due to the high energy of the flowing water. Flood waters can snap trees, topple buildings, and easily move large boulders or other structures. Six inches of rushing water can upend a person; another 18 inches might carry off a car. Generally, upstream floods cause severe damage over relatively localized areas. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can result from inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at any time of the year in Illinois, but they are most common in the spring and summer months.

Downstream floods, sometimes called riverine floods, refer to floods on large rivers at locations with large upstream catchments. Downstream floods are typically associated with precipitation events that are of relatively long duration and occur over large areas. Flooding on small tributary streams may be limited, but the contribution of increased runoff may result in a large flood downstream. The lag time between precipitation and time of the flood peak is much longer for downstream floods than for upstream floods, generally providing ample warning for people to move to safe locations and, to some extent, secure some property against damage. Riverine flooding on the large rivers of Illinois generally occurs during either the spring or summer.

Previous Occurrences of Flooding

The NCDC database reported 19 flood events in Boone County since 1993. The most significant flood event occurred on August 7th 2007, when four to six inches of rain quickly fell over southern Boone County, resulting several flooded roads and basements.

Table 4-19 identifies NCDC-recorded floods that caused damage, death, or injury in Boone County. Additional details of individual hazard events are on the NCDC website.

Table 4-19: NCDC-Recorded Floods that Caused Damage, Death, or Injury in Boone County

Location or County*	Date	Deaths	Injuries	Property Damage (x $1000)	Crop Damage (x $1000)
Poplar Grove	06/18/2007	0	0	10	0
Belvidere	08/07/2007	0	0	100	0
	Total:	**0**	**0**	**$110**	**$0**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Repetitive Loss Properties

FEMA defines a repetitive loss structure as a structure covered by a contract of flood insurance issued under the NFIP that has suffered flood loss damage on two or more occasions during a 10-year period that ends on the date of the second loss, in which the cost to repair the flood damage is ≥ 25% of the market value of the structure at the time of each flood loss.

For confidentiality purposes, repetitive loss data provided by IEMA includes only the type of and number of structures per jurisdiction, and the total number of losses reported. Table 4-20 lists 2013 data for damages to these repetitive loss structures.

Table 4-20: Boone County Repetitive Loss Structures

Jurisdiction	Occupancy Type	Number of Structures	Number of Losses
Belvidere	Residential	1	2
Garden Prairie	Agricultural	1	4
Love's Park	Residential	1	2
Love's Park	Residential	1	2
Love's Park	Commercial	1	2

Geographic Location for Flooding

Most flooding in Illinois occurs in the spring to early summer because of excessive rainfall and/or snowmelt. Severe thunderstorms may cause flooding during the summer or fall, but are often localized. The Kishwaukee and Piscasaw Rivers are the primary sources of river flooding in Boone County. Flash floods, brief heavy flows in small streams or normally dry creek beds, also occur within the county.

The 2010 Preliminary Digital Flood Insurance Rate Map (DFIRM) identified specific stream reaches for analysis. The map in Appendix D depicts areas of riverine flooding.

NOAA's Advanced Hydrologic Prediction Service provides information from stream gauges at points along various rivers across the United States. Boone County has one stream gage on the Kishwaukee River at Belvidere, IL (05438500).

Hazard Extent for Flooding

All floodplains are susceptible to flooding in Boone County. The floodplain of concern is for the 100-year flood event, shown in Figure 4-9. However, flooding is dependent on various local factors including, but not limited to, impervious surfaces, amount of precipitation, river-training structures, etc.

Risk Identification for Flood Hazard

Based on historical information, future occurrence of flooding in Boone County is probable. According to the Risk Priority Index (RPI), flooding is ranked as the number four hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
3	x	2	=	6

Critical Facilities

All critical facilities within the floodplain are vulnerable to floods. An essential facility will encounter many of the same impacts as other buildings within the flood boundary. These impacts can include structural failure, extensive water damage to the facility, and loss of facility functionality (e.g., a damaged police station cannot serve the community). Appendices E and F include a list and map of all critical facilities in Boone County.

Infrastructure

The types of infrastructure potentially impacted by a flood include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available for this plan, it is important to emphasize that a flood could damage any number of these items. The impacts to these items include: broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); or railway failure from broken or impassable railways. Bridges could also fail or become impassable, causing risk to motorists.

Hazus-MH Flood Analysis Using General Building Stock

SIU used Hazus-MH to generate the flood depth grid for a 100-year return period and made calculations by clipping the USGS one-third-arc-second DEM (~10 m) to the flood boundary. Next, SIU used Hazus-MH to estimate the damages for Boone County by utilizing Hazus' General Building Stock. According to this analysis, there are approximately 206 buildings located in the Boone County 100-year floodplain. The estimated damage to these structures is $128 million. Figure 4-9 depicts the total relative losses by census block as a result of a 100-year flood scenario and Table 4-21 shows the loss estimates by occupancy class.

Figure 4-9: Aggregate Flood Damage by Census Block for Boone County (100-Year Flood)

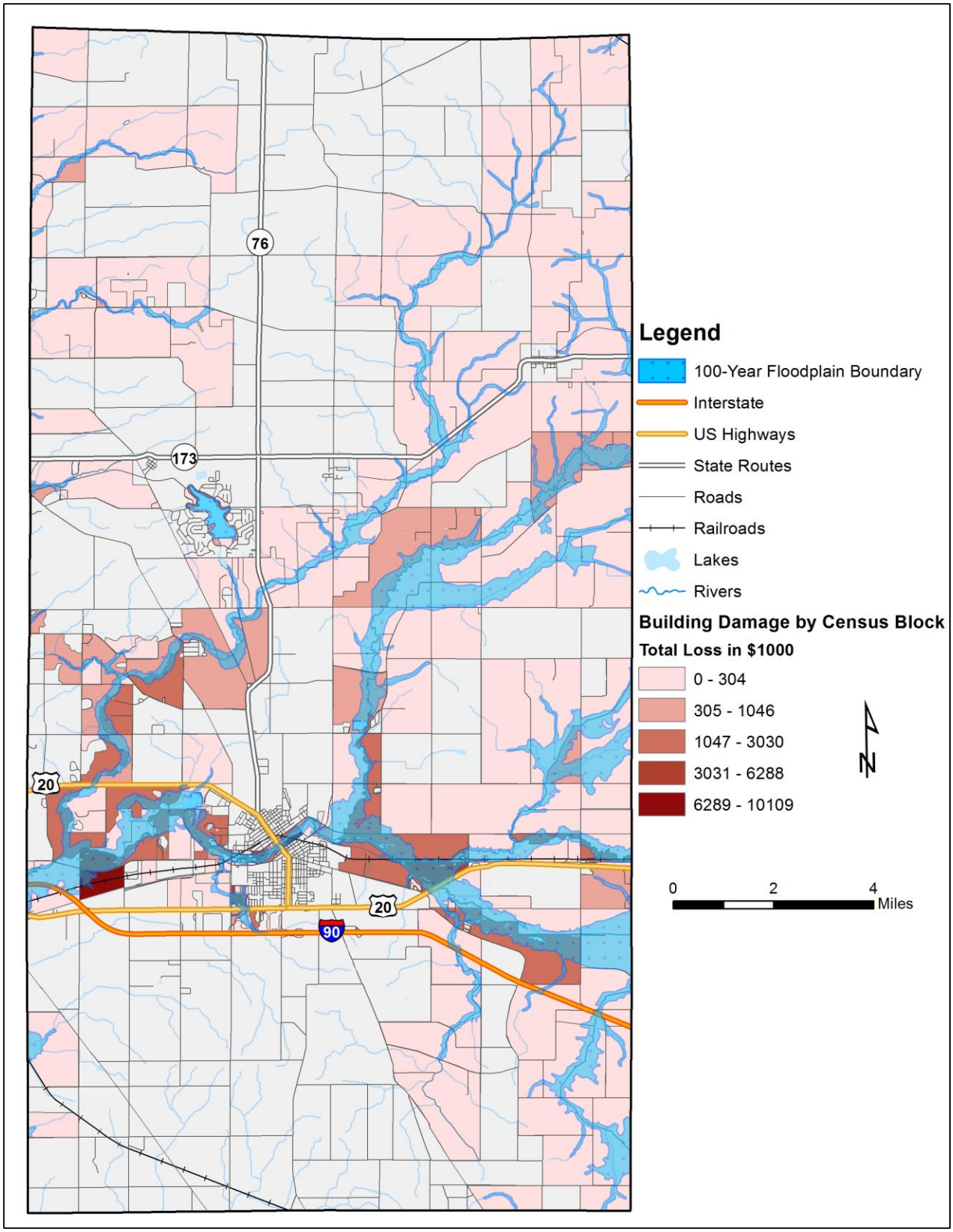


Table 4-21: Estimated Flood Losses within the 100-year Floodplain

Occupancy Class	Number of Structures	Estimated Building Related Losses (x $1000)
Residential	190	128,000
Agricultural	0	0
Commercial	0	0
Industrial	0	0
Religious/Non Profit	0	0
Government	0	0
Total:	**190**	**$128,000**

Essential Facilities Damage

The analysis identified no essential facilities that are subject to flooding.

Vulnerability Analysis for Flash Flooding

Flash flooding could affect any low-lying location or areas of poor drainage within the county; therefore, a significant portion of the county's population and buildings are vulnerable to a flash flood. These structures can expect the same impacts as discussed in a riverine flood.

Appendices E and F include a list and map of all critical facilities in Boone County.

Suggestions for Community Development Trends

Reducing floodplain development is crucial to reducing flood-related damages. Areas with recent development may be more vulnerable to drainage issues. Storm drains and sewer systems are usually most susceptible to drainage issues. Damage to these can cause back-up of water, sewage, and debris into homes and basements, causing structural and mechanical damage as well as creating public health hazards and unsanitary conditions.

4.4.3 Hazardous Materials Storage and Transportation Hazard

Hazard Definition

Illinois has numerous active transportation lines that run through many of its counties. Active railways transport harmful and volatile substances across county and state lines every day. Transporting chemicals and substances along interstate routes is commonplace in Illinois. The rural areas of Illinois have considerable agricultural commerce, meaning transportation of fertilizers, herbicides, and pesticides is common on rural roads. These factors increase the chance of hazardous material releases and spills throughout the state of Illinois.

The release or spill of certain substances can cause an explosion. Explosions result from the ignition of volatile products such as petroleum products, natural and other flammable gases, hazardous materials/chemicals, dust, and bombs. An explosion can potentially cause death, injury, and property damage. In addition, a fire routinely follows an explosion, which may cause further damage and inhibit emergency response. Emergency response may require fire, safety/law enforcement, search and rescue, and hazardous materials units.

Previous Occurrences of Hazardous Materials Storage and Transportation Hazard

Boone County has not experienced a significantly large-scale hazardous material incident at a fixed site or during transport resulting in multiple deaths or serious injuries. Minor releases have put local firefighters, hazardous materials teams, emergency management, and local law enforcement into action to try to stabilize these incidents and prevent or lessen harm to Boone County residents.

Geographic Location of Hazardous Materials Storage and Transportation Hazard
Hazardous material hazards are countywide and are primarily associated with the transport of materials via highway, railroad, and/or river barge.

Hazard Extent of Hazardous Materials Storage and Transportation Hazard
The extent of the hazardous material hazard varies both in terms of the quantity of material being transported as well as the specific content of the container.

Risk Identification of Hazardous Materials Storage and Transportation Hazard
Based on input from the planning team, the occurrence of a hazardous materials accident is likely. According to the RPI, "hazardous materials storage and transport" ranked as the number five hazard in Boone County.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
2	x	3	=	6

Vulnerability Analysis for Hazardous Materials Storage and Transportation Hazard
The entire county is vulnerable to a hazardous material release and can expect impacts within the affected area. The main concern during a release or spill is the affected population. Table 4-10 includes the building exposure for Boone County, as determined from building inventory. This plan will therefore consider all buildings located within the county as vulnerable.

Critical Facilities
All critical facilities and communities within the county are at risk. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure due to fire or explosion and loss of function of the facility (e.g., a damaged police station can no longer serve the community). Table 4-9 lists the types and numbers of all essential facilities in the area. Appendices E and F include a list and map of all critical facilities.

Building Inventory
Table 4-10 includes the building exposure including types and numbers of buildings for the entire county. Buildings within the county can expect impacts similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris, and loss of function of the building (e.g., a person cannot inhabit a damaged home, causing residents to seek shelter).

Infrastructure
During a hazardous material release, the types of potentially impacted infrastructure include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available to this plan, it is important to emphasize that a hazardous materials release could damage any number of these items. The impacts to these items include: broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); and railway failure from broken or impassable railways. Bridges could become impassable causing risk to motorists.

ALOHA Hazardous Chemical Release Analysis
SIU used the U.S. Environmental Protection Agency's ALOHA (Areal Locations of Hazardous Atmospheres) model to assess the impacted area for ammonia and chlorine releases in Belvidere. The Boone County planning team selected Belvidere because of significant rail and truck traffic along major transportation routes within a relatively densely populated area.

Ammonia is a clear colorless gas with a strong odor. Ammonia is shipped as a liquid under its own vapor pressure. The density of liquid ammonia is 6 lb/gal. Contact with the unconfined liquid can cause frostbite.

Gas is generally regarded as nonflammable but does burn within certain vapor concentration limits and with strong ignition. Fire hazard increases in the presence of oil or other combustible materials. Although gas is lighter than air, vapors from a leak initially hug the ground. Prolonged exposure of containers to fire or heat may cause violent rupturing and rocketing. Long-term inhalation of low concentrations of the vapors or short-term inhalation of high concentrations have adverse health effects. Used as a fertilizer, as a refrigerant, and in the manufacture of other chemicals (NOAA Reactivity, 2007).

SOURCE: http://cameochemicals.noaa.gov/chemical/4860

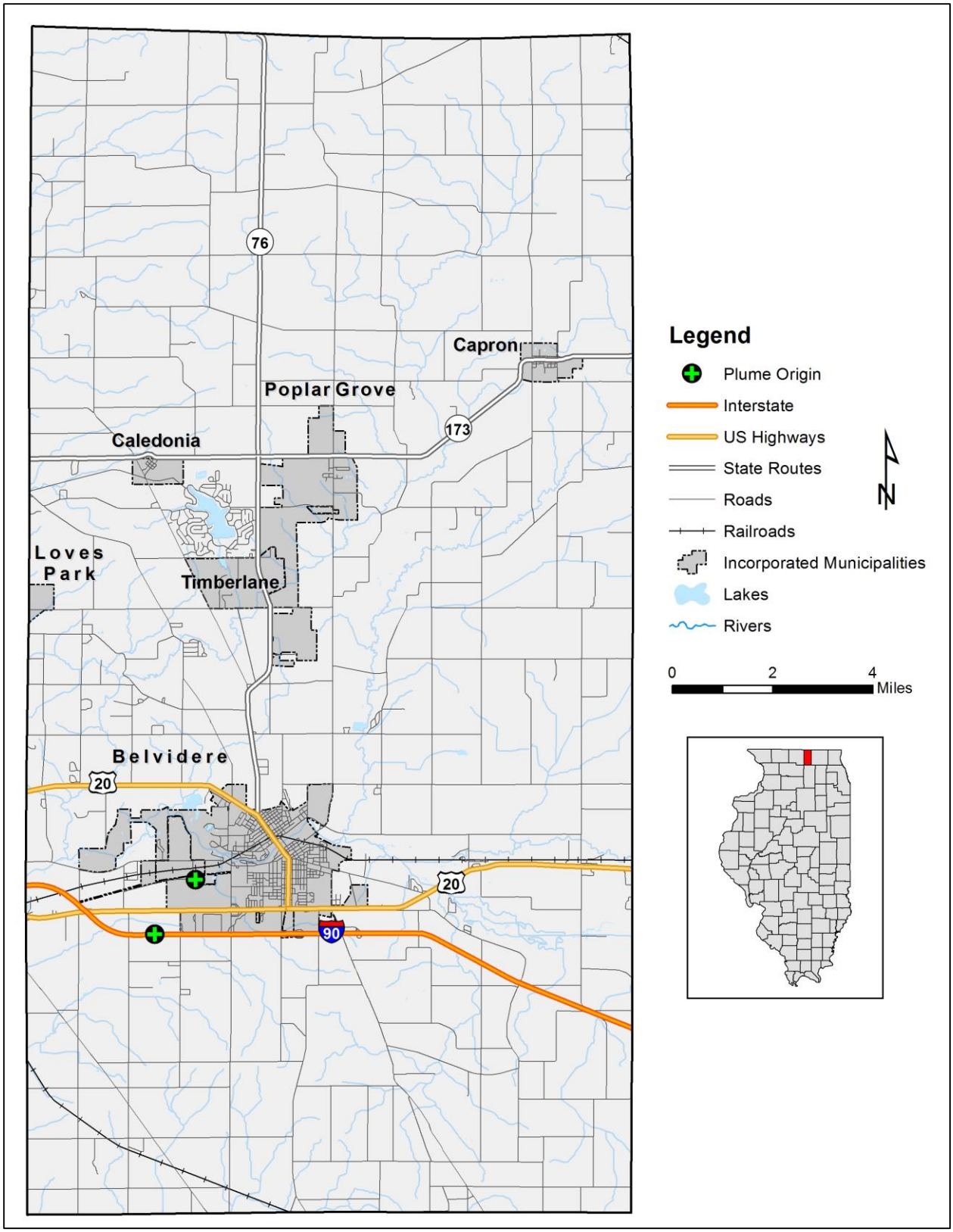
Chlorine is a greenish yellow gas with a pungent to suffocating odor. The gas liquefies above -35°C at ambient pressure and will liquefy from pressure applied at room temperature. Contact with unconfined liquid chlorine can cause frostbite from evaporative cooling. Chlorine does not burn but, like oxygen, supports combustion. The toxic gas can have adverse health effects from either long-term inhalation of low concentrations of vapors or short-term inhalation of high concentrations. Chlorine vapors are much heavier than air and tend to settle in low areas. Chlorine is commonly used to purify water, bleach wood pulp, and make other chemicals (NOAA Reactivity 2007).

SOURCE: http://cameochemicals.noaa.gov/chemical/2862

ALOHA is a computer program designed for response to chemical accidents, as well as emergency planning and training. Ammonia, chlorine, and propane are common chemicals used in industrial operations and are found in either liquid or gas form. Rail and truck tankers haul ammonia, chlorine, and propane to and from facilities.

For the both Belvidere scenarios, SIU assumed moderate atmospheric and climatic conditions with a slight breeze from the west. The Boone County planning team chose the Belvidere target area due to its large population and the potential for a transportation related accidental release. Figures 4-10 depicts the plume origins of the modeled hazardous chemical releases in Boone County.

Figure 4-10: ALOHA Modeled Hazardous Chemical Plume Origins in Boone County



Analysis Parameters for Belvidere Ammonia Release

The ALOHA atmospheric modeling parameters for the Belvidere ammonia release, depicted in Figure 4-11, were based upon a westerly wind speed of 5 miles per hour. The temperature was 68°F with 75% humidity and a cloud cover of five-tenths skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet (12,408 gallons). At the time of its release, it was estimated that the tank was 75% full. The ammonia in this tank is in its liquid state.

This release was based on a leak from a 2.5-inch-diameter hole, 12 inches above the bottom of the tank. According to these ALOHA parameters, this scenario would release approximately 7,730 pounds of material per minute. Figure 4-12 depicts the plume footprint generated by ALOHA.

Figure 4-11: ALOHA Modeling Parameters for Ammonia Release in Belvidere

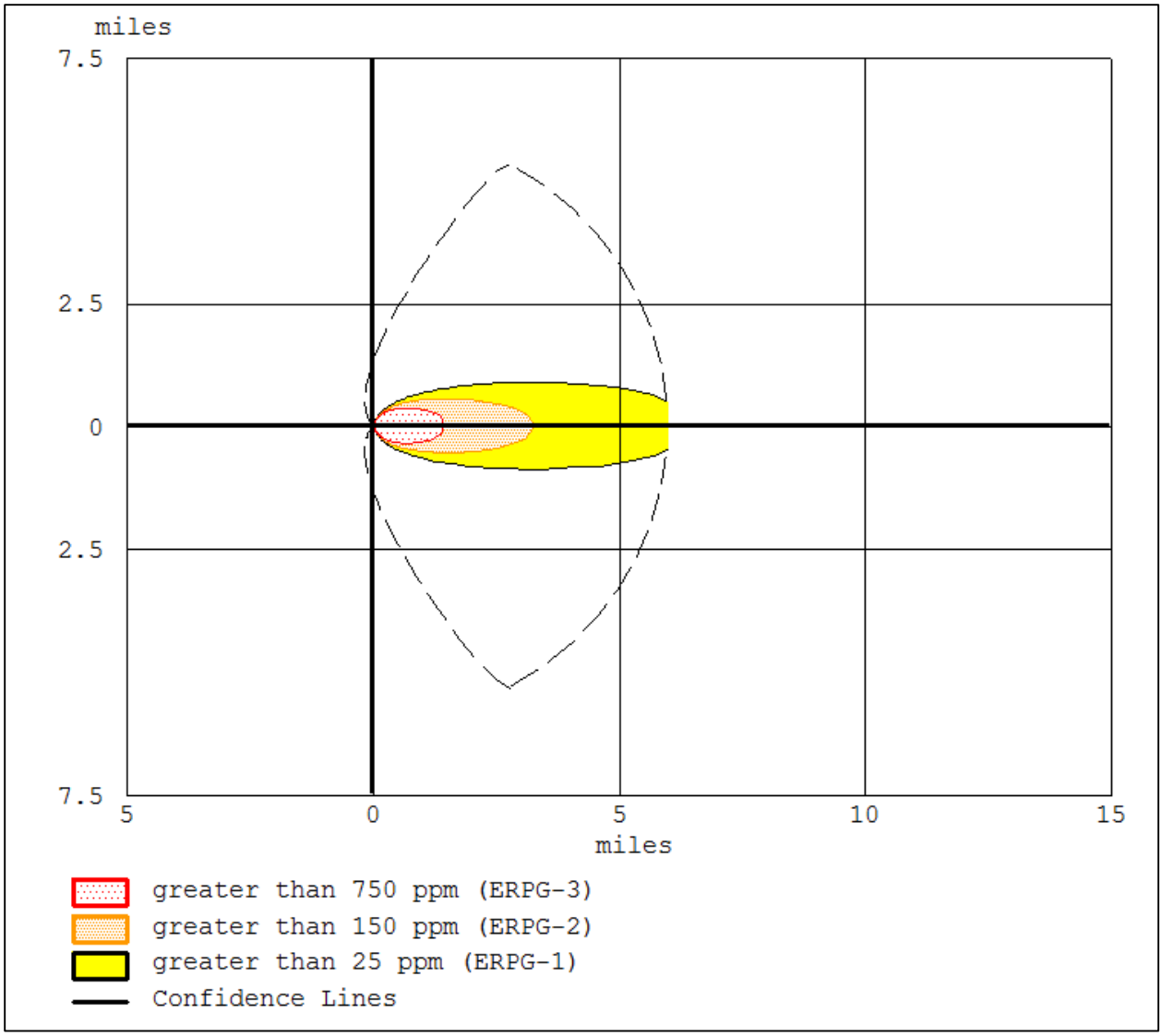
```
SITE DATA:
   Location: BELVIDERE AMMONIA, ILLINOIS
   Building Air Exchanges Per Hour: 0.30 (sheltered single storied)
   Time: June 21, 2013  0946 hours CDT (using computer's clock)

 CHEMICAL DATA:
   Chemical Name: AMMONIA                  Molecular Weight: 17.03 g/mol
   AEGL-1 (60 min): 30 ppm   AEGL-2 (60 min): 160 ppm   AEGL-3 (60 min): 1100 ppm
   IDLH: 300 ppm      LEL: 150000 ppm      UEL: 280000 ppm
   Ambient Boiling Point: -29.2° F
   Vapor Pressure at Ambient Temperature: greater than 1 atm
   Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

 ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
   Wind: 5 miles/hour from WSW at 10 meters
   Ground Roughness: open country          Cloud Cover: 5 tenths
   Air Temperature: 68° F                  Stability Class: B
   No Inversion Height                     Relative Humidity: 75%

 SOURCE STRENGTH:
   Leak from hole in horizontal cylindrical tank
   Flammable chemical escaping from tank (not burning)
   Tank Diameter: 8 feet                   Tank Length: 33 feet
   Tank Volume: 12,408 gallons
   Tank contains liquid                    Internal Temperature: 68° F
   Chemical Mass in Tank: 23.7 tons        Tank is 75% full
   Circular Opening Diameter: 2.5 inches
   Opening is 12 inches from tank bottom
   Release Duration: 9 minutes
   Max Average Sustained Release Rate: 7,730 pounds/min
      (averaged over a minute or more)
   Total Amount Released: 43,924 pounds
   Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).
```

Figure 4-12: ALOHA Generated Plume Footprint of Belvidere Ammonia Release



Analysis Parameters for Belvidere Chlorine Release

The ALOHA atmospheric modeling parameters for the Belvidere chlorine release, depicted in Figure 4-13, were based upon a westerly wind speed of 5 miles per hour. The temperature was 68°F with 75% humidity and a cloud cover of five-tenths skies.

The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet (12,408 gallons). At the time of its release, it was estimated that the tank was 75% full. The chlorine in this tank is in its liquid state.

This release was based on a leak from a 2.5-inch-diameter hole, 12 inches above the bottom of the tank. According to these ALOHA parameters, this scenario would release approximately 10,400 pounds of material per minute. Figure 4-14 depicts the plume footprint generated by ALOHA.

Figure 4-13: ALOHA Modeling Parameters for Belvidere Chlorine Release

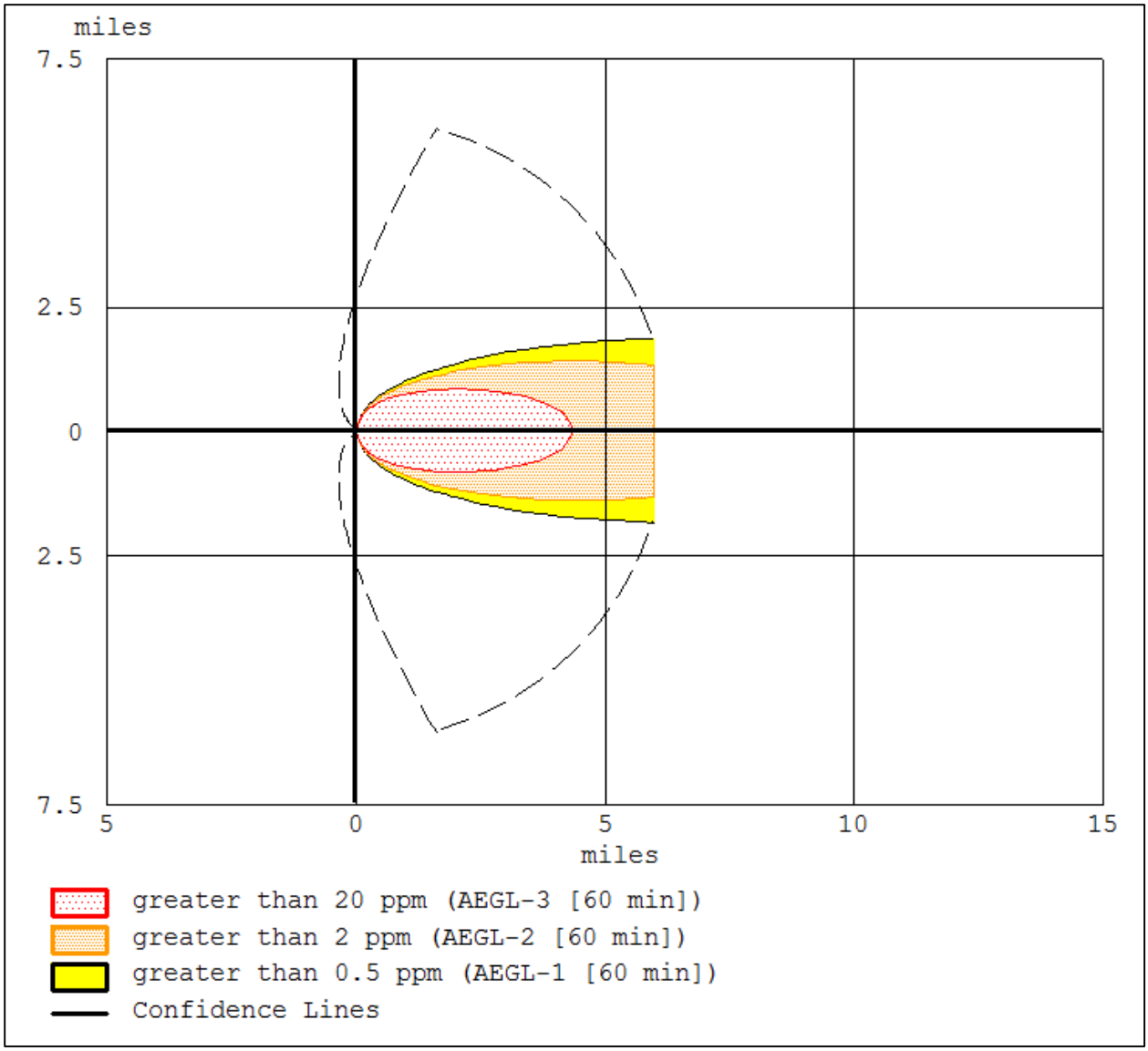
```
SITE DATA:
  Location: BELVIDERE CHLORINE, ILLINOIS
  Building Air Exchanges Per Hour: 0.30 (sheltered single storied)
  Time: June 21, 2013  0935 hours CDT (using computer's clock)

CHEMICAL DATA:
  Chemical Name: CHLORINE                Molecular Weight: 70.91 g/mol
  AEGL-1 (60 min): 0.5 ppm   AEGL-2 (60 min): 2 ppm   AEGL-3 (60 min): 20 ppm
  IDLH: 10 ppm
  Ambient Boiling Point: -30.4° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 5 miles/hour from WSW at 10 meters
  Ground Roughness: open country         Cloud Cover: 5 tenths
  Air Temperature: 68° F                 Stability Class: B
  No Inversion Height                    Relative Humidity: 75%

SOURCE STRENGTH:
  Leak from hole in horizontal cylindrical tank
  Non-flammable chemical is escaping from tank
  Tank Diameter: 8 feet                  Tank Length: 33 feet
  Tank Volume: 12,408 gallons
  Tank contains liquid                   Internal Temperature: 68° F
  Chemical Mass in Tank: 55.0 tons       Tank is 75% full
  Circular Opening Diameter: 2.5 inches
  Opening is 12 inches from tank bottom
  Release Duration: 15 minutes
  Max Average Sustained Release Rate: 10,400 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 101,933 pounds
  Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).
```

Figure 4-14: ALOHA Generated Plume Footprint of Belvidere Chlorine Release



Acute Exposure Guideline Levels (AEGL) are intended to describe the health effects on humans due to once-in-a-lifetime or rare exposure to airborne chemicals. The National Advisory Committee for AEGLs is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills or other catastrophic exposures. As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm).

- **AEGL 3:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.
- **AEGL 2:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-

lasting adverse health effects or an impaired ability to escape. The orange buffer (≥ 2.0 ppm) extends greater than six miles from the point of release after one hour.

- **AEGL 1:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure. The yellow buffer (≥ 0.5 ppm) extends more than six miles from the point of release after one hour.
- **Confidence Lines**: The dashed lines depict the level of confidence in which the exposure level will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

Emergency Response Planning Guidelines (ERPG) estimate the concentrations at which most people will begin to experience health effects if they are exposed to a hazardous airborne chemical for one hour. The Emergency Response Planning Committee of the American Industrial Hygiene Association is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills or other catastrophic exposures. As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm).

- **ERPG 3:** The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects. The red buffer (≥750 ppm) extends greater than six miles from the point of release after one hour.
- **ERPG 2:** The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action. The orange buffer (≥ 150 ppm) extends greater than six miles from the point of release after one hour.
- **ERPG 1:** The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hour without experiencing other than mild transient health effects or perceiving a clearly defined, objectionable odor. The yellow buffer (≥ 25 ppm) extends greater than six miles from the point of release after one hour.
- **Confidence Lines**: The dashed lines depict the level of confidence in which the exposure level will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

Source: http://response.restoration.noaa.gov/

Results for Ammonia Release Analysis in Belvidere

SIU calculated an estimate of property exposed to the ammonia spill in Belvidere by using the building inventory and intersecting these data with each of the AEGL levels (AEGL 3: ≥ 20.0 ppm, AEGL 2: ≥ 2.0 ppm and AEGL 1: ≥ 0.5 ppm). Figure 4-15 depicts the ammonia spill footprint and location of the buildings exposed to the ammonia in Belvidere. This GIS overlay analysis estimates that the full replacement cost of the buildings exposed to the ammonia plume are over $800 million. Table 4-22 lists building exposure by AEGL zone.

Figure 4-15: ALOHA Plume Footprint Overlaid in ArcGIS for the Belvidere Ammonia Release

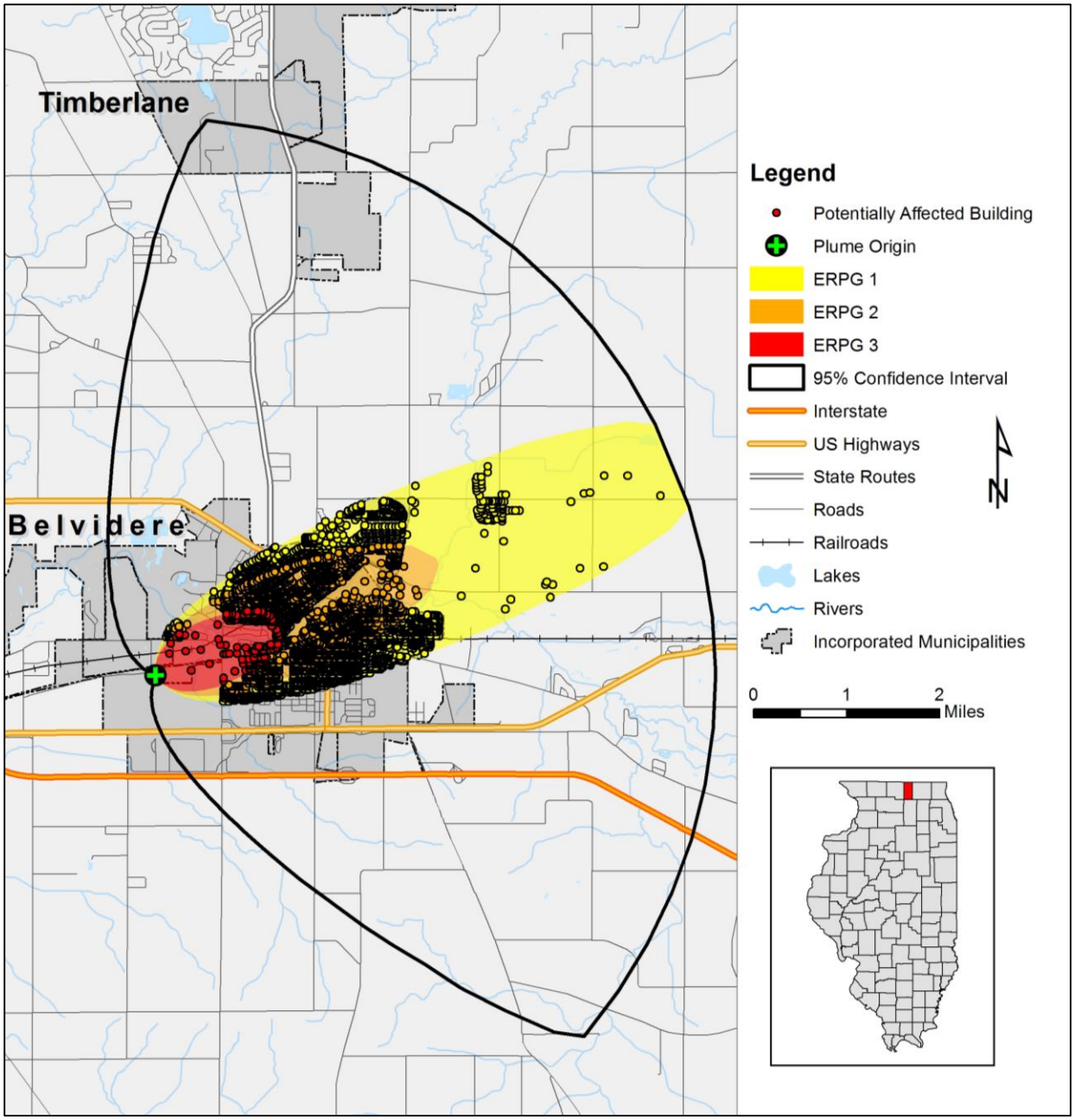


Table 4-22: Estimated Building Exposure for all AEGL Zones (x 1000) as a result of the Belvidere Ammonia Release

Occupancy	Building Exposure			Number of Buildings		
	AEGL 1	AEGL 2	AEGL 3	AEGL 1	AEGL 2	AEGL3
Residential	$326,467,706	$306,925,209	$27,471,650	1743	1901	175
Commercial	$22,694,046	$46,433,016	$12,246,348	41	205	25
Industrial	$15,751,238	$41,464,605	$13,902,105	30	54	7
Agriculture	$6,461,688	$535,128	$1,157,772	18	2	1

Occupancy	Building Exposure			Number of Buildings		
	AEGL 1	AEGL 2	AEGL 3	AEGL 1	AEGL 2	AEGL3
Religious	$1,876,854	$465,120	$0	1	1	0
Government	$0	$2,989,800	$0	0	4	0
Education	$0	$0	$0	0	0	0
Total:	**$373,251,531**	**$398,812,878**	**$54,777,875**	**1833**	**2167**	**208**

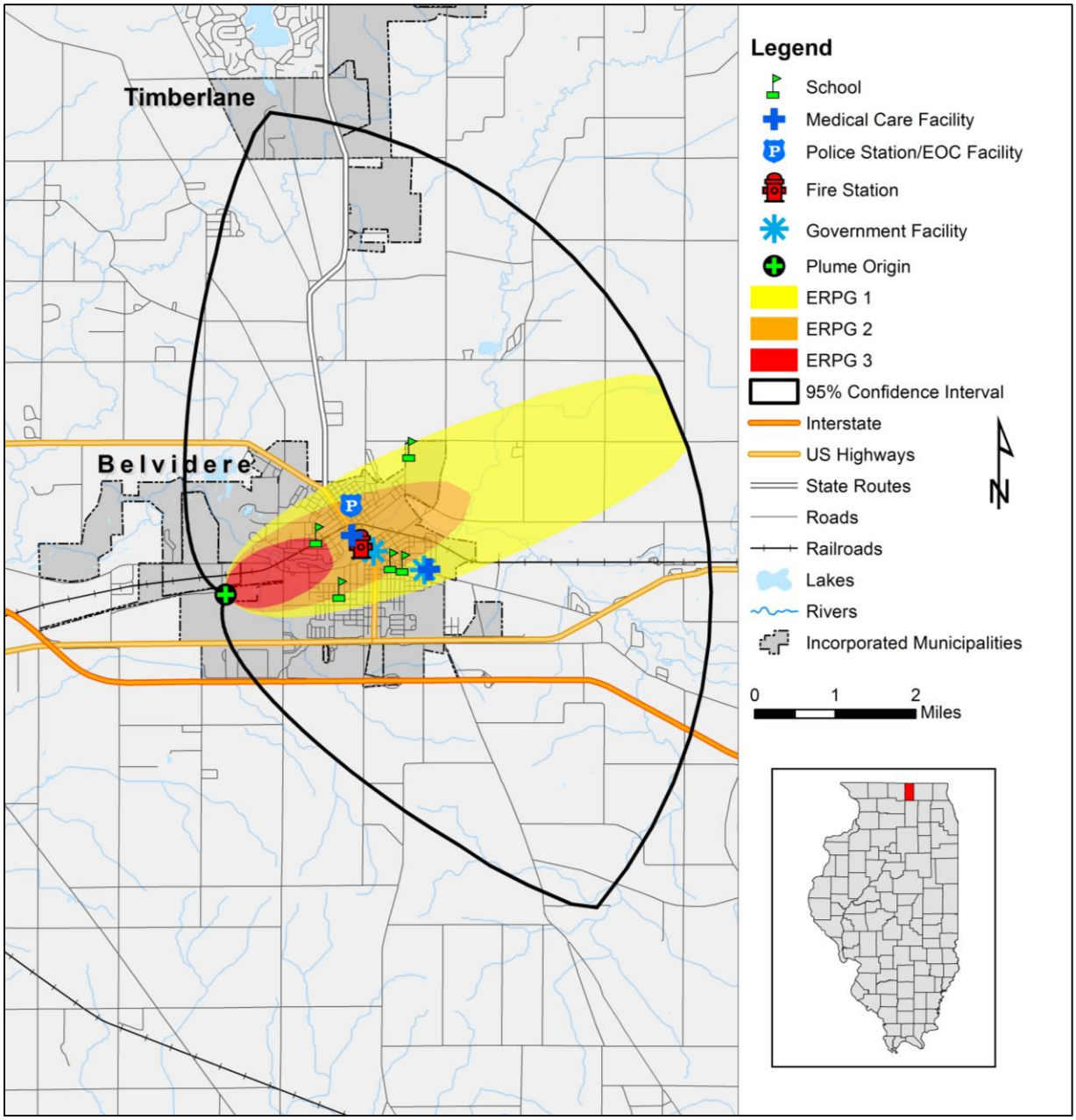
Essential Facilities Damage

There are eleven essential facilities within the limits of the Belvidere ammonia scenario. Table 4-23 and Figure 4-16 identifies the affected facilities.

Table 4-23: Essential Facilities within the Ammonia Plume Footprint in Belvidere

Essential Facility	Facility Name
Fire Station	Belvidere Fire Dept. (S. State St.)
Government Facility	Belvidere City Hall
	Boone County Administration Campus
Medical Care Facility	Crusader Community Health Belvidere
	OSF Medical Group
Police Stations/Emergency Operations Center	Boone County Sheriff's Office
School	Lincoln Elementary School
	Perry Elementary School
	Regional Learning Center Ark
	St. James Catholic School
	Washington Academy School

Figure 4-16: Map of Essential Facilities Located within the Ammonia Plume Footprint in Belvidere



Results for Chlorine Release Analysis in Belvidere

SIU calculated an estimate of property exposed to the chlorine spill in Belvidere by using the building inventory and intersecting these data with each of the AEGL levels (AEGL 3: ≥ 20.0 ppm, AEGL 2: ≥ 2.0 ppm and AEGL 1: ≥ 0.5 ppm). Figure 4-23 depicts the chlorine spill footprint and location of the buildings exposed to the chlorine in Belvidere. This GIS overlay analysis estimates that the full replacement cost of the buildings exposed to the ammonia plume are over $1.6 million. Table 4-24 lists building exposure by AEGL zone.

Figure 4-17: ALOHA Plume Footprint Overlaid in ArcGIS for the Belvidere Chlorine Release

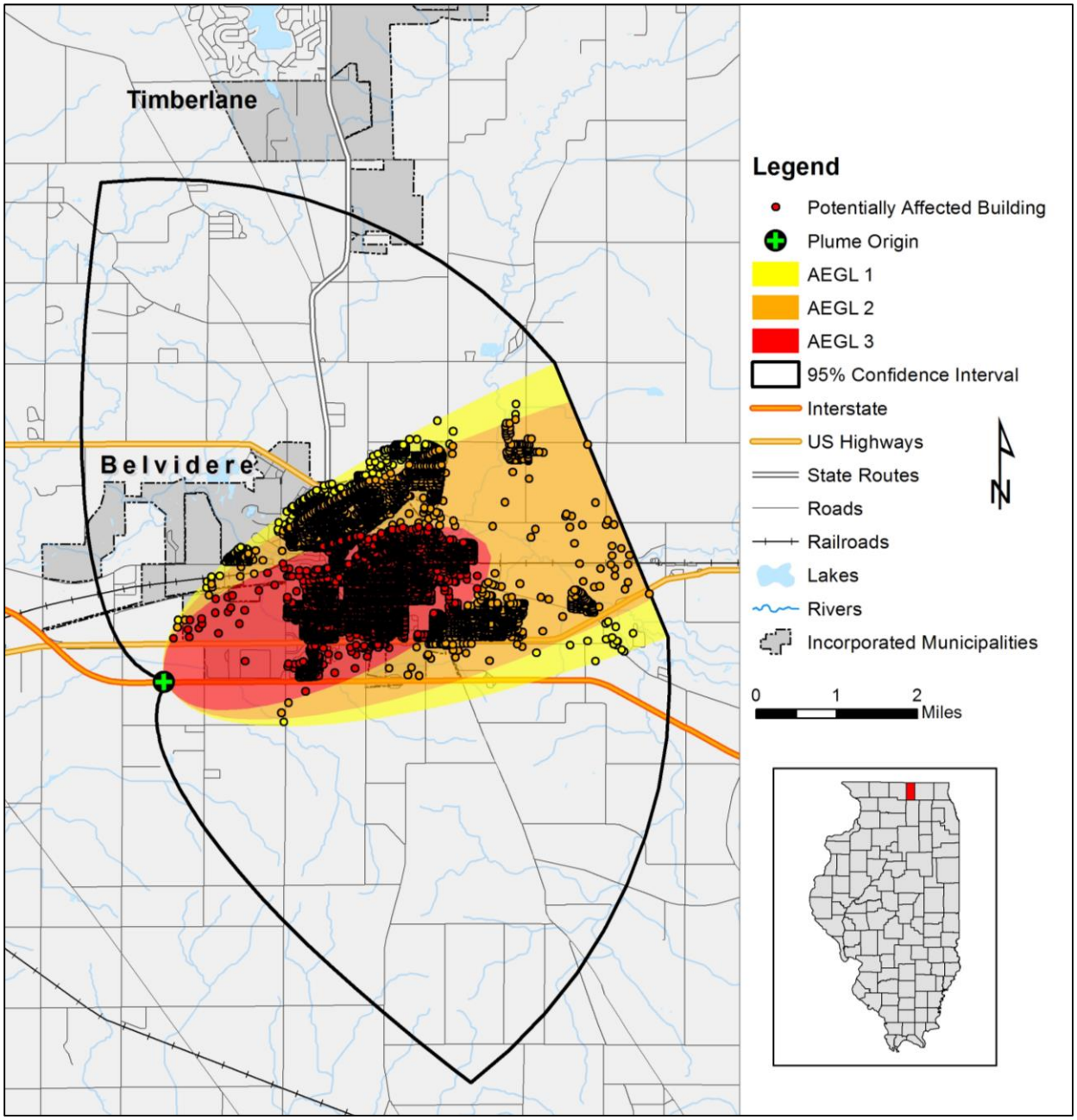


Table 4-24: Estimated Building Exposure for all AEGL Zones (x 1000) as a result of the Belvidere Chlorine Release

Occupancy	Building Exposure			Number of Buildings		
	AEGL 1	AEGL 2	AEGL 3	AEGL 1	AEGL 2	AEGL3
Residential	$84,215,102	$388,636,484	$576,129,726	417	1893	3431
Commercial	$10,693,992	$74,278,506	$141,492,318	14	111	244
Industrial	$29,891,430	$73,264,410	$227,595,542	18	62	43
Agriculture	$1,832,394	$17,782,152	$6,389,034	6	29	8

Occupancy	Building Exposure			Number of Buildings		
	AEGL 1	AEGL 2	AEGL 3	AEGL 1	AEGL 2	AEGL3
Religious	$0	$0	$2,609,436	0	0	3
Government	$0	$276,348	$2,713,452	0	1	3
Education	$0	$0	$0	0	0	0
Total:	**$126,632,918**	**$554,237,899**	**$956,929,508**	**455**	**2096**	**3732**

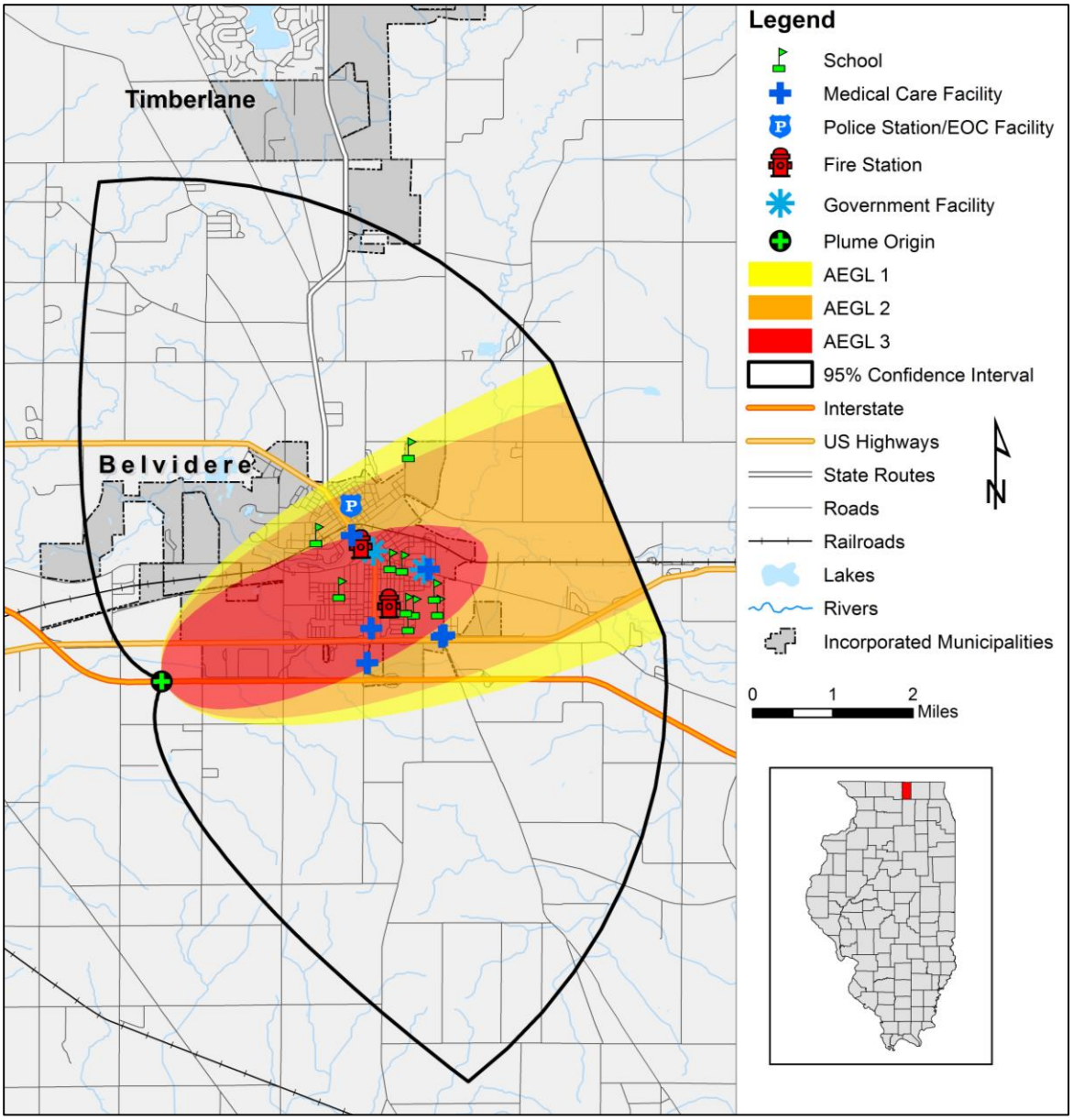
Essential Facilities Damage

There are twenty-one essential facilities within the limits of the Belvidere chlorine scenario. Table 4-25 and Figure 4-18 identifies the affected facilities.

Table 4-25: Essential Facilities within the Chlorine Plume Footprint in Belvidere

Essential Facility	Facility Name
Fire Station	Belvidere Fire Dept. (S. State St.)
	Belvidere Fire Dept. (E. 6th St.)
Government Facility	Belvidere City Hall
	Boone County Administration Campus
Medical Care Facility	Crusader Community Health Belvidere
	Physicians Immediate Care
	SwedishAmerican Medical Center of Belvidere
	Shappert Health Center
	Rockford Health Physicians
	OSF Medical Group
Police Station/Emergency Operations Center	Boone County Sheriff's Office
School	Belvidere High School
	Belvidere South Middle School
	Boone County Center
	Immanuel Lutheran School
	Lincoln Elementary School
	Meehan Elementary School
	Perry Elementary School
	Regional Learning Center Ark
	St. James Catholic School
	Washington Academy School

Figure 4-18: Map of Essential Facilities Located within the Chlorine Plume Footprint in Belvidere



Building Inventory Damage

Table 4-10 lists the building exposure, including type and number of buildings, for the entire county. Buildings within the county can all expect impacts similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris and loss of function of the building (e.g., a person cannot inhabit a damaged home, causing residents to seek shelter).

Vulnerability to Future Assets/Infrastructure for Hazardous Materials Storage and Transportation Hazard

Any new development within the county will be vulnerable to these events, especially development along major roadways.

Suggestion for Community Development Trends

Because the hazardous material hazard events may occur anywhere within the county, future development is impacted. The major transportation routes and the industries located in Boone County pose a threat of dangerous chemicals and hazardous materials release.

4.4.4 Drought and Extreme Heat

Hazard Definition for Drought Hazard

Drought is a climatic phenomenon. The meteorological condition that creates a drought is below-normal rainfall. However, excessive heat can lead to increased evaporation, which enhances drought conditions. Droughts can occur in any month. Drought differs from normal arid conditions found in low-rainfall areas. Drought is the consequence of a reduction in the amount of precipitation over an undetermined length of time (usually a growing season or longer).

The severity of a drought depends on location, duration, and geographical extent. Additionally, drought severity depends on the water supply, usage demands by human activities, vegetation, and agricultural operations. Drought will affect the quality and quantity of crops, livestock, and other agricultural assets. Drought can adversely impact forested areas leading to an increased potential for extremely destructive forest and woodland fires that could threaten residential, commercial, and recreational structures.

Hazard Definition for Extreme Heat Hazard

Drought conditions are often accompanied by extreme heat, which is defined as temperatures that exceed the average high for the area by 10°F or more and last for several weeks.

Common Terms Associated with Extreme Heat

Heat Wave: Prolonged period of excessive heat often combined with excessive humidity.

Heat Index: A number, in degrees Fahrenheit, which estimates how hot it feels when relative humidity is added to air temperature. Exposure to full sunshine can increase the heat index by 15°F.

Heat Cramps: Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe, they are often the first signal that the body is having trouble with heat.

Heat Exhaustion: Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs, resulting in a form of mild shock. If left untreated, the victim's condition will worsen. Body temperature will continue to rise, and the victim may suffer heat stroke.

Heat and Sun Stroke: A life-threatening condition. The victim's temperature control system, which produces sweat to cool the body, stops working. The body's temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
Source: FEMA

Previous Occurrences for Drought and Extreme Heat

The NCDC database reported eleven drought/heat wave events in Boone County since 1995. The most recent reported event occurred in 2012. Northern Illinois experienced an intense heat wave during the first week of July. High temperatures at Chicago O'Hare Airport reached 102 on the 4th, 103 on the 5th and 6th and 98 on the 7th.

According to NCDC, Northern Illinois experienced an intense heat wave from July 12, 1995 to July 16, 1995 that claimed 583 lives in Chicago and the surrounding areas. Temperatures peaked at 104 ºF in

Chicago and the heat index peaked at 119ºF. High humidity, intense July sunshine, and light wind worsened the effects of the high temperatures.

Table 4-26 includes NCDC-recorded droughts/heat waves that caused damage, death, or injury in Boone County. Additional details of individual hazard events are on the NCDC website.

Table 4-26: NCDC-Recorded Drought and/or Extreme Heat That Caused Damage, Death, or Injury in Boone County

Location or County	Date	Deaths	Injuries	Property Damage (x $1000)	Crop Damage (x $1000)
Northeast Illinois	07/12/1995	583	0	0	0
	Total:	**583**	**0**	**$0**	**$0**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location for Drought and Extreme Heat

Droughts are regional in nature. Most areas of the United States are vulnerable to the risk of drought and extreme heat.

Hazard Extent for Drought and Extreme Heat

The extent of droughts or extreme heat varies both depending on the magnitude and duration of the heat and the range of precipitation.

Risk Identification for Drought and/or Extreme Heat

Based on input from the Boone County planning team, drought occurrence is likely. Drought and/or extreme heat ranked as the number eight hazard, according to the RPI.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
1	x	4	=	4

Vulnerability Analysis for Drought and Extreme Heat

Drought and extreme heat are a potential threat across the entire county; therefore, the county is vulnerable to this hazard and can expect impacts within the affected area. According to FEMA, approximately 175 Americans die each year from extreme heat. Young children, elderly, and hospitalized populations have the greatest risk.

The entire population and all buildings are at risk. Table 4-10 includes the building exposure for Boone County, as determined from the building inventory.

Critical Facilities

All critical facilities are vulnerable to drought. A critical facility will encounter many of the same impacts as any other building within the jurisdiction, which should involve little or no damage. Potential impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather. Table 4-9 lists the types and numbers of all of the essential facilities in the area. Appendices E and F include a list and map of all critical facilities in Boone County.

Building Inventory

Table 4-10 lists the building exposure, including types and numbers of buildings for the entire county. The buildings within the county can all expect impacts similar to those discussed for critical facilities. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather.

Infrastructure

During a drought, the types of potentially impacted infrastructure include roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with fire, which could result from hot, dry conditions. Since the county's entire infrastructure is vulnerable, damage to any infrastructure is possible. The impacts to these items include: impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); or impassable railways. Bridges could become impassable, causing risk to motorists.

Vulnerability to Future Assets/Infrastructure from Drought/Extreme Heat Hazard

Future development will remain vulnerable to droughts. Typically, some urban and rural areas are more susceptible than others. For example, urban areas are subject to water shortages during periods of drought. Excessive demands of densely populated areas put a limit on water resources. In rural areas, crops and livestock may suffer from extended periods of heat and drought. Dry conditions can lead to the ignition of wildfires that could threaten residential, commercial, and recreational areas.

Assessment of Community Development Trends

Because droughts and extreme heat are regional in nature, future development is susceptible to drought. Although urban and rural areas are equally vulnerable to this hazard, those living in urban areas may have a greater risk from the effects of a prolonged heat wave. The atmospheric conditions that create extreme heat tend to trap pollutants in urban areas, adding contaminated air to the excessively hot temperatures and creating increased health problems. Furthermore, asphalt and concrete store heat longer, gradually releasing it at night and producing high nighttime temperatures. This phenomenon is known as the "urban heat island effect."

Source: FEMA

Local officials should address drought and extreme heat hazards by educating the public on steps to take before and during the event—for example, temporary window reflectors to direct heat back outside, staying indoors as much as possible, and avoiding strenuous work during the warmest part of the day.

4.4.5 Winter Storm Hazard

Hazard Definition of Winter Storm Hazard

Severe winter weather consists of various forms of precipitation and weather conditions. This may include one or more of the following: freezing rain, sleet, heavy snow, blizzards, icy roadways, extreme low temperatures, and strong winds. These conditions can cause human health risks such as frostbite, hypothermia, or death and cause property damage and disrupt economic activity.

Ice (Glazing) and Sleet Storms

Ice or sleet, even in small quantities, can result in hazardous driving conditions and can cause property damage. Sleet involves raindrops that freeze completely before reaching the ground. Sleet does not stick to trees and wires. Ice storms, on the other hand, involve liquid rain that falls through subfreezing air and/or onto sub-freezing surfaces, freezing on contact with those surfaces. The ice coats trees, buildings, overhead wires, and roadways, sometimes causing extensive damage.

Ice storms are some of the most damaging winter storms in Illinois. Ice storms occur when moisture-laden Gulf air converges with the northern jet stream causing freezing rain that coats power and communication lines and trees with heavy ice. Strong winds can cause the overburdened limbs and cables to snap; leaving large sectors of the population without power, heat, or communication.

Snow Storms

Rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility, characterize significant snowstorms. A blizzard is categorized as a snow storm with winds of 35 miles per hour or greater and/or visibility of less than one-quarter mile for three or more hours. Strong winds during a blizzard blow falling and fallen snow, creating poor visibility and impassable roadways. Blizzards potentially result in property damage.

Blizzards repeatedly affect Illinois. Blizzard conditions cause power outages, loss of communication, and transportation difficulties. Blizzards can reduce visibility to less than one-quarter mile, and the resulting disorientation makes even travel by foot dangerous if not deadly.

Severe Cold

Severe cold involves ambient air temperatures that drop to 0˚F or below. These extreme temperatures can increase the likelihood of frostbite and hypothermia. High winds during severe cold events can enhance the air temperature's effects. Fast winds during cold weather events can lower the wind chill factor (how cold the air feels on your skin). As a result, the time it takes for frostbite and hypothermia to affect a person's body will decrease.

Previous Occurrences of Winter Storm Hazard

The NCDC database identified 33 winter storm and extreme cold events for Boone County since 1994. The most recent reported event occurred in January of 2012 when fast moving winter storm moved across northern Illinois. Snow began falling during the late morning hours and ended during the mid to late evening hours. Table 4-27 lists the NCDC-recorded winter storms that caused damage, death, or injury in Boone County. Additional details of individual hazard events are on the NCDC website.

Table 4-27: NCDC-Recorded Winter Storms That Caused Damage, Death, or Injury in Boone County

Location or County	Date	Deaths	Injuries	Property Damage
Northern Illinois	12/06/1994	0	0	$10,000
Boone	01/01/1999	1	0	0
Boone	01/23/2003	1	0	0
Boone	02/18/2006	1	0	0
Boone	02/02/1996	3	0	0
Boone	01/15/1997	5	0	0
	Total:	**11**	**0**	**$10,000**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location of Winter Storm Hazard

Severe winter storms are regional in nature. Most of the NCDC data are calculated regionally or in some cases statewide.

Hazard Extent of Winter Storm Hazard

The extent of the historical winter storms varies in terms of storm location, temperature, and ice or snowfall. A severe winter storm can occur anywhere in the county.

Risk Identification of Winter Storm Hazard

Based on historical information and input from the planning team, the occurrence of future winter storms is likely. The county should expect winter storms of varying magnitudes. According to the RPI, winter storms ranked as the number three hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
3	x	4	=	12

Vulnerability Analysis of Winter Storm Hazard

Winter storm impacts are equally likely across the entire county; therefore, the entire county is vulnerable to a winter storm and can expect impacts within the affected area. Table 4-10 includes the building exposure for Boone County, as determined from the building inventory.

Critical Facilities

All critical facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as other buildings within the county. These impacts include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow. Table 4-9 lists the types and numbers of the essential facilities in the area. Appendices E and F include a list and map of all critical facilities.

Building Inventory

Table 4-10 lists the building exposure in terms of types and numbers of buildings for the entire county. The impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These include loss of gas or electricity from broken or damaged utility lines, damaged or impassable roads and railways, broken water pipes, and roof collapse from heavy snow.

Infrastructure

During a winter storm, the types of potentially impacted infrastructure include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is vulnerable, it is important to emphasize that a winter storm could impact any structure. Potential impacts include broken gas and/or electricity lines or damaged utility lines, damaged or impassable roads and railways, and broken water pipes.

Potential Dollar Losses for Winter Storm Hazard

SIU determined that Boone County has incurred $10,000 in damages related to winter storms since 1994, including sleet/ice and heavy snow. NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event. As a results, SIU cannot reliably constrain potential dollar losses for a future even; however based on average property damage, SIU estimates that Boone County incurs property damage of approximately $500 per year related to winter storms.

Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard

Any new development within the county will remain vulnerable to these events.

Suggestions for Community Development Trends

Because winter storm events are regional in nature, future development across the county will also face winter storms.

4.4.6 Fire Hazard

Hazard Definition for Fire Hazard

This plan addresses three major categories of fires for Boone County: (1) tire/scrap fires; (2) structural fires; and (3) wildfires.

Tire Fires

The state of Illinois generates thousands of scrap tires annually. Many of those scrap tires end up in approved storage sites that are carefully regulated and controlled by federal and state officials. However, scrap tires are sometimes dumped in unapproved locations throughout the state, the number of which is inestimable.

Tire disposal sites are potential fire hazards, in large part, because of the large number of scrap tires typically present at one site. This large amount of fuel renders standard firefighting practices nearly useless. Flowing and burning oil released by the scrap tires can spread the fire to adjacent areas. Tire fires differ from conventional fires in the following ways:

- Relatively small tire fires can require significant fire resources to control and extinguish.
- Those resources often strain local community and county capabilities.
- Major tire fires can have significant environmental consequences. Extreme heat can convert a standard vehicle tire into approximately two gallons of oily residue that may leak into the soil or migrate to streams and waterways.

Structural Fires

Lightning strikes, poor building construction, and poor building condition are the main causes for most structural fires in Illinois. Boone County has a few structural fires each year countywide.

Wildfires

When hot and dry conditions develop, forests may become vulnerable to wildfires. In the past few decades, increased commercial and residential development near forested areas has dramatically changed the nature and scope of the wildfire hazard. In addition, the increase in structures resulting from new development can strain the effectiveness of fire service personnel in the county.

Previous Occurrences for Fire Hazard

Boone County has not experienced a significant or large-scale fire that resulted in a large number of fatalities or serious injuries.

Geographic Location for Fire Hazard

Fire hazards occur countywide and therefore affect the entire county. The forested areas in the county have a higher chance of widespread fire hazard.

Hazard Extent for Fire Hazard

The extent of the fire hazard varies both in terms of the severity of the fire and the type of material burning. Fires are a potential hazard for all communities in Boone County.

Risk Identification for Fire Hazard

Based on input from the Boone County planning team, fire occurrence is likely. Fire/explosion ranked as the number six hazard, according to the RPI.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
2	x	4	=	8

Vulnerability Analysis for Fire Hazard

Fire hazard threatens the entire jurisdiction; therefore, the entire population and all buildings within the county are vulnerable to fires.

Table 4-10 includes the building exposure for Boone County, as determined from the building inventory. The entire population and all buildings are at risk.

Critical Facilities

All critical facilities are vulnerable to fire hazards. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural damage from fire and water damage from efforts extinguishing fire. Table 4-9 lists the types and numbers of essential facilities in the area. Appendices E and F include a list and map of all critical facilities in Boone County.

Building Inventory

Table 4-10 lists building exposure, including types and numbers of buildings for the entire county. Impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These impacts include structural damage from fire and water damage from efforts to extinguish the fire.

Infrastructure

During a fire, potentially impacted infrastructure includes roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that a fire could damage any number of these items. Potential impacts include structural damage resulting in impassable roadways and power outages.

Vulnerability to Future Assets/Infrastructure for Fire Hazard

Any future development will be vulnerable to these events.

Assessment of Community Development Trends

Fire hazard events may occur anywhere within the county, therefore future development is at risk.

4.4.7 Earthquake Hazard

Hazard Definition

An earthquake is a shaking of the earth caused by the energy released when large blocks of rock slip past each other in the earth's crust. Imagine pressing two sandpaper blocks firmly together and trying to slide them past one another; at first they don't move at all, but as you continue to work harder they slip past each other very quickly. Similarly, blocks of the earth's crust (tectonic plates) are very slowly trying to slide past each other. When they build up enough energy, they quickly slip past each other, generating an earthquake.

Most earthquakes occur at tectonic plate boundaries; however, some earthquakes occur in the middle of plates, for example the New Madrid Seismic Zone or the Wabash Valley Fault System. Both of these seismic areas have a geologic history of strong quakes, and an earthquake from either seismic area could possibly affect Illinois counties. There may be other, currently unidentified faults in the Midwest also capable of producing strong earthquakes.

Strong earthquakes can collapse buildings and infrastructure, disrupt utilities, and trigger landslides, avalanches, flash floods, fires, and tsunamis. When an earthquake occurs in a populated area, it may cause death, injury, and extensive property damage. An earthquake might damage essential facilities, such as fire departments, police departments, and hospitals, disrupting emergency response services in the affected area. Strong earthquakes may also require mass relocation; however, relocation may be impossible in the short-term aftermath of a significant event due to damaged transportation infrastructure and public communication systems.

Earthquakes are usually measured by two criteria: intensity and magnitude (M). Earthquake intensity qualitatively measures the strength of shaking produced by an earthquake at a certain location and is determined from effects on people, structures, and the natural environment. Earthquake magnitude

quantitatively measures the energy released at the earthquake's subsurface source in the crust, or epicenter. SIU uses magnitude in the earthquake hazard analysis. Table 4-28 provides a comparison of magnitude and intensity, and Table 4-29 provides qualitative descriptions of intensity, for a sense of what a given magnitude might feel like.

Source: http://earthquake.usgs.gov/learning/topics/mag_vs_int.php

Table 4-28: Comparison of Earthquake Magnitude and Intensity

Magnitude (M)	Typical Maximum Modified Mercalli Intensity
1.0 – 3.0	I
3.0 – 3.9	II – III
4.0 – 4.9	IV – V
5.0 – 5.9	VI – VII
6.0 – 6.9	VII – IX
7.0 and higher	VIII or higher

Table 4-29: Abbreviated Modified Mercalli Intensity Scale

Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motorcars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motorcars rocked noticeably.
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, and walls. Heavy furniture overturned.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Previous Occurrences for Earthquakes

Historically, the most significant seismic activity in Illinois is associated with New Madrid Seismic Zone. The New Madrid Seismic Zone produced three large earthquakes in the central U.S. with magnitudes estimated between 7.0 and 7.7 on December 16, 1811, January 23, 1812, and February 7, 1812. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment (sand blows) over an

area >10,500 km^2, and uplifted a 50 km by 23 km zone (the Lake County uplift). The shaking was felt over a total area of over 10 million km^2 (the largest felt area of any historic earthquake). The United States Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) at the University of Memphis estimate the probability of a repeat of the 1811-1812 type earthquakes (M7.5-8.0) is 7%-10% over the next 50 years (USGS Fact Sheet 2006-3125).

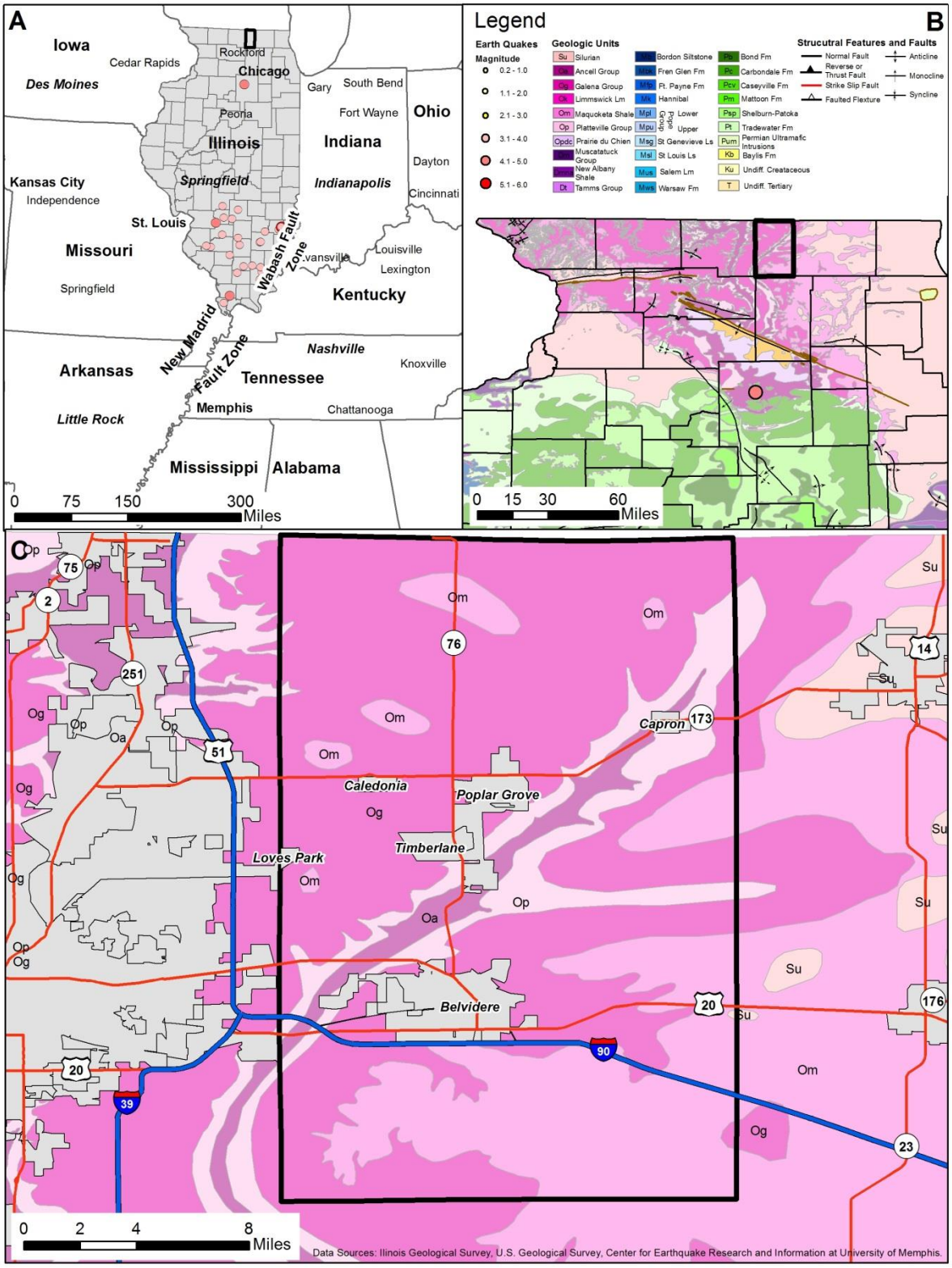
Earthquakes measured in Illinois typically vary in magnitude from very low microseismic events of M=1-3 to larger events up to M=5.4. The most recent earthquake in Illinois—as of the date of this report—is a M2.1 event on November February, 2013 approximately four miles SW of Tamms, IL. The last earthquake in Illinois to cause minor damage occurred on April 18, 2008 near Mt. Carmel, IL and measured 5.2 in magnitude. Earthquakes resulting in more serious damage have occurred about every 70 to 90 years and are historically concentrated in southern Illinois.

Geographic Location for Earthquake Hazard

The two most significant zones of seismic activity in Illinois are the New Madrid Seismic Zone and the Wabash Valley Fault System. There are no earthquake epicenters recorded in Boone County. While large earthquakes (>M7.0) experienced during the New Madrid Events of 1811 and 1812 are unlikely in Boone County, moderate earthquakes (≤ 6.0M) in or in the vicinity of Boone County are probable. The USGS estimates the probability of a moderate M5.5 earthquake occurring in Boone County within the next 500-years at approximately 0% (USGS 2009).

Figure 4-19 depicts the following: (A) location of notable earthquakes in Illinois region; (B) generalized geologic bedrock map with earthquake epicenters and geologic structures; (C) geologic and earthquake epicenter map of Boone County.

Figure 4-19: Recorded Earthquakes in the U.S. Midwest and Geology of Boone County



Hazard Extent for Earthquake Hazard

Earthquake effects are possible anywhere in Boone County. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. SIU used a National Earthquake Hazards Reduction Program (NEHRP) compliant soils map provided by FEMA for the analysis. The map identifies the soils most susceptible to failure.

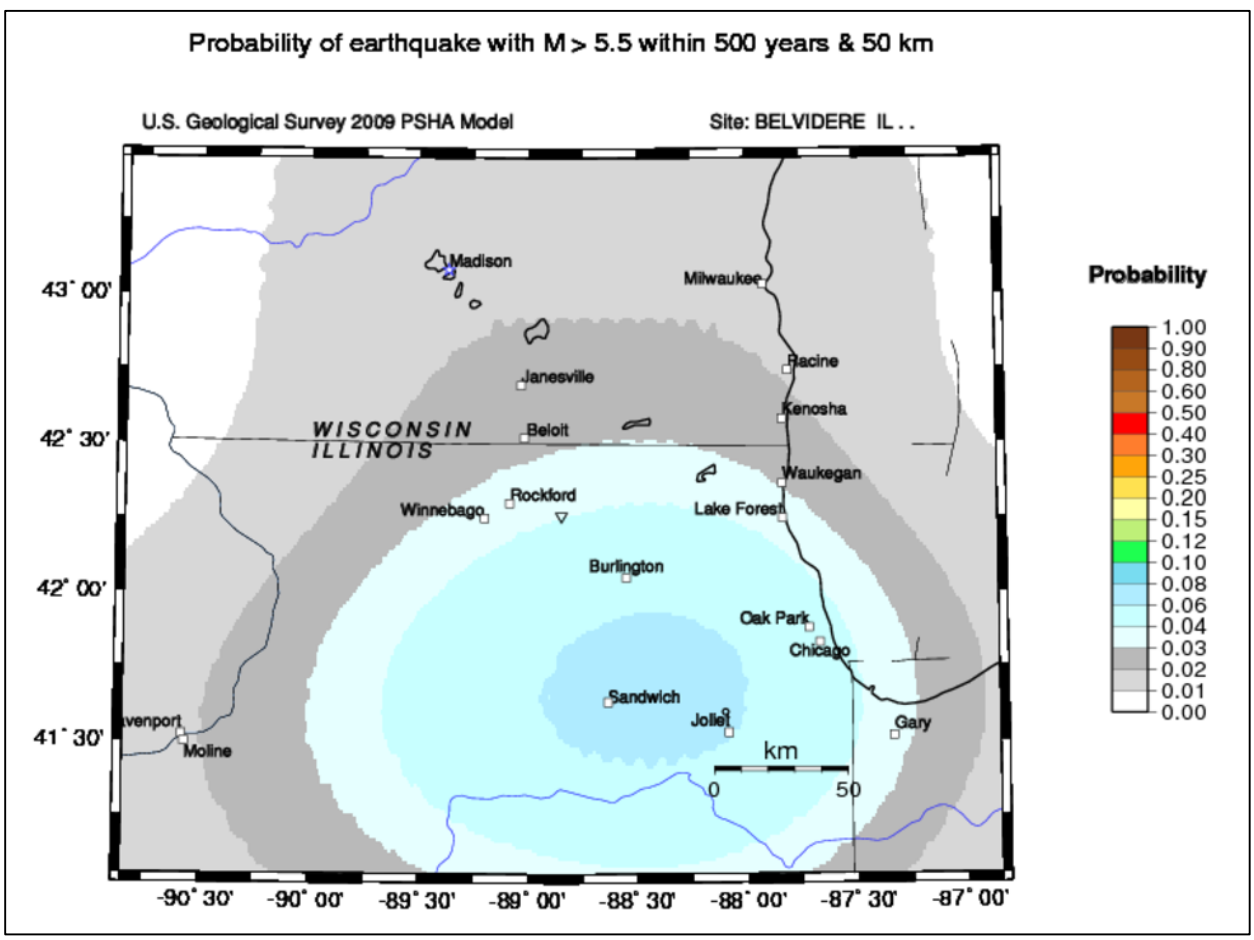
Risk Identification for Earthquake Hazard

Based on historical information and current USGS and SIU research and studies, future earthquakes in Boone County are possible, but large (>M7.0) earthquakes that cause catastrophic damage are unlikely. Figure 4-20 illustrates the probability of a M5.5 event occurring within the next 500 years in the Boone County region. According to the Boone County planning team's assessment, earthquakes are ranked as the number nine hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
1	x	4	=	4

Figure 4-20: USGS Probability Map for a M5.5 Earthquake Occurring in the Next 500 Years within Boone County



Vulnerability Analysis for Earthquake Hazard

Earthquakes could impact the entire county equally; therefore, the entire county's population and all buildings are vulnerable to an earthquake. To accommodate this risk, this plan considers all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities are vulnerable to earthquakes. A critical facility would encounter many of the same impacts as any other building within the county. These impacts include structural failure and loss of facility functionality (e.g., a damaged police station cannot serve the community). Appendices E and F include a list and map of all critical facilities in Boone County.

Building Inventory

Table 4-10 displays the building exposure in terms of types and numbers of buildings for the entire county. The buildings within the county can expect similar impacts to those discussed for critical facilities. These impacts include structural failure and loss of building function which could result in indirect impacts (e.g., damaged homes will no longer be habitable causing residents to seek shelter).

Infrastructure

During an earthquake, the types of infrastructure that shaking could impact include roadways, utility lines/pipes, railroads, and bridges. Since an extensive inventory of the infrastructure is not available to SIU, it is important to emphasize that any number of these items could become damaged in the event of an earthquake. The impacts to these items include broken, failed, or impassable roadways, broken or failed utility lines (e.g., loss of power or gas to community), and railway failure from broken or impassable railways. Bridges could also fail or become impassable, causing risk to motorists.

Hazus-MH Analyses for Four Earthquake Scenarios

SIU reviewed existing geological information and recommendations from the planning team for earthquake scenarios. SIU ran a deterministic and a probabilistic earthquake scenario to provide a reasonable basis for earthquake planning in Boone County. The deterministic scenario was a Moment Magnitude of 5.5 with the epicenter located in Boone County near Belvidere, IL. This represents a realistic scenario for planning purposes.

Additionally, the earthquake-loss analysis included a probabilistic scenario based on ground-shaking parameters derived from U.S. Geological Survey probabilistic seismic hazard curves for the earthquake with the 500-year return period. This scenario evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude typical of that expected for a 500-year return period.

The earthquake hazard modeling scenarios performed are:

- Magnitude 5.5 deterministic event near Belvidere, IL
- Magnitude 5.0 500-year probability event in Boone County
- Magnitude 7.1 deterministic event along the Wabash Valley Seismic Zone
- Magnitude 7.7 deterministic event along the New Madrid Seismic Zone

Modeling a deterministic scenario requires user input for a variety of parameters. One of the most critical sources of information required for accurate assessment of earthquake risk is soils data. SIU used a NEHRP soil classification map for Illinois in the analysis. NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking. FEMA provided the soils map and liquefaction-potential map that is the default in Hazus-MH.

Earthquake hypocenter depths in Illinois range from less than 1.0 to ~25.0 km. The deterministic scenarios used the average hypocenter depth of ~10.0 km. For this scenario type, Hazus-MH requires the user to define an attenuation function. SIU used the Toro et al. (1997) attenuation function for the deterministic

earthquake scenario to maintain consistency with the USGS (2006) strong ground motion modeling in the central United States.

This report presents two types of building losses: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

Results for M5.5 Deterministic Scenario – General Building Stock

Figure 4-21 and Tables 4-30 and 4-31 show the results of the deterministic M5.5 earthquake scenario with an epicenter near Belvidere, IL. Hazus-MH estimates that approximately 2,100 buildings will be at least moderately damaged. This is more than 12% of the total number of buildings in the region. Hazus-MH estimates that the event would damage 72 buildings beyond repair. Total building-related losses totaled $217 million; 12% of the estimated losses were related to the business interruption. The residential occupancy class sustained the largest loss, experiencing 59% of the total loss.

Figure 4-21: 5.5 Magnitude Earthquake Scenario for Boone County

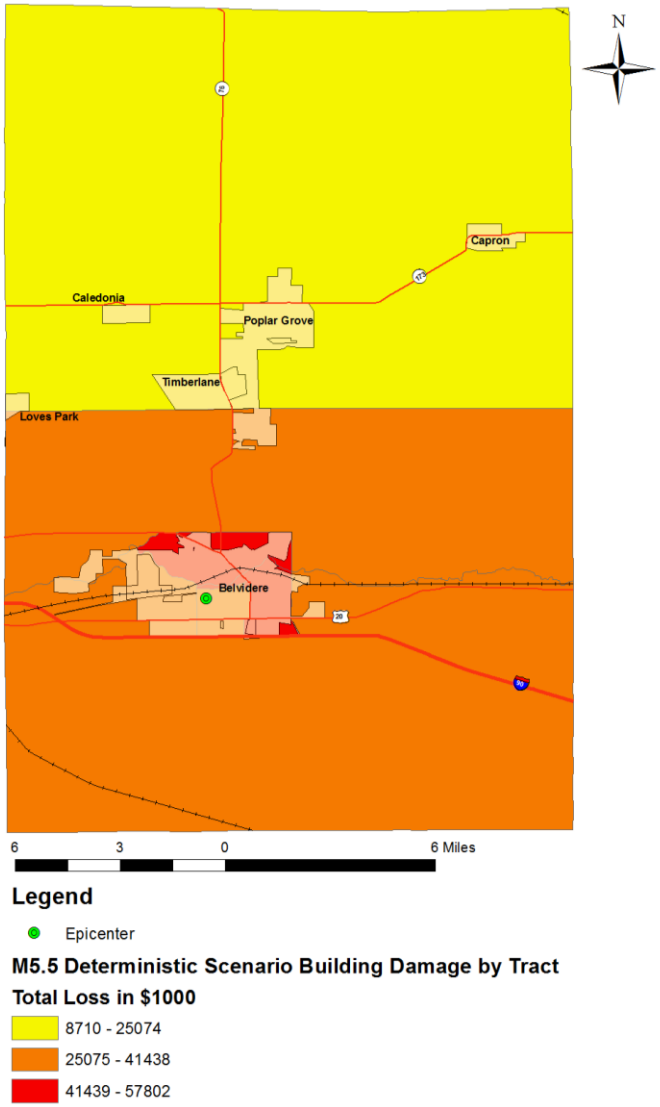


Table 4-30: Building Occupancy for a 5.5 Magnitude Damage Estimates in Boone County

	None		Slight		Moderate		Extensive		Complete	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	116	0.99	21	0.63	15	0.93	5	1.13	116	0.99
Commercial	471	4.03	134	4.04	95	5.88	31	7.53	471	4.03
Educational	13	0.11	3	0.10	2	0.15	1	0.19	13	0.11
Government	16	0.14	4	0.12	3	0.18	1	0.21	16	0.14
Industrial	246	2.11	61	1.85	47	2.88	14	3.47	246	2.11
Other Residential	2,399	20.54	775	23.30	436	26.92	99	24.24	2,399	20.54
Religion	34	0.29	10	0.29	7	0.41	2	0.54	34	0.29
Single Family	8,387	71.79	2,316	69.67	1,015	62.64	256	62.71	8,387	71.79
Total:	**11,683**		**3324**		**1620**		**490**		**11682**	

Table 4-31: Building Economic Losses (in Millions of Dollars) for a 5.5 Magnitude Estimates in Boone County

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	0.00	0.07	3.39	0.80	0.30	4.56
	Capital-Related	0.00	0.03	2.94	0.49	0.06	3.51
	Rental	1.86	1.30	1.84	0.25	0.09	5.34
	Relocation	6.88	1.22	2.92	0.92	0.83	12.77
	Subtotal:	**8.74**	**2.61**	**11.09**	**2.47**	**1.28**	**26.18**
Capital Stock Losses	Structural	13.08	2.10	3.93	2.89	1.16	23.16
	Non-Structural	56.18	14.97	15.20	16.77	3.71	106.83
	Content	24.46	5.14	10.77	13.79	2.70	56.86
	Inventory	0.00	0.00	0.32	3.62	0.08	4.02
	Subtotal:	**93.72**	**22.21**	**30.23**	**37.06**	**7.65**	**190.87**
	Total:	**102.46**	**24.81**	**41.32**	**39.53**	**8.92**	**217.05**

Results for M5.0 500-Year Probabilistic Scenario – General Building Stock

Tables 4-32 and 4-33 show the results of the 500-year probabilistic analysis. Hazus-MH estimates that the event would at least moderately damage approximately 42 buildings. This is less than 1% of the total number of buildings in the region. Hazus-MH estimates that the event would damage no buildings beyond repair. Building-related losses totaled $1.9 million; 24% of the estimated losses were related to the business interruption of the region. The residential occupancy class sustained the largest loss, experiencing 62% of the total loss.

Table 4-32: 500-Year Probabilistic Earthquake Damage Estimates by Building Occupancy for Boone County

	None		Slight		Moderate		Extensive		Complete	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	156	0.92	1	1.37	0	2.23	0	0.00	0	0.00
Commercial	732	4.30	4	5.90	0	9.06	0	0.00	0	0.00
Educational	20	0.12	0	0.17	0	0.20	0	0.00	0	0.00

Government	24	0.14	0	0.15	0	0.18	0	0.00	0	0.00
Industrial	368	2.16	2	3.00	0	5.10	0	0.00	0	0.00
Other Residential	3,701	21.72	21	33.55	1	32.50	0	0.00	0	0.00
Religion	53	0.31	0	0.46	0	0.61	0	0.00	0	0.00
Single Family	11,987	70.34	35	55.41	2	50.12	0	0.00	0	0.00
Total:	**17,041**		**64**		**3**		**0**		**0**	

Table 4-33: 500-Year Probabilistic Earthquake Estimates of Building Economic Losses (in Millions of Dollars) for Boone County

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	0.00	0.00	0.01	0.00	0.00	0.01
	Capital-Related	0.00	0.00	0.01	0.00	0.00	0.01
	Rental	0.00	0.00	0.01	0.00	0.00	0.01
	Relocation	0.01	0.00	0.00	0.00	0.00	0.02
	Subtotal:	**0.01**	**0.00**	**0.02**	**0.01**	**0.00**	**0.04**
Capital Stock Losses	Structural	0.04	0.01	0.01	0.01	0.00	0.07
	Non-Structural	0.29	0.07	0.14	0.23	0.04	0.77
	Content	0.16	0.03	0.11	0.17	0.03	0.50
	Inventory	0.00	0.00	0.00	0.04	0.00	0.05
	Subtotal:	**0.49**	**0.11**	**0.26**	**0.45**	**0.07**	**1.38**
	Total:	**0.50**	**0.11**	**0.29**	**0.46**	**0.08**	**1.43**

Results for M7.1 Wabash Valley Scenario – General Building Stock

Figure 4-22 and Tables 4-34 and 4-35 show the results of the deterministic M7.1 Wabash Valley Seismic Zone scenario. Hazus-MH estimates that approximately three buildings will be at least moderately damaged. This is less than 1% of the total number of buildings in the region. Hazus-MH estimates that the event would damage no buildings beyond repair. Total building-related losses totaled $1.4 million; 3% of the estimated losses were related to the business interruption. The residential occupancy class sustained the largest loss, experiencing 43% of the total loss.

Figure 4-22: 7.1 Magnitude Wabash Valley Earthquake Scenario for Boone County

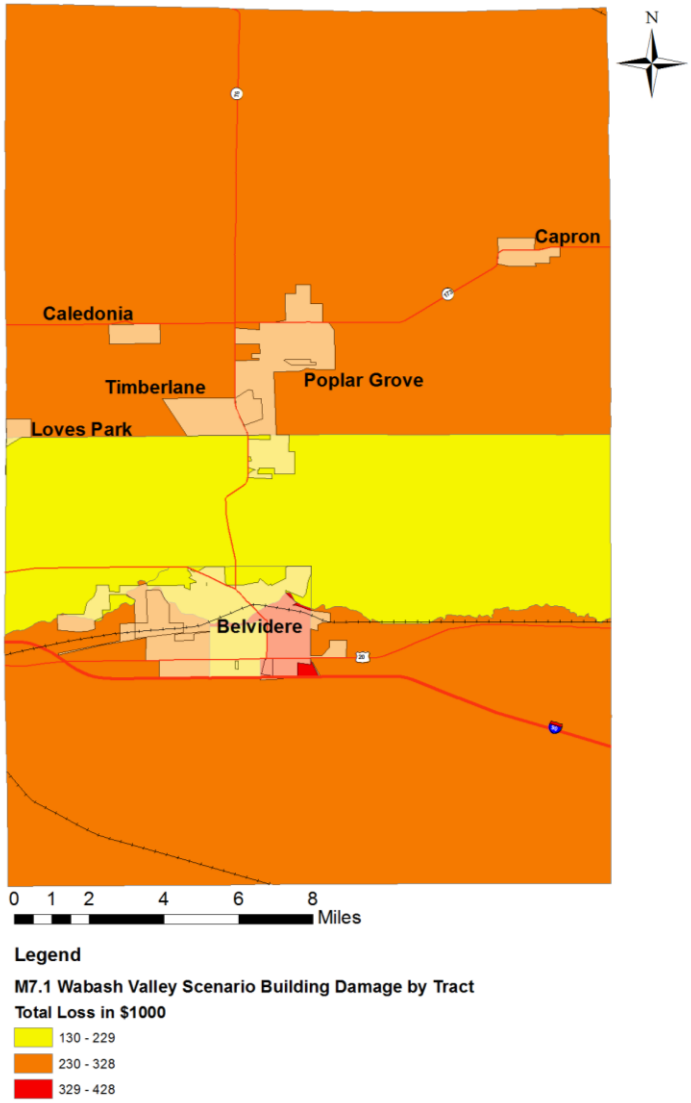


Table 4-34: Building Occupancy for a 7.1 Magnitude Damage Estimates in Boone County

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	203	2.15	38	2.73	10	5.37	0	7.07	0	2.88
Commercial	346	3.68	60	4.28	15	7.50	0	9.75	0	4.82
Educational	19	0.20	3	0.24	1	0.36	0	0.42	0	0.47
Government	19	0.20	3	0.19	1	0.27	0	0.30	0	0.29
Industrial	99	1.05	17	1.24	5	2.33	0	3.05	0	1.21
Other Residential	2,348	24.94	404	28.69	64	32.94	1	23.76	0	21.88
Religion	44	0.47	8	0.59	2	0.92	0	1.17	0	0.93
Single Family	6,338	67.32	875	62.04	98	50.31	3	54.49	0	67.53
Total:	**9,416**		**1,408**		**196**		**4**		**0**	

Table 4-35: Building Economic Losses (in Millions of Dollars) for a 7.1 Magnitude Estimates in Boone County

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	0.00	0.01	0.21	0.02	0.04	0.28
	Capital-Related	0.00	0.00	0.16	0.01	0.01	0.18
	Rental	0.11	0.06	0.16	0.01	0.01	0.35
	Relocation	0.36	0.06	0.19	0.07	0.10	0.78
	Subtotal:	**0.47**	**0.13**	**0.72**	**0.11**	**0.16**	**1.59**
Capital Stock Losses	Structural	0.80	0.16	0.25	0.13	0.22	1.56
	Non-Structural	6.10	1.48	1.99	1.52	1.09	12.18
	Content	3.61	0.59	1.58	1.22	0.92	7.92
	Inventory	0.00	0.00	0.06	0.22	0.05	0.33
	Subtotal:	**10.51**	**2.23**	**3.88**	**3.09**	**2.28**	**21.99**
	Total:	**10.98**	**2.36**	**4.60**	**3.20**	**2.44**	**23.58**

Results for M7.7 New Madrid Scenario – General Building Stock

Figure 4-23 and Tables 4-36 and 4-37 show the results of the deterministic M7.7 New Madrid Seismic Zone scenario. Hazus-MH estimates that approximately nine buildings will be at least moderately damaged. This is less than 1% of the total number of buildings in the region. Hazus-MH estimates that the event would damage no buildings beyond repair. Total building-related losses totaled $3 million; 4% of the estimated losses were related to the business interruption. The residential occupancy class sustained the largest loss, experiencing 43% of the total loss.

Figure 4-23: 7.7 Magnitude New Madrid Earthquake Scenario for Boone County

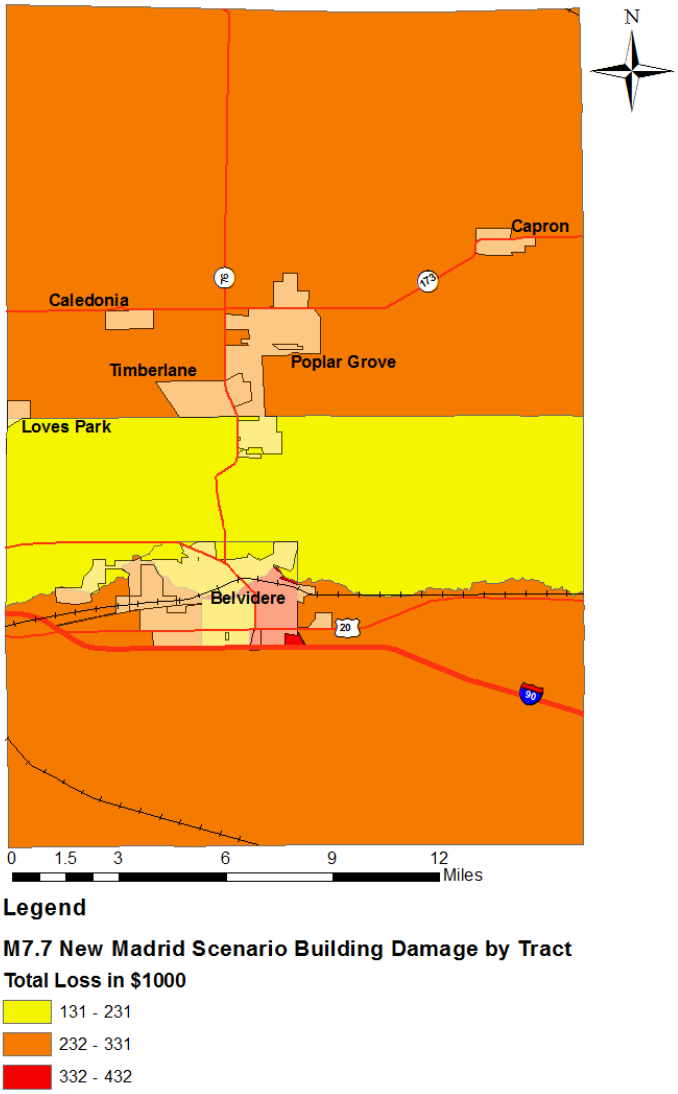


Table 4-36: Building Occupancy for a 7.7 Magnitude Damage Estimates in Boone County

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	155	0.01	2	1.30	0	2.03	0	2.20	0	0.00
Commercial	727	4.29	8	5.59	1	8.23	0	8.93	0	0.00
Educational	20	0.12	0	0.17	0	0.19	0	0.28	0	0.00
Government	24	0.14	0	0.17	0	0.22	0	0.30	0	0.00
Industrial	365	2.16	4	2.90	0	4.81	0	4.56	0	0.00
Other Residential	3,667	21.63	53	37.09	4	42.15	0	15.16	0	0.00
Religion	52	0.31	1	0.42	0	0.51	0	0.69	0	0.00
Single Family	11,946	70.45	74	52.36	4	41.85	0	67.89	0	0.00
Total:	**16,957**		**142**		**9**		**0**		**0**	

Table 4-37: Building Economic Losses (in Millions of Dollars) for a 7.7 Magnitude Estimates in Boone County

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	0.00	0.00	0.01	0.01	0.00	0.02
	Capital-Related	0.00	0.00	0.01	0.00	0.00	0.02
	Rental	0.01	0.00	0..02	0.00	0.00	0.03
	Relocation	0.01	0.01	0.01	0.01	0.00	0.04
	Subtotal:	**0.02**	**0.01**	**0.05**	**0.02**	**0.01**	**0.11**
Capital Stock Losses	Structural	0.08	0.02	0.03	0.03	0.01	0.16
	Non-Structural	0.61	0.16	0.29	0.46	0.08	1.60
	Content	0.35	0.06	0.22	0.34	0.06	1.03
	Inventory	0.00	0.00	0.01	0.09	0.00	0.10
	Subtotal:	**1.04**	**0.23**	**0.54**	**0.92**	**0.16**	**2.89**
	Total:	**1.06**	**0.24**	**0.60**	**0.94**	**0.16**	**3.00**

Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

New construction, especially critical facilities, should accommodate earthquake mitigation design standards.

Suggestions for Community Development Trends

Community development should occur outside of the low-lying areas in floodplains with a water table within five feet of grade that is susceptible to liquefaction.

At Meeting 4, the MHMP team discussed specific mitigation strategies for reducing earthquake hazard. The discussion included strategies to harden and protect future and existing structures against the possible termination of public services and systems including power lines, water and sanitary lines, and public communication (see Section 5).

4.4.8 Thunderstorm Hazard

Hazard Definition – Thunderstorm

Severe thunderstorms are weather events with one or more of the following characteristics: strong winds, large and damaging hail, and frequent lightning. Severe thunderstorms most frequently occur in Illinois during the spring and summer months, but can occur at any time. A severe thunderstorm's impacts can be localized or can be widespread in nature. A thunderstorm is classified as severe when it meets one or more of the following criteria:

- Hail 0.75 inches or greater in diameter
- Frequent and dangerous lightning
- Wind speeds greater than or equal to 58 miles per hour

Hail

Hail is a possible product of a strong thunderstorm. Hail usually falls near the center of a storm, but strong winds occurring at high altitudes in the thunderstorm can blow the hailstones away from the storm center, resulting in damage in other areas near the storm. Hailstones range from pea-sized to baseball-sized, and some reports note hailstones larger than softballs.

Lightning

Lightning is a discharge of electricity from a thunderstorm. Lightning is often perceived as a minor hazard, but lightning damages many structures and kills or severely injures numerous people in the United States each year.

Severe Winds (Straight-Line Winds)

Straight-line winds from thunderstorms are fairly common in Illinois. Straight-line winds can cause damage to homes, businesses, power lines, and agricultural areas, and may require temporary sheltering of individuals who are without power for extended periods of time.

Previous Occurrences for Thunderstorm Hazard

The NCDC database reported 35 hailstorms in Boone County since 1963. Hailstorms occur nearly every year in the late spring and early summer months. The most recent reported occurrence was on July of 2012, when severe thunderstorms moved across parts of northern Illinois during the middle to late evening hours of July 18th that produced hail across the county. Additional details of individual hazard events are on the NCDC website.

The NCDC database reported two occurrences of significant lightning strikes in Boone County. Table 4-38 identifies NCDC-recorded lightning strikes that caused damage, death, or injury in Boone County.

Table 4-38: NCDC-Recorded Lightning Strikes That Caused Damage, Death, or Injury in Boone County

Location or County*	Date	Deaths	Injuries	Property Damage (x $1000)	Crop Damage (x $1000)
Capron	08/09/2001	1	0	0	0
Belvidere	07/07/2008	0	0	5	0
	Total:	**1**	**0**	**$5**	**$0**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

The NCDC database includes 99 wind storms reported since 1972. The most recent event was in September of 2012 when a strong line of thunderstorms dropped into northern Illinois. Severe winds occurred ahead of the line of thunderstorms as a gust front surged south.

Table 4-39 shows the NCDC-recorded thunderstorms that have caused damage, death, or injury in Boone County. Additional details of individual hazard events are on the NCDC website.

Table 4-39: NCDC-Recorded Wind Storms That Caused Damage, Death, or Injury in Boone County

Location or County*	Date	Deaths	Injuries	Property Damage (x $1000)	Crop Damage (x $1000)
Boone	06/18/2010	0	0	0.5	0
Boone	06/8/2011	0	0	0.5	0
Boone	06/7/1995	0	0	1	0
Boone	07/24/1995	0	0	1	0
Boone	07/31/2008	0	0	1	0
Boone	07/7/2008	0	0	5	0
Boone	09/4/2012	0	0	5	0
Belvidere	07/15/2003	0	0	6	0
Boone	06/1/2007	0	0	10	0

Location or County*	Date	Deaths	Injuries	Property Damage (x $1000)	Crop Damage (x $1000)
Capron	08/24/2006	0	0	25	0
Boone	07/11/2011	0	0	25	0
Boone	07/11/2011	0	0	25	0
Poplar Grove	07/11/2011	0	0	45	0
Belvidere	08/25/2006	0	0	400	0
Boone	11/13/2003	0	0	0	0
Boone	11/10/1998	0	0	0	0
Capron	08/9/2001	0	0	0	0
Boone	10/24/1995	0	0	0	0
Boone	03/9/2002	0	0	200	0
	Total:	**0**	**0**	**$750**	**$0**

*NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event.

Geographic Location of Thunderstorm Hazard

The entire county has the same risk for occurrence of thunderstorms. They can occur at any location within the county.

Hazard Extent for Thunderstorm Hazard

The extent of the historical thunderstorms depends upon the extent of the storm, the wind speed, and the size of hail stones. Thunderstorms can occur at any location within the county.

Risk Identification for Thunderstorm Hazard

Based on historical information, the occurrence of future high winds, hail, and lightning is likely. The county should expect high winds, hail, and lightning of widely varying magnitudes in the future. According to the RPI, thunderstorms and high wind damage ranked as the number two hazard.

RPI = Probability x Magnitude/Severity.

Probability	x	Magnitude/Severity	=	RPI
4	x	2	=	8

Vulnerability Analysis for Thunderstorm Hazard

The entire county's population and all buildings are vulnerable to a severe thunderstorm and can expect the same impacts within the affected area. This plan will therefore consider all buildings located within the county as vulnerable. Table 4-9 and 4-10 show the existing buildings and infrastructure in Boone County.

Critical Facilities

All critical facilities are vulnerable to severe thunderstorms. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g., a damaged police station cannot serve the community). Table 4-9 lists the types and numbers of all of the essential facilities in the area. Appendices E and F include a list and map of all critical facilities in Boone County.

Building Inventory

Table 4-10 displays the building exposure in terms of types and numbers of buildings for the entire county. The buildings within the county can expect impacts similar to those discussed for critical facilities. These impacts include structural failure, damaging debris (trees or limbs), roofs blown off or windows broken by

hail or high winds, fires caused by lightning, and loss of building functionality (e.g., a person cannot inhabit a damaged home, causing residents to seek shelter).

Infrastructure

A severe thunderstorm could impact roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is vulnerable, it is important to emphasize that a severe thunderstorm could damage any number of these structures. The impacts to these structures include broken, failed, or impassable roadways; broken or failed utility lines (e.g., loss of power or gas to community); or impassable railways. Bridges could become impassable causing risk to motorists.

Potential Dollar Losses for Thunderstorm Hazard

SIU determined that Boone County has incurred $750,000 in damages relating to thunderstorms, including hail, lightning, and high winds since 1963. NCDC records are estimates of damage compiled by the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature and may not match the final assessment of economic and property losses related to a given weather event. As a result, SIU cannot reliably constrain potential dollar losses for a future event; however, based on average property damage in the past decade, SIU estimates that Boone County incurs property damages of approximately $15,000 per year related to severe thunderstorms.

Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard

All future development within the county and all communities will remain vulnerable to these events.

Suggestions for Community Development Trends

Local officials will enhance severe storm preparedness if they sponsor a wide range of programs and initiatives to address the overall safety of county residents. The county needs to build new structures with more sturdy construction, and harden existing structures to lessen the potential impacts of severe weather. Building more warning sirens will warn the community of approaching storms to ensure the safety of Boone County residents.

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Section 5 Mitigation Strategies

5.1 Community Capability Assessment

The goal of mitigation is to reduce the future impacts of a hazard, including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. Overall, mitigation strategies attempt to build disaster-resistant communities. Mitigation actions and projects are necessarily based on a well-constructed risk assessment (Section 4). Mitigation is an ongoing process that adapts over time to accommodate a community's needs.

5.1.1 National Flood Insurance Program (NFIP)

Belvidere, Capron, Poplar Grove, Timberland, and the unincorporated areas of Boone County participate in the NFIP. Communities with a flood risk who choose not to participate in the NFIP include Caledonia, and Timberlane. Boone County will continue to educate these jurisdictions on the benefits of the program. Table 5-1 includes a summary of additional information for Boone County participation in the NFIP.

The county and incorporated areas do not participate in the NFIP'S Community Rating System (CRS). The CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance.

Table 5-1: Information on Communities in Boone County Participating in the NFIP

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Floodplain Ordinance
Boone County	11/17/82	02/18/11	-	-	01/19/2001
Belvidere	01/06/82	02/18/11	-	-	01/03/2011
Caledonia	-	-	-	-	-
Capron	02/18/11	02/18/11	-	-	03/12/2012
Cherry Valley	03/16/81	02/18/11	-	-	-
Loves Park	10/17/78	02/18/11	-	-	-
Poplar Grove	02/18/11	02/18/11	-	-	03/13/2012
Timberlane	02/18/11	02/18/11	-	-	-

*NFIP status and information are documented in the Community Status Book Report updated on 06/15/2012.

Since the establishment of the NFIP in 1978, Boone County had several flood insurance claims. Table 5-2 summarizes the claims since 1978.

Table 5-2: Policy and Claim Statistics for Flood Insurance in Boone County, IL

Community	Closed Losses	Open Losses	CWOP Losses	Total Losses	Payments
Boone County	13	0	7	20	$133,102.00
Belvidere	21	0	5	26	$144,369.16
Caledonia	-	-	-	-	-
Capron	-	-	-	-	-
Cherry Valley	2	0	2	4	$4,449.65
Loves Park	65	0	30	95	$968,677.62
Poplar Grove	-	-	-	-	-

Community	Closed Losses	Open Losses	CWOP Losses	Total Losses	Payments
Timberlane	-	-	-	-	-

*NFIP policy and claim statistics since 1978 until the most recently updated date of 12/31/2013. Closed Losses refer to losses that are paid; open losses are losses that are not paid in full; CWOP losses are losses that are closed without payment; and total losses refers to all losses submitted regardless of status. Lastly, total payments refer to the total amount paid on losses.

5.1.2 Jurisdiction Ordinances

Ordinances that directly pertain, or can pertain, to disaster mitigation are listed in Table 5-3 and are discussed in more detail, if information was provided, in this section.

Table 5-3: Boone County's Jurisdiction Ordinances and Most Recent Adoption Date

Community Name	Zoning	Storm water Mgmt	Subdivision Control	Burning	Seismic	Erosion Mgmt	Land Use Plan	Building Codes
Boone County	7/9/08	-	6/13/01	6/11/03	-	-	2/14/79	2/14/07
Belvidere	4/3/06	-	5/17/93	1/3/11	-	-	3/6/06	8/18/03
Caledonia								
Capron	8/12/13	-	3/12/12	4/11/11	-	-	3/12/12	4/11/11
Poplar Grove	4/9/12	-	5/1/89	11/9/09	-	-	3/13/12	11/9/09
Timberlane	8/18/05	-	9/20/01	6/11/03	-	-	-	-

5.1.3 Fire Insurance Ratings

Table 5-4 lists Boone County's fire departments and respective information.

Table 5-4: Fire Departments, Their Insurance Ratings, and Number of Employees/Volunteers

Fire Department Name	Fire Insurance Rating	Number of Employees
Belvidere Fire Department	4	29
Boone County Fire Protection District #1	5-8B	22
Boone County Fire Protection District #2	6/9 split rating	40
Boone County Fire Protection District #3	6/9 split rating	25

5.2 Mitigation Goals

In Section 4 of this plan, the risk assessment identified Boone County as prone to several hazards. The mitigation planning team members understand that although they cannot eliminate hazards altogether, Boone County can work towards building disaster-resistant communities. Below is a generalized list of goals, objectives, and actions. The goals represent long-term, broad visions of the overall vision the county would like to achieve for mitigation. The objectives are strategies and steps that will assist the communities in attaining the listed goals.

Goal 1: Lessen the impacts of hazards to new and existing infrastructure

(a) Objective: Retrofit critical facilities and structures with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.

(b) Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.

(c) Objective: Minimize the amount of infrastructure exposed to hazards.

(d) Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.

(e) Objective: Improve emergency sheltering in Boone County.

Goal 2: Create new or revise existing plans/maps for Boone County

(a) Objective: Support compliance with the NFIP for each jurisdiction in Boone County.

(b) Objective: Review and update existing, or create new, community plans and ordinances to support hazard mitigation.

(c) Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.

Goal 3: Develop long-term strategies to educate Boone County residents on the hazards affecting their county

(a) Objective: Raise public awareness on hazard mitigation.

(b) Objective: Improve education and training of emergency personnel and public officials.

5.3 Mitigation Actions/Plans

Upon completion of the risk assessment and development of the goals and objectives, the mitigation planning committee reviewed a list of the six mitigation measure categories from the FEMA State and Local Mitigation Planning How-to Guides. The measures are listed as follows:

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and storm water management regulations.
- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.
- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.
- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream-corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.
- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.
- **Structural Projects:** Actions that involve the construction of structures to reduce the impacts of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting 3, held on April 17, 2013, the mitigation planning team was presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The planning team brought their mitigation ideas to Meeting 4, held on June 11, 2013. FEMA uses their evaluation criteria STAPLE+E (stands for social, technical, administrative, political, legal, economic and environmental) to assess the developed mitigation strategies.

Social:

- Will the proposed action adversely affect one segment of the population?
- Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of lower income people?

Technical:

- How effective is the action in avoiding or reducing future losses?
- Will it create more problems than it solves?
- Does it solve the problem or only a symptom?
- Does the mitigation strategy address continued compliance with the NFIP?

Administrative:

- Does the jurisdiction have the capability (staff, technical experts, and/or funding) to implement the action, or can it be readily obtained?
- Can the community provide the necessary maintenance?
- Can it be accomplished in a timely manner?

Political:

- Is there political support to implement and maintain this action?
- Is there a local champion willing to help see the action to completion?
- Is there enough public support to ensure the success of the action?
- How can the mitigation objectives be accomplished at the lowest cost to the public?

Legal:

- Does the community have the authority to implement the proposed action?
- Are the proper laws, ordinances, and resolutions in place to implement the action?
- Are there any potential legal consequences?
- Is there any potential community liability?
- Is the action likely to be challenged by those who may be negatively affected?
- Does the mitigation strategy address continued compliance with the NFIP?

Economic:

- Are there currently sources of funds that can be used to implement the action?
- What benefits will the action provide?
- Does the cost seem reasonable for the size of the problem and likely benefits?
- What burden will be placed on the tax base or local economy to implement this action?
- Does the action contribute to other community economic goals such as capital improvements or economic development?
- What proposed actions should be considered but be “tabled” for implementation until outside sources of funding are available?

Environmental:

- How will this action affect the environment (land, water, endangered species)?

- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

5.4 Implementation Strategy and Analysis of Mitigation Projects

Implementation of the mitigation plan is critical to the overall success of the mitigation planning process. The first step is to decide, based upon many factors, which action will be undertaken first. In order to pursue the top priority first, an analysis and prioritization of the actions is important. Some actions may occur before the top priority due to financial, engineering, environmental, permitting, and site control issues. Public awareness and input of these mitigation actions can increase knowledge to capitalize on funding opportunities and monitoring the progress of an action.

At Meeting 4, the planning team prioritized mitigation actions based on a number of factors. The factors were the STAPLE+E criteria listed in Table 5-5. For each incorporated jurisdiction, a rating of high, medium, or low was assessed for each mitigation item and is listed next to each item in Table 5-6 through 5-12.

Table 5-5: Summary of STAPLE+E Criteria

S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T – Technical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
A – Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P – Political	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L – Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E – Economic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E – Environmental	Sustainable mitigation actions that do not have an adverse effect on the environment, comply with federal, state, and local environmental regulations, and are consistent with the community's environmental goals, have mitigation benefits while being environmentally sound.

For each mitigation action related to infrastructure, new and existing infrastructure was considered. Additionally, the mitigation strategies address continued compliance with the NFIP. While an official cost-benefit review was not conducted for any of the mitigation actions, the estimated costs were discussed. The overall benefits were considered when prioritizing mitigation items from high to low. An official cost-benefit review is conducted prior to the implementation of any mitigation actions. Tables 5-6 through 5-12 present mitigation projects for each incorporated jurisdiction developed by the planning committee, as well as actions that are ongoing or already completed. Boone County did not have applicable, detailed mitigation strategies in their first plan. The objective of this updated plan is to generate proactive mitigation strategies with clearer goals and objectives.

Table 5-6: List of Mitigation Strategies Developed at Meeting 4 for Boone County

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Public Education/Awareness	Goal: Develop long-term strategies to educate Boone County residents on the hazards affecting their community Objective: Raise public awareness of hazard mitigation	All Hazards	Medium	Boone County recognizes that public education is important and expensive. The county plans to obtain as much funding as possible to raise public awareness of hazards.
Mutual Aid Agreements	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Boone County currently has mutual aid agreements with the Local Emergency responders, County and City Public Works, and the County Health Department
Back-up Generators	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	All Hazards	High	Boone County plans to obtain back-up generators for each critical facility and county government building (local law enforcement, fire departments hospitals, city and county buildings, schools, etc.)
Enhanced Communication Systems/Emergency Alert Systems (Sirens)	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication abilities of emergency services throughout the county	All Hazards	High	Boone County is currently in the process of updating all communications systems to improve communications between emergency operators as well as between emergency operators and the public.
Family Disaster Plans & Kits	Goal: Develop long-term strategies to educate residents on the hazards affecting their community Objective: Raise public awareness on hazard mitigation	All Hazards	Medium	Boone County Emergency Management and Local CERT plans to obtain funding for family disaster plans and kits. They would advertise and demonstrate at local events in cooperation with Boone County EMA and Emergency Services.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Establish Local Emergency Planning Committee	Goal: Create new or revise existing plans/maps for Boone County Objective: Review and update existing, or create new community plans and ordinances to support hazard mitigation	All Hazards	High	The Boone County Local Emergency Planning Committee meets regularly and will continue to review and update its services in the future.
Special Needs Population List	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication abilities of emergency services throughout the county	All Hazards	High	Boone County 911 has a special needs population list established and will continue to maintain it.
Procure a Back-up Water Supply	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	All Hazards	Low	Boone County wishes to establish an emergency fund to obtain water from an outside source in the event a disaster disrupts their potable water supply.
Obtain Tents / Shelters	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	All Hazards	High	Boone County would like to obtain funding for tents and shelters to increase the sheltering needs in the event of a major hazard.
Participate in the NFIP	Goal: Create new or revise existing plans/maps for Boone County Objective: Support compliance with the NFIP for the community	Flood	High	Boone County has participated in the NFIP since 1982.
Stormwater Management and Floodplain Ordinance	Goal: Create new or revise existing plans/maps for Boone County Objective: Review and update existing, or create new community plans and ordinances to support hazard mitigation	Flood	High	Boone County has recently adopted a Storm Water Ordinance and will continue to monitor its floodplain ordinance.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Dam Maintenance and Emergency Response Plan	Goal: Create new or revise existing plans/maps for Boone County Objective: Review and update existing, or create new community plans and ordinances to support hazard mitigation	Flood	Medium	Boone County is interested in seeking funding for maintenance plans. The County currently updates the EOP annually.
Installation of Pumping Stations	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards	Flood	High	Boone County is in the process of installing pumping stations but with funding additional work could be completed to the infrastructure.
Elevate Low-lying Roads	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards	Flood	High	The Boone County is interested in elevating low-lying roads and plans to seek funding. Studies need to be done to research the effects.
Provide and Publicize Locations of Safe Rooms and/or Shelters	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the county	Tornado / Severe Storms	High	Boone County is currently working on identifying all shelters in the county to provide this information to the public. The County will work with different associations on getting private shelters installed and advertised.
Tree Management	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	Tornado / Severe Storms	High	Boone County already has a tree trimming and management program and will continue to maintain it.
Cooling/Warming Shelters	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the county	Extreme Temperatures	High	Boone County would like to obtain funding for cooling and warming shelters. The local law enforcement, fire and emergency management will oversee the project.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Burn Ordinance	Goal: Create new or revise existing plans/maps for county Objective: Review and update existing, or create new community plans and ordinances to support hazard mitigation	Wild Fire	Medium	Several municipalities have their own burn ordinance, but Boone County has its own burn ordinance in place.
Procure Snow Removal Equipment	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	Winter Storms	Medium	Boone County Continuously updates equipment but would like to obtain additional funding for maintenance.
Earthquake Response Plan	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	Earthquake	Medium	Boone County Emergency Management has an earthquake response plan in place and will continue to monitor and update it in the future.
Harden infrastructure	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards	Earthquake	Medium	Boone County would like to obtain funding to harden existing infrastructure to minimize the amount of damage as the result of an earthquake.
Emergency Plan / Protocol for HAZMAT	Goal: Create new or revise existing plans/maps for county Objective: Review and update existing, or create new community plans and ordinances to support hazard mitigation	Hazmat	High	Boone County along with the Belvidere Fire Departments, Boone County Emergency Management, and Boone County LEPC currently maintains an emergency plan for HAZMAT incidents.
Conduct a Commodity Flow Study	Goal: Create new or revise existing plans/maps for the community Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Hazmat	Medium	Boone County Emergency Management will oversee this project. Funding will be sought from ILDOT, IEMA, and FEMA. If funding is available, implementation will begin within three years.

Table 5-7: List of Mitigation Strategies Developed at Meeting 4 for Belvidere

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Enhanced Communication Systems/NOAA Weather Radios	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Belvidere would like a reverse 911 system for flooding and hazmat incidents.
Special Needs Population List	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication abilities of emergency services throughout the county	All Hazards	Medium	Belvidere would like to seek funding to establish a special needs population list. Belvidere will work with residents to identify residents with special needs and create maps to pinpoint their locations.
Procure a Back-up Water Supply	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	All Hazards	Medium	Belvidere has identified the need to procure funding for a back-up water supply - particularly in the event of a drought or earthquake.
Provide and Publicize Locations of Safe Rooms and/or Shelters	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the county	Tornado / Severe Storms / Winter Storms	High	Belvidere will work on identifying all shelters in the community and provide this information to the public.
Cooling/Warming Shelters	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in the community	Extreme Temperatures	High	Belvidere would like to seek funding for cooling/warming shelters.

Table 5-8: List of Mitigation Strategies Developed at Meeting 4 for Caledonia

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Public Education/Awareness	Goal: Develop long-term strategies to educate Boone County residents on the hazards affecting their community Objective: Raise public awareness of hazard mitigation	All Hazards	Medium	Caledonia wishes to seek funding to support expand education/awareness programs
Family Disaster Plans & Kits	Goal: Develop long-term strategies to educate residents on the hazards affecting their community Objective: Raise public awareness on hazard mitigation	All Hazards	Medium	Caledonia would like to seek funding to discuss the importance of creating a family disaster plan and kit. Disaster information will be provided to citizens through local emergency responders.
Back-up Generators	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	All Hazards	High	Some facilities have back-up generators but there is the need for generators at other critical facilities.
NOAA Weather Radios	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Some facilities are equipped with weather radios. Procuring weather radios, at a reduced cost to citizens is needed, especially for those who are not within a certain radius of warning sirens.

Table 5-9: List of Mitigation Strategies Developed at Meeting 4 for Capron

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Public Education/Awareness	Goal: Develop long-term strategies to educate Boone County residents on the hazards affecting their community Objective: Raise public awareness of hazard mitigation	All Hazards	Medium	Capron wishes to seek funding to support expand education/awareness programs

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Family Disaster Plans & Kits	Goal: Develop long-term strategies to educate residents on the hazards affecting their community Objective: Raise public awareness on hazard mitigation	All Hazards	Medium	Capron would like to seek funding to discuss the importance of creating a family disaster plan and kit. Disaster information will be provided to citizens through local emergency responders.
NOAA Weather Radios	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Some facilities are equipped with weather radios. Procuring weather radios, at a reduced cost to citizens is needed, especially for those who are not within a certain radius of warning sirens.
Mutual Aid Agreements	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Maintain mutual aid agreements among emergency aid responders throughout the county.
Emergency Alert System – Sirens	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	Medium	Apply for grants to increase the number of early warning sirens.

Table 5-10: List of Mitigation Strategies Developed at Meeting 4 for Poplar Grove

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Public Education/Awareness	Goal: Develop long-term strategies to educate Boone County residents on the hazards affecting their community Objective: Raise public awareness of hazard mitigation	All Hazards	Medium	Poplar Grove wishes to seek funding to support the County EMA and to obtain certifications for public education and training programs.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Family Disaster Plans & Kits	Goal: Develop long-term strategies to educate residents on the hazards affecting their community Objective: Raise public awareness on hazard mitigation	All Hazards	Medium	Poplar Grove would like to seek funding to discuss the importance of creating a family disaster plan and kit.
Back-up Generators	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards	All Hazards	High	Poplar Grove plans to obtain back-up generators for critical facilities within the community.
Enhanced Communication Systems	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	Hazmat	Medium	Poplar Grove wishes to seek funding to enhance the communication systems in response to hazmat incidents
Emergency Plan / Protocol for HAZMAT	Goal: Create new or revise existing plans/maps for county Objective: Review and update existing, or create new community plans and ordinances to support hazard mitigation	Hazmat	High	Poplar Grove does not have an individual Emergency Plan in response to a HAZMAT incident.
NOAA Weather Radios	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	Severe Storms / Tornado	High	Polar Grove wishes to seek funding to provide NOAA radios to community members.
Anchoring of Manufacture Homes & Exterior Attachments	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards	Tornado	Medium	Poplar Grove would like to obtain funding to harden the existing infrastructure (e.g., trailer parks) within the community.

Table 5-11: List of Mitigation Strategies Developed at Meeting 4 for Timberlane

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
NOAA Weather Radios	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Some facilities in Timberlane are equipped with weather radios. Procuring weather radios, at a reduced cost to citizens is needed, especially for those who are not within a certain radius of warning sirens.
Mutual Aid Agreements	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	High	Maintain mutual aid agreements among emergency aid responders throughout the county.
Emergency Alert System – Sirens	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	Medium	Apply for grants to increase the number of early warning sirens.
Family Disaster Plans & Kits	Goal: Develop long-term strategies to educate residents on the hazards affecting their community Objective: Raise public awareness on hazard mitigation	All Hazards	Medium	Timberlane would like to seek funding to discuss the importance of creating a family disaster plan and kit. Disaster information will be provided to citizens through local emergency responders.

Table 5-12: List of Mitigation Strategies Developed at Meeting 4 for Boone County EMA

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Public Education/Awareness	Goal: Develop long-term strategies to educate Boone County residents on the hazards affecting their community Objective: Raise public awareness of hazard mitigation	All Hazards	High	Boone County EMA wishes to seek funding to obtain certifications for public education and training programs.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Priority	Comments
Enhanced Communication Systems	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	All Hazards	Medium	Boone County EMA would like to develop a reverse 911 communications system – practically in the event of a HAZMAT incident
Family Disaster Plans & Kits	Goal: Develop long-term strategies to educate residents on the hazards affecting their community Objective: Raise public awareness on hazard mitigation	All Hazards	Medium	Boone County EMA would like to seek funding to discuss the importance of creating a family disaster plan and kit.
NOAA Weather Radios	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services	Severe Storms / Tornado	High	Boone County EMA wishes to seek funding to provide and distribute NOAA radios to community members

* Representatives from a few of the Boone County EMA suggest several mitigation items specific to the County and County EMA

The Boone County Emergency Management Agency will be the local champions for the mitigation actions. The County Commissioners and the city and town councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified actions.

5.5 Multi-Jurisdictional Mitigation Strategy

As a part of the multi-hazard mitigation planning requirements, at least two identifiable mitigation action items have been addressed for each hazard listed in the risk assessment and for each jurisdiction covered under this plan.

Each of the eight incorporated communities within and including Boone County was invited to participate in brainstorming sessions in which goals, objectives, and strategies were discussed and prioritized. Each participant in these sessions was armed with possible mitigation goals and strategies provided by FEMA, as well as information about mitigation projects discussed in neighboring communities and counties. All potential strategies and goals that arose through this process are included in this plan. The county planning team used FEMA's evaluation criteria to gauge the priority of all items. A final draft of the disaster mitigation plan was presented to all members to allow for final edits and approval of the priorities.

Section 6 Plan Maintenance

6.1 Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, the Boone County Emergency Management Agency (EMA) will reconvene the mitigation planning team to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held during 2018, to address the five-year update of this plan. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

The committee will review the county goals and objectives to determine their relevance to changing situations in the county. In addition, state and federal policies will be reviewed to ensure they are addressing current and expected conditions. The committee will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts are proceeding, and which strategies should be revised.

Updates or modifications to the MHMP during the five-year planning process will require a public notice and a meeting prior to submitting revisions to the individual jurisdictions for approval. The plan will be updated via written changes, submissions as the committee deems appropriate and necessary, and as approved by the county commissioners.

The GIS data used to prepare the plan was obtained from existing county GIS data as well as data collected as part of the planning process. This updated Hazus-MH GIS data has been returned to the county for use and maintenance in the county's system. As newer data becomes available, these updated data will be used for future risk assessments and vulnerability analyses.

6.2 Implementation through Existing Programs

The results of this plan will be incorporated into ongoing planning efforts since many of the mitigation projects identified as part of this planning process are ongoing. Boone County and its incorporated jurisdictions will update the zoning plans and ordinances listed in Table 5-3 as necessary and as part of regularly scheduled updates. Each community will be responsible for updating its own plans and ordinances.

6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by the EMA Coordinator and forwarded to the mitigation planning team for discussion. Education efforts for hazard mitigation will be ongoing through the EMA. The public will be notified of periodic planning meetings through notices in the local newspaper. Once adopted, a copy of the MHMP will be maintained in each jurisdiction and in the county EMA Office.

Acronyms

A B **C** **D** **E** **F** **G** **H** **I** J K L **M** **N** O **P** Q **R** **S** T **U** V W X Y Z

A
AEGL – Acute Exposure Guideline Levels
ALOHA – Areal Locations of Hazardous Atmospheres

C
CERI – Center for Earthquake Research and Information
CRS – Community Rating System

D
DEM – Digital Elevation Model
DFIRM – Digital Flood Insurance Rate Map
DMA – Disaster Mitigation Act of 2000

E
EMA – Emergency Management Agency
ERPG – Emergency Response Planning Guidelines

F
FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Map

G
GIS – Geographic Information System

H
Hazus-MH – Hazards USA Multi-Hazard
HMGP – Hazard Mitigation Grant Program
HUC – Hydrologic Unit Code

I
IA – Individual Assistance
IDOT - Illinois Department of Transportation
IEMA – Illinois Emergency Management Agency
IUPUI – Indiana University – Purdue University, Indianapolis

M
MHMP – Multi-Hazard Mitigation Plan
MOU – Memorandum of Understanding

N
NCDC – National Climatic Data Center
NEHRP – National Earthquake Hazards Reduction Program

NFIP – National Flood Insurance Program
NOAA – National Oceanic and Atmospheric Administration

P

PA – Public Assistance
PPM – Parts Per Million

R

RPI – Risk Priority Index

S

SIU – Southern Illinois University Carbondale
SPC – Storm Prediction Center

U

USGS – United States Geological Survey

Appendices

Appendix A. MHMP Meeting Minutes

IEMA Multi-Hazard Mitigation Plan

Assembly of the Boone County Planning Team Meeting 1
Chairman: Bob Walberg
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: 11/08/2012

Meeting Time: 10:00 AM

Place: 1212 Logan Avenue, Belvidere, Illinois 61008

Planning Team/Attendance: 15

Introduction to the Multi-Hazard Mitigation Planning Process

The meeting is called to order

Elizabeth Ellison introduced and summarized the multi-hazard mitigation planning process. She explained that this project is in response to the Disaster Mitigation Act of 2000. The project is funded by a grant awarded by FEMA. A twenty-five percent match will be required from the county to fund this project. The county match will be met by sweat equity and data acquired from the County Assessor's Office. The sweat equity will be an accumulation of time spent at the meetings, on research assignments, surveys, along with the time spent reviewing and producing the planning document.

Elizabeth introduced the multi-hazard mitigation planning website (pdmplanning.com) to the planning team, and a username and password was given to the planning team to access the site. The web site is used to schedule meetings, post contact information and download material pertaining to the planning process.

Elizabeth divided the planning project into five to six meetings. Elizabeth stated that participation is very important throughout the planning process, and each meeting is open to the public. At the 1st meeting, the planning team will review critical facility maps to verify the locations of all critical facilities in the county. At the 2nd meeting the discussion will focus on natural disasters that are relevant to this area. The SIUC Geology Department will research these hazards and present them to the planning team; the planning team will rank each hazard based on occurrence and potential level of risk. FEMA requires that Boone County publicizes the 3rd meeting encourage public participation in the planning process. At the 3rd meeting, the SIUC Geology Department will present historic accounts of natural disasters that have affected Boone County. The SIUC Geology Department will produce a risk assessment in draft form (each planning team member will get a copy), and present strategies and projects that FEMA and other counties have undertaken for the planning team to review. The 4th meeting is a brain storming session focused on mitigation strategies for disasters that the county identified as a significant risk. FEMA requires that for every identified hazard, a strategy to mitigate the loss and damage must be in place. The strategies may range from educational awareness to hardening a building or building a levee. After the 4th meeting the plan will be in its final draft form. At the 5th meeting, the planning team will review the plan prior to sending it to IEMA. IEMA will review the plan and will make recommendations for revision before the plan is sent to FEMA. Once the plan is submitted to FEMA, local governments are eligible to apply for grants to mitigate these established hazards. After FEMA approves the plan, it is sent back to the planning team. At the 6th meeting, the planning team will present the multi-hazard mitigation plan to the Boone County Board for adoption. Incorporated communities must either adopt the county plan or prepare its own plan, in order to access mitigation assistance from FEMA. The communities are encouraged to participate and contribute to development of the plan. Once the Boone County Board has adopted the plan, each incorporated community will have the opportunity to adopt the plan as well.

Elizabeth then assigned homework to individual planning team members to locate missing or incorrect critical facilities.

Lastly, Elizabeth fielded any questions from the planning team about the mitigation planning process.

Meeting was adjourned.

Meeting 1

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Boone County Sheriff	Jerry L. Ashens	JRA	Lieutenant	Jerryashens@ Boone County Sheriff.com	815-544-9322
Boone County	Bob Walberg	B.W.	Chairman, County Board	Boardchairman@ Boonecounty il.org	815-547-4770

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Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly Meeting 1

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
High School	Heather Walsh		Assistant Principal North Boone High School	hwalsh@ nbcusd.org	815-765-3311
CITY OF BELVIDERE	CLAYTON STEVENS		WARD #1 ALDERMAN	LITUNE@ COMCAST.NET	815-544-6663
BELVIDERE FIRE	DAVID WORRELL		FIRE CHIEF	BELVFIRE@AOL.com	815-378-9243
Boone County	Ken Terrinoni		County Administrator	kt boone@ boonecounty il.org	815-494 5326
Boone County	Duane L. Wirth		Sheriff	duane Wirth a Boone County Sheriff.com	815-544-9322
BOONE COUNTY	Bill Purvis		CAPTAIN Sheriff. Dep	billpurvis@Boone County Sheriff 815 544-9322	
Belvidere Fire	Ken Jaeger		Capt. Belvidere Fire	Kjaeger@ belviderefire.com	815-494 4555
BOONE CO. HIGHWAY	RICHARD LUNDIN		CO ENGINEER	boonecohwy @comcast.net	815-544-2066
Boone County Fire Dist #1	Greg Holmes		Chief	ffholmes@juno.com	815 569 2061

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Meeting 1

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
CITY OF BELVIDERE	RUTH FALKENSTEIN		DEPUTY CHIEF OF POLICE	815-504-6730 falkenstein@belvidere police.com
Boone County EMA	Brad Bartell		Coordinator	brad bartell@ boone County Sheriff.com 815-790-0669
Canoe Wick Lake Asso.	Roland Wood		Chief of Public Safety	815-765-2827 Ext. 212 RWW@CANOEWICK-LAKE.ORG
Boone County	Ellen Genrich		ERC Boone County Health	815 547-8590 egenrich@boonehealth.org

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IEMA Multi-Hazard Mitigation Plan

Assembly of the Boone County Planning Team Meeting 2
Chairman: Bob Walberg
Plan Directors: SIU Geology Department and IUPUI - Polis

Meeting Date: 04/30/2013

Meeting Time: 10:00 AM

Place: 1212 Logan Avenue, Belvidere, Illinois 61008

Planning Team/Attendance: 14

Historical Hazards, their Probability, and Hazard Ranking

Elizabeth Ellison called the meeting to order.

Elizabeth Ellison began the meeting by re-introducing the objectives of the multi-hazard mitigation plan (MHMP) document. The MHMP document is mandated as a result of the "Disaster Mitigation Act of 2000". Elizabeth stated that the objective of the meeting was to prioritize a list of disasters that are relevant to Boone County.

Elizabeth Ellison provided the planning team with a handout to direct the focus of the meeting discussion. As Elizabeth began to conduct the prioritizing process, she described the risk assessment ranking that FEMA has established, the risk priority index (RPI).

The Planning Team was then asked to assess and rank the hazards that could potentially befall Boone County using the RPI. The Boone County planning team previously established a county-wide ranking of hazards using a similar methodology to the RPI. The planning team agreed that the previously established hazard ranking was still suitable for the county, and were provided handouts for representatives from each jurisdiction to rank hazards. The identified hazards for Boone County were ranked as followed:

#1: Winter Storms
#2: Extreme Temperatures
#3: Fire
#4: Severe Thunderstorms (including wind and hail)
#5: Flood/Flash Flood
#6: Hazmat (including chemical explosion, tank leak, transportation accident)
#7: Tornado
#8: Drought
#9: Earthquake
#10: Dam Failure

Elizabeth then asked the planning team to analyze the historical disaster events plotted on a map of the county and communities therein. No corrections were noted by the planning team. The Boone County planning team identified flood, earthquake, tornado, or hazmat release scenarios they wished SIU to model for the risk assessment in the MHMP. These scenarios include:

- Tornado: Historical 4/21/1967 F4 Scenario through southern Belvidere
- Tornado: F4 Scenario through Polar Grove and Capron
- Hazmat: transportation accident on I-90 southwest of Belvidere (chlorine)
- Hazmat: building leak between Newburg Road and train tracks west of Belvidere (ammonia)
- Earthquake: Deterministic 5.5M, epicenter in center of Belvidere
- Earthquake: 5.0M, 500-year probability
- Earthquake: Wabash Valley Scenario – 7.1M
- Earthquake: New Madrid Scenario – 7.7M
- Flood – 100 year flood
- Dam Failure/Flood – will use Illinois Department of Natural Resources scenario of the dam removal of the Kishwaukee River

The planning team agreed to complete any missing information pertaining to critical facilities by the next meeting. The planning team informed SIU that Garden Prairie unincorporated from Boone County and now falls under county jurisdiction.

SIU will update the county on match documents and will check on GIS and assessor's data usage with Brad, County EMA.

SIU will provide the County with a copy of the draft risk assessment at least a week in advance to make sure that there is no sensitive information the county does not want made public.

SIU will also talk with Ellen, County Health Department about the various impact scenarios (risk assessment) that SIU will perform to see if the coincide with other planning initiatives in the county.

Meeting was adjourned.

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Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Ken Jaeger		Fire Captain	815-494-4555	kjaeger@belviderefire.com
10 miles Boone County	Richard Lundin		County Engineer	815-544-2066	boonecohwy@comcast.net
15 miles Boone County	Greg Holmes	GH	Fire Chief, District #1	815-569-2061	ffholmes@juno.com
Boone County	Jerry Ashens	JA	Lieutenant, County Sheriff Dept	815-544-9322	jerryashens@boonecountysheriff.com
Boone County	Bob Walberg		County Board Chairman	815-547-4770	boardchairman@boonecountyil.org
30 MILES SWEDISH AMERICAN	STEVEN KIRSCHBAUM	SKK	EMS EDUCATOR	815 489-6085	SKIRSCHBAUM@SWEDISHAMERICAN.ORG
BOONE CO.	PERRY GAY	PG	LIEUTENANT BOONE CO. SHERIFF	815 547-5122	PERRYGAY@BOONECOUNTYSHERIFF.COM
BOONE CO	BILL PURVIS	BP	CAPTAIN BOONE CO. SHERIFF	815-547 5028	billpurvis@boonecountysheriff.com
Boone Co	Duane Wirth	DW	Sheriff Boone Co Sheriff	815-544 9322	duanewirth@boonecountysheriff.com
1 Belvidere	BRENT ANDERSON	BA	Belvidere DPW	815-547-9256	banderson@ci.belvidere.il.us

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Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Butch Falkenstein		Deputy Chief of Police	815-509-6730	falkenstein@belviderepolice.com
Boone County	Brad Bartell	BB	EMA Coordinator	815-790-0669	bradbartell@boonecountysheriff.com
Candlewick Lake Association	Roland Wood		Chief of Public Safety	815-765-2827 (x212)	rww@candlewick-lake.org
0 Boone County	Ellen Genrich	EG	ERC; Boone County Health	815-547-8590	egenrich@boonehealth.org
Poplar Grove	Heather Walsh		Assistant Principal, North Boone High School	815-765-3311	hwalsh@nbcusd.org
5 miles Belvidere	Clayton Stevens	CS	Ward #1, Alderman (?)	815-544-6163	lhune@comcast.net
5 miles Belvidere	David Worrell	DW	Fire Chief	815-378-9243	belvfire@aol.com
Boone County	Ken Terrinoni		County Administrator	815-494-5326	ktboone@boonecountyil.org
Boone County	Duane Wirth		Sheriff	815-544-9322	duanewirth@boonecountysheriff.com
Boone County	Bill Purvis		Captain, County Sheriff Dept.	815-544-9322	billpurivs@boonecountysheriff.com

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Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Boone County EMA	Brad Bartell	BB	Coordinator BC EMA		
Boone County Sheriff	Jerry L. Ashews	JLA	Lieutenant Boone County Sheriff's Dept.		

IEMA Multi-Hazard Mitigation Plan

Assembly of the Boone County Planning Team Meeting 3:
Chairman: Bob Walberg
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: 07/09/2013

Meeting Time: 10:00 AM

Place: 1212 Logan Avenue, Belvidere, Illinois 61008

Planning Team/Attendance: 11

Public Meeting and the County Risk Assessment

The meeting was called to order.

Elizabeth Ellison opened the meeting with an overview of the planning process and the roles of SIUC and the Polis Center. She went on to explain the topics and objectives of the current meeting. Elizabeth first presented the planning team with the list of hazards that the team previously ranked by their level of risk from the previous meeting. She also presented a power point presentation of the history of Boone County's past disasters. This included covering each hazard that the county identified as a significant risk, the history of each disaster, and the mitigation strategies for each disaster. She defined mitigation as the act of avoidance and preparedness.

A draft of chapter 4 of the Boone County Multi-Hazard Mitigation Plan and a copy of Mitigation Ideas, produced by FEMA in January 2013, were given to each of the planning team members for review. Elizabeth explained the contents of the booklet and that each of the planning team members should return to meeting 4 with at least two mitigation strategies for each of the hazards identified by the planning team.

Elizabeth then asked the audience for questions or comment. After some discussion about the plan and how it would affect the community and its residents, she thanked those who came and a closed the presentation.

Meeting was adjourned.

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Belvidere	Butch Falkenstein		Deputy Chief of Police	815-509-6730 falkenstein@belviderepolice.com
Boone County	Brad Bartell	BB	EMA Coordinator	815-790-0669 bradbartell@booneconuntysheriff.com
Candlewick Lake Association	Roland Wood		Chief of Public Safety	815-765-2827 (x212) rww@candlewick-lake.org
Boone County	Ellen Genrich		ERC; Boone County Health	815-547-8590 egenrich@boonehealth.org
Poplar Grove	Heather Walsh		Assistant Principal, North Boone High School	815-765-3311 hwalsh@nbcusd.org
Belvidere	Clayton Stevens		Ward #1, Alderman (?)	815-544-6163 lhune@comcast.net
Belvidere	David Worrell	DW	Fire Chief	815-378-9243 belvfire@aol.com
Boone County	Ken Terrinoni		County Administrator	815-494-5326 ktboone@boonecountyil.org
Boone County	Duane Wirth		Sheriff	815-544-9322 duanewirth@boonecountysheriff.com
Boone County	Bill Purvis		Captain, County Sheriff Dept.	815-544-9322 billpurvis@boonecountysheriff.com

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Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Ken Jaeger		Fire Captain	815-494-4555	kjaeger@belviderefire.com
Boone County	Richard Lundin		County Engineer	815-544-2066	boonecohwy@comcast.net
Boone County	Greg Holmes	GAH	Fire Chief, District #1	815-569-2061	ffholmes@juno.com
Boone County	Jerry Ashens		Lieutenant, County Sheriff Dept	815-544-9322	jerryashens@boonecountysheriff.com
Boone County	Bob Walberg	B.W.	County Board Chairman	815-547-4770	boardchairman@boonecountyil.org
Swedish American	Steven Kirschbaum		EMS Educator	815-489-6085	skirschbaum@swedishamerican.org
Boone County	Perry Gay		Lieutenant at Boone County Sheriff's Dept.	815-547-5122	perrygay@boonecountysheriff.com
Belvidere	Brent Anderson		Belvidere DPW	815-544-9256	bandersoneci.belvidere.il.us
"	Danny Anderson	DA	"	"	" " "
HRFD	Ramona Lake	RGL	Lt / MEDIC	8156237827	HRFD RGALDONLake@gmail.com

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IEMA Multi-Hazard Mitigation Plan

Assembly of the Boone County Planning Team Meeting 3 Redo:
Plan Directors: SIUC Geology Department and IUPUI - Polis

Meeting Date: 03/25/2014

Meeting Time: 5:00 PM

Place: 1212 Logan Avenue, Belvidere, Illinois 61008

Planning Team/Attendance: 11

Public Meeting and the County Risk Assessment

The meeting was called to order.

Prof. Nicholas Pinter opened the meeting with an overview of the planning process and the roles of SIUC and the Polis Center. He went on to explain the topics and objectives of the current meeting. Prof. Pinter first presented the list of hazards that the planning team ranked by their level of risk from an earlier meeting. Next, he covered the history of Boone County's past disasters. This included covering each hazard that the county identified as a significant risk, the history of each disaster, and potential mitigation strategies for each disaster. Finally, Prof. Pinter presented the results of the risk assessment.

Prof. Pinter then asked the audience for questions or comment. After some discussion about the current status of the plan, it was determined that the Fire Hazard needs to be reevaluated. The planning team will meet one more time to discuss the implications of removing/keeping Fire on the list of Ranked Hazards. In addition, corrections to essential facility names and locations were addressed. Amanda Damptz will make the necessary changes to the plan and asked that any additional revisions be sent via email before the end of March.

Meeting was adjourned.

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Belvidere	Butch Falkenstein		Deputy Chief of Police	815-509-6730 falkenstein@belviderepolice.com
Boone County	Brad Bartell		EMA Coordinator	815-790-0669 bradbartell@boonecountysheriff.com
Candlewick Lake Association	Roland Wood		Chief of Public Safety	815-765-2827 (x212) rww@candlewick-lake.org
Boone County	Ellen Genrich	EG	ERC; Boone County Health	815-547-8590 egenrich@boonehealth.org
Poplar Grove	Heather Walsh		Assistant Principal, North Boone High School	815-765-3311 hwalsh@nbcusd.org
Belvidere	Clayton Stevens	C.S.	Ward #1, Alderman	815-544-6163 lhume@comcast.net
Belvidere	David Worrell	DW	Fire Chief	815-378-9243 belvfire@aol.com
Boone County	Ken Terrinoni		County Administrator	815-494-5326 ktboone@boonecountyil.org
Boone County	Duane Wirth		Sheriff	815-544-9322 duanewirth@boonecountysheriff.com
Boone County	Bill Purvis		Captain, County Sheriff Dept.	815-544-9322 billpurvis@boonecountysheriff.com

Boone County – Meeting 3 redo – March 25, 2014 Page 1

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Boone County	Mike Lowe		EMA Volunteer	815-520-4022	Mike1205@live.com
Boone County	Cindy Lowe		EMA Volunteer	815-979-1066	Waterpolo02@comcast.net
Boone County	Robert Gieseche		EMA Volunteer	815-262-6317	N9kux@yahoo.com
Boone County	Rodney Kamptranz		EMA Volunteer	815-236-4028	rkamptranz@yahoo.com
Boone County	Pat Sabel		EMA Volunteer	815-222-2972	tbearkeeper@yahoo.com
Boone County	Robby Paulsen		EMA Volunteer	815-895-6058	Ema-cert.gsar.teamlearder@msn.com
Boone County	Jan Hinz		EMA Volunteer	815-544-4644	Janhinz3@aol.com
Boone County	Joseph Moore		EMA Volunteer	608-208-0630	Joseph.moore@comcast.net
Boone County	Jason Swanson		Boone Fire Dist #1 Captain	815-703-7607	jswanson@belviderefire.com
Boone County	Paul Cassidy		EMA Volunteer	815-895-6058	Pr47mc@gmail.com
* Boone County	Fred Celletti	FC	Assist. Emergency Manager	815-621-2334	f.celletti@comcast.net

Boone County – Meeting 3 redo – March 25, 2014 Page 3

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Ken Jaeger		Fire Captain	815-494-4555	kjaeger@belviderefire.com
Boone County	Richard Lundin		County Engineer	815-544-2066	boonecohwy@comcast.net
Boone County	Greg Holmes		Fire Chief, District #1	815-569-2061	ffholmes@juno.com
Boone County	Jerry Ashens		Lieutenant, County Sheriff Dept	815-544-9322	jerryashens@boonecountysheriff.com
Boone County	Bob Walberg		County Board Chairman	815-547-4770	boardchairman@boonecountyil.org
Swedish American	Steven Kirschbaum		EMS Educator	815-489-6085	skirschbaum@swedishamerican.org
Boone County	Perry Gay	PG	Lieutenant at Boone County Sheriff's Dept.	815-547-5122	perrygay@boonecountysheriff.com
Belvidere	Brent Anderson		Belvidere DPW	815-544-9256	bandersoneci@belvidere.il.us
Belvidere	Danny Anderson		Belvidere DPW	815-544-9256	dandersonneci@belvidere.il.us
HRFD	Ramona Lake		Lt/Medic	815-823-7867	hrfdrsaldonilake@gmail.com
EMA	Vill Marsh		EMA Volunteer	630-967-8530	Dagit80@gmail.com

Boone County – Meeting 3 redo – March 25, 2014 Page 2

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Brent Anderson		Public Works Director		
County Highway	Rich Lundin		County Engineer		
Health Department	Ellen Genrich		Emergency Response Coordinator		
BCFD#1	Greg Holmes	GH	Chief		ffhomes@Juno.com
Belvidere Fire	Ken Jaeger		Captain		KJaeger@Belviderefire.com
Boone Co.	JOANNE BAKER		EMA Volunteer		baktrus 14@gmail.com baktrus 14 ✓
Boone Co.	MARY Cooper		CPIM $150.00/HR		mcooper[illegible]@gmail.com ✓
	LULAINE DRAKE		OFFICE MANAGER		ldrake@booneecountyil.org
	Lee Revels		Boone County LEPC Chair General Mills		lee.Revels@genmills.com

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Popular Grove / Caledonia	Pamela Cangelosi		Volunteer in Police Service (VIPS)	815-765-9595	pamgiese@netzero.com
Popular Grove / Caledonia	Joseph Cangelosi		Volunteer in Police Service (VIPS)	815-765-9595	N/A
Belvidere	Mark Pollock	MP	Deputy Chief of Police	815-547-5528	Pollock@belviderepolice.com
Belvidere	James DeCoto		Driver / Mechanic	815-243-8778	jamesdecoto@gmail.com
Belvidere	Susan Simon		EMA Volunteer	815-547-5670	mdse@foxvalley.net
Boone County	Jerry L Ashens		Lieutenant/ Boone Co. Sheriff		
Boone County	Perry Gay		Lieutenant/ Boone Co. Sheriff		
Belvidere Fire	David Worrell		Fire Chief		
Boone County	Ken Terrinoni		County Administrator		
Boone County	Duane Wirth		Sheriff		
Boone County	Bill Purvis		Captain Sheriff's Office		

IEMA Multi-Hazard Mitigation Plan

Assembly of the Boone County Planning Team Meeting 4:
Plan Directors: SIU Geology Department and IUPUI – Polis

Meeting Date: January 21,2014

Meeting Time: 6:00 PM

Place: Boone County Administration Building – 1212 Logan Ave, Belvidere, IL, 61008

Planning Team/Attendance: 22 – Sheets Attached

Determining Hazard Mitigation Strategies

The meeting was called to order.

Prof. Nicholas Pinter began by introducing Amanda Damptz, the new Project Manager for Boone County's Multi Hazard Mitigation Plan, and explained the change in personal at Southern Illinois University. Amanda Damptz covered the basics of Hazard Mitigation planning and what has been done up to date for any new planning team members. She explained that this meeting would cover mitigation strategies that the planning team believed would prevent or eliminate the loss of life and property. She explained that the planning team should not make any reservations in the form of money or resources when developing this list. Amanda directed the planning team to be specific about the location or focus area of a strategy whenever possible. The planning team listed at least two new or current on-going mitigation strategies for each hazard addressed in the plan. The planning team then prioritized mitigation actions. A rating of high, medium, or low was assessed for each mitigation item.

Amanda Damptz thanked everyone for attending the meeting and stated that if the planning team members needed extra mitigation strategy handbooks that they were available upon request.

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Butch Falkenstein		Deputy Chief of Police	815-509-6730	falkenstein@belvidierepolice.com
Boone County	Brad Bartell	BB	EMA Coordinator	815-790-0669	bradbartell@boonecountysheriff.com
Candlewick Lake Association	Roland Wood		Chief of Public Safety	815-765-2827 (x212)	rww@candlewick-lake.org
Boone County	Ellen Genrich		ERC; Boone County Health	815-547-8590	egenrich@boonehealth.org
Poplar Grove	Heather Walsh		Assistant Principal, North Boone High School	815-765-3311	hwalsh@nbcusd.org
Belvidere	Clayton Stevens		Ward #1, Alderman	815-544-6163	lhune@comcast.net
Belvidere	David Worrell		Fire Chief	815-378-9243	belvfire@aol.com
Boone County	Ken Terrinoni		County Administrator	815-494-5326	ktboone@boonecountyil.org
Boone County	Duane Wirth		Sheriff	815-544-9322	duanewirth@boonecountysheriff.com
Boone County	Bill Purvis		Captain, County Sheriff Dept.	815-544-9322	billpurvis@boonecountysheriff.com

Boone County - Meeting 4 – January 21, 2014 Page 1

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
EMA	Mike Lowe		Sales associate	815-520-4022	Mike1205@live.com
EMA	Cindy Lowe		Warehouse Worker	815 974-1066	waterpolo02@comcast.net
EMA	Robert Giesecke		AEROSPACE ENGINEER	815 262 6317	N9KUX@yahoo.com
EMA	Rodney Kampfeare		Team Lead WATER RESCUE Mech. Maint	815 2364028	rkampfeare@yahoo.com
EMA	Pat Sabel		Asst. mgr	815-202-2972	tbearkeeper@yahoo.com
Boone Co. EMA	Robby Paulsen		Technical Assy	815-895-6058	ema-certgser.teamleader@msn.com
Boone EMA	Jan Hinz		general public volunteer	815-544 4644	janhinz3@aol.com
Belvidere Fire	David Worrell		CHIEF	815 544-2242	BELVFIRE@AOL.Com
EMA	Joseph Moore		Engineering Manager ~~Volunteer~~	608 208 0630	joseph.moore@comcast.net
Boone Fire Dist #1	Jason Swanson		Capt	815 703-7607	jswanson@belvidere fire.com
Boone Co EMA	Paul Cassidy		MEDICAL RESPONSE TEAM LEADER	815 895 6058	PR47MEC@GMAIL.com

Boone County – Meeting 4 – January 21, 2014 Page 3

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Belvidere	Ken Jaeger		Fire Captain	815-494-4555	kjaeger@belviderefire.com
Boone County	Richard Lundin		County Engineer	815-544-2066	boonecohwy@comcast.net
Boone County	Greg Holmes		Fire Chief, District #1	815-569-2061	ffholmes@juno.com
Boone County	Jerry Ashens		Lieutenant, County Sheriff Dept	815-544-9322	jerryashens@boonecountysheriff.com
Boone County	Bob Walberg		County Board Chairman	815-547-4770	boardchairman@boonecountyil.org
Swedish American	Steven Kirschbaum		EMS Educator	815-489-6085	skirschbaum@swedishamerican.org
Boone County	Perry Gay		Lieutenant at Boone County Sheriff's Dept.	815-547-5122	perrygay@boonecountysheriff.com
Belvidere	Brent Anderson		Belvidere DPW	815-544-9256	bandersoneci@belvidere.il.us
Belvidere	Danny Anderson		Belvidere DPW	815-544-9256	dandersonneci@belvidere.il.us
HRFD	Ramona Lake		Lt/Medic	815-823-7867	hrfdrsaldonilake@gmail.com
EMA	Vik Marsh		MASTER Copier technician	630-967-8530	dragit80@gmail.com

Boone County – Meeting 4 – January 21, 2014 Page 2

Multi-Hazard Mitigation Planning Meeting Attendance

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)		
Boone Co.	Fred Cellini	FCL	Assist. Eng. Manager	815 621-2334	F.Cellini@comcast.net	
Poplar Grove / Boone Co.	Caledonia Pamela Cangelosi	PC	VIDS - CERT - Vol Retired	815-765-9595	pamgiese@netzero.com	Vol
Poplar Grove / Boone Co	Caledonia Joseph J. Cangelosi	JC	VIDS/CERT - Vol. Retired	815 765-9595	X	Vol.
Boone Co	Ken Terrinoni	KT	County Administrator	815 494 5326	ktboone@boonecounty.il.org	
Belvidere	Mark Pollock	MP	Deputy Chief of Police	815 547-5528	pollock@belvidere police, com	
Boone / Belvidere Fire Chief	James DeCoto	J.D	Driver/mechanic	(815) 243-8778	jamesdecoto@gmail.com	
Boone	Perry Gay	PG	Lieutenant / Boone County Sheriff	815 509-3598	PERRYGAY@BOONECOUNTYSHERIFF.com	
Boone	Bob Walberg	BW	Chairman, Boone Co.	815 670-1170	BOARDCHAIRMAN@BooneCountyIL.ORG	
Belvidere Township / Boone	Susan Simon	SS	Retired	815-547-5670	mdse@fox valley.net	✓

Boone County – Meeting 4 – January 21, 2014 Page 4

IEMA Multi-Hazard Mitigation Plan

Assembly of the Boone County Planning Team Meeting 5

Meeting Date: March 12, 2014

Place: Boone County Fire District #2 Station

Planning Team/Attendance: 11 – Sheets Attached

MHMP Draft Review

The planning team met on March 12 at the Boone County Fire District #2 station to review the draft plan and propose revisions. All of the participants have been forwarded an electronic copy for review prior to the meeting. During this review many corrections were noted and the proper departments and agencies would research and get the corrected information to the Emergency Management office so it can be sent to SIU.

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly

3-12-14

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Boone County Sheriff's Office	Terry C. Bates	TCB	Lieutenant Boone County Sheriff's Office	
Boone Co. Sheriff	Roger Gray	RG	Lieutenant/Boone Co Sheriff	
Fire District	David Wheretell	DW	Fire Chief	
Boone County	Ken Terrinoni	KT	Emergency Mgmt Coordinator County Administrator	
Boone County	Wayne E. Dodd	WED	Sheriff	
Boone County Sheriff	Bill Turnis	WT	Captain Boone County Sheriff's Office	
Boone Utilities	Brent Anderson	BA	Boone Utilities Director	

Page

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly

3-12-14

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Co. Hwy	Rich Lundin		Co. Engr/Boone Co.		
Health Dept	Ellen Genrich		Emergency Response Coordinator		
BCFD #1	Greg Holmes		chief	ffholmes@juno.com	
Belvidere Fire	Ken Jaeger		Capt.	KJaeger@belviderefire.com	

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Boone County Emergency Management
Hazard Mitigation Plan Meeting

Date 1/13/2014

The meeting was called to order by Coordinator Bartell at the Belvidere Township Building

Discussion topic: Hazard Mitigation Plan

An explanation of the plan as a whole and what role Emergency Management Responders play in the preparation of said plan.

An overview of historic Disasters and the achievements, failures and changes that should be discussed or incorporated into the plan

The Mitigation Strategy Survey Items or classifications were discussed and what agencies should take the lead role.

Discussion of how this differs from the County EOP.

Discussion on how often the plan should be updated

An invitation to the meeting on January 21st was given to all.

It was decided that a follow up meeting with Emergency Management would be held on February 10th for further discussion.

Meeting adjourned

Boone County EMA Response / Event Sign-In Sheet

- [ ] Air Wagon
- [ ] Medical
- [ ] Weather
- [ ] C.E.R.T.
- [ ] SAR
- [ ] VRC
- [x] C.E.R.T. / EMA
- [ ] Security
- [ ] Communications
- [ ] Water Rescue

Date / Time of call 1/8/14 - 1800
Response Type M + C
Location Township.

Requesting Agency

Notes:

Name (last, first)	Contact Number	Location (if other then scene)	Time In	Time Out
TRED CELLETTI			1630	2000
Cindy Howe			17.25	
Mike Howe			17.25	
JOE NAEGE			5:35	
Jan Hinz			5:35	
Pat Sabel			5:40	
Robert Giesecke			17:40	
Joseph Moore			17:45	
Pam Cangelosi			1745	
JOE Cangelosi			17:45	
PAUL OASSIDY			1745	
Nik Marsil			1745	
Vicki Massel			17:45	
James DeCato	(815) 243-8775		17.45	
BOBBY PAUL			1745	
Michelle Dyson			1755	
DAVID HASCELL			17:30	
DENISE HASCELL			17:30	
Frankie Perez			17:55	
Susan Simon			17:55	
Diane E Reed			17:55	2000

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Boone County EMA Response / Event Sign-In Sheet

- [ ] Air Wagon
- [ ] Medical
- [ ] Weather
- [ ] C.E.R.T.
- [ ] SAR
- [ ] VRC
- [x] C.E.R.T. / EMA
- [ ] Security
- [ ] Communications
- [ ] Water Rescue

Date / Time of call 1/13/14 1800
Response Type M+G
Location Township

Requesting Agency

Notes:

Name (last, first)	Contact Number	Location (If other then scene)	Time In	Time Out
Gerry Reed			17:55	2000
Rowley Kimy Hall			17:55	
Judy Rie			17:55	
Judy Lifka Nelson			1800	
Dawn Fisher-Perre			1800	2000

Page 2 OF 2

Boone County Emergency Management
Hazard Mitigation Planning Meeting

Date 1/23/2014

The meeting was called to order by Chairman Walberg

Topics discussed were Mitigation Strategies and participation regarding the County match as in kind participation.

It was decided as a group that more participation from First Responders would help in both bringing more and new ideas to the table and also improve participation.

Mitigation Strategies were discussed and work began on Command Staff filling out the Mitigation Strategy survey.

A meeting was scheduled for the week of January 20th date to be decided early in the week.

The meeting was adjourned .

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly 1/23/14

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Boone County EMA	Brad Burtell	BB	Emergency Management Coordinator	bradburtell@boonecountyillinois.com 815-547-1215
Boone County	Bob Walberg	BW	Chairman	Boone Chairman@boonecounty.il.gov
Boone County	Terry L. Atkins	TLA	Lieutenant	Terry.Atkins@boonecounty.il.gov 815-544-8322
Boone County	Perry Gray	PG	Lieutenant	Perry.Gray@boonecountysheriff.com 815-544-9322
Boone County	Bill Jorns	BJ	Captain	billjorns@boonecountysheriff.com
Boone County	Mike Wirth	MW	Sheriff	mike.wirth@boonecountysheriff.com 815-544-9322
Boone County	Ken Terrinoni	KT	County Administrator	815-544-5326 ktboone@boonecounty.il.org

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Boone County Emergency Management
Hazard Mitigation Plan Meeting

Date 1/23/2014

Discussion topic: Hazard Mitigation Plan and In-Kind Match

On January 23rd a meeting was held to discuss the Hazard Mitigation Plan and how to proceed with the in-kind match. Meeting attendees included representatives of the Boone County Board of Commissioners.

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly 1-Mr

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
1.23 Boone County	BOB WALBERG	BW.	Chairman Boone County	
1.23 Boone County	Ken Terrinoni	KT	County Administrator	
1.23 Boone County	Brad Fidler	BF	Chair, Public Safety committee	

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Boone County Emergency Management Hazard Mitigation Plan

January 29th 2014 0900-1200

On January 29th a meeting was held to complete the Hazard Mitigation Strategy Worksheet and discuss further action needed to complete this portion of the planning process.

10 attended representing the following jurisdictions:

Belvidere

Capron

Caledonia

Poplar Grove

Timberlane

It was decided that further meetings with the County Engineer and Building Inspector would be necessary.

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly 1-29-14

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
NB Dist #3	RAY MORSE		Trustee President	815 877-9321
NORTH BOONE #3	JOHN RAGLAND		ASST. CHIEF	815-509-9982
North Boone #3	Gail Worley		Chief	815-703-5063
Sonoma Rescue	Dan Costner		Trustee President	815-243-3018
CAPRON RESCUE	DENNIS AHRENS		CHIEF	815-347-4292
Boone Co. SHERIFF	Perry Gay		LIEUTENANT	815 509-3598
Boone Co.	BOB WALBERG		CHAIRMAN	815-670-1170
Boone County	Ken Terrinoni		County Administrator	815-494-5326
Boone county #1	Greg Holmes		Chief BCFD #1	Holmes@Jcrad.com 815 398 2534
Belvidere Police	[illegible]		Deputy Chief Police	Rojeck@belvidereplice.com 815-547-5518

Brad,

I held a meeting with the North Boone School District administrative leadership on January 31st, 2014 in which the elements of the proposed Hazard Mitigation plan were discussed. The meeting lasted approximately one hour.

Thanks,

Ken Terrinoni
Boone County Administrator

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly Meeting January 31, 2014 12:00 - 1:00 pm

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Boone County	Ken Terrinoni	KT	County Administrator	kterrinoni@boonecounty.org
NBCUSD200	Steve Bowles	SB	Superintendent	815-765-3322
NBCUSD	Kristi Crawford	KC	Principal/Poplar Grove Elementary	kcrawford@nbcusd.org 815-765-3113
NBCUSD	Lindsay Abbadutto	LA	Principal NBHS/NBMS	labbadutto@NBCUSD.org 815-765-9274

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Boone County Hazard Mitigation Plan

Minutes for meetings held for the Hazard Mitigation plan

On 02/07/14 a meeting was held with the Belvidere Fire Department's Hazardous Materials Response Team members and the discussion of the Hazardous Materials release areas and scenarios that are listed and discussed in the Draft plan and at planning meetings was plausible. It was discussed that a possible drill could be formulated from this information and possibly should start thinking of future preplans using like information with both the County and Local Emergency Responders.

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly 2-7-14 2 hr

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Belv. Fire	Brian A. Hagesson	BAH	Lt. 1550	bhagesson@belviderefire.com 815-703-7303
Belvidere Fire	Nicolas Thornton	NT	FF/PM Belvidere Fire	n-thornton@belvidaerfire.com 815-544-2242
Boone EMA	Brad Bartell	BB	Coordinator	

Page 1

5/5

Boone County Hazard Mitigation Plan

Minutes for meetings held for the Hazard Mitigation plan

On 02/10/14 a meeting was held to inform the County Emergency Management Agency of the Plan and what is needed to move forward to complete, additional meetings that will be held and the roll that they will play in providing information to make the plan as up to date as possible.

On 02/10/14 an additional meeting was held to inform the County Board's Public Safety Committee of where we stand in the completion and where we stand with the matching funds or in kind match. The questions were asked of what different agencies or groups should be invited to any additional meetings so we can get as much participation as possible.

5/5

Boone County EMA Response / Event Sign-In Sheet

☐ Air Wagon ☐ Medical ☐ Weather ☐ C.E.R.T. ☐ SAR ☐ VRC ☒ C.E.R.T. / EMA ☐ Security ☐ Communications ☐ Water Rescue

Date / Time of call 2/10/14
Response Type monthly mtg
Location Health Dept

Requesting Agency

Notes: Discussion on Hazard Mitigation Plan

Name (last, first)	Contact Number	Location (if other then scene)	Time In	Time Out
FRED CELLETTI			1600	19:30
TERI FOUST			17:00	
TOM BARLOW			1735	
Jain Hinz			17:40	
JOE NAESE			17:40	
Mike Lowe			17:40	
Cindy Lowe			17:40	
PAUL CASSIDY			1740	
BOBBY PAULSEN			1740	
R. Gieseke			17:50	
PAT SABEL			17:50	
Joseph Moore			17:50	
Michelle Dyson			17:50	
Chris Kampfrantz			18:00	
RODNEY KAMPFRANTZ			18:00	
DAVE HASKELL			17:30	
DENISE HASKELL			17:30	
JAMES FERRINO			1731	
James ReCofo			16:22	
Diane E. Reed			17:55	
Gerry Reed			17:55	
FRANKIE PEREZ			19:40	
Susan Simon			18:10	

Page 1 OF 2

5/5

Boone County EMA Response / Event Sign-In Sheet

- [ ] Air Wagon
- [ ] Medical
- [ ] Weather
- [ ] C.E.R.T.
- [ ] SAR
- [ ] VRC
- [ ] C.E.R.T. / EMA
- [ ] Security
- [ ] Communications
- [ ] Water Rescue

Date / Time of call 2/10/14
Response Type
Location

Requesting Agency

Notes: Discussion on Hazard Mitigation Plan

Name (last, first)	Contact Number	Location (If other then scene)	Time In	Time Out
Jim Nelson	815-790-3256		17:00	19:30
Brad Bartell			16:00	19:30

Page 2 OF 2

5/5

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly

Public Safety
02/10/14

1 HR

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Boone County	Ken Terinoni	KT	Co. Administrator	ktboone@boonecounty.mo.gov
Boone County	Chris Brenner	CB	Boone County Dist. 3	cbrenner@boonecounty.mo.gov
Boone County	Brad Fidler	BF	Boone County Board	bfidler@boonecounty.mo.gov
Boone County Sheriff's Dept.	Terry L. Ashers	TLA	Lieutenant	
Boone Co.	Craig Wand	CW	Boone Co. Board	mikecathwand@cs.com
Boone Co.	[illegible]	[illegible]	Boone Co. Board	MS Threadready47
Boone Co.	Craig A. Schultz	CAS	Boone Co. Board	cschultz@gmail.com
Boone Co.	John K. Hare	JKH	Boone Co. Jail	cubsinsf22@yahoo.com
Public	Pat Ken	PJ	Public	pmkenn@boonecountysheriff.com
Boone Co	William Pierson	WP	Boone Co Board	bcpierson@yahoo.com
Boone Co	Bob Walberg	Blw	Chairman, County Board	815-544-5115

Page

Boone County Emergency Management Hazard Mitigation Plan

February 20th 2014

Meeting Minutes for the Hazard Mitigation Plan;

On February 20th a meeting was held from 08:30 to 10:30 at the Boone County PSB for the 911 board and funding opportunities or avenues were discussed. It was noted that by being part of the planning team for the Hazard Mitigation Plan could in the future possibly open up such an opportunity. The need for enhanced communications for all of the Counties Departments was discussed and agreed upon that new funding opportunities should be looked into and all agreed that the participation in the planning team would be beneficial.

A meeting was held at Boone County Fire District #2 to inform responders of the plan and the roll the Fire Department should have in creating it. The need for Hazmat Training and Equipment was discussed and also the roll we would play in Severe Weather, Floods and Disasters.

MEETING SIGN-UP ROSTER 5/

Boone County Fire Dist #2 DATE: 2/20/14

Hazard Mitigation Plan Meeting 7:00 PM - 9:00 PM

1. BRAD HEISER
2. [illegible]
3. Pat Kurent
4. [illegible]
5. Kirk Gritzmacher
6. Bob [illegible]
7. Brent Bryan
8. [illegible]
9. [illegible]
10. Michael Heuer
11. Don THUNBERG
12. TOM [illegible]
13. Don Kowalsky
14. Javier Garcia
15. [illegible]
16. Cedam [illegible]
17. Brad Bartell
18.
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36.

Multi-Hazard Mitigation Planning Meeting Attendance 2-20-2014

Please print clearly 911 Board

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)	
Boone Co EMA	Brad Bartell		Coordinator		
Belvidere Police	MARK POLLOCK		Deputy Chief		
BOONE CO. SHERIFF	PERRY GAY		LIEUTENANT		
Boone Co Treasurer	Curtis Newport		County Treasurer		
Chairman	PAUL MOSES		Chairman		
Village of Garden	Owen Costa		Trustee	owen@flashnet.com	
Boone Co 911/Dispatch	Teresa Nyman		Dispatcher/ Trainer	Teresanyman@boonecountysheriff.com	
BCFPD#1	Greg Holmes		Chief	ffholmes@juno.com	

Page

Boone County Hazard Mitigation Plan

Minutes for meetings held for the Hazard Mitigation plan

On 03/10/14 at the County Board's Public Safety Committee an update was given on the plan and match funds. Meeting dates were given for both the 03/25 and the 03/12 review of the draft plan. An explanation of what is needed to complete the plan and the participation it will take.

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly

3-10-14

1-Hour

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)		
BCSO.	Wayne E. Wells	WEW	Sheriff			
BCSO	John K. Hare	JKH	Lt. Corrections			
Boone Cnty	Ken Terrinoni	KT	Co. Administrator	Kterrinoni@boonecounty.il.org		
Boone County	Chris Brewer	CB	Board Dist 3			
Boone Co.	Brad Fidler	BF	Board Dist 1	bradfidler@boonecounty.org		
Boone Co.	Cathy Ward	CW	Board District 2	mikecathyward@cs.com		
Boone Co.	Mike Kelly	MK	Board District #3	mkelly@boonecounty.org		
Boone Co.	Craig A. Gaertner	CAG	Town Board #3			
	Bill Pysson	WP				
Boone Co.	Bob Walberg	BW	Chairman			
Boone Co Emg Mgt	Brad Bartell	BB	Coordinator			

Page

Boone County Hazard Mitigation Plan

On March 12th a City County Coordination meeting was held at the Boone County Administration Campus. The Counties Hazard Mitigation Plan was discussed and a Draft Plan was looked over for corrections. This meeting was one hour in length. Sign in sheet labeled City County Coordinating Meeting. Attendance sheet Ken Terrioni, Daniel Snow, James Campbell, Craig Schultz, Ron Wait, Bill Pysen, Tom Ratcliff, Denny Ellingson, Brad Fider, Clayton Stevens and Bob Walberg. All are either County Board Members or City Council Members.

City County Coordinating Committee March 12, 2014

Multi-Hazard Mitigation Planning Meeting Attendance

Please print clearly

Jurisdiction Name	Print Name	Initial	Job Title/Company	Contact Information (e-mail address and/or phone number)
Boone County	Ken Terrioni	KT	County Administrator	
Belvidere city	Daniel Snow	DPS	Alderman, ward 2	
Belvidere	James Campbell	JC	Alderman, ward #5	8
Boone County	Craig A. Schultz	CAS	County Board Dist #3	815-985-3519
Boone County	Ron Wait	RW	" " " 2	815-547-7000
Boone County	Bill Pysen	WP	" " 1	815 544-5[illegible]
Boone County	Tom Ratcliff	TR	Alderman Water 3	815-262-7793
Boone County	Denny Ellingson	DE	County Board member	815-703-5461
Boone Co	Brad Fider	BF	County B #1	815-566-2115
City of Belvidere	Clayton Stevens	CS	Alderman Ward #1	815-544-0163
Boone Co	Bob Walberg	BW	Chairman Boone C.	

Page

Meeting Minutes for the March 27th Planning Team

A review of the Plan and corrections took place.

A change in the order of potential disasters and or the ranking was made final spelling and positions or titles.

Some final items were discussed to be added pertaining to ordinances and personnel employed. This will be completed and sent to SIU by Friday the 4th.

3-27-14

NAME	AGENCY
Ellen Genrich	Boone Co. Health Dept
PERRY GAY	BOONE CO. SHERIFF'S OFFICE
Ken Jaeger	Belvidere Fire
DAVID WORRELL	BELVIDERE FIRE
Greg Holmes	Boone County #1
MARK BLACK	Belvidere Police Dept.

Appendix B. Local Newspaper Articles

12 Jan. 17th., 2014 The Boone County Journal 815-544-4430 *In Our 18th Year* www.boonecountyjournal.com

Events continued from page...11

favorite scissors, pencil, ruler, chalk to mark dark fabrics, needle, and white or off-white thread. And, of course, bring your favorite dish to pass! The potluck, which will begin between 11:30 a.m. and noon on the cutting day, is a highlight of the Heritage Quilters' social year! Group president Jan Knight will divulge most of the details that day at the musuem. But she did say the blue and tan traditional quilt will feature two different blocks, one more than a century old. The finished quilt will be raffled off, with proceeds benefiting the nonprofit McHenry County Historical Society. This program, which began in 1980, will result in a quilt this spring. It should be ready to hang in March.

Eighty blocks are needed, so if you quilt - or would like to learn how - circle this date on your calendar. Attendees will receive templates and fabric packets - plus plenty of detailed instruction – regardless whether they choose to sew by hand or using a machine. As in the past, quilt blocks are due back to the museum in mid-February. Learn more about the Heritage Quilters at www.gothistory.org.

Goodwill Industries of Northern Illinois is operating its free income tax preparation and filing sites for the fifth year in a row. The GoodTAXES program will begin on February 1st and continue through April 12th, 2014. The sites will be located at the Goodwill Mission Services Center, 615 N. Longwood Street in Rockford and also in the Goodwill Machesney Park store, 8010 N. Second Street. Goodwill will also have a mobile site that will travel to several locations in the Northern Illinois region. The GoodTAXES sites offer free tax assistance to families with income less than $50,000 and individuals with income less than $25,000. Our Volunteer Tax Assistors also assist community members in claiming any special credits and deductions for which they may be eligible. Last year, the GoodTAXES sites served 2,087 individuals and returned over $2.1 million to communities. Additionally, the program saved participants over $368,800 in tax preparation fees. Goodwill

provide including the Community Resource Room. RSVP to Mary by Feb. 7th. 815-965-6745 x124 or mwabel@easterseals chicago.org

The VFW All You Can Eat Breakfast will be January 26th from 8am-11am. Biscuits & Gravy, Pancakes, Ham, 2 kinds of Sausage, Eggs made to order, coffee, Juice and Milk. $7 for adults and Kids under 12 are only $4. VFW Post 1461, 1310 W. Lincoln, Ave., Belvidere, IL.

Boone County Emergency Management Public Meeting on Boone County Multi-Hazard Mitigation Plan. The Boone County Multi-Hazard Mitigation Steering Committee will host a public information and strategy planning session at 6:00 p.m. on January 21st at Boone County Administration Building 1212 Logan Ave. Through a grant, Boone County EMA has formed an alliance with Southern Illinois University Carbondale (SIU) and the Polis Center of Indiana University-Purdue University Indianapolis (IUPUI) to identify potential natural hazards and to produce a mitigation Plan (MHMP), which will seek to identify potential natural hazards for Boone County, and then establish mitigation measures that are intended to reduce or eliminate the negative impact that a particular hazard may have on the locality.

Bridge Repairs continued from page...11

The estimated cost for the first item could total $350,000. The second item could cost $270,000. The third need identified could cost $240,000 and the final item of repair could cost $200,000. The firm also provided the city with an estimate of the potential cost to replace the concrete deck and overlay that they believe could have another 15 years of life expectancy. The estimated cost to replace the concrete deck could total at or above $1.2 million, if done today. The firm reported that the scope of the full bridge deck replacement could qualify for federal aid funding.

Mr. Anderson went through the report from the civil engineering firm and explained that the first item listed is the most critical. All four of

As many of you will remember The Boone County Journal lost a dear friend and co-worker, Richelle Kingsbury on June 14th, 2013 suddenly. There will be a team walking in the "American Heart Association Heart Walk" in her Memory.

American Heart Association. My Heart. My Life.

May 3rd, 2014

is the walk date

If you are interested in joining the walk in her memory or would like to donate, please give Dena Roethler a call 815-217-1344

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815.547.7111 880 Belvidere Road, Logan Square, Belvidere, IL www.goldsilverjewelrycoin.com

Appendix C. Adopting Resolutions

Resolution #_____

ADOPTING THE BOONE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, Boone County recognizes the threat that natural hazards pose to people and property; and

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

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, Boone County participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that Boone County hereby adopts the Boone County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Boone County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2014.

_____
County Board Chairman

_____
County Board Member

_____
County Board Member

_____
County Board Member

_____
County Board Member

_____
Attested by: County Clerk

Resolution #_____

ADOPTING THE BOONE COUNTY MULTI-HAZARD MITIGATION PLAN

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

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

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the City of Belvidere participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the City of Belvidere hereby adopts the Boone County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Boone County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2014.

_____
City Board Chairman

_____
City Board Member

_____
City Board Member

_____
City Board Member

_____
City Board Member

_____
Attested by: City Clerk

Resolution #_____

ADOPTING THE BOONE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Caledonia recognizes the threat that natural hazards pose to people and property; and

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

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Caledonia participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Caledonia hereby adopts the Boone County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Boone County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2014.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE BOONE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Capron recognizes the threat that natural hazards pose to people and property; and

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

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Capron participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Capron hereby adopts the Boone County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Boone County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2014.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE BOONE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Poplar Grove recognizes the threat that natural hazards pose to people and property; and

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

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Poplar Grove participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Poplar Grove hereby adopts the Boone County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Boone County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2014.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Resolution #_____

ADOPTING THE BOONE COUNTY MULTI-HAZARD MITIGATION PLAN

WHEREAS, the Village of Timberlane recognizes the threat that natural hazards pose to people and property; and

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

WHEREAS, an adopted multi-hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

WHERAS, the Village of Timberlane participated jointly in the planning process with the other local units of government within the County to prepare a Multi-Hazard Mitigation Plan;

NOW, THEREFORE, BE IT RESOLVED, that the Village of Timberlane hereby adopts the Boone County Multi-Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED that the Boone County Emergency Management Agency will submit on behalf of the participating municipalities the adopted Multi-Hazard Mitigation Plan to the Illinois Department of Homeland Security and the Federal Emergency Management Agency for final review and approval.

ADOPTED THIS _____ Day of _____, 2014.

_____
Village President

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Village Council Member

_____
Attested by: Village Clerk

Appendix D. Historical Hazards Map

See Attached Large-Format Map

Appendix E. List of Critical Facilities

Not all data is available for every facility. Other facility specifics may be available upon request.

Structure Type	Facility Name	Address	City	Replacement Cost *(in $1000)*	Comments *(depends on the facility as to how the comments are structured)*	Owner
Airport	Bob Walberg Field Airport	12000 Russellville Rd	Belvidere			
Airport	Compass Rose Airport	1819 Rockton Rd	Caledonia			
Airport	Henderson Airport		Belvidere			
Airport	Lee Creek Airport	21355 Grade School Rd	Caledonia			
Airport	Marys Landing Airport	17940 Burr Oak Rd	Capron			
Airport	McCurdy Strip	1912 Krupke Rd	Caledonia			
Airport	Munch Heliport	1844 County Line Rd				
Airport	Pine Hill Airport	21543 Capron Rd	Capron			
Airport	Poplar Grove Airport	11619 Illinois 76	Poplar Grove	10651		
Airport	Sd Aero		Capron			
Airport	Untied Acres Airport	5158 Spring Center Rd	Belvidere			
Dam	Belvidere Dam				Kishwaukee River	Illinois Department of Natural Resources
Dam	Candlewick Lake Dam				Trib Beaver Creek	Candlewick Lake Association
Emergency Operations Center	Boone County Sheriff's Office	615 N Main St	Belvidere		EOC in Basement	
Fire Station	Belvidere Fire Department	123 S State St	Belvidere			
Fire Station	Belvidere Fire Department	353 E 6th St	Belvidere			
Fire Station	Boone County Fire District 2	1777 Henry Luckow Ln	Belvidere			
Fire Station	Boone County Fire District 2	10944 Us Route 20	Garden Prairie			

Structure Type	Facility Name	Address	City	Replacement Cost *(in $1000)*	Comments *(depends on the facility as to how the comments are structured)*	Owner
Fire Station	Boone County Fire Protection District 1	105 W Ogden St	Capron			
Fire Station	North Boone Fire District 3	305 W Grove	Poplar Grove			
Fire Station	North Boone Fire District 3	2428 Main St	Caledonia			
Government	Belvidere City Hall	401 Whitney Blvd	Belvidere			
Government	Boone County Administration Campus	1212 Logan Ave	Belvidere			
Medical Care	Crusader Community Health Belvidere	1050 Logan Ave	Belvidere		Family Practice, Pediatrics, Dental, Podiatry, Medication Resource Center	
Medical Care	OSF Medical Group	143 Kishwaukee Street	Belvidere		Family Medicine	
Medical Care	OSF Medical Group Poplar Grove	13539 Illinois Route 76	Poplar Grove		Family Medicine – Geriatric Medicine	
Medical Care	Physicians Immediate Care	1663 Belvidere Rd	Belvidere		Walk-in Injury and Illness Center	
Medical Care	Rockford Health Physicians	1669 Belvidere Road	Belvidere		Primary care services	
Medical Care	Shappert Health Center	2170 Pearl Street	Belvidere		Acute and chronic care for all ages	
Medical Care	SwedishAmerican Medical Center of Belvidere	1625 S. State St.	Belvidere		SwedishAmerican Medical Hospital System; 24-Hour Emergency Physicians, inpatient unit	
Medical Care	SwedishAmerican Medical Group	1700 Henry Luckow Lane	Belvidere		Clinic (primary care services, specialty care services and ancillary services)	
Police Station	Boone County Sheriff's Office	615 N Main St.	Belvidere	1544		
School	Belvidere Central Middle School	8787 Beloit Rd	Belvidere	22283		
School	Belvidere High School	1500 East Ave	Belvidere	64458		
School	Belvidere North High School	9393 Beloit Rd	Belvidere			

Structure Type	Facility Name	Address	City	Replacement Cost *(in $1000)*	Comments *(depends on the facility as to how the comments are structured)*	Owner
School	Belvidere South Middle School	919 E 6th St.	Belvidere	23229		
School	Boone County Center	1320 E Avenue	Belvidere	528		
School	Caledonia Elementary School	2311 Randolph	Caledonia	15363		
School	Camelot School	7133 Garden Prairie	Garden Prairie	5320		
School	Capron Elementary School	200 N Wooster St.	Capron	2666		
School	Immanuel Lutheran School	1045 Belvidere Rd	Belvidere	4262		
School	Lincoln Elementary School	1011 Bonus Ave	Belvidere	13350		
School	Manchester Elementary School	3501 Blaine Rd	Poplar Grove	2605		
School	Meehan Elementary School	1401 E 6th St.	Belvidere	13059		
School	North Boone High School	17823 Poplar Grove	Poplar Grove	7845		
School	North Boone Middle School	17641 Poplar Grove	Poplar Grove	3790		
School	North Boone Upper Elementary School	6200 N Boone School Rd	Poplar Grove	3509		
School	Perry Elementary School	633 W Perry St.	Belvidere	4202		
School	Poplar Grove Elementary School	208 N State St.	Poplar Grove	2543		
School	Regional Learning Center Ark	620 Logan Ave	Belvidere	2116		
School	Seth Whitman Elementary School	8989 Beloit Rd	Belvidere			
School	St. James Catholic School	320 Logan Avenue	Belvidere	1976		
School	Washington Academy School	1031 5th Ave	Belvidere	23571		

Structure Type	Facility Name	Address	City	Replacement Cost *(in $1000)*	Comments *(depends on the facility as to how the comments are structured)*	Owner
Waste Water	Belvidere Sewage Treatment Plant	2001 Newburg Road	Belvidere			
Waste Water	Capron Sewage Treatment Plant	415 South Wooster Street	Capron			
Waste Water	Poplar Grove Sewage Treatment Plant	Edson Road	Poplar Grove			
Hazardous Materials	Capron Mfg. Co.	200 N. Burr Oak Rd.	Capron		Nickel	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		"1,2,4-Trimethylbenz	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Benzene	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Certain Glycol Ether	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Ethylbenzene	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Ethylene Glycol	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Manganese Compounds	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Methanol	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Methyl Ethyl Ketone	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Methyl Tert-Butyl Et	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Nickel Compounds	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Nitrate Compounds	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Sodium Nitrite	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Toluene	

Structure Type	Facility Name	Address	City	Replacement Cost *(in $1000)*	Comments *(depends on the facility as to how the comments are structured)*	Owner
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Xylene (Mixed Isomer	
Hazardous Materials	Chrysler Corp. Belvidere Assembly	3000 W. Chrysler Dr.	Belvidere		Zinc Compounds	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Certain Glycol Ether	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Chromium Compounds	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Cyanide Compounds	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Nickel Compounds	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Nitrate Compounds	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Nitric Acid	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Sodium Nitrite	
Hazardous Materials	Deveco Corp.	424 Fairview Ave.	Belvidere		Zinc Compounds	
Hazardous Materials	FPM/Ipsen Heat Treating	666 U.S. Rte. 20	Cherry Valley		Ammonia	
Hazardous Materials	Taptite Products - Automotive	826 E. Madison St.	Belvidere		Ammonia	
Hazardous Materials	Taptite Products - Automotive	826 E. Madison St.	Belvidere		Chromium	
Hazardous Materials	Taptite Products - Automotive	826 E. Madison St.	Belvidere		Nitric Acid	
Hazardous Materials	U.S. Chrome Corp. of Illinois	305 Herbert Rd.	Kingston		Chromium Compounds	
Hazardous Materials	U.S. Chrome Corp. of Illinois	305 Herbert Rd.	Kingston		Nitrate Compounds	
Hazardous Materials	U.S. Chrome Corp. of Illinois	305 Herbert Rd.	Kingston		Nitric Acid	

Structure Type	**Facility Name**	**Address**	**City**	**Replacement Cost** *(in $1000)*	**Comments** *(depends on the facility as to how the comments are structured)*	**Owner**
Hazardous Materials	U.S. Chrome Corp. of Illinois	305 Herbert Rd.	Kingston		Zinc Compounds	
Natural Gas	Natural Gas Pipe Line Company Of America	Bloods Point And Stone Quarry	Belvidere			

Appendix F. Critical Facilities Map

See Attached Large-Format Map