White County, Illinois Multi-Hazard Mitigation Plan

A 2017 Update of the 2009 Countywide MHMP

FEMA

IEMA
ILLINOIS EMERGENCY MANAGEMENT AGENCY

GWRPC

SIU
Southern Illinois University
CARBONDALE

Multi-Hazard Mitigation Plan

White County, Illinois

Adoption Date: -- _____ --

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White County Board

Wes Trout, County Board Chairman
Don Puckett, Vice Chairman
David Dosher
Ronald McAnulty
Ken Usery

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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 a 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. The Illinois Emergency Management Agency (IEMA) has determined that Hazus-MH should play a critical role in the risk assessments performed in Illinois.

White County completed their first Multi-Hazard Mitigation Plan in 2009. Throughout the five-year planning cycle, the White County Emergency Management Agency and Mitigation Planning Team reconvened to monitor, evaluate, and update the plan on an annual basis. The Natural Hazards Research and Mitigation Group at Southern Illinois University Carbondale (SIU), Greater Wabash Regional Planning Commission (GWRPC) and White County have joined efforts in updating the County's first mitigation plan. The update process addressed changes in the probability and impact of specific hazards to the county, as well as changes in land-use, population, and demographics. The plan incorporates detailed GIS and Hazus-MH Level 2 analyses to improve the risk assessment, and finally revised and updated mitigation strategies. This document hereby serves as White County's Multi-Hazard Mitigation Plan update.

Section 2. Planning Process

2.1 Timeline

The MHMP update process is broken into a series of four meetings. These meetings were organized by SIU, GWRPC and hosted by the White County Emergency Management Agency. At these meetings, various tasks were completed by SIU, GWRPC, and the White County Mitigation Planning Team.

Meeting 1: Introduction of the MHMP process and organize resources. SIU gathered local resources that contributed to the detailed county risk assessment and presented the county's historical hazards. Based on this information, the Planning Team identified natural hazards to include in the plan, and ranked hazards by potential damages and occurrences.

Meeting 2: SIU presented the draft risk assessment, derived from the Hazus-MH and GIS modeling of the identified disasters, to the Planning Team. The general public was invited to this meeting through a series of newspaper articles and/or radio spots. At the end of the meeting, SIU encouraged the general public to ask questions and provide input to the planning process, fulfilling one of FEMA's requirements for public input.

Meeting 3: This meeting also consisted of a "brainstorming session." The Planning Team lent 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. At this meeting, SIU and GWRPC presented options for funding implementation of different mitigation strategies, including a written guide to be distributed to all participants.

Meeting 4: The Planning Team reviewed the draft plan and, proposed revisions, and accepted the plan after SIU incorporated the necessary changes. Subsequently, SIU forwarded the county MHMP to the mitigation staff at the Illinois Emergency Management Agency (IEMA) for review prior to submitting it to FEMA.

2.2 Jurisdiction Participation Information

Approximately fourteen jurisdictions participated in the development of this MHMP with the intent of formally adopting the plan and subsequently fulfill the requirements of the DMA 2000. Various representatives from each jurisdictions were present at the meetings (see Section 2.3 Planning Team Information). Each jurisdiction falls under the one of the following categories: County, City, Village, Town, School, or Non-Profit Organization.

Participating Jurisdictions

White County	Grayville	Carmi-White CUSD #5
Carmi	Mill Shoals	Grayville CUSD #1
Crossville	Norris City	Norris-City-Omaha-Enfield CUSD #3
Enfield	Springerton	Wayne-White Counties Electric Co-Op
Phillipstown		Wabash Ohio Valley Special Education District

2.3 Planning Team Information

Ken Pryor, White County EMA Coordinator, heads the Planning Team. The Planning Team includes representatives from various county departments, municipalities, and public and private utilities. Members of the Planning Team have a common vested interest in the County's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. All members of the Planning Team actively participated in the meetings, reviewed and provided comments on the draft plan, participated in the public input process and the county's formal adoption of the plan.

White County Planning Team Members

Jurisdiction	Name	Title
White County	Jim Totten	EMA Coordinator
	David Dosher	Board Member
	Brian Ray	County Engineer
	Doug Maier	Sheriff
Carmi	Jeff Pollard	Mayor
	Sandra Irvine	Administrator; Director Economic Development
	Mike Buckman	Public Works Supervisor
	James Renshaw	Floodplain Manager
	Larry Hite	ESDA
	Randal Questelle	Safety Director
	Jason Carter	Chief of Police
Enfield	Tom Harbour	Village President
Grayville	David Jordan	Commissioner
	Joe Bisch	Mayor
Norris City	Roy Kissel	Village President
Phillipstown	Stan Maurer	Village President
Grayville CUSD #1	Sarah Emery	Superintendent
Norris-City-Omaha-Enfield CUSD #3	Matt Vollman	Superintendent
Wayne-White Counties Electric Co-Op	Chris Hopfinger	System Engineer
Little Wabash Fire Department	Rob Spencer	Fire Chief
University of Illinois Extension	Courtney Yost	Community Educator
Dillman Services Inc.	Gary Dillman	Business Owner
Wabash & Ohio Valley Special Education	David Kaytor	Superintendent

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

The first MHMP update meeting was held in Carmi, Illinois on November 20th, 2014. Representatives from SIU explained the rationale behind the MHMP update process and answered questions from the participants. SIU representatives also provided an overview of GIS/Hazus-MH, described the timeline and the process of mitigation planning.

Planning Meetings

MEETING 1	Nov 20th, 2014 & Feb 26th, 2015
MEETING 2	*March 9th, 2016*
MEETING 3	*Oct 12th, 2016*

The White County Planning Team assembled for three formal meetings and one informal meeting. Each meeting was approximately two hours in length. Additional meetings were held outside of the four meetings. Appendix A includes the minutes for all meetings. 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 for the future, and assisted with preparation of the public participation information.

2.4 Public Involvement

The White County EMA solicited public input throughout the planning process and a public meeting was held on March 9, 2016 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 MHMP development process.

2.5 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.

Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Title/Organization
Ken Pryor	Crawford County	EMA Coordinator
Debbie Judge	Edwards County	EMA Coordinator
Jess Angle	Lawrence County	EMA Coordinator
Gerald Brooks	Wabash County	EMA Coordinator
Jeff Jake	Wayne County	EMA Coordinator

2.6 Review of Technical Documents

The White County Planning Team identified technical documents from key agencies to assist in the planning process. These documents includes 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. The following technical data, reports, and studies were utilized:

- Federal Emergency Management Agency
  - *Developing the Mitigation Plan (April 2003)*
  - *Mitigation Ideas (January 2003)*
  - *Local Mitigation Planning Handbook*
  - *Flood Insurance Study (February 2012)*
- United State Census Bureau
  - *County Profile Information*
  - *2010 Census Data*
  - *American Community Survey (2009-2013)*
- United States Department of Transportation
  - *PHMSA Hazardous Materials Incident Data*
- United States Geological Survey
  - *Earthquake Data*
- United States Army Corps of Engineers
  - *National Inventory of Dams*
  - *National Levee Database*
- NOAA National Climatic Data Center
  - *Climate Data*
- NOAA / National Water Service Storm Prediction Center
  - *Severe Weather Data*
- Illinois Emergency Management Agency
  - *2013 Illinois Natural Hazard Mitigation Plan*
  - *Hazardous Materials Incident Reports*
- Illinois Environmental Protection Agency
  - *2014 303d Listed Waters and Watershed Maps*
- Illinois State Water Survey
  - *Climate Data*
- Illinois Department of Natural Resources
  - *Repetitive Loss Data*
  - *Dam and Levee Data*
- Illinois State Geological Survey
  - *Geologic Data*
- White County
  - *2013 Assessment Records*
  - *2013 Countywide GIS Parcel Database*
  - *2009 Multi-Hazard Mitigation Plan*

2.7 Adoption by Local Government

Upon IEMA and FEMA approval, the Planning Team presented and recommended the plan to the County Board for formal adoption. The plan was formally adopted by the White County Board on <adoption date>. The Planning Team worked with the County and its jurisdictions to ensure all parties formally adopted the plan. Appendix C contains the Adopting Resolutions for each participating jurisdiction.

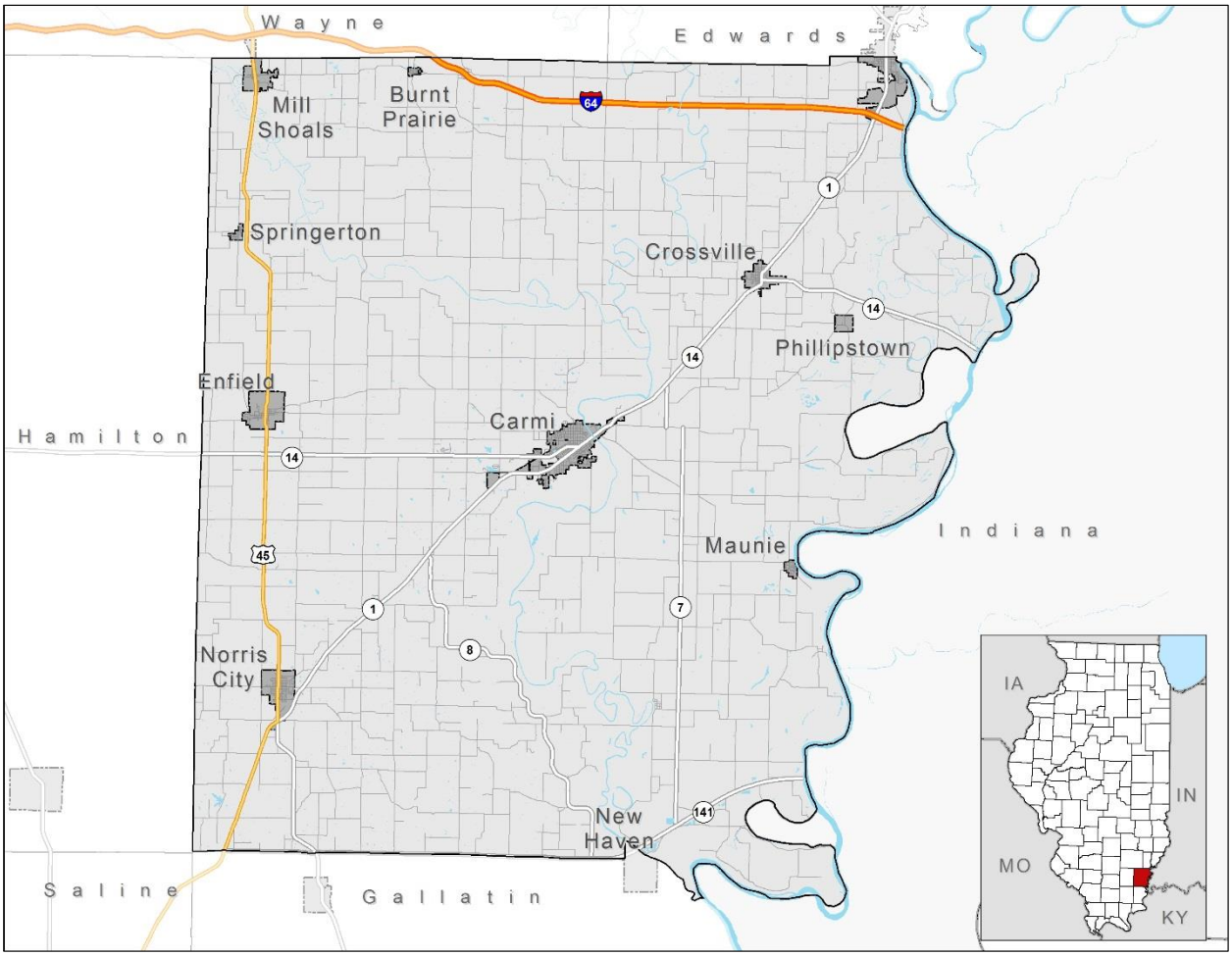
Section 3. County Profile

3.1 County Background

White County was named after Captain Leonard White, a Gallatin County legislator who is credited with the idea of extending the Illinois-Wisconsin border a few miles north of the southern tip of Lake Michigan. Carmi, the county seat, was founded in 1814 and incorporated in 1816. The second half of the nineteenth century saw the establishment of the towns of Grayville, Norris City, Springerton, Mill Shoals, Epworth, Herald, Burnt Prairie, Crossville, Phillipstown, Concord, Maunie, and Rising Sun.

White County is located in the heart of southern Illinois (Figure 3-1). It is bounded on the north by Wayne and Edwards Counties, on the south by Gallatin County, on the west by Hamiliton County, on the east by the Wabash River. Its relation to major urban areas are as follows: 193 miles west-southwest of Indianapolis, Indiana; 194 miles south-southeast of Springfield, Illinois; 292 miles south of Chicago, Illinois. The major cities and villiages in White County includes Burnt Prairie, Carmi, Crossville, Enfield, Grayville, Maunie, Mill Shoals, New Haven, Norris City, Phillipstown, and Springerton.

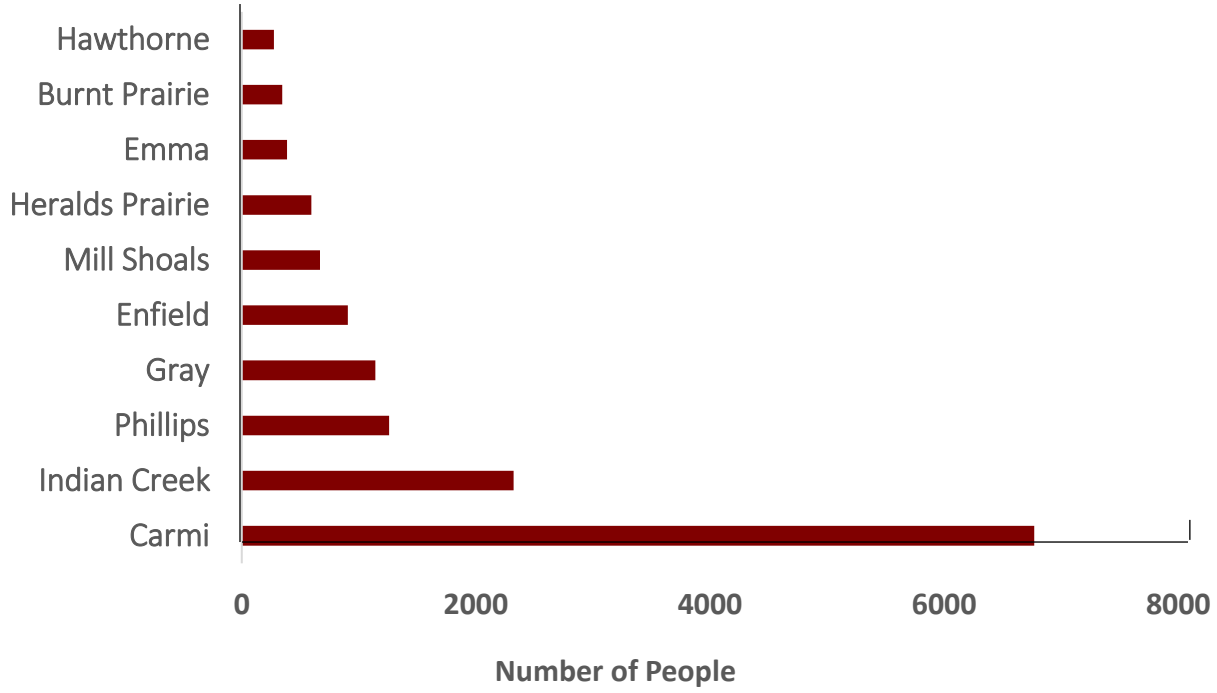
Figure 3-1. White County and Surrounding Region



3.2 Demographics

White County's population has experienced a slight decline in total population over the past three decades. According to the U.S. Census Bureau, White County's 2014 population estimate is 14,374, a decrease of -2.0% from 2010. The population is spread throughout ten townships: Burnt Prairie, Carmi, Emma, Enfield, Gray, Hawthorne, Heralds Prairie, Indian Creek, Mill Shoals, and Phillips. Figure 3-2 displays the breakdown of population by precinct from the 2010 Census.

Figure 3-2. White County 2010 Population by Precinct



3.3 Economy and Industry

The diversified White County workforce is spread across agriculture, forestry, construction, manufacturing, retail, healthcare and social assistance, hospitality, education, and transportation. Table 3-1 lists the top employers and the approximate number of employees in White County. The majority of the labor force is in Carmi but many citizens work in the factories of Evansville or Mt. Vernon, Indiana, located 45 and 25 miles to the east, respectively. Interstate 64 running east and west through the county, provides a major travel route for business. Oil and agriculture continues to be mainstays in the White County system, but underground coal mining has also taken off south of Carmi. Besides oil and agriculture, industries include auto parts manufacturing, plastics, and convenience store distribution centers. The 2013 annual per capita income in the county is $25,375, compared to an Illinois average of $29,666.

Table 3-1. White County's Major Employers

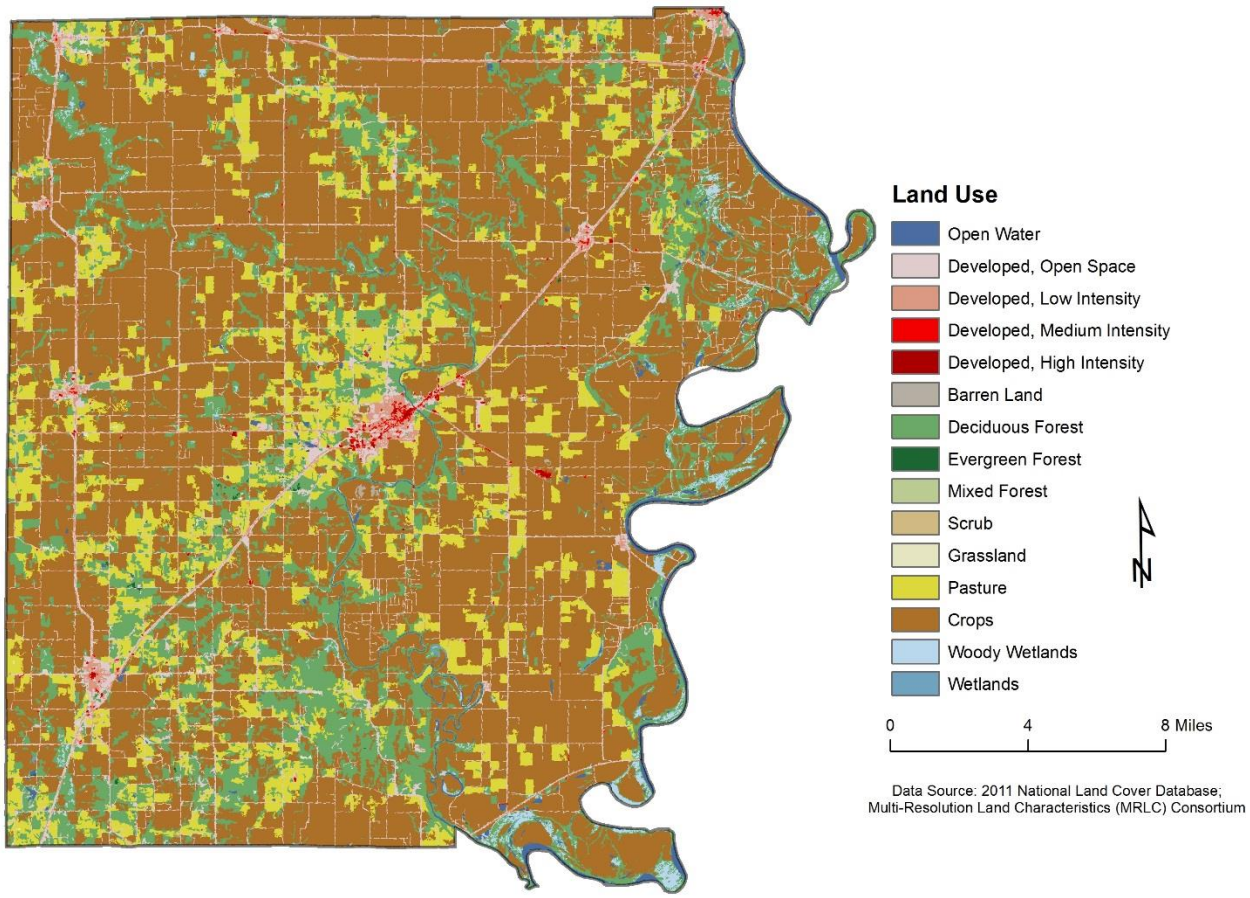
Employer	Industry	Approximate Number of Employees
Wal-Mart Super Center	Retail	200
Wabash Valley Service Company	Agriculture	180
Wabash Christian Retirement	Nursing & Convalescent Homes	175
Wabash and Ohio Valley Special Education District	Education	150
Les Wilson Inc. Drilling and Services Company	Oil and Gas Field Services	140

Source: Connect SI Foundation, Inc.

3.4 Land Use and Development Trends

Today, agriculture is the predominant land cover in the county. Figure 3-3 displays the current land use in White County. Corn is the primary crop, followed by soybeans, winter wheat, and hay. In recent years, residential developments tend to focus along Illinois Routes 1 and 14, particularly within the city limits of Carmi. Residential land use has had few significant developments within the county at this time. The largest community within the county is the city of Carmi (5,240), according to the U.S. Census 2014 population estimates.

Figure 3-3. Land Use in White County



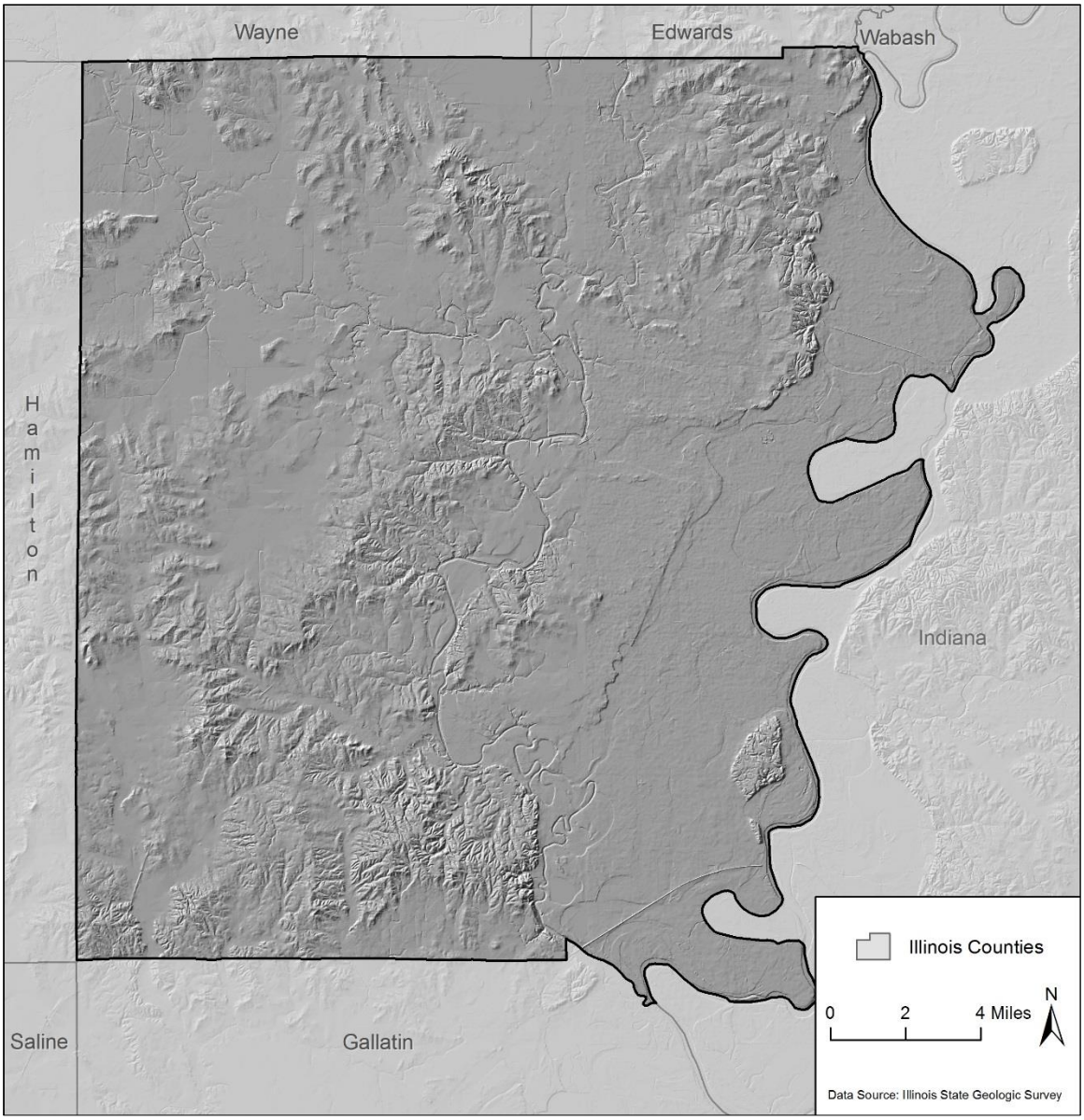
3.5 Climate

White County climate is typical of Southern Illinois and generally characterized by hot dry summers and cool wet winters. The variables of temperatures, precipitation, and snowfall can vary greatly from one year to the next. The average annual temperature for White County is 54.9 degrees Fahrenheit (°F), which is higher than the Illinois average of 51.37°F. The coldest average temperatures are in January, and the warmest average temperatures are in July. White County's average annual total precipitation is 42.58 inches, which includes an average annual snowfall of 13.1 inches.

3.6 Topography

White County is located in the Mount Vernon Hill Country physiographic sub-division of the Till Plains Section. Figure 3-4 depicts the terrain within White County. The topography consists of upland plains, terraces, lake plains, and floodplains which are the result of the action of continental glaciers in the recent geologic past and the preglacial bedrock surface. Most of the gently rolling uplands are bedrock controlled and have a mantle of Illinoian glacial till and loess. Terraces formed when the deposition of Wisconsin-aged outwash dammed river valleys creating lakes. These lakes then were filled with sediments and became lake plains. The uplands are in all areas of the county except for the southeastern part between the Little Wabash and Wabash River where the terraces are found. The lake plains surround the terraces, and the floodplains are adjacent to the rivers and streams. The widest floodplains are along the Wabash River. Elevation in the county varies from slightly more than 580 feet above sea level to approximately 340 feet above sea level.

Figure 3-4. Physiographic Divisions of White County and Surrounding Terrain

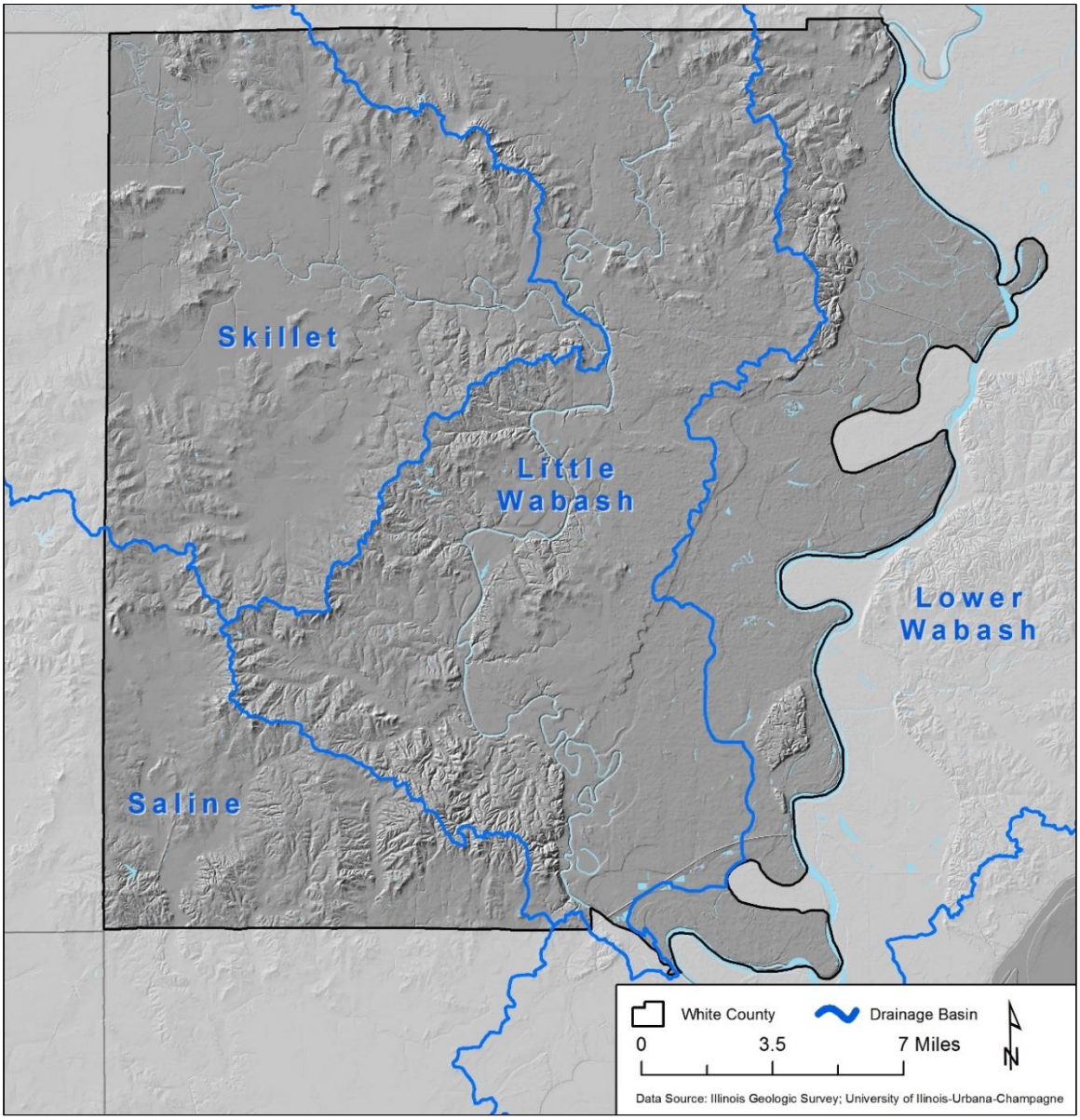


3.7 Major Lakes, Rivers, and Watersheds

Of the 102 Illinois Counties, White County ranks as number 60 in terms of most open water acreage in Illinois. 5,943 acres are covered by lakes, rivers and streams. Figure 3-5 depicts the major drainage basins in White County. White County lies on the dividing ridge between four eight-digit Hydrologic Unit Code (HUC) Watersheds: Skillet, Saline, Little Wabash and Lower Wabash.

There are several major rivers in White County: Wabash River, Little Wabash River, Skillet Fork River and Saline River. There are no significant lakes in White County.

Figure 3-5. Major drainage basins in White 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 a 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. This risk assessment consists of three components—hazard identification, vulnerability assessment, and risk analysis.

4.1 Hazard Identification

4.1.1 Existing Plans

The Planning Team identified technical documents from key agencies to assist in the planning process and incorporated the natural hazard mitigation elements from previous 2009 White County Multi-Hazard Mitigation Planning efforts. Several other documents were used to profile historical hazards and guide the Planning Team during the hazard ranking exercise. Section 2-6 contains a complete list of the technical documents utilized to develop this plan.

4.1.2 National Hazard Records

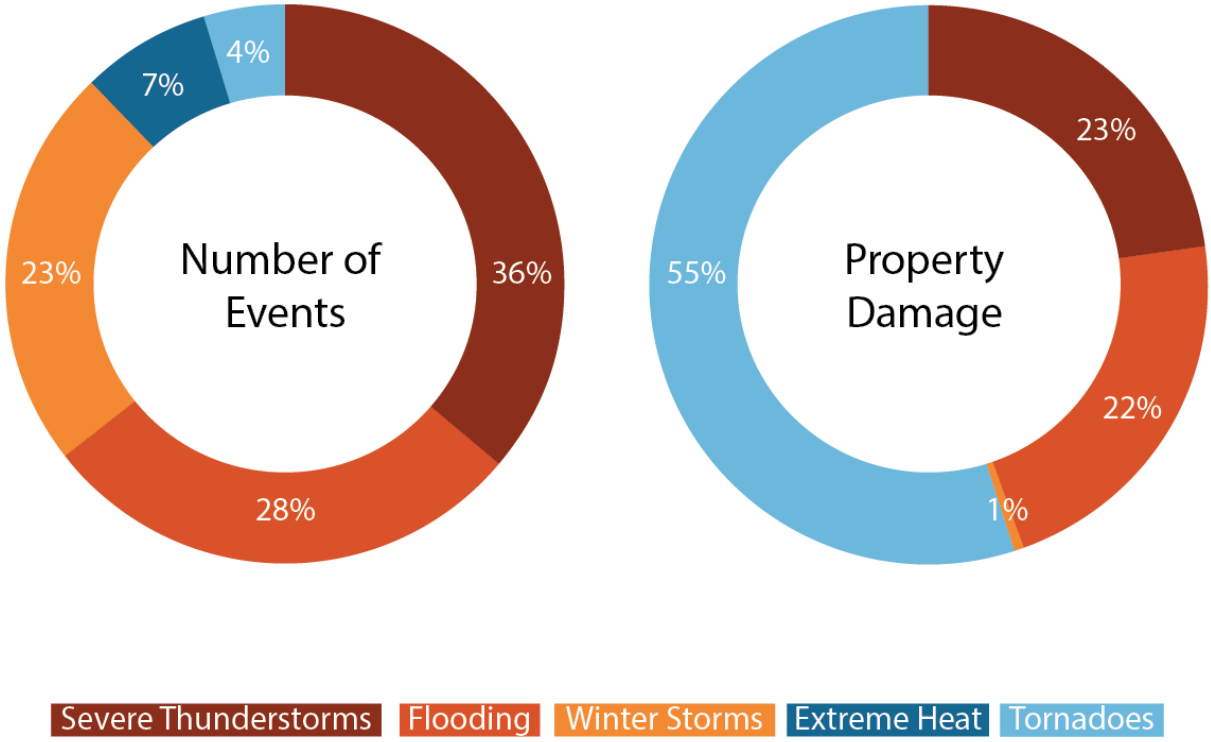
To assist the Planning Team, historical storm event data from the National Climatic Data Center (NCDC) was complied. NCDC records are estimates of damages reported to the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature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

The NCDC database included 467 reported meteorological events in White County from 1950-2014 (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 the meteorological hazards reported for White County. Figure 4-1 summarize the relative frequency of NCDC reported meteorological hazards and the percent of total damage associated with each hazard for White County. Full details of individual hazard events are on the NCDC website. In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail was mapped using SPC-recorded latitudes and longitudes. Appendix D includes a map of these events.

Table 4-1. Summary of Meteorological Hazards Reported by the NCDC for White County

Hazards	Time Period		Number of Events	Property Damage	Deaths	Injuries
	Start	End				
Severe Thunderstorms	1975	2014	169	$3,740,000	1	5
Flooding	1996	2014	133	$3,580,000	0	1
Winter Storms	1996	2014	109	$100,000	1	5
Extreme Heat	1997	2014	35	$0	0	0
Tornadoes	1965	2014	21	$8,970,000	0	6

Figure 4-1. Distribution of NCDC Meteorological Hazards for White County



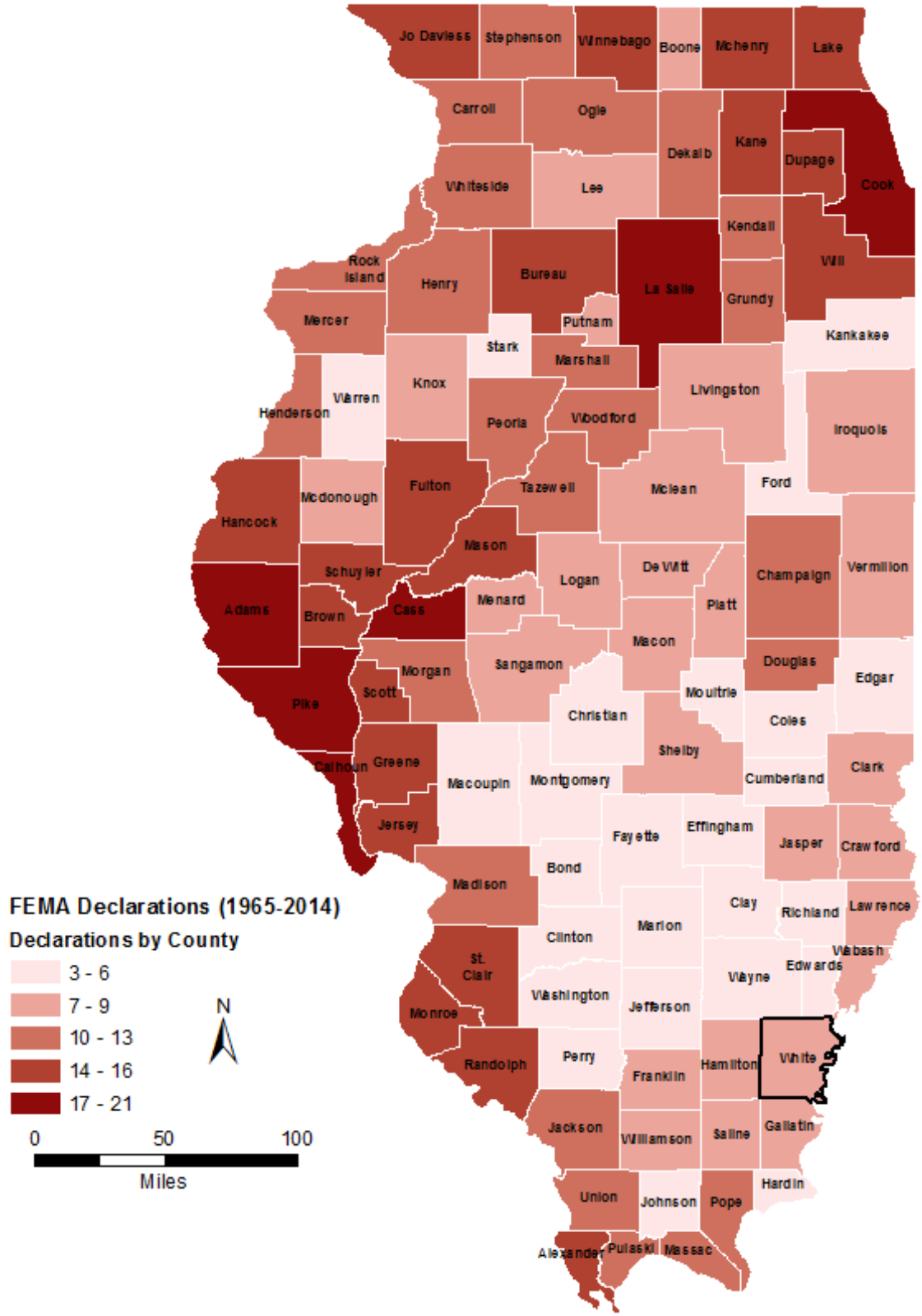
4.1.3 FEMA Disaster Information

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). White County has received federal aid for six declared disasters and two emergencies since 1965. Table 4-2 lists specific information for each disaster declaration in White County. Figure 4-2 depicts the disasters and emergencies that have been declared for the State of Illinois and White County since 1965.

Table 4-2. Details of FEMA-declared Emergencies and Disasters in White County

Declaration Number	Date of Declaration	Description
684	6/6/1983	Severe Storms, Tornadoes & Flooding
819	1/13/1989	Severe Storms & Tornadoes
871	6/22/1990	Severe Storms, Tornadoes & Flooding
1112	5/6/1996	Severe Storms & Flooding
1416	5/21/2002	Severe Storms, Tornadoes & Flooding
3199	2/1/2005	Record/Near Snow
3230	9/7/2005	Hurricane Katrina Evacuation
1991	6/7/2011	Severe Storms & Flooding

Figure 4-2. FEMA-declared Emergencies and Disasters in Illinois



4.1.4 Hazard Ranking Methodology

Based on Planning Team input, national datasets, and existing plans, the White County Planning Team re-ranked the list of hazards from the 2009 MHMP. These hazards ranked the highest based on the Risk Priority Index discussed in Section 4.1.5.

White County Hazard List

TORNADOES

EARTHQUAKES

HAZARDOUS MATERIALS RELEASE

SEVERE THUNDERSTORM

FLOODING

WINTER STORMS

DROUGHT / EXTREME HEAT

DAM / LEVEE FAILURE

4.1.5 Risk Priority Index

The Risk Priority Index (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 the probability, combined with knowledge of local conditions to determine the possible severity of a hazard. Tables 4-3 and 4-4 display the criteria the Planning Team used to quantify hazard probability and magnitude.

Table 4-3. Hazard Probability Ranking

Probability	Characteristics
4 – Highly Likely	Event is probable within the next calendar year This event has occurred, on average, once every 1-2 years in the past
3 – Likely	Event is probable within the next 10 years Event has a 10-50% chance of occurring in any given year This event has occurred, on average, once every 3-10 years in the past
2 – Possible	Event is probable within the next 50 years Event has a 2-10% chance of occurring in any given year This event has occurred, on average, once every 10-50 years in the past
1 – Unlikely	Event is probable within the next 200 years Event has a 0.5-2% chance of occurring in any given year This event has occurred, on average, once every 50-200 years in the past

Table 4-4. Hazard Severity Ranking

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. After evaluating the calculated RPI, the Planning Team adjusted the ranking to better suit the County. Table 4-5 identifies the RPI and adjusted ranking for each hazard specified by the Planning Team.

Table 4-5. White County Hazard Priority Index and Ranking

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornadoes	4	8	32	1
Earthquakes	3	8	24	2
Hazardous Materials Release	3	3	9	3
Severe Thunderstorms	4	2	8	4
Flooding	4	2	8	5
Winter Storms	3	2	6	6
Drought / Extreme Heat	3	2	6	7
Dam / Levee Failure	2	2	4	8

4.1.6 Jurisdictional Hazard Ranking

Each jurisdiction created its own RPI because hazard susceptibility may differ by jurisdiction. 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 4-6 lists the jurisdictions and their respective hazard rankings (Ranking 1 being the highest concern). The individual jurisdictions made these rankings at Meeting 1.

Table 4-6. Hazard Ranking by Jurisdiction

Jurisdiction	Tornadoes	Earthquakes	HAZMAT	Severe Storms	Flooding	Winter Storms	Heat / Drought	Dam / Levee Failure
Carmi	1	3	7	2	4	5	6	8
Crossville	2	3	7	1	5	4	6	8
Enfield	1	3	2	4	8	5	6	0
Grayville	2	6	5	1	3	4	7	8
Mill Shoals	1	6	5	3	2	4	7	8
Norris City	1	2	3	4	5	6	7	8

Jurisdiction	Tornadoes	Earthquakes	HAZMAT	Severe Storms	Flooding	Winter Storms	Heat / Drought	Dam / Levee Failure
Phillipstown	1	2	6	3	7	4	5	8
Springerton	1	2	3	1	1	1	1	0
Carmi-White CUSD #5	1	7	8	4	3	2	5	6
Grayville CUSD #1	1	2	5	3	6	4	7	-
Norris-City-Omaha-Enfield CUSD #3	1	5	4	3	6	7	7	8
Wayne-White Counties Electric Co-Op	1	-	-	-	3	2	-	-
Wabash Ohio Valley Special Education District	1	2	3	4	5	6	7	8

4.2 Vulnerability Assessment

4.2.1 Asset Inventory

Processes and Sources for Identifying Assets

Before meeting one, the Planning Team used their resources to update the list of critical facilities from the 2009 MHMP. Local GIS data was used 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. White County also provided local assessment and parcel data to estimate the actual number of buildings susceptible to damage for the risk assessment.

Essential Facilities List

Table 4-7 identifies the number of essential facilities identified in White County. Essential facilities are a subset of critical facilities. Appendix E includes a comprehensive list of the essential facilities in White County and Appendix F displays a large format map of the locations of the critical facilities within the county.

Table 4-7. White County's Essential Facilities

Facility	Number of Facilities
Care Facilities	7
Ambulance Services / First Responders	5
Fire Stations	6
Police Stations	7
Schools	10

Facility Replacement Costs

Table 4-8 identifies facility replacement costs and total building exposure. White County provided local assessment data for updates to replacement costs. Tax-exempt properties such as government buildings, schools, religious and non-profit structures were excluded from this study because they do not have an assessed value. Table 4-8 also includes the estimated number of buildings within each occupancy class.

Table 4-8. White County's Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure
Residential	6,662	$462,248,509
Agriculture	577	$32,400,936
Commercial	703	$126,372,942
Industrial	62	$48,578,220
Total:	**8,004**	**$669,600,607**

Future Development

White County is expected to see a modest increase in population due to the expansion of existing distribution centers, light industry, and the creation of new opportunities in the service industry such as retail stores, restaurants, and hotels. Most of this expansion is expected to take place within the city limits of Carmi within close proximity to transportation corridors such as Illinois Routes 1 and 14.

4.3 Risk Analysis

4.3.1 GIS and Hazus-MH

The third step in the risk assessment is the risk analysis, which quantifies the risk to the population, infrastructure, and economy of the community. The hazards were quantified 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.

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.

The following assumptions were made during analysis:

- Hazus-MH aggregate data was used to model the building exposure for all earthquake analyses. It is assumed that the aggregate data is an accurate representation of White County.
- The analyses were restricted to the county boundaries. Events that occur near the county boundaries do not contain damage assessments from adjacent counties.
- For each tax-assessment parcel, it is assumed there is only one building that bares all the associated values (both structure and content).
- For each parcel, it is assumed that all structures are wood-framed, one-story, slab-on-grade structures, unless otherwise stated in assessment records. These assumptions are based on sensitivity analyses of Hazus and regional knowledge.

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 4-9 indicates the analysis type (i.e. GIS, Hazus-MH, or historical records) used for each hazard assessment.

Table 4-9. Risk Assessment Tool Used for Each Hazard

Hazard	Risk Assessment Tool(s)
Tornadoes	GIS-based
Earthquakes	Hazus-MH
Hazmat Materials Release	GIS-based
Severe Thunderstorm	Historical Records
Flooding	Hazus-MH
Winter Storms	Historical Records
Drought / Extreme Heat	Historical Records
Dam / Levee Failure	Historical Records

4.3.2 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 4-10 outlines the Enhanced Fujita intensity scale.

Table 4-10. 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,

Enhanced Fujita Number	Estimated Wind Speed	Path Width	Path Length	Description of Destruction
				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

There have been several occurrences of tornadoes in White County during recent decades. The National Climatic Data Center (NCDC) database reported twenty-one tornadoes/funnel clouds in White County since 1950. Table 4-11 identifies NCDC-recorded tornadoes that caused damage, death, or injury in White County. Additional details of individual hazard events are on the NCDC website.

The most recent damaging tornado event occurred on April 3, 2014, when thunderstorms intensified within a zone of strong southerly low level winds that provided abundant warmth and moisture. These strong low level winds enhanced wind shear, which promoted the development of supercells with isolated tornadoes. The storms formed near a warm front that was draped across southeast Missouri, southern Illinois, and western Kentucky. In White County, an EF1 was reported. A home with an attached garage, the roof was lifted and partially separated from the walls. A large 42-by-66 foot machine shed with an attached lean-to was partially unroofed, and the doors were blown inward. Several small outbuildings were overturned. Approximately a dozen trees, mainly pine trees, were snapped or uprooted. Some debris was blown at least one-half mile away. The most intense damage occurred on County Road 1560N, northwest of Carmi. Peak winds were estimated near 100 mph.

Table 4-11. NCDC-Recorded Tornadoes That Caused Damage, Death, or Injury in White County

Location or County*	Date	Scale	Deaths	Injuries	Property Damage
White County	2/9/1965	F2	0	0	$250,000
White County	5/30/1976	F2	0	0	$25,000
White County	5/2/1983	F1	0	0	$25,000
White County	1/7/1989	F2	0	6	$2,500,000
White County	5/16/1990	F1	0	0	$2,500
Carmi	4/19/1996	F1	0	0	$1,000,000
Springerton	10/24/2001	F0	0	0	$50,000
White County	4/19/2011	EF2	0	0	$2,000,000
White County	4/19/2011	EF1	0	0	$300,000
Enfield	1/22/2012	EF2	0	0	$250,000
Carmi	3/2/2012	EF0	0	0	$15,000

Location or County*	Date	Scale	Deaths	Injuries	Property Damage
White County	4/3/2014	EF1	0	0	$50,000
		Total:	**0**	**6**	**$6,467,500**

*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, although many other tracks are possible, from more southerly to northerly directions. 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 White 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 White County Planning Team's risk assessment.

Risk Priority Index

Probability	x	Magnitude	=	RPI
4	x	8	=	32

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. Tables 4-7 and 4-8 display the existing buildings and critical infrastructure in White County.

Critical Facilities

All critical facilities are vulnerable to tornadoes. Critical facilities are 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 4-7 lists the types and number of critical facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

Table 4-8 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

An EF4 hypothetical tornado scenario through Norris City, Carmi and Crossville was conducted for White County. The following analysis quantifies the anticipated impacts of tornado in the county in terms of numbers and types of buildings and infrastructure damaged.

GIS-overlay modeling was used to determine the potential impacts of an EF4 tornado. The analysis used a hypothetical path based upon an EF4 tornado that tracks 21 miles through Norris City, Carmi and Crossville. Table 4-12 depicts tornado damage curves and path widths utilized for the modeled scenario. The damage curve is based on conceptual wind speeds, path winds, and path lengths from the Enhanced-Fujita Scale guidelines.

Table 4-12. 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 EF4 tornado, a hypothetical tornado path was digitized in GIS with buffers added (damage zones) around the tornado path. Table 4-13 and Figure 4-3 illustrate the zone analysis. Figure 4-4 depicts the selected hypothetical tornado paths.

Table 4-13. EF4 Tornado Zones and Damage Curves

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

Figure 4-3. Tornado Analysis (Damage Curves) Using GIS Buffers

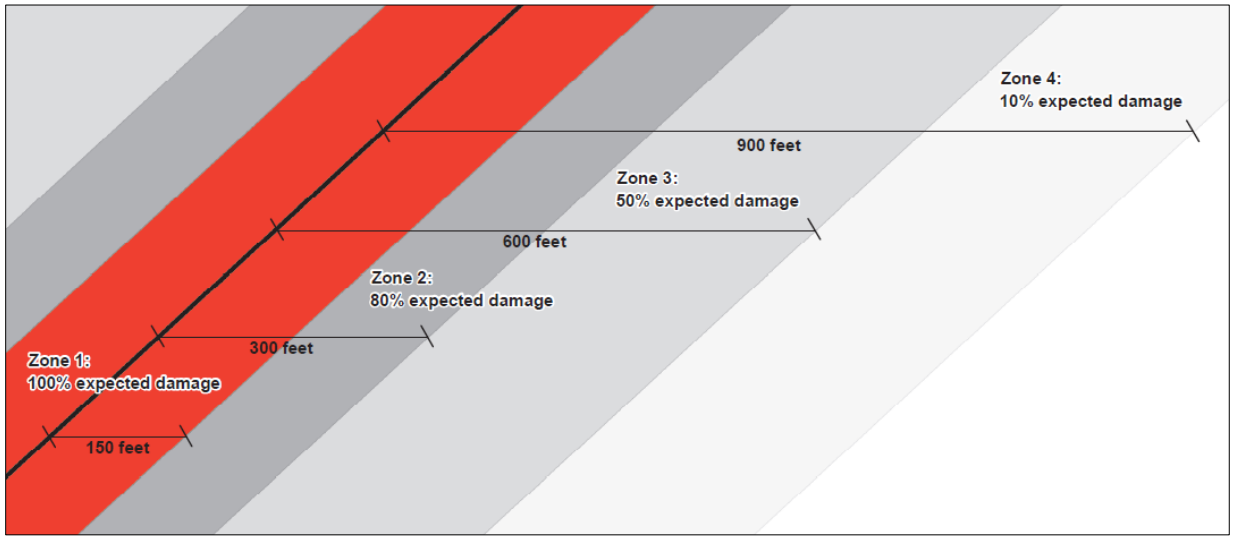


Figure 4-4. Modeled Hypothetical EF4 Tornado Track for White County

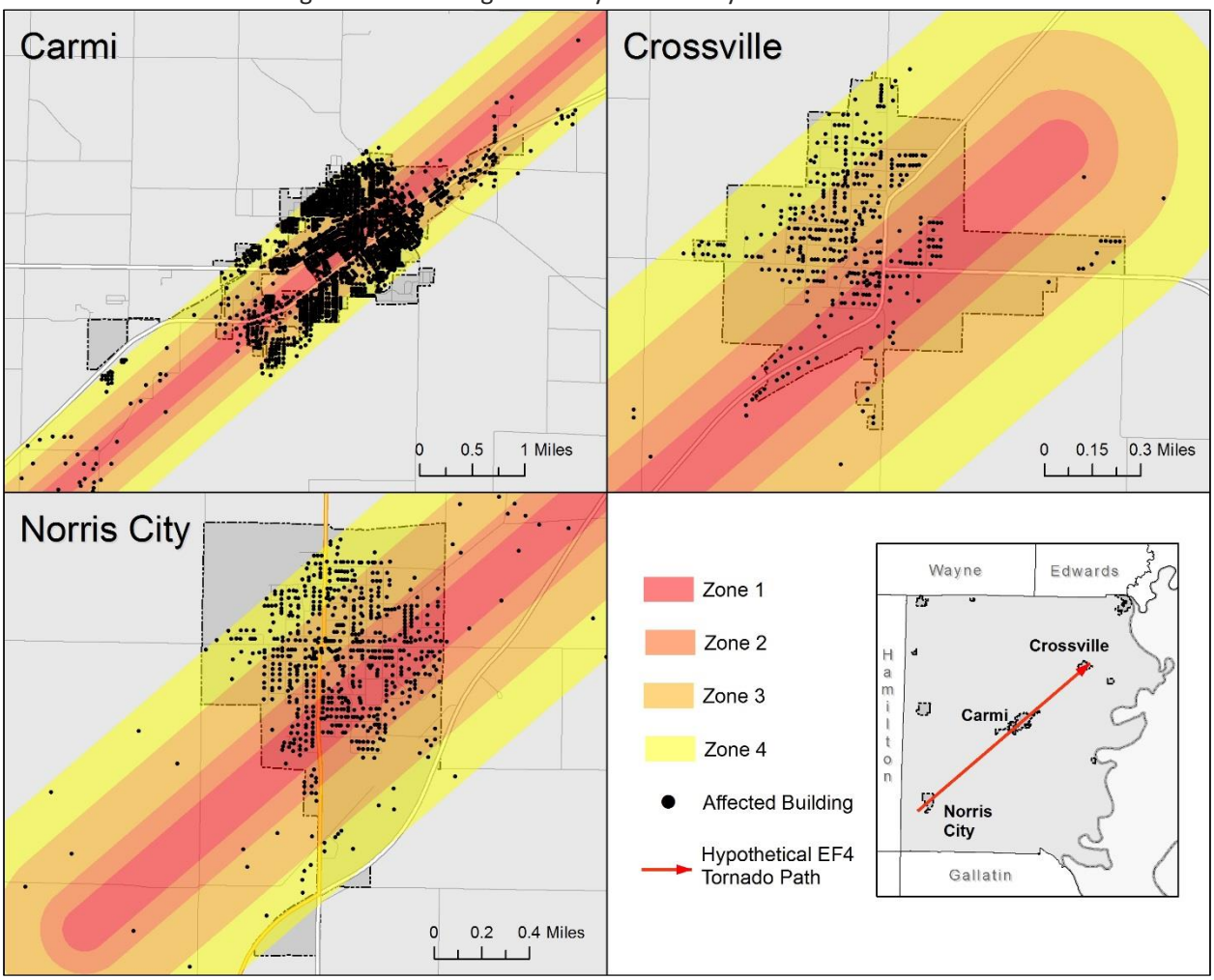
Modeled Impacts of the EF4 Tornado

The GIS analysis estimates that the modeled EF4 tornado would damage 824 buildings. The estimated building losses are over $46 million. The building losses are an estimate of building replacement costs multiplied by the damage percent. Table 4-14 and Figures 4-5 show the results of the EF4 tornado analysis.

Table 4-14. Estimated Building Loss by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$10,524,000	$8,188,000	$4,452,000	$1,000,000
Agriculture	$2,987,000	$3,550,000	$3,160,000	$252,000
Commercial	$0	$11,072	$515,000	$341,000
Industrial	$5,000	$54,000	$118,000	$1,000
Total:	**$13,516,000**	**$11,803,072**	**$8,245,000**	**$1,594,000**

Figure 4-5. Building Inventory Affected by the EF4 Tornado



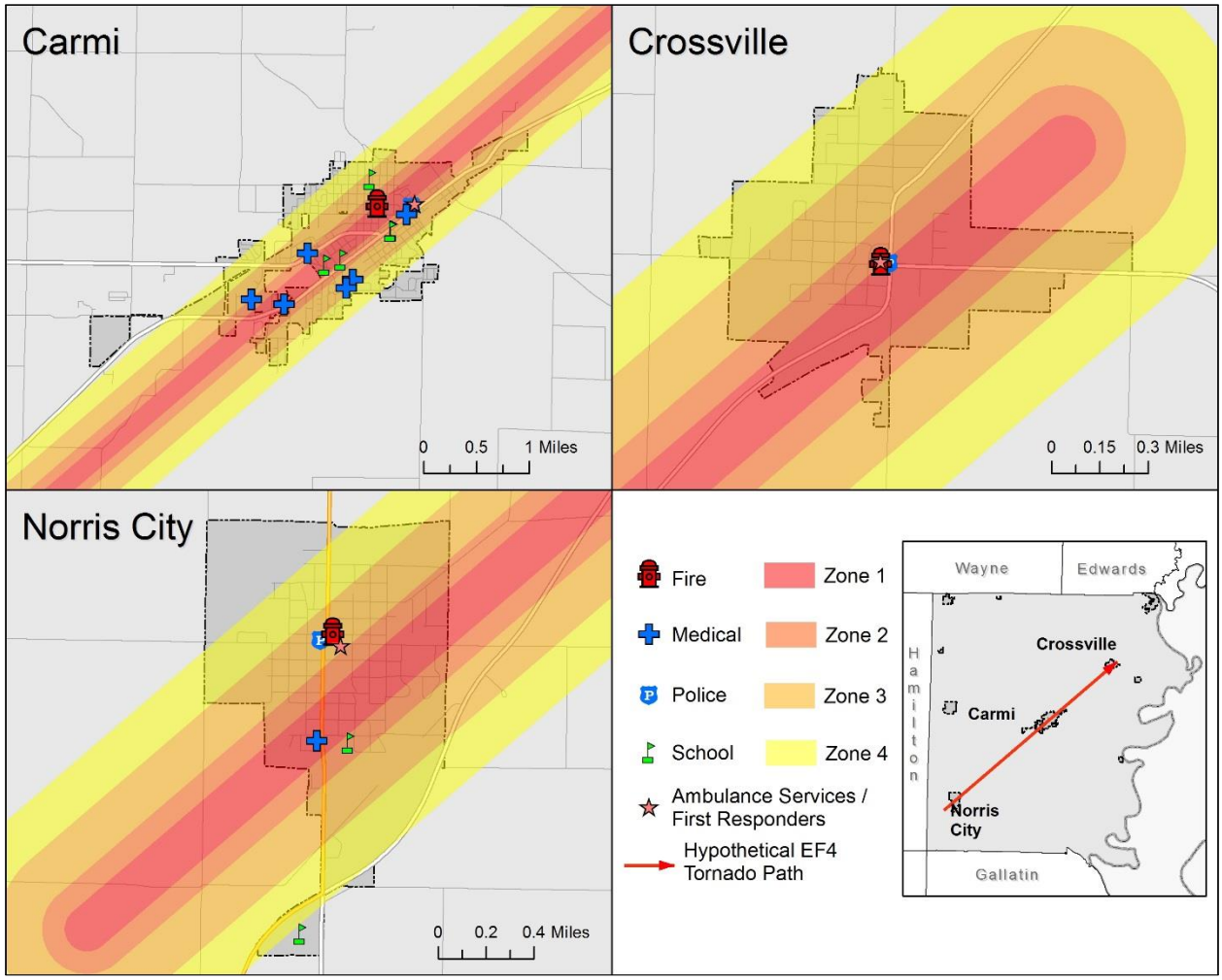
Essential Facilities Damage

There are twenty-four essential facility located within 900 feet of the EF4 tornado path. The affected facilities are identified in Table 4-15, and their geographic locations are shown in Figure 4-6.

Table 4-15. Essential Facilities Affected by the EF4 Tornadoes Modeled for White County

Essential Facility	Facility Name
Police Stations	Carmi Police Department
	White County Sheriff Department
	Crossville Police Department
	Norris City Police Department
Fire Stations	Crossville Fire Department
	Norris City Fire Protection District
	Carmi Fire Department
Ambulance Services / First Responders	Norris City Ambulance Service
	White County Ambulance Service / White County E9-1-1
	Crossville First Responders
Schools	Jefferson School
	Lincoln School
	Norris City-Omaha Elementary School
	Washington Attendance Center
	Carmi-White County Junior High School
	Carmi-White County High School
	Norris City High School
Medical	Egyptian Health Department
	Wabash and Ohio Valley Special Education District
	The Guardian Center
	Supportive Living of Wabash
	Wabash Christian Retirement Center
	Carmi Community Health Center
	Wabash Christian Therapy & Medical Clinic

Figure 4-6. Essential Facilities Affected by the EF4 Tornado



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 4-8 includes the building exposure for White County. All essential facilities in the county are at risk. Appendix E include a list of the essential facilities in White County and Appendix F displays a large format map of the locations of all critical facilities within the county.

Suggestions for Community Development Trends

Preparing for severe storms will be enhanced if local officials sponsor a wide range of programs and initiative to address severe storm preparedness. It is suggested that the county should build new structures with more sturdy construction, and harden existing structures to lessen the potential impacts of severe weather. This is particularly import where the future economic expansion is expected to take place within the city limits of Carmi. Additional warning sirens can warn the community of approaching storms to ensure the safety of White County residents and minimizing property damage.

4.3.3 Earthquake Hazard

Hazard Definition

An earthquake is the shaking of the earth caused by the energy released when large blocks of rock slip past each other in the earth's crust. 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. Table 4-19 provides a comparison of magnitude and intensity, and Table 4-20 provides qualitative descriptions of intensity, for a sense of what a given magnitude might feel like.

Table 4-19. 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 4-20. 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.

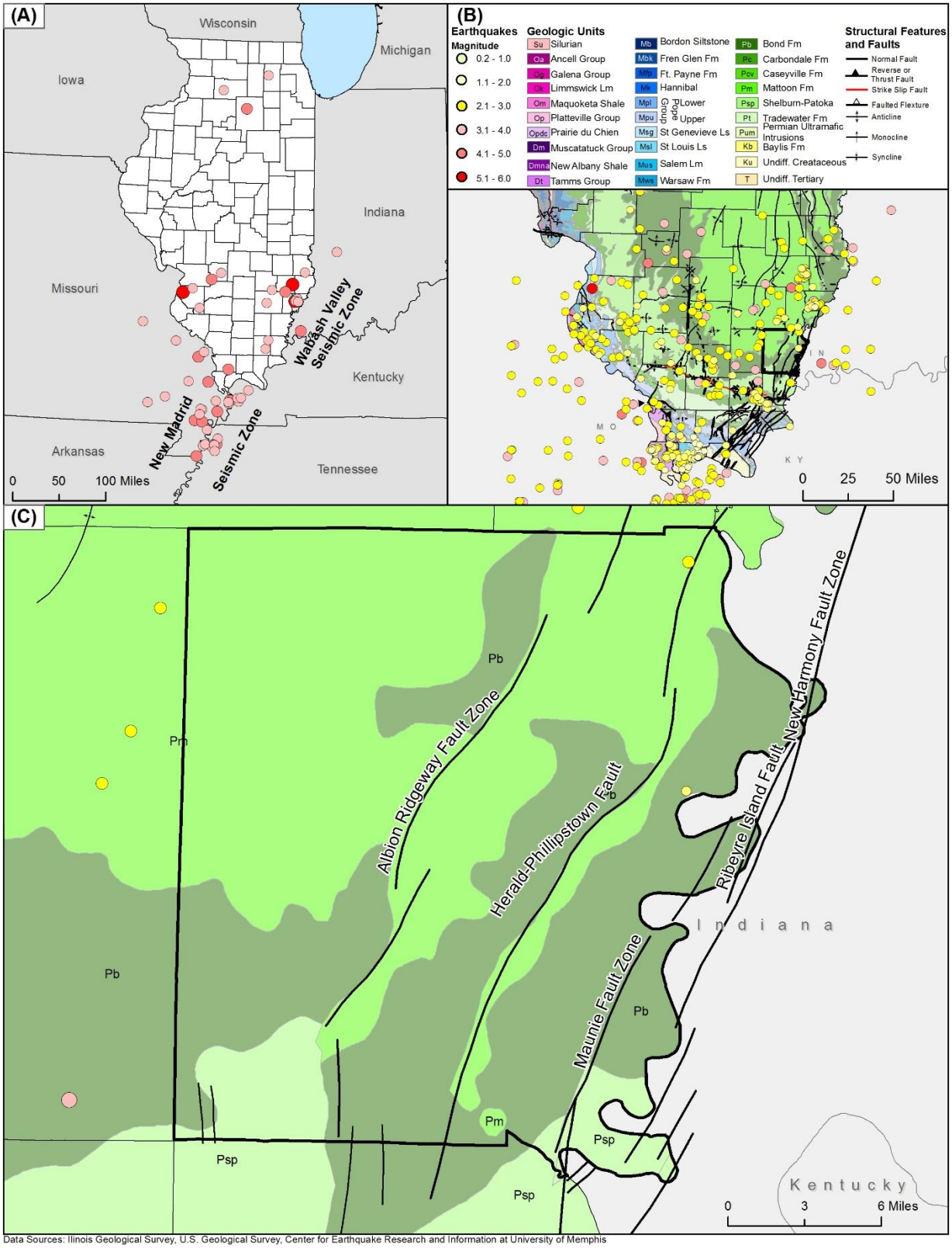
Mercalli Intensity	Description
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	Damage slight in specially designed structures; considerable 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. Figure 4-7 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 White County. The most recent earthquake in Illinois—as of the date of this report—was a M2.3 event in February 2014, approximately 6 miles NNW of Mound City in Pulaski County. 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.

Figure 4-7. Notable Earthquakes in Illinois with Geologic and Earthquake Epicenters in White County

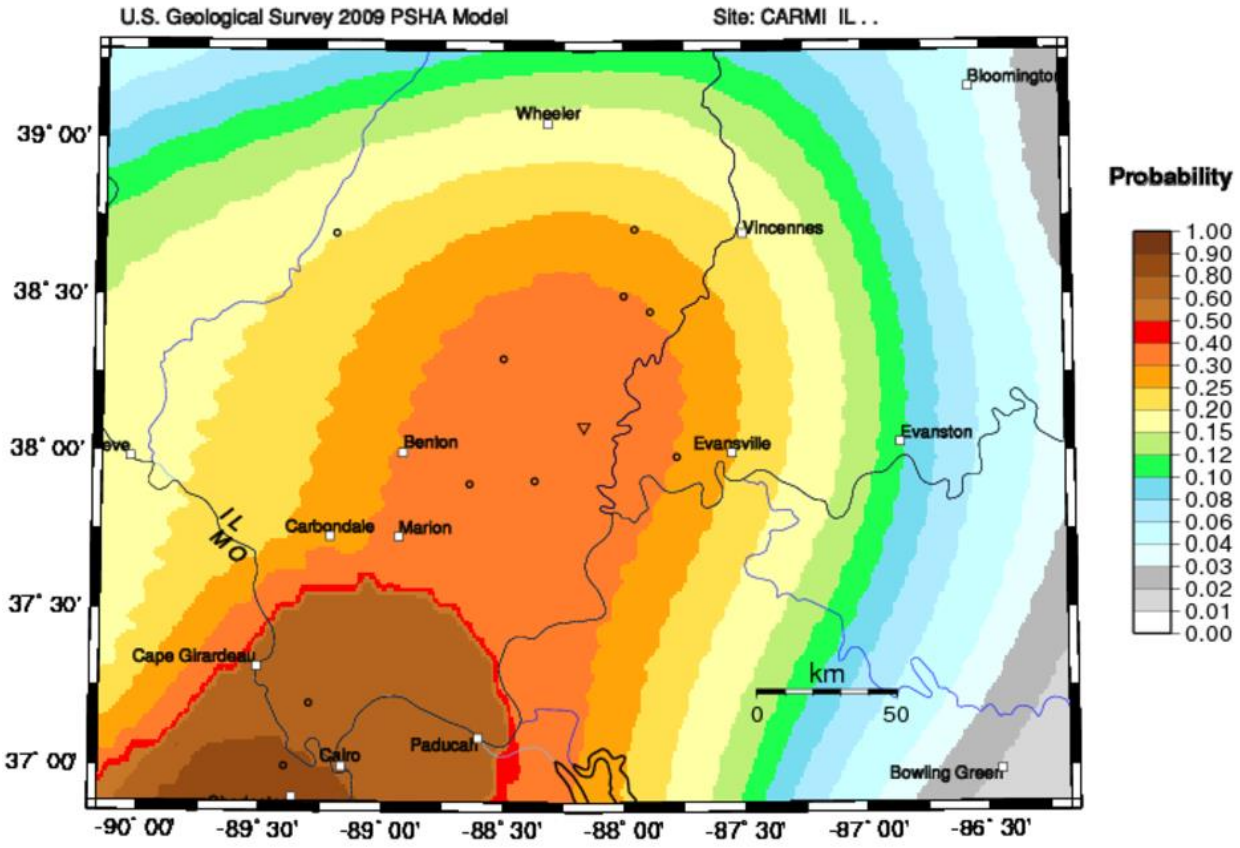


Geographic Location for Earthquake Hazard

White County is situated in a region susceptible to earthquakes. Since 1974, the epicenters of two small earthquakes (M1.5-M2.7) have been recorded in White County (see Figure 4-7(C)). This local seismic activity is believed to be associated with the Wabash Valley Fault System.

The two most significant zones of seismic activity in Illinois are the New Madrid Seismic Zone and the Wabash Valley Fault System. Return periods for large earthquakes within the New Madrid System are estimated to be ~500–1000 years; moderate quakes between magnitude 5.5 and 6.0 can recur within approximately 150 years or less. The Wabash Valley Fault System extends nearly the entire length of southern Illinois and has the potential to generate an earthquake of sufficient strength to cause damage between St. Louis, MO and Indianapolis, IN. While large earthquakes (>M7.0) experienced during the New Madrid Events of 1811 and 1812 are unlikely in White County, moderate earthquakes (≤ 6.0M) in or in the vicinity of White County are probable. The USGS estimates the probability of a moderate M5.5 earthquake occurring in White County within the next 500-years at approximately 30% (see Figure 4-8).

Figure 4-8. Probability of M5.5 Earthquake occurring in White County within the next 500 years



Hazard Extent for Earthquake Hazard

Earthquake effects are possible anywhere in White County. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. The National Earthquake Hazards Reduction Program (NEHRP) compliant soils map was provided by FEMA for the analysis. This 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 White County are possible, but large (>M7.0) earthquakes that cause catastrophic damage are unlikely. According to the White County Planning Team's assessment, earthquakes are ranked as the number two hazard.

Risk Priority Index

Probability	x	Magnitude	=	RPI
3	x	8	=	24

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. Tables 4-7 and 4-8 display the existing buildings and critical infrastructure in White County.

Critical Facilities

All critical facilities are vulnerable to earthquakes. Critical facilities are susceptible to many of the same impacts as any other building within the jurisdiction. These impacts include structural failure and loss of facility functionality (e.g., a damaged police station will no longer be able to serve the community). Table 4-7 lists the types and number of critical facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

Table 4-8 lists 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 was not available for use in the earthquake models, 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 Earthquake Analyses

Existing geological information was reviewed prior to the Planning Team selection of earthquake scenarios. A Magnitude 5.5 probabilistic earthquake scenario was performed to provide a reasonable basis for earthquake planning in White County. The other two scenarios included a Magnitude of 7.7 with the epicenter located on the New Madrid Fault Zone and a Magnitude 7.1 with the epicenter located on the Wabash Fault Zone.

The earthquake-loss analysis for the probabilistic scenario was 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 New Madrid Fault Zone runs along the Mississippi River through Arkansas, Tennessee, Missouri, Kentucky and Southern Illinois. The Wabash Valley Fault Zone runs through Southeastern Illinois, Western Kentucky and Southwest Indiana. This represents a realistic scenario for planning purposes.

The earthquake hazard modeling scenarios performed:

- Magnitude 5.5 probabilistic earthquake in White County
- Magnitude 7.7 event along the New Madrid Fault Zone
- Magnitude 7.1 event along the Wabash Valley Fault Zone

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 Earthquake Scenario

The results of the M5.5 probabilistic earthquake scenario are depicted in Tables 4-21, 4-22, and Figure 4-9. Hazus-MH estimates that approximately 766 buildings will be at least moderately damaged. This is over 10% of the total number of buildings in the White County. It is estimated that twenty-four buildings would be damaged beyond repair.

The total building related losses are approximately $62 million dollars. It is estimated that 17% of the losses are related to the business interruption of the region. By far, the largest loss is sustained by the residential occupancies which make up over 57% of the total loss.

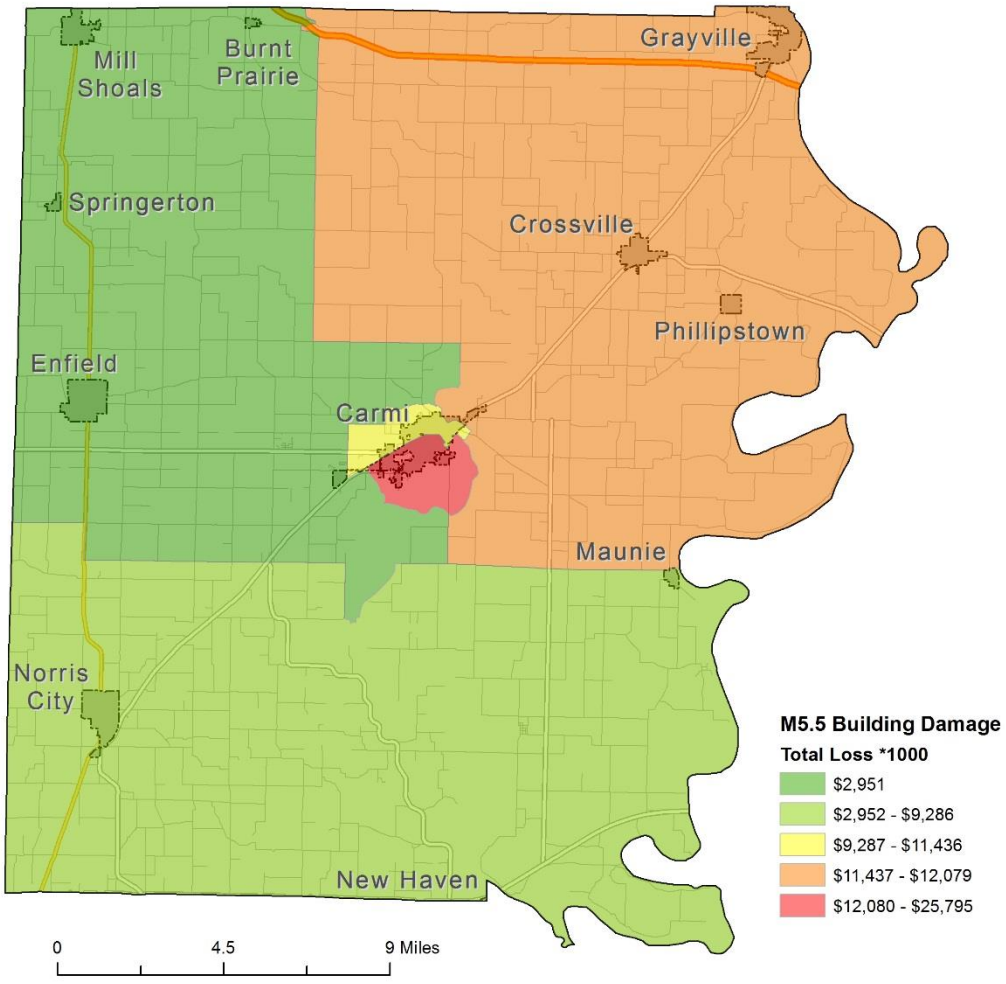
Table 4-21. M5.5 Earthquake Damage Estimates by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	80	1.41	17	1.46	12	2.09	4	2.31	0	1.42
Commercial	273	4.82	83	7.16	60	10.17	19	12.71	3	10.89
Educational	19	0.33	5	0.44	4	0.63	1	0.72	0	0.85
Government	20	0.35	5	0.45	4	0.65	1	0.59	0	0.67
Industrial	92	1.62	24	2.03	19	3.20	6	3.97	1	2.62
Other Residential	611	10.79	207	17.85	191	32.39	40	26.14	4	17.23
Religion	43	0.76	11	0.94	8	1.28	3	1.71	0	1.70
Single Family	4,524	79.92	808	69.66	292	49.59	79	51.86	16	64.62
Total:	**5,662**		**1,160**		**590**		**153**		**24**	

Table 4-22. M5.5 Earthquake Estimates of Building Economic Losses (in Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	$0.00	$0.14	$1.70	$0.06	$0.20	$2.10
	Capital-Related	$0.00	$0.06	$1.43	$0.04	$0.04	$1.57
	Rental	$0.54	$0.34	$0.84	$0.04	$0.07	$1.83
	Relocation	$1.99	$0.52	$1.31	$0.20	$0.64	$4.66
	Subtotal:	**$2.53**	**$1.06**	**$5.28**	**$0.34**	**$0.95**	**$10.16**
Capital Stock Losses	Structural	$4.51	$1.12	$2.09	$0.73	$1.12	$9.57
	Non-Structural	$15.57	$3.95	$5.16	$2.08	$2.42	$29.18
	Content	$5.54	$1.00	$2.86	$1.52	$1.40	$12.32
	Inventory	$0.00	$0.00	$0.08	$0.21	$0.03	$0.32
	Subtotal:	**$25.62**	**$6.07**	**$10.19**	**$4.54**	**$4.97**	**$51.39**
	Total:	**$28.15**	**$7.13**	**$15.47**	**$4.88**	**$5.92**	**$61.55**

Figure 4-9. White County M5.5 Earthquake Building Economic Losses



Results for M7.7 New Madrid Earthquake

The results of the M7.7 New Madrid earthquake scenario are depicted in Tables 4-23, 4-24, and Figure 4-10. Hazus-MH estimates that approximately 136 buildings will be at least moderately damaged. It is estimated that two buildings would be damaged beyond repair.

The total building related losses are approximately $15.47 million dollars. It is estimated that 7% of the losses are related to the business interruption of the region. By far, the largest loss is sustained by the residential occupancies which make up over 64% of the total loss.

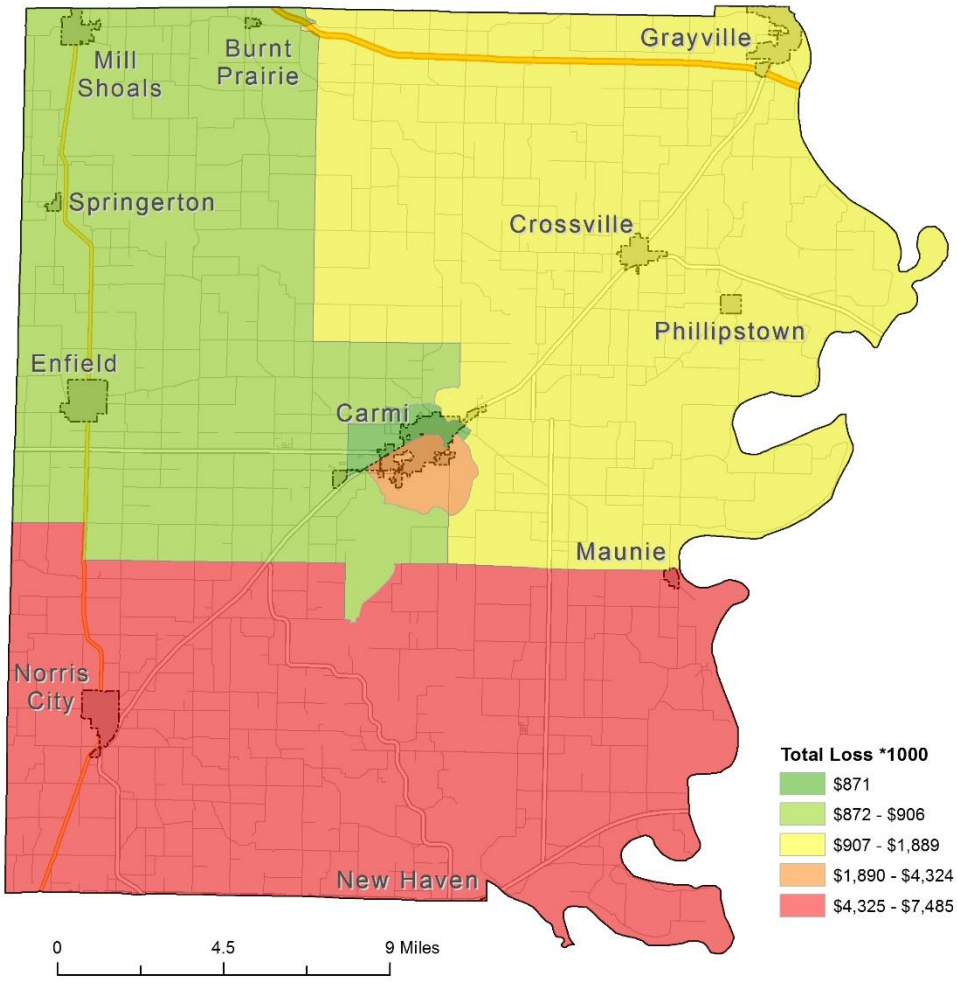
Table 4-23. New Madrid M7.7 Earthquake Damage Estimates by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	101	1.43	8	2.19	3	2.86	0	1.84	0	0.42
Commercial	404	5.72	25	6.38	8	6.64	1	8.51	0	7.14
Educational	25	0.36	3	0.68	1	0.64	0	0.64	0	0.64
Government	28	0.39	2	0.44	0	0.38	0	0.24	0	0.19
Industrial	130	1.84	8	2.07	3	2.50	0	2.28	0	1.28
Other Residential	829	11.74	148	38.24	72	61.00	3	20.87	0	10.22
Religion	61	0.86	3	0.66	1	0.58	0	1.05	0	1.13
Single Family	5,486	77.67	191	49.33	30	25.39	10	64.56	2	78.98
Total:	**7,064**		**388**		**118**		**14**		**2**	

Table 4-24. New Madrid M7.7 Earthquake Estimates of Building Economic Losses (in Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	$0.00	$0.02	$0.12	$0.00	$0.02	$0.17
	Capital-Related	$0.00	$0.01	$0.10	$0.00	$0.01	$0.12
	Rental	$0.07	$0.04	$0.09	$0.00	$0.01	$0.20
	Relocation	$0.23	$0.12	$0.12	$0.01	$0.06	$0.54
	Subtotal:	**$0.30**	**$0.19**	**$0.43**	**$0.01**	**$0.10**	**$1.03**
Capital Stock Losses	Structural	$0.65	$0.20	$0.22	$0.04	$0.14	$1.26
	Non-Structural	$4.51	$1.04	$1.27	$0.64	$0.65	$8.11
	Content	$2.63	$0.35	$0.95	$0.50	$0.53	$4.96
	Inventory	$0.00	$0.00	$0.03	$0.07	$0.02	$0.12
	Subtotal:	**$7.79**	**$1.59**	**$2.47**	**$1.25**	**$1.34**	**$14.45**
	Total:	**$8.09**	**$1.78**	**$2.90**	**$1.26**	**$1.44**	**$15.48**

Figure 4-10. New Madrid M7.7 Earthquake Building Economic Losses



Results M7.1 Magnitude Wabash Valley Earthquake – General Building Stock

The results of the Wabash Valley M7.1 earthquake scenario are depicted in Tables 4-25, 4-26, and Figure 4-11. Hazus-MH estimates that approximately sixty-six buildings will be at least moderately damaged. This is over 1% of the buildings in the county. Two buildings would be damaged beyond repair.

The building related losses are approximately $19 million dollars. It is estimated that 5% of the losses are related to the business interruption of the region. By far, the largest loss is sustained by the residential occupancies which make up over 53% of the total loss.

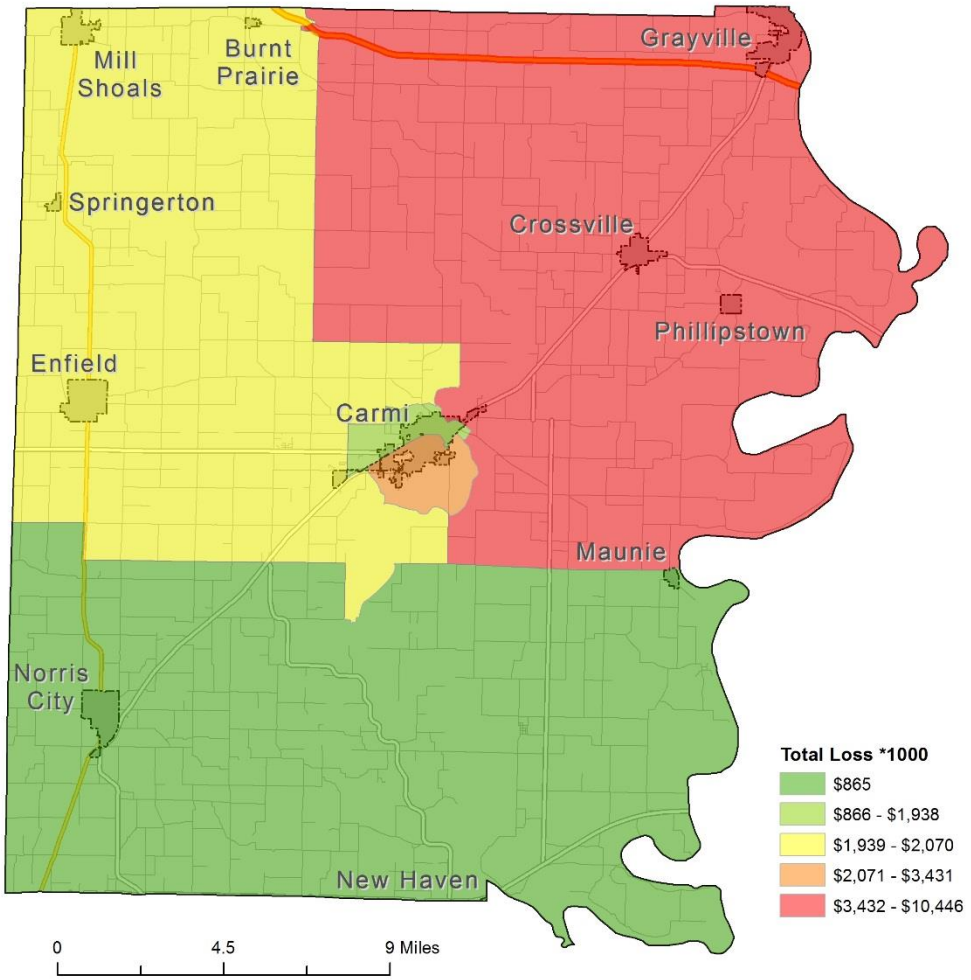
Table 4-25. Wabash Valley 7.1 Magnitude Earthquake Damage Estimates by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	101	1.39	9	3.35	3	5.39	0	1.62	0	0.42
Commercial	407	5.61	23	8.64	7	12.02	1	8.68	0	7.13
Educational	27	0.38	1	0.45	0	0.53	0	0.63	0	0.63
Government	28	0.39	2	0.60	0	0.71	0	0.30	0	0.20
Industrial	126	1.74	11	4.01	4	6.72	0	2.67	0	1.28
Other Residential	976	13.47	61	22.32	15	27.35	1	10.01	0	10.22
Religion	59	0.81	4	1.45	1	1.92	0	1.38	0	1.15
Single Family	5,525	76.21	161	59.17	25	45.35	7	74.72	2	78.99
Total:	**7,249**		**272**		**55**		**9**		**2**	

Table 4-26. Wabash 7.1 Magnitude Earthquake Estimates of Building Economic Losses (in Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Other	Total
Income Losses	Wage	0.00	0.02	0.10	0.01	0.02	0.16
	Capital-Related	0.00	0.01	0.09	0.01	0.00	0.11
	Rental	0.05	0.04	0.07	0.01	0.01	0.18
	Relocation	0.18	0.04	0.10	0.05	0.05	0.42
	Subtotal:	**0.23**	**0.11**	**0.36**	**0.08**	**0.08**	**0.87**
Capital Stock Losses	Structural	0.52	0.11	0.18	0.18	0.12	1.11
	Non-Structural	4.58	1.06	1.57	1.77	0.83	9.81
	Content	2.84	0.43	1.25	1.45	0.72	6.69
	Inventory	0.00	0.00	0.04	0.21	0.03	0.28
	Subtotal:	**7.94**	**1.60**	**3.04**	**3.61**	**1.70**	**17.89**
	Total:	**8.17**	**1.71**	**3.40**	**3.69**	**1.78**	**18.76**

Figure 4-11. Wabash Valley M7.1 Scenario Building Economic Losses



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. It is important 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.

4.3.4 Hazardous Material 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

White 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.

The Illinois Emergency Management Agency maintains a comprehensive Hazardous Materials Incident Report Database for the State of Illinois. The database contains information on all Hazardous Materials Reports since 1987 but does not include an assessment of economic and property losses in terms of dollars of damage. The database reported 333 incidents in White County as of February 2015.

Industries regulated by The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) are required to report incidents which meet or exceed established reporting criteria. The data for reported incidents are available on the PHMSA website via the U.S. Department of Transportation Hazmat Intelligence Portal. The database reported nine incidents in White County as of February 2015. Table 4-28 identifies PHMSA reported incidents that caused damage, death, or injury in White County. Additional details of individual hazard events are on the PHMSA website.

Table 4-28. Selected PHMSA-Recorded Hazardous Material Incidents that Caused Damage, Death, or Injury

Location	Date	Mode of Transportation	Hazardous Material Class	Death	Injuries	Damages*
Crossville	8/14/1993	Highway	Hydrochloric Acid Solution	0	0	$1,700
Carmi	10/10/1975	Highway	Gasoline	0	0	0
New Haven	12/18/2004	Highway	Gasoline	0	0	$100,000
Enfield	8/23/2008	Highway	Diesel Fuel	0	0	$163,600
Enfield	3/2/1992	Highway	Petroleum Crude Oil	0	0	$48,500
Carmi	8/22/1980	Highway	Compound Lacquer Paint	0	0	0
Carmi	10/10/1975	Highway	Gasoline	0	0	0
Carmi	12/21/1971	Highway	Gasoline	0	0	0
Carmi	7/24/1995	Highway	Corrosive Liquid Acidic Organic N.O.S.	0	0	$2,575
			Totals:	**0**	**0**	**$316,375**

Source: U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration

* Damages includes the cost of the material lost, carrier damage, property damage, response costs, and remediation cleanup costs.

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, future occurrence of hazardous materials accident in White County is likely. According to the Risk Priority Index (RPI) and County input, hazardous materials storage and transportation hazard is ranked as the number three hazard.

Risk Priority Index

Probability	x	Magnitude	=	RPI
3	x	3	=	9

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. This plan will therefore consider all buildings located within the county as vulnerable. To accommodate this risk, this plan considers all buildings located within the county as vulnerable. Tables 4-7 and 4-8 display the existing buildings and critical infrastructure in White County.

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 4-7 lists the types and number of critical facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

Table 4-8 lists 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 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.

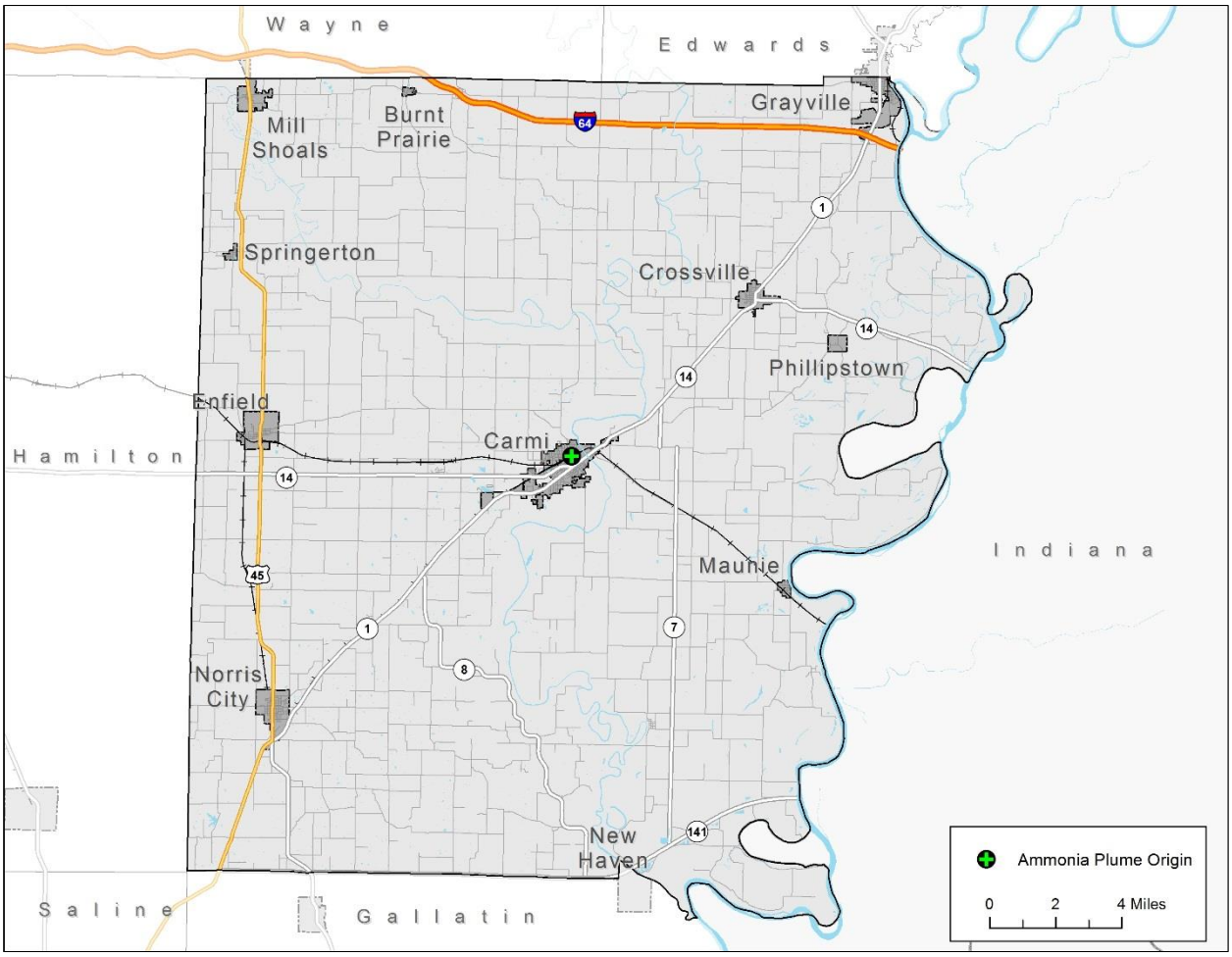
ALOHA Hazardous Chemical Release Analysis

The U.S. Environmental Protection Agency's ALOHA (Areal Locations of Hazardous Atmospheres) model was used to assess the impacted area for an ammonia release at the train tracks on 3rd street in Carmi. ALOHA is a computer program designed for response to chemical accidents, as well as emergency planning

and training. The White County Planning Team selected this location because of frequent rail and truck traffic. Ammonia is a common chemical transported via truck and rail.

For the ammonia scenario, SIU assumed average atmospheric and climatic conditions for the spring season with a breeze from the west-northwest. SIU considered the seasonal conditions upon the request of the Planning Team and obtained average monthly conditions for the Lawrenceville Airport from NOAA's Monthly Weather Summary. Figure 4-12 depicts the plume origin of the modeled hazardous chemical release in White County. The ALOHA atmospheric modeling parameters for the ammonia release, depicted in Figure 4-13, were based upon a west-north-west speed of 9.2 miles per hour. The temperature was 67.3°F with 75% humidity and a cloud cover of five-tenths skies. SIU used average weather conditions for the month of May reported from NOAA for wind direction, wind speed, and temperature to simulate spring conditions.

Figure 4-12. ALOHA Modeled Hazardous Chemical Plume Origin in White County



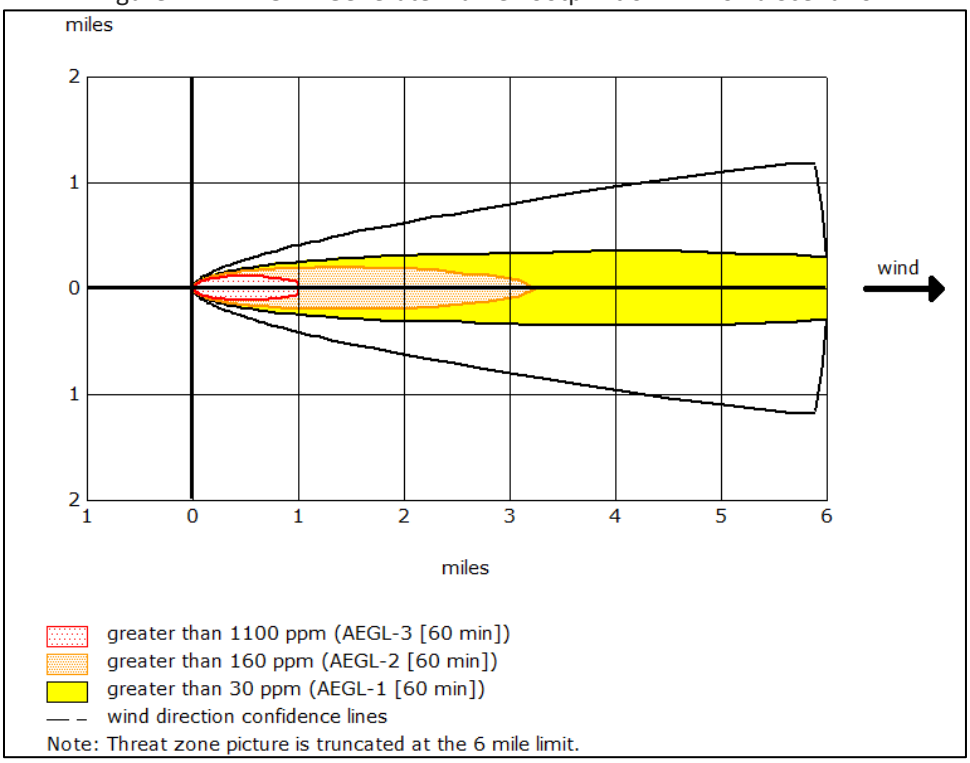
The source of the chemical spill is a horizontal, cylindrical-shaped tank. The diameter of the tank was set to 8 feet and the length set to 33 feet (12,408 gallons). At the time of its release, it was estimated that the tank was 75% full. The ammonia in this tank is in its liquid state. This release 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 7,680 pounds of material per minute. Figure 4-13 shows the plume modeling parameters in greater detail.

Figure 4-13. ALOHA Modeling Parameters for Ammonia Release

```
SITE DATA:
  Location: CARMI, ILLINOIS
  Building Air Exchanges Per Hour: 0.85 (unsheltered single storied)
  Time: June 22, 2015  1001 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: -28.6° 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: 9.2 miles/hour from WNW at 10 feet
  Ground Roughness: open country          Cloud Cover: 5 tenths
  Air Temperature: 67.3° F                Stability Class: D
  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: 67.3° F
  Chemical Mass in Tank: 23.8 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: 7,680 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 44,109 pounds
  Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).
```

Using the parameters in Figure 4-13, approximately 44,109 pounds of material would be released. The image in Figure 4-14 depicts the plume footprint generated by ALOHA. 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.

Figure 4-14. ALOHA Generate Plume Footprint of Ammonia Scenario



The AEGL-3 threat zone travels 1 mile, AEGL-2 threat zone traveled roughly three miles and the remaining threat zones extend greater than 6 miles from the point of release. The dashed line depicts the level of confidence within the confines of the entire plume footprint. The ALOHA model is 95% confident that the release will stay within this boundary.

Acute Exposure Guideline Levels (AEGL) are intended to describe the risk to humans resulting from once-in-a-lifetime, or rare exposure to airborne chemical (U.S. EPA AEGL Program). The National Advisory Committee for the Development of Acute Exposure Guideline Levels for Hazardous Substances (AEGL Committee) is involved in developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills, or other catastrophic exposures. AEGLs represent threshold exposure limits for the general public and are applicable to emergency exposure periods ranging from 10 minutes to 8 hours. The three AEGLs have been defined as follows:

> AEGL-1: the airborne concentration, expressed as parts per million or milligrams per cubic meter (ppm or mg/m3) of a substance above which 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.
>
> AEGL-2: the airborne concentration (expressed as ppm or mg/m3) of a substance above which 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.
>
> AEGL-3: the airborne concentration (expressed as ppm or mg/m3) of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Airborne concentrations below the AEGL-1 represent exposure levels that can produce mild and progressively increasing but transient and non-disabling odor, taste, and sensory irritation or certain asymptomatic, non-sensory effects. With increasing airborne concentrations above each AEGL, there is a progressive increase in the likelihood of occurrence and the severity of effects described for each corresponding AEGL. Although the AEGL values represent threshold levels for the general public, including susceptible subpopulations, such as infants, children, the elderly, persons with asthma, and those with other illnesses, it is recognized that individuals, subject to unique or idiosyncratic responses, could experience the effects described at concentrations below the corresponding AEGL.

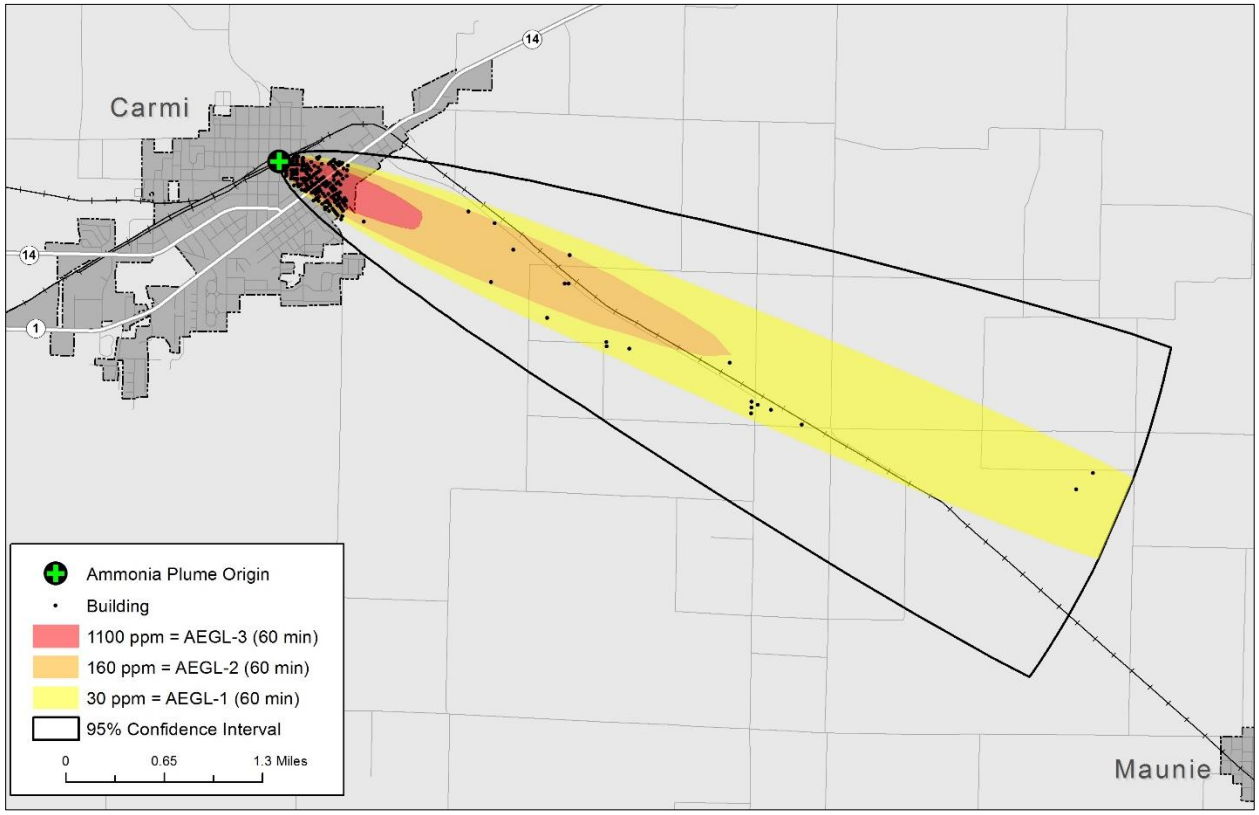
Results for Ammonia Release

An estimate of property exposed to the ammonia spill was calculated by using the building inventory and intersecting these data with each of the AEGL levels (AEGL 3: ≥ 4800 ppm, AEGL 2: ≥ 1200 ppm and AEGL 1: ≥ 250 ppm). The White County assessment and parcel data was utilized for this analysis. There are approximately 253 buildings within the ammonia plume. It should be noted that the results should be interpreted as potential degrees of loss rather than exact number of buildings damaged to the ammonia release. Table 4-29 lists the total amount of building exposure to each AEGL zone. Figure 4-15 depicts the ammonia spill footprint and location of the buildings exposed. The GIS overlay analysis estimates that the full replacement cost of the buildings exposed to the ammonia plume is approximately $30 million.

Table 4-29. Estimated Building Exposure as a Result of the Ammonia Release

Occupancy	Building Exposure			Number of Buildings		
	AEGL 1	AEGL 2	AEGL 3	AEGL 1	AEGL 2	AEGL3
Residential	$1,381,037	$2,138,126	$3,714,543	23	32	64
Commercial	$490,296	$1,058,130	$12,807,540	10	14	100
Industrial	$8,561,910	$0	$72,038	3	0	3
Agricultural	$121,830	$9,960	$0	3	1	0
Total:	**$10,555,073**	**$3,206,216**	**$16,594,121**	**39**	**47**	**167**

Figure 4-15. ALOHA Plume Footprint and Buildings Exposed to Ammonia Release



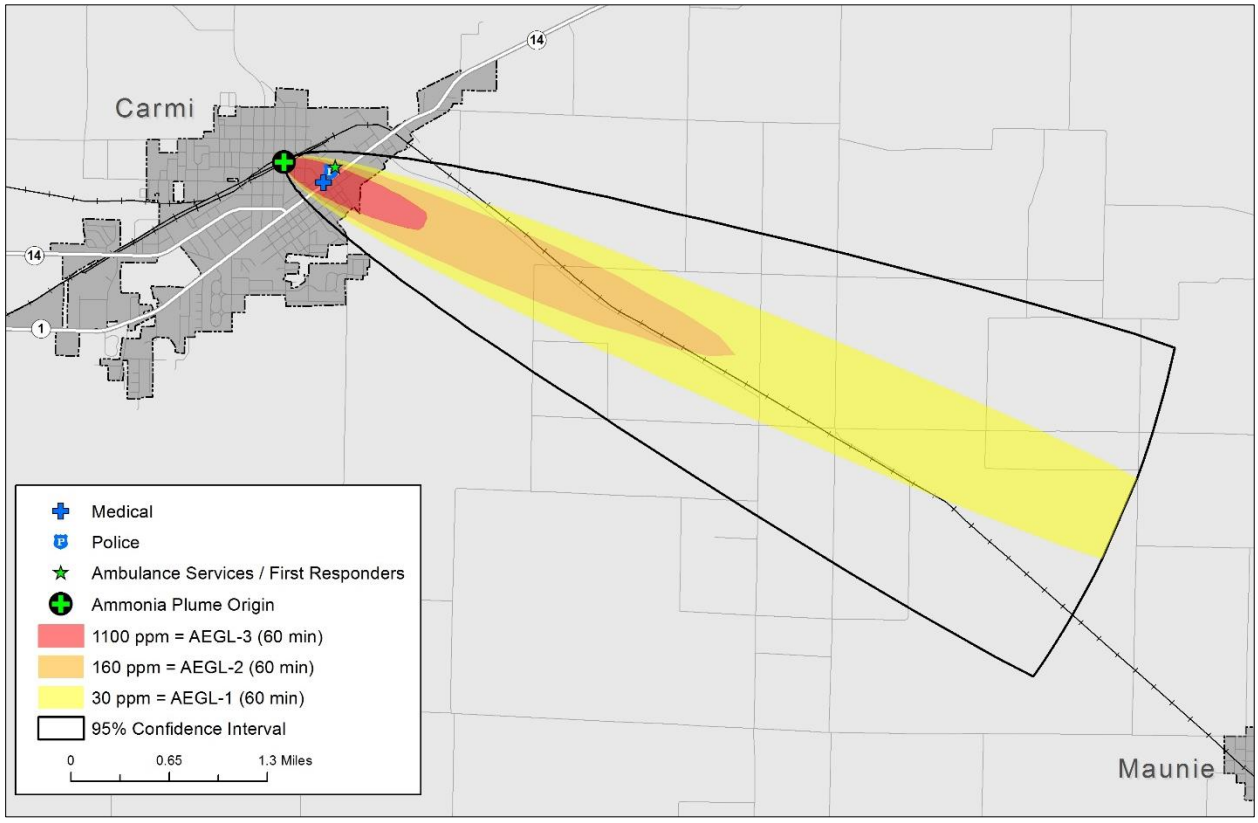
Essential Facilities Damage

There are four essential facilities within the limits of the AEGL-3 zone where the airborne concentration could experience life-threatening health effects or death. Table 4-30 and Figure 4-16 identifies the affected facilities.

Table 4-30. Essential Facilities within the Ammonia Plume Footprint

Essential Facility	Facility Name
Fire Departments	Carmi Police Department
	White County Sheriff Department
Ambulance Services / First Responders	White County Ambulance Service / White County E9-1-1
Medical	The Guardian Center

Figure 4-16. Map of Essential Facilities within the Ammonia Plume Footprint



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

White County is expect to see future economic expansion within the city limits of Carmi. These areas are particularly vulnerable to chemical releases because of transportation of hazardous materials along railways, and Illinois Routes 1 and 14, US 45 and Interstate 64.

Suggestion for Community Development Trends

Because the hazardous material hazard events may occur anywhere within the county, future development is susceptible to the hazard. The major transportation routes and the industries located in White County pose a threat of dangerous chemicals and hazardous materials release. Regional particularly vulnerable are within the city limits of Carmi within close proximity to transportation corridors such as Illinois Routes 1 and 14.

4.3.5 Thunderstorm Hazard

Hazard Definition

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

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.

Frequent and dangerous 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.

Wind speeds greater than or equal to 58 miles per hour

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 of Thunderstorm Hazards

The National Climatic Data Center (NCDC) database reported fifty-three hailstorms in White County since 1950. Hailstorms occur nearly every year in the late spring and early summer months. The most damaging reported event occurrence was on April 24th 2002, when baseball size hail dented some vehicles beyond repair. Some windshields were broken. Hundreds of homes and vehicles were damaged by hail across White County resulting in $750,000 in damages. Table 4-16 lists the significant hail storms (such as those that cause death, damage or injury) in White County.

Table 4-16. Selected NCDC-Recorded Hail that Caused Damage, Death, or Injury in White County

Location or County*	Date	Deaths	Injuries	Property Damage
Enfield	05/16/1995	0	0	$1,000
White County	04/24/2002	0	0	$750,000
Total:		**0**	**0**	**$751,000**

*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.

The NCDC database reported six lightning events in White County. The most damaging reported event occurred on February 27th, 1996 in Enfield when a barn housing a tractor and combine was destroyed by a lightning-caused fire. Table 4-17 identifies NCDC-recorded lightning that caused damage, death, or injury in White County.

Table 4-17. Selected NCDC-Recorded Lightning that Caused Damage, Death, or Injury in White County

Location or County*	Date	Deaths	Injuries	Property Damage
Grayville	6/8/2007	0	0	$4,000
Crossville	5/23/2000	0	0	$5,000
Carmi	7/7/1995	0	0	$20,000
Crossville	4/9/2011	0	0	$50,000
Enfield	2/27/1996	0	0	$80,000
Total:		**0**	**0**	**$159,000**

*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.

The NCDC database reported 110 severe thunder and wind storms in White County. The most damaging event occurred on April 19th, 2011 when thunderstorms organized into a bow echo that produced widespread very damaging winds and isolated tornadoes. A shortwave trough over the central and southern high Plains moved northeast through the Mid-Mississippi Valley into the upper Great Lakes. A swath of damaging straight-line winds around 90 mph extended from Carmi northeast to Crossville. In Carmi and Crossville, there was widespread damage to trees and power lines. Numerous power poles were snapped. Sections of the metal walls of a large warehouse type building in Carmi were peeled back on the south and west sides. A mobile home was knocked off its foundation in Carmi. Much of the city was without power for 36 to 48 hours. Part of the roof was blown off the high school. Uprooted trees fell across homes and vehicles. A carport was blown into trees. In Crossville, numerous trees and limbs were blown down on every street. Some trees landed on houses and vehicles. A mobile home was demolished about a mile east of Crossville. Table 4-18 identifies selected NCDC-recorded wind storms that caused major damage (over $50,000), death, or injury in White County.

Table 4-18. Selected NCDC-Recorded Thunder and Wind Storms that Caused Major Damage (over $50,000), Death, or Injury in White County

Location or County*	Date	Deaths	Injuries	Property Damage
White County	07/19/1994	0	0	$50,000
White County	07/11/2000	0	0	$50,000
White County	06/08/2007	0	0	$50,000
White County	06/15/2010	0	0	$50,000
White County	04/02/2006	0	0	$100,000
White County	06/14/2007	0	0	$100,000
White County	01/29/2008	0	0	$100,000
White County	09/28/2004	0	0	$150,000
White County	10/24/2001	0	2	$200,000
White County	04/24/2002	0	0	$750,000
White County	04/19/2011	0	0	$850,000
	Total:	**0**	**2**	**$2,450,000**

*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 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 hypothetical 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 highly likely. The County should expect high winds, hail, and lightning of widely varying magnitudes in the future. According to the White County Planning Team's assessment, severe thunderstorms are ranked as the number four hazard.

Risk Priority Index

Probability	x	Magnitude	=	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. To accommodate this risk, this plan considers all buildings located within the county as vulnerable. Tables 4-7 and 4-8 display the existing buildings and critical infrastructure in White 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 4-7 lists the types and number of critical facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

Table 4-8 lists 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 from Thunderstorm Hazard

According to the NDCD, White County has incurred approximately $3.8 million in damages relating to thunderstorms, including hail, lightning, and high winds since 1950. 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, the potential dollar losses for a future event cannot be reliably constrained; however, based on average property damage in the past

decade, SIU estimates that White County incurs property damages of approximately $60,000 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 severe thunderstorm events.

Suggestions for Community Development Trends

Local officials should enhance severe storm preparedness if they sponsor a wide range of programs and initiatives to address the overall safety of county residents. It is suggested that the county should build new structures with more sturdy construction, and harden existing structures to lessen the potential impacts of severe weather. This is particularly import where the future economic expansion is expected to take place within the city limits of Carmi. Additional warning sirens can warn the community of approaching storms to ensure the safety of White County residents and minimizing property damage.

4.3.6 Flooding 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. Floods are classified 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 133 flooding events in White County. The most recent recorded event was in April 2014, Heavy rainfall during the first week of April caused most of the region's rivers to rise. Many rivers experienced minor to moderate flooding. Minor flooding occurred along the Wabash River. Low-

lying fields near the river were inundated. A few county roads were flooded. Table 4-31 identifies NCDC-recorded flooding events that caused damage (over $50,000), death, or injury in White County.

Table 4-31. NCDC-recorded Flooding Events that caused Death, Damage (over $50,000) or Injury in White County

Location or County*	Date	Deaths	Injuries	Property Damage
White County	07/11/2000	0	0	$50,000
White County	04/28/1996	0	0	$100,000
White County	07/07/2011	0	1	$100,000
White County	05/01/2011	0	0	$23,000
White County	01/06/2005	0	0	$300,000
White County	03/18/2008	0	0	$300,000
White County	05/10/1996	0	0	$500,000
White County	08/28/2004	0	0	$500,000
White County	01/05/2005	0	0	$500,000
Total:		**0**	**1**	**$2,373,000**

*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.

There are several structures in White County that have experienced repetitive losses due to flooding. 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.

The Illinois Emergency Management Agency and Illinois Department of Natural Resources was contacted to determine the location of repetitive loss structures in White County. Records indicate that there are five repetitive loss structures within the county. The total amount paid for building replacement and building contents for damage to these repetitive loss structures is $296,691. Table 4-32 describes the repetitive loss structures for each jurisdiction.

Table 4-32. Repetitive Loss Structures in White County

Jurisdiction	Number of Properties	Number of Losses	Total Paid
Carmi	3	9	$59,389.33
White County	2	5	$237,301.66
Total:	**5**	**14**	**$296,691**

Geographic Location of Flooding

Most riverine flooding in Illinois occurs during either the spring or summer and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Flash flooding of low-lying areas in Illinois can occur during any time of the year, but tends to be less frequent and more localized between mid-summer and early winter.

The primary sources of river flooding in White County are the Wabash River, Little Wabash River, Skillet Fork, and Elliot Creek (both tributaries to the little Wabash). Flooding along Skillet Fork, Elliott Creek and the Little Wabash River tend to inundate the northern and central portions of White County including the

incorporated areas of Carmi, Mills Shoals, and Crossville. Flooding along the Wabash River impacts the eastern portion of the county and can inundate portions of Grayville and all of Maunie.

Flash flooding in White County typically occurs or is best documented in urban/developed areas. For example in the town of Carmi, flash flooding can result in the closure of US 45, State Route 1 and several side roads. Flash flooding has also closed US 45 near Enfield and Norris City.

Hazard Extent for Flooding

All floodplains are susceptible to flooding in White County. The floodplain of concern is for the 100-year flood event which is defined as areas that have a 1% chance of flooding in any given year. However, flooding is dependent on various local factors including, but not limited to, impervious surfaces, amount of precipitation, river-training structures, etc. The 100-year flood plain covers approximately 15% of White County

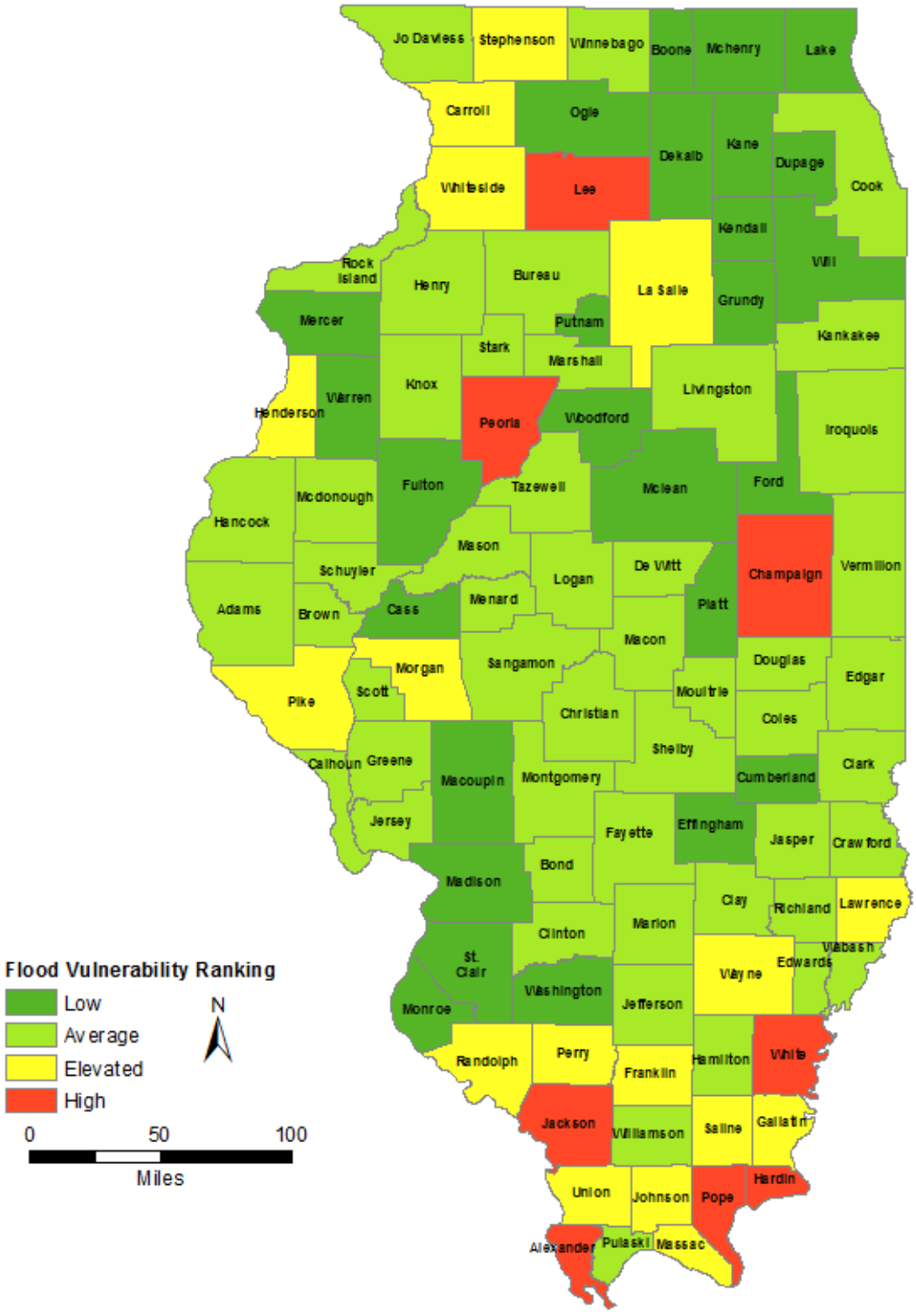
Vulnerability Analysis for Flooding

The 2013 Illinois Hazard Mitigation Plan analyzed a variety potential natural hazards including vulnerability to flooding. A Flood Vulnerability Index (FVI) was calculated for all counties and jurisdictions in Illinois. FVI combines Hazus-based estimates of flood exposure and loss with the widely utilized Social Vulnerability Index (SoVI). The highest vulnerability scores and vulnerability ratings were generally in rural counties and communities located along Illinois's large rivers (i.e., Mississippi, Green, Illinois, Kaskaskia, Rock and Ohio Rivers). Figure 4-17 displays the Flood Vulnerability Ratings for the 102 Counties in Illinois. The vulnerability ratings are categorically representations (low, average, elevated, or high) of the flood vulnerability index. White County has a High Flood Vulnerability Rating and ranks 3 out of the 102 Counties in Illinois in terms of loss estimation according to Hazus-MH for floods. Table 4-33 lists the jurisdictional Flood Vulnerability Ratings for White County. One jurisdiction in White County, Maunie, surpasses a High Flood Vulnerability Rating and ranks 8th in the State.

Table 4-33. Jurisdictional Flood Vulnerability Ranking for White County

Jurisdiction	State Ranking	Flood Vulnerability Rating
Maunie	8	High
Mill Shoals	34	Elevated
New Haven	35	Elevated
Crossville	45	Elevated
Carmi	58	Elevated
Springerton	85	Elevated
Grayville	271	Average

Figure 4-17. County Flood Vulnerability Rating for Illinois



Because all floodplains are susceptible to flooding in White County; therefore, the population and all buildings located within the floodplain are vulnerable to flooding. To accommodate this risk, this plan considers all buildings located within 100-year flood plain as vulnerable.

Risk Identification for Flood Hazard

Based on historical information and the Flood Vulnerability Rating, future occurrence of flooding in White County is likely. According to the Risk Priority Index (RPI) and County input, flooding is ranked as the number five hazard.

Risk Priority Index

Probability	x	Magnitude	=	RPI
4	x	2	=	8

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). Appendix E include a list of the critical facilities in White County and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

All buildings within the floodplain are vulnerable to floods. These impacts can include structural failure, extensive water damage to the facility, and loss of facility functionality (e.g., damaged home will no longer be habitable, causing residents to seek shelter). This plan considers all buildings located within 100-year flood plain as vulnerable.

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

Hazus-MH was utilized 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, Hazus-MH was used to estimate the damages for White County by utilizing a detailed building inventory database created from assessor and parcel data.

According to this analysis, there are 659 buildings located in the White County 100-year floodplain. The estimated damage to these structures is $8 billion. It should be noted that the results should be interpreted as degrees of loss rather than exact number of buildings exposed to flooding. Figure 4-18 depicts the building inventory within the 100-year floodplain and Table 4-34 shows the loss estimates by occupancy class.

Figure 4-18. Building Inventory Located within the 100-year Floodplain in White County

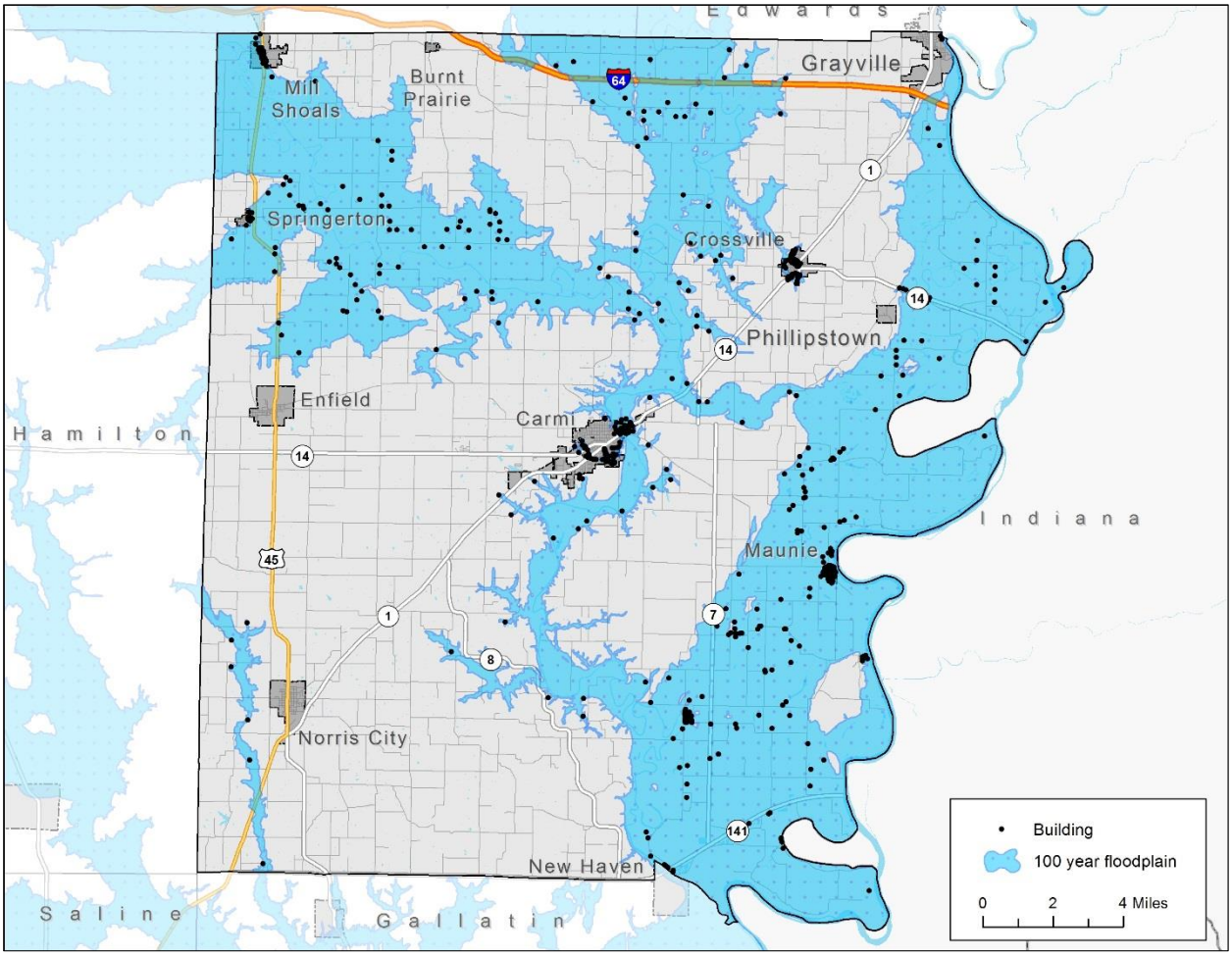


Table 4-34. Estimated Flood Losses within the 100-year Floodplain

Occupancy Class	Number of Structures	Estimated Building Related Losses
Residential	496	$5,681,792
Commercial	47	$1,868,848
Industrial	4	$121,978
Agricultural	112	$1,242,857
Total:	**659**	**$8,915,475,000**

Essential Facilities Damage

The analysis identified zero essential facilities that are subject to flooding.

Vulnerability Analysis to Future Assets/Infrastructure

Flooding may affect nearly any location within the county; therefore all buildings and infrastructure are vulnerable. Table 4-8 includes the building exposure for White County. All essential facilities in the county are at risk. Appendix E include a list of the essential facilities in White County and Appendix F displays a large format map of the locations of all critical facilities within the county. Currently, the municipal planning commission reviews new developments for compliance with the local flood zoning ordinance. At this time no new construction is planned with the 100-year floodplain.

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.

4.3.7 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 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.

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 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 reported 109 winter storm and extreme cold events for White County since 1950. The most recent reported event occurred in April 2014 when high pressure moved east across the Ohio Valley bringing unseasonably cold air and widespread freezing temperatures. Lows were from 28 to 32 degrees at many locations in southern Illinois. The coldest observed temperature was 28 degrees at the

Mount Vernon airport. Other lows included 31 degrees at the Carbondale airport and at Metropolis. Table 4-27 identifies NCDC-recorded winter storm events that caused damage, death, or injury in White County.

Table 4-27. NCDC-Recorded Winter Storms that Caused Damage, Death, or Injury in White County

Location or County*	Date	Deaths	Injuries	Property Damage
White County	01/26/2009	0	0	$100,000
White County	02/09/2011	1	0	$0
White County	02/21/2008	0	3	$0
White County	12/12/2010	0	2	$0
Total:		**1**	**5**	**$100,000**

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, the probability of future winter storms in White County is likely. The county should expect winter storms with varying magnitudes to occur in the future. Winter storms ranked as the number six hazard according to the White County Planning Team's risk assessment.

Risk Priority Index

Probability	x	Magnitude	=	RPI
3	x	2	=	6

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. To accommodate this risk, this plan considers all buildings located within the county as vulnerable. Tables 4-7 and 4-8 display the existing buildings and critical infrastructure in White County.

Critical Facilities

All critical facilities are vulnerable to winter storms. 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 4-7 lists the types and number of critical facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

Table 4-8 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 from Winter Storm Hazard

According to the NDCD, White County has incurred approximately $100,000 in damages relating to winter storms since 1950. 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, the potential dollar losses for a future event cannot be reliably constrained; however, based on average property damage in the past decade, SIU estimates that White County incurs property damages of approximately $1,500 per year related to winter storms, including sleet/ice and heavy snow.

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.

4.3.8 Drought and Extreme Heat Hazard

Hazard Definition for Drought Hazard

Drought is a normal climatic phenomenon that can occur across the state of Illinois and within White County. 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. Droughts will affect the quality and quantity of crops, livestock, and other agricultural assets. Droughts 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.

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 for the last for several weeks. Such extreme heat can have severe implications for humans. Below are common terms associate 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.

Previous Occurrences for Drought and Extreme Heat

The NCDC database reported thirty-five drought/heat wave events in White County since 1950. The most damaging recorded event occurred in August 2013 when afternoon heat indices topped out between 105 and 110 degrees at most airport observing sites. The heat index reached 107 degrees at Carbondale, 105 degrees at Harrisburg, and 107 degrees at Carmi. Actual air temperatures were as high as the mid 90's. The hot and humid conditions were the result of a southwest wind flow ahead of a cold front over central Illinois and central Missouri.

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 historical information, the occurrence of future droughts and/or prolonged extreme heat is highly likely. The County should expect high winds, hail, and lightning of widely varying magnitudes in the future. According to the White County Planning Team's assessment, drought and/or extreme heat are ranked as the number seven hazard.

Risk Priority Index

Probability	x	Magnitude	=	RPI
3	x	2	=	6

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. To accommodate this risk, this plan considers all buildings located within the county as vulnerable. Tables 4-7 and 4-8 display

the existing buildings and critical infrastructure in White County. Even though the exact areas affected are not known, a discussion of the potential impacts are detailed below.

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 4-7 lists the types and number of critical facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

Table 4-8 lists 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 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.

Potential Dollar Losses from Drought and Extreme Heat

According to the NDCD, White County has not experienced any damages relating to drought and extreme heat events since 1950. 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, the potential dollar losses for a future event cannot be reliably constrained.

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.

Suggestion of Community Development Trends

Because drought 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." 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.

4.3.9 Dam and Levee Failure

Hazard Definition for Dam and Levee Failure

Dams are structures that retain or detain water behind a large barrier. When full or partially full, the difference in elevation between the water above the dam and below creates large amounts of potential energy, creating the potential for failure. The same potential exists for levees when they serve their purpose, which is to confine flood waters within the channel area of a river and exclude that water from land or communities land-ward of the levee. Dams and levees can fail due to either: 1) water heights or flows above the capacity for which the structure was designed; or 2) deficiencies in the structure such that it cannot hold back the potential energy of the water. If a dam or levee fails, issues of primary concern include loss of human life/injury, downstream property damage, lifeline disruption (of concern would be transportation routes and utility lines required to maintain or protect life), and environmental damage.

Many communities view both dams and levees as permanent and infinitely safe structures. This sense of security may very well be false, leading to significantly increased risks. Both downstream of dams and on floodplains protected by levees, security leads to new construction, added infrastructure, and increased population over time. Levees in particular are built to hold back flood waters only up to some maximum level, often the 100-year (1% annual probability) flood event. When that maximum is exceeded by more than the design safety margin, then the levee will be overtopped or otherwise fail, inundating communities in the land previously protected by that levee. It has been suggested that climate change, land-use shifts, and some forms of river engineering may be increasing the magnitude of large floods and the frequency of levee-failure situations.

In addition to failure that results from extreme floods above the design capacity, levees and dams can fail due to structural deficiencies. Both dams and levees require constant monitoring and regular maintenance to assure their integrity. Many structures across the U.S. have been under-funded or otherwise neglected, leading to an eventual day of reckoning in the form either of realization that the structure is unsafe or, sometimes, an actual failure. The threat of dam or levee failure may require substantial commitment of time, personnel, and resources. Since dams and levees deteriorate with age, minor issues become larger compounding problems, and the risk of failure increases.

Previous Occurrences of Dam and Levee Failure

According to the White County planning team, there are no records or local knowledge of any dam or certified levee failure in the county; however, agricultural levees along the Wabash River have breached during large floods in January 2005 and March 2008.

Geographic Location of Dams and Levees in White County

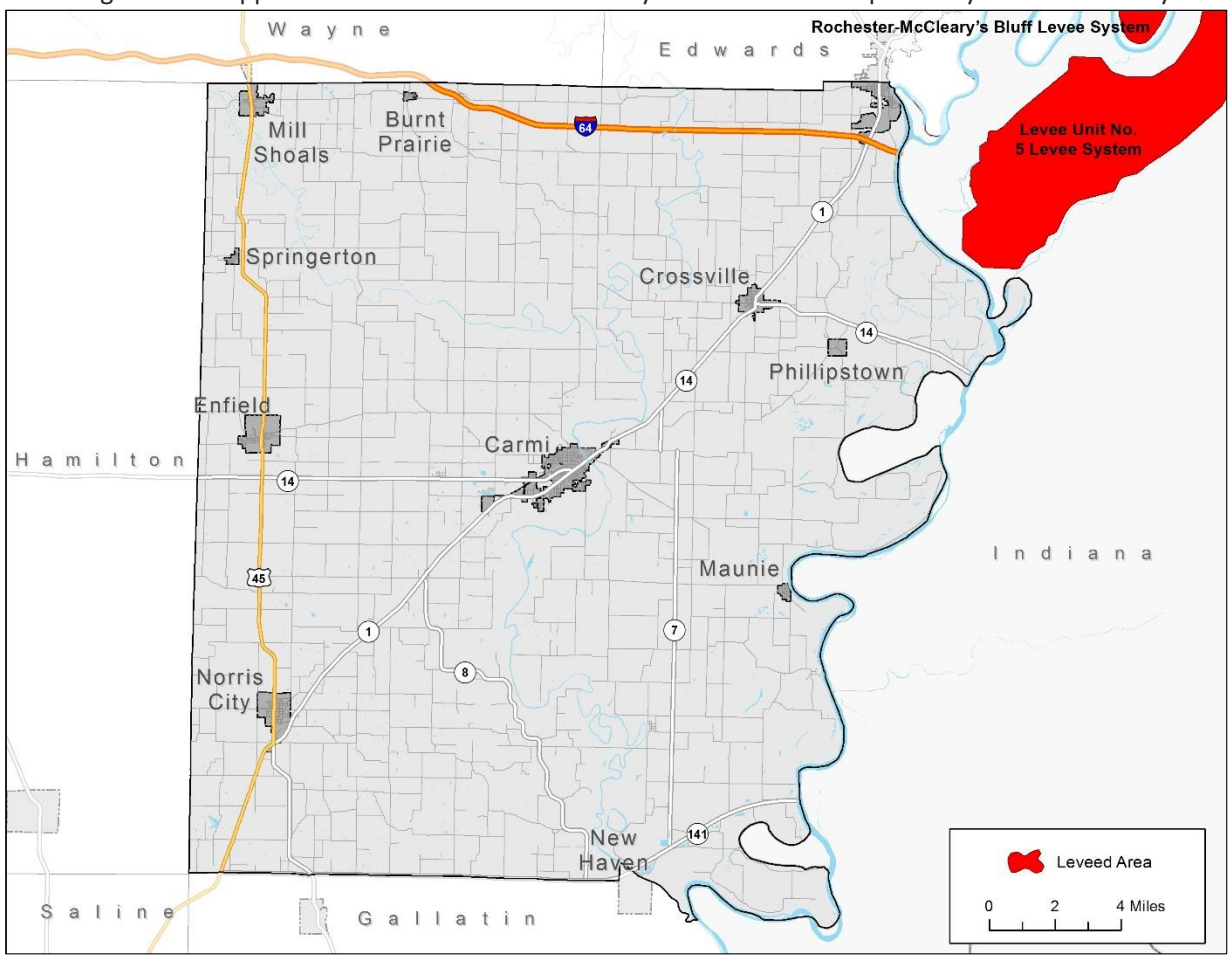
A review of the US Army Corps of Engineers National Levee Database and IDNR records did not reveal any levee systems within White County. However, there are two levee systems within close proximity to White County on the Wabash River. Table 4-35 lists the levees within close proximity to White County and their respective U.S. Army Corps of Engineers (USACE) inspection rating. The approximate location of the levee systems are shown in Figure 4-19.

Table 4-35. White County Levee Inventory

Levee System	Levee Area Acreage	USACE Levee Inspection Rating*
Rochester-McCleary's Bluff Levee System	4823.40	Minimally Acceptable
Levee Unit No. 5 Levee System	50583.45	Minimally Acceptable

*Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable. If a levee system comprises of one or more levee segments (if there are different levee sponsors for different parts of the levee) then the overall levee system rating is the lowest of the segment ratings.

Figure 4-19. Approximate Location of the Levee Systems within close proximity to White County



The U.S. Army Corps of Engineers maintains the National Inventory of Dams (NID) which identified seven dams in White County. According to NID records, one of the dams in White County is classified as high hazard and zero dams have Emergency Action Plans (EAP). Table 4-36 list of the dams located in White County and their respective classification level.

Table 4-36. White County Dam Inventory

Dam Name	Stream/River	Hazard Rating	EAP
Sandy Run Lake Dam	Trib. Bear Creek	S	N
Norris City Reservoir Dam	Indian Cree	H	N
Pont-CA Lake Dam	Trib. Little Wabash River	S	N
Cantrell Lake Dam	Trib. Fox River	L	N

Dam Name	Stream/River	Hazard Rating	EAP
Griffith Farm Lake Dam	Trib. Little Wabash River	S	N
Pollards Pond Dam	Pollard Creek Ditch	L	N
Absher Lake Dam	Trib. Little Wabash River	H	N

Hazard Extent for Dam and Levee Failure

Dams are assigned a low hazard potential classification which means that failure or incorrect operation of the dam will result in no human life losses and no economic or environmental losses. Losses are principally limited to the owner's property. A significant hazard classification means that failure or incorrect operation results in no probable loss of human life; however, dam or levee failure can cause economic loss, environmental damage, and disruption of lifeline facilities. Significant hazard potential dams are often located in predominantly rural or agricultural areas, but could be located in populated areas with a significant amount of infrastructure. A high hazard potential classification means that failure or incorrect operation has the highest risk to cause loss of human life and to significantly damage buildings and infrastructure.

According to NID records, one dams in White County is classified as high hazard and zero dams have Emergency Action Plans (EAP). An EAP is not required by the State of Illinois but is recommended in the 2003 Illinois Dam Safety & Inspection Manual.

Risk Identification for Dam and Levee Failure

Based on operation and maintenance requirements and local knowledge of the dams and levees in White County, the probability of failure is possible. However, the warning time and duration of a dam or levee failure event could be very short. According to the Risk Priority Index (RPI) and County input, flooding due to dam or levee failure is ranked as the number eight hazard.

Risk Priority Index

Probability	x	Magnitude	=	RPI
2	x	2	=	4

Vulnerability Analysis for Dam and Levee Failure

An Emergency Action Plan (EAP) is required to assess the effect of dam failure on these communities. In order to be considered creditable flood protection structures on FEMA's flood maps, levee owners must provide documentation to prove the levee meets design, operation, and maintenance standards for protection against the 1% annual probability flood.

Because all floodplains are susceptible to flooding in White County; therefore, the population and all buildings located within the floodplain are vulnerable to dam and levee failure. To accommodate this risk, this plan considers all buildings located within 100-year flood plain as vulnerable.

Critical Facilities

All critical facilities within the floodplain are vulnerable to dam and levee failure. 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). Table 4-7 lists the types and number of critical

facilities for the entire county and Appendix F displays a large format map of the locations of all critical facilities within the county.

Building Inventory

All buildings within the floodplain are vulnerable to floods as a result of dam and/or levee failure. These impacts can include structural failure, extensive water damage to the facility, and loss of facility functionality (e.g., damaged home will no longer be habitable, causing residents to seek shelter). This plan considers all buildings located within 100-year flood plain as vulnerable.

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

See section 4.3.2 Flooding Hazard for the results of the Hazus-MH Flood Analysis.

Vulnerability to Future Assets/Infrastructure for Dam and Levee Failure

Flooding as a result of dam or levee failure may affect nearly any location within the county; therefore, all buildings and infrastructure are vulnerable. Table 4-8 includes the building exposure for White County. All essential facilities in the county are at risk. Appendix E include a list of the essential facilities in White County and Appendix F displays a large format map of the locations of all critical facilities within the county. Currently, the municipal planning commission reviews new developments for compliance with the local flood zoning ordinance. At this time no new construction is planned with the 100-year floodplain.

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.

Section 5. Mitigation Strategies

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. Throughout the planning process, the White County Planning Team worked to identify existing hazard mitigation policies, develop mitigation goals, and create a comprehensive range of mitigation strategies specific to each jurisdiction. This work provides a blueprint for reducing the potential loses identified in the risk assessment (section 4).

5.1 Existing Hazard Mitigation Policies, Programs and Resources

This section documents each jurisdictions existing authorities, policies, programs and resources related to hazard mitigation and the ability to improve these existing policies and programs. It is important to highlight the work that has been completed in White County that pertains to hazard mitigation. In addition, the following information also provides an evaluation of these abilities to determine whether they can be improved in order to more effectively reduce the impact of future hazards.

5.1.1 Successful Mitigation Projects

To be successful, mitigation must be a recurrent process that is continually striving to lessen the impact of natural hazards within the county. White County has made great strides to improve its ability to mitigation against future hazards. The following are projects that have been successfully completed prior to the development of the White County 2017 Multi-Hazard Mitigation Plan.

Mitigation Project Title

Flood Buy-out in 2015 – City of Carmi – Buy-out of 20 repetitive flooding properties on the Little Wabash River through a grant in the amount of $943,343 from IEMA.

5.1.2 National Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding. This section covers the County's NIFP status, flood insurance policy and claim statistics, repetitive loss structures, and Community Rating System status.

NFIP Status

In White County, five out of the seven incorporated communities participate in the NFIP. Table 5-1 includes a summary of information for White County participation in the NFIP. The Village of Mill Shoals was mapped with a flood risk but was sanctioned on July 19, 1975. The Village of Springerton was mapped with a flood risk but was sanctioned on December 6, 1975. Sanctioned communities do not qualify for flood-related Federal disaster assistance for acquisition, construction, or reconstruction purposes in Special Flood Hazard Areas. This may have serious consequences for the community's real estate market and economic viability, as each federally regulated lender must notify the purchaser or lessee that Federal disaster assistance is not available for that property in the event of a flood. Toledo does not have an identified flood hazard boundary; therefore, this community does not participate in the NIFP. White

County will continue to provide information to its non-participating jurisdictions regarding the benefits of the National Flood Insurance Program.

No communities in this county are mapped as Non-Special Flood Hazard Areas (NSFHA). NSFHA areas have a moderate-to-low risk flood zone and is not in any immediate danger from flooding caused by overflowing rivers or hard rains. However, it's important to note that structures within a NSFHA are still at risk. In fact, nearly 1 in 4 NFIP flood claims occur in these moderate- to low-risk areas.

Table 5-1: Information on White County's Participation in the NFIP

Community	Participate in the NFIP	Initial Flood Hazard Boundary Map Identified	Initial FIRM Identified	Current Effective Map Date
Carmi	Yes	04/05/74	01/02/81	02/16/12
Crossville	Yes	03/29/74	12/18/84	02/16/12
Grayville	Yes	05/31/74	08/24/84	02/16/12
Maunie	Yes	01/09/74	02/16/12	02/16/12
White County	Yes	12/01/78	04/03/85	02/16/12
Mill Shoals	No	07/19/74	02/16/12	02/16/12
Springerton	No	12/06/74	02/16/12	02/16/12
Burnt Prairie	No			02/16/12
Enfield	No			02/16/12
Norris City	No			02/16/12
Phillipstown	No			02/16/12

NFIP status and information are documented in the Community Status Book Report updated on 03/03/2015.
NSFHA – No Special Flood Hazard Area
(M) – No Elevation Determined – All Zone A, C and X

Flood Insurance Policy and Claim Statistics

As of June 30, 2016, 85 flood insurance policies were in-force, insuring $9,870,200 in property value. The total premiums collected for the policies amounted to $55,445. Since the establishment of the NFIP in 1978, 70 flood insurance claims were filed in White County, totaling in $1,159,531.80 in payments. Table 5-2 summarizes the claims since 1978.

Table 5-2: Policy and Claim Statistics for Flood Insurance in White County

Community	Total Losses	Closed Losses	Open Losses	CWOP Losses	Payments
Carmi	44	36	0	8	$346,247.24
Crossville	1	1	0	0	$11,814.57
Maunie	2	2	0	0	$27,449.95
White County	23	19	0	4	$774,020.04

*NFIP policy and claim statistics since 1978 until the most recently updated date of 6/30/2016. 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.

Repetitive Loss Structures

White County has 5 repetitive loss structures. 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. Currently there are over 122,000 Repetitive Loss properties nationwide.

Community Rating System Status

White County and its 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. More than 1,200 communities from all 50 states participate in the CRS. Although joining the CRS is free, completing CRS activities and maintain a CRS rating will require a degree of commitment from the community, including dedicating staff. Joining the CRS could be one way White County or its incorporated communities improve their existing floodplain management policies and further reduce the flood hazard risk.

5.1.3 Jurisdiction Ordinances

Hazard Mitigation related ordinances, such as zoning, burning, or building codes, have the potential to reduce the risk from known hazards. These types of regulations provide many effective ways to address resiliency to known hazards. Table 5-3 list White County's current ordinances that directly pertain, or can pertain, to hazard mitigation. It is important to evaluate the local building codes and ordinances to determine if they have the ability to reduce potential damages caused by future hazards. The White County Planning Team worked to identify gaps in the current list of ordinances and suggested changes/additions in Section 5.3.

Table 5-3: White County's Jurisdiction Ordinances

Community	Zoning	Storm water Mgmt	Flood	Subdivision Control	Burning	Seismic	Erosion Mgmt	Land Use Plan	Building Codes
White County	N	N	Y	N	N	N	N	N	N
City of Carmi	Y	Y	Y	N	Y	N	N	N	N
Crossville	N	N	Y	N	Y	N	N	N	N
Grayville	Y	Y	Y	Y	Y	N	Y	Y	Y
Norris City	N	N	N	N	Y	N	N	N	N

*Only those jurisdictions that have ordinances are included in the table.

The adoption of new ordinances, including the adoption of new development standards or the creation of hazard-specific overlay zones tied to existing zoning regulations, present opportunities to discourage hazardous construction and manage the type and density of land uses in areas of known natural hazards. Adopting and enforcing higher regulatory standards for floodplain management (i.e., those that go beyond the minimum standards of the NFIP) is another effective method for minimizing future flood losses, particularly if a community is experiencing growth and development patterns that influence flood hazards in ways that are not accounted for on existing regulatory floodplain maps. Revisions to existing building codes also present the opportunity to address safe growth. Many state and local codes are based

off national or industry standard codes which undergo routine evaluations and updates. The adoption of revised code requirements and optional hazard-specific standards may help increase community resilience.

5.1.4 Fire Insurance Ratings

By classifying communities' ability to suppress fires, the Insurance Service Office (ISO) Public Protection Classification Program helps communities evaluate their public fire-protection services. The program provides a countrywide standard that helps fire departments in planning and budgeting for facilities, equipment, and training. Information is collected on municipal fire-protection efforts in communities throughout the United States. In each of those communities, ISO analyzes the relevant data using a Fire Suppression Rating Schedule. Rating are assigned from 1 to 10 where Class 1 generally represents superior property fire protection, and Class 10 indicates that the area's fire-suppression program doesn't meet ISO's minimum criteria. There are seven Fire Protection Districts servicing White County. Table 5-4 displays each Fire Protection District's insurance rating and total number of employees.

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

Fire Department	Fire Insurance Rating	Number of Employees
Crossville Volunteer FD	7	20
Enfield FPD	7	30
Little Wabash FPD	7	16
Norris City FPD	7	21
Enfield FPD Station 2	7	24
Carmi FD	5	19
Carmi Rural	7	19

5.2 Mitigation Goals

In Section 4 of this plan, the risk assessment identified White County as prone to several hazards. The Planning Team members understand that although they cannot eliminate hazards altogether, White 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

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

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

Objective: Minimize the amount of infrastructure exposed to hazards.

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

Objective: Improve emergency sheltering in White County.

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

Objective: Support compliance with the NFIP for each jurisdiction in White County.

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

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

Goal 3: Develop long-term strategies to educate White County residents on the hazards

Objective: Raise public awareness on hazard mitigation.

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

5.3 Multi-Jurisdictional Mitigation Strategies

After reviewing the Risk Assessment, the Mitigation Planning Team was presented with the task of individually listing potential mitigation activities using the FEMA STAPLEE evaluation criteria (see table 5-5). FEMA uses their evaluation criteria STAPLEE (stands for social, technical, administrative, political, legal, economic and environmental) to assess the developed mitigation strategies. Evaluating possible natural hazard mitigation activities provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. The Planning Team brought their mitigation ideas to Meeting 3.

Table 5-5. FEMA's STAPLEE Evaluation Criteria

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.
Technical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
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.
Legal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
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.
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.

Table 5-6 contains a comprehensive range of specific mitigation actions and projects for each jurisdiction, with an emphasis on new and existing buildings and infrastructure. At least two identifiable mitigation action items have been addressed for each hazard listed in the risk assessment. Each of the incorporated communities within and including White 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 Table 5-6. The mitigation strategies are arranged by hazards they directly address. In some cases, certain mitigation strategies can address all hazards. If provided by the jurisdiction, each mitigation strategy contains specific details

pertaining to the implementation, responsible and/or organizing agency, and potential funding source. Potential funding sources are identified by Federal, State, Local, or Private. A code is assigned to each mitigations strategy for ease of reference when reviewing the prioritization of each mitigations strategies in Section 5.4.

Table 5-6: White County's Multi-Jurisdictional Mitigation Strategies

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
	ALL HAZARDS				
AH1	**Equip critical facilities with back-up generators** *Jurisdictions throughout the county will research and purchase back-up generators at their facilities. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Norris City, Carmi, NCOE CUSD#3, Springerton, Phillipstown, Crossville	Proposed/Ongoing	L, S, F	County EMA
AH2	**Purchase emergency signage for closures and direction** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within three years.*	County EMA, Enfield, Phillipstown, Grayville	Proposed/Ongoing	L	County EMA
AH3	**Develop mutual aid agreements** *The county will work with jurisdictions within and without to have mutual aid agreements. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, Crossville	Proposed	L, S	County EMA, Carmi, Crossville
AH4	**Develop social media techniques to provide critical weather updates and disseminate critical information** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within next year.*	County EMA, Carmi, NCOE CUSD#3, Carmi-White County CUSD #5	Proposed/Ongoing	L, F	County EMA, Carmi, NCOE CUSD#3, Carmi-White County CUSD #5
AH5	**Establish an Incident Management Team** *Norris City and Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City, Carmi	Ongoing	L, S, F	Norris City, Carmi
AH6	**Enhance emergency communication system infrastructure** *Norris City will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City	Ongoing	S, F	Norris City
AH7	**Relocate existing utility lines underground** *Involved jurisdictions will oversee this strategy to work toward a more robust utility infrastructure by moving some existing utility lines underground. If funding is available, implementation is forecasted within the next year.*	Norris City, Carmi, NCOE CUSD#3	Ongoing	L, S, F	Norris City, Carmi, NCOE CUSD#3
AH8	**Create additional heating / cooling shelter** *Norris City will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City	Ongoing	L, S, F	Norris City
AH9	**Supply all critical facilities with basic survival gear, food, and water** *Involved jurisdictions will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City, Crossville, Grayville	Proposed/Ongoing	L, S, F	Norris City, Crossville, Grayville
AH10	**Establish local emergency planning committee** *Carmi and WOVSED will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi, WOVSED	Ongoing	L	Carmi, WOVSED
AH11	**Enhance emergency communication system infrastructure** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi, NCOE CUSD#3	Proposed/Ongoing	L, F	County EMA
AH12	**Improve communication between utility companies** *Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi	Ongoing	L	Carmi

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
AH13	**Distribute NOAA Weather Radios** *Local resources will be used to evaluate the cost benefits of radios. Funding has not yet been secured as of 2016 If funding is available, is forecasted to be complete within approximately three year.*	Carmi, Enfield, WOVSED	Proposed/Ongoing	L, S, F	Carmi, Enfield, WOVSED
AH14	**Develop vulnerable population list** *Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi	Proposed	L	Carmi
AH15	**Improve/maintain access to public right-of-ways (Tree Management)** *Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi	Proposed	L	Carmi
AH16	**Acquire portable lighting for mass casualty preparation** *Carmi and Grayville will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi, Grayville	Proposed	L	Carmi, Grayville
AH17	**Acquire a Hazard Even Training Trailer** *Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi	Proposed	L	Carmi
AH18	**Promote disaster resilience through workshops, education materials, and planning guides** *N.C.O.E CUSD #3 will oversee this strategy. If funding is available, implementation is forecasted within the next three years.*	NCOE CUSD#3	Proposed	S	NCOE CUSD#3
AH19	**Construct additional community safe rooms** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	NCOE CUSD#3	Proposed	F	NCOE CUSD#3
AH20	**Storm hardening utilities** *Wayne and White Counties Electric Coop will work to install new and stronger facilities to prevent damage from tornadoes, severe storms, and winter storms. Funding will be sought from federal and private sources. Implementation is forecasted within the next three years.*	Wayne and White Counties Electric Coop	Proposed	F, P	Wayne and White Counties Electric Coop
AH21	**Improve/maintain access to public right-of-ways (Tree Management)** *Wayne and White Counties Electric Coop will clear and maintain right of way to prevent utility damage during tornadoes, severe thunderstorms, and winter storms. If funding is available, implementation is forecasted within the next year.*	Wayne and White Counties Electric Coop	Ongoing	F, P	WWC Electric Coop
AH22	**Develop alternative traffic routes** *Enfield will oversee this strategy. If funding is available, implementation is forecasted within the next five years.*	Enfield	Proposed	L	Enfield
AH23	**Develop and maintain comprehensive plan to incorporate natural disasters** *Carmi- White County CUSD #5 and WOVSED would like to have an emergency readiness plan in place for all natural disasters. If funding is available, implementation is forecasted within the next year.*	Carmi White County CUSD #5, WOVSED	Ongoing	L	Carmi-White County CUSD #5, WOVSED
TORNADO / SEVERE THUNDERSTROMS					
ST1	**Equip critical facilities with lightning protection devices** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, Grayville CUSD #1, Grayville	Proposed/Ongoing	L, S, F	County EMA

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
ST2	**Provide jurisdiction-wide siren warning coverage** *Most jurisdictions have existing sirens; the County EMA will verify all are working properly. Norris City will seek to expand their siren system. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Norris City, Carmi, Springerton, Grayville	Proposed/Ongoing	L, S, F	County EMA, Norris City, Carmi, Springerton, Grayville
ST3	**Anchor Manufactured Homes and Exterior Attachments** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi	Ongoing	L, S, P	County EMA, Carmi
ST4	**Develop ordinance to require new development to place all new utility lines underground** *Carmi will seek to pass ordinance to eliminate power outages. Individual jurisdictions will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City, Carmi, Wayne and White Counties Electric Coop	Proposed/Ongoing	L, S, F, P	Norris City, Carmi
ST5	**Retrofit Structures to withstand high winds** *Grayville CUSD #1 will oversee this strategy. If funding is available, implementation is forecasted within the next three years.*	Grayville CUSD #1	Proposed	S, F	Grayville CUSD #1
ST6	**Require the construction of safe rooms within new public buildings** *N.C.O.E. #3 and Grayville will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	NCOE CUSD#3, Grayville	Proposed	F	NCOE CUSD#3, Grayville
ST7	**Construct new safe rooms** *Involved jurisdictions will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	NCOE CUSD#3, Carmi White County CUSD #5, Grayville	Proposed	S, F	NCOE CUSD#3, Carmi-White County CUSD #5, Grayville
ST8	**Install lightning detection system** *Grayville will oversee the implementation of this project. If funding is available, is forecasted within the next three to five years*	Grayville	Proposed	L, S	Grayville
	EARTHQUAKE				
EQ1	**Map and assess community vulnerability to seismic hazards** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, NCOE CUSD#3	Ongoing	L, S, F	County EMA
EQ2	**Perform detailed engineering studies of bridges and buildings** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Proposed/Ongoing	L, S, F	County EMA
EQ3	**Develop NEHRP soils map, liquefaction map, and/or topographic map** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Ongoing	L, S, F	County EMA
EQ4	**Develop Earthquake Emergency Action Plan** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Norris City, Carmi, Crossville	Proposed/Ongoing	L, S, F	County EMA
EQ5	**Install automatic shutoff valves** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City, Carmi, Grayville CUSD #1, NCOE CUSD#3	Proposed/Ongoing	L, S, F	County EMA

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
EQ6	**Retrofit/harden critical facilities** *Grayville CUSD #1 will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Grayville CUSD #1	Proposed	L, S, F	Grayville CUSD #1
	HAZARDOUS MATERIALS RELEASE				
HAZ1	**Update hazmat emergency response plan** *The county emergency response plan was updated 7/2016. County EMA will work with local jurisdictions to involve them in plan and keep LEPC active. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Norris City, Carmi, Grayville CUSD #1, NCOE CUSD#3, Grayville	Ongoing	L, S, F	County EMA
HAZ2	**Acquire Protective Gear** *County EMA will oversee this strategy and seek to outfit police departments, fire departments and others with necessary gear. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, Grayville CUSD #1, Grayville	Proposed/Ongoing	L, S, F	County EMA
HAZ3	**Equip critical facilities with centralized positive-pressure HVAC systems** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Norris City, NCOE CUSD#3	Ongoing	S, F	County EMA
HAZ4	**Update hazardous material facilities to current regulations** *Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next three years.*	Carmi	Proposed	S, F	Carmi
	FLOODING / DAM AND LEVEE FAILURE				
F1	**Add or increase requirements for feet above Base Flood Elevation(BFE) in Flood Damage Prevention Ordinance** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Ongoing	L	County EMA
F2	**Improve public awareness on NIFP, buyout programs, and flood mitigation** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi	Ongoing	L	County EMA, Carmi
F3	**Institute a buy-out plan for repetitive loss properties** *Through FEMA Mitigation buyouts, Carmi purchased 16 flood prone properties in 2015. Two previous buyouts in past 20 years totaled 25 properties. County EMA will oversee the continuation of this strategy in Carmi and throughout the county. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi	Ongoing	L, S, F	County EMA, Carmi
F4	**Institute a relocation or buyout plan for flood prone properties** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Grayville	Ongoing	L	County EMA
F5	**Regularly inspect dam / levees** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next three years.*	County EMA	Ongoing	L, F	County EMA
F6	**Repair old or install new levee system to 100 or 500 year flood protection level** *Corps of engineers recommended the Little Wabash River needs a levee but funding was not available. Funding will be sought for this project and other similar projects in the area. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi	Proposed/Ongoing	L, S, F	County EMA, Carmi
F7	**Elevate low-lying roads** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, NCOE CUSD#3	Proposed	L, S, F	County EMA
F8	**Culvert replacement/maintenance** *Local jurisdictions don't have funds to perform necessary maintenance. Funding will be sought to help with these projects. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Grayville CUSD #1, NCOE CUSD#3	Proposed/Ongoing	L, S, F	County EMA

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
F9	**Regularly perform drainage system maintenance** *Jurisdictions need outside funding for these projects. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Ongoing	L, S, F	County EMA
F10	**Conduct watershed analysis of runoff and drainage systems to predict insufficient capacity in storm drain/natural creek systems** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Proposed	L, S	County EMA
F11	**Repair old or install new flood gates** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Ongoing	F	County EMA
F12	**Install Pumping Stations in levee systems** *County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA	Ongoing	F	County EMA
F13	**Train local floodplain managers through programs offered by the State Floodplain Coordinator, FEMA and/or Illinois Association of Floodplain and Storm water Management** *The 15+ year floodplain manager of Carmi recently retired; the city will need to train new managers to replace him. Others in the county will seek further training in these subjects. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, Crossville	Proposed/Ongoing	L, S, F	County EMA
F14	**Maintain a list of flood prone structures** *Carmi has a list of flood prone properties that were not purchased in previous buyouts. Carmi will oversee this strategy.*	Carmi	Ongoing	L	Carmi
F15	**Maintain participating status in NFIP by enforcing the Flood Damage Prevention Ordinance** *Carmi will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	Carmi	Ongoing	L	Carmi
F16	**Elevate structures and utilities in flood prone areas** *Wayne and White Counties Electric Coop will oversee this strategy of raising facilities to prevent damage from flooding If funding is available, implementation is forecasted within the next three years.*	Wayne and White Counties Electric Coop	Proposed	F, P	Wayne and White Counties Electric Coop
	WINTER STORMS				
WS1	**Purchase deicing chemicals** *Jurisdictions don't have enough money to cover their needs in this area. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, Grayville CUSD #1, NCOE CUSD#3, Grayville	Ongoing	L, S, F	County EMA
WS2	**Establish a network of 4WD/Off-road vehicles to access stranded people** *Better equipment is needed throughout the county for snow removal and outside funding is needed. Carmi has started a network and will be updating the list in the next year. County EMA will oversee this strategy. If funding is available, implementation is forecasted within the next year.*	County EMA, Carmi, Grayville	Ongoing	L, S, F	County EMA
WS3	**Install signs that direct traffic toward shelters and safe travel routes** *Grayville CUSD #1 will oversee this strategy. If funding is available, implementation is forecasted within the next three year.*	Grayville CUSD #1	Proposed	L, S, F	Grayville CUSD #1
WS4	**Develop requirement for new development to place all new utility lines underground** *Wayne and White Counties Electric Coop will oversee this strategy. If funding is available, implementation is forecasted within the next years.*	Wayne and White Counties Electric Coop	Proposed	F, P	Wayne and White Counties Electric Coop

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
	DROUGHT/EXTREME HEAT/FIRE				
H1	**Develop/Enforce Strict Burn Ordinances** *Grayville will oversee the implementation of this ordinance.*	Grayville	Proposed	L, S,	Grayville

* F – Federal, S – State, L – Local, P – Private

5.4 Prioritization of Multi-Jurisdictional Mitigation Strategies

Implementation of the mitigation strategies is critical to the overall success of the mitigation plan. It is important 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 vital. It is important to note that 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. It is also critical to take into account the amount of time it will take the community to complete the mitigation project.

Table 5-7 displays the priority ranking for each mitigation strategy. Each code refers to a specific mitigations strategy listed in Table 5-6. For each participating jurisdiction a rating (high, medium, or low) was assessed for each mitigation item. The ranking is the result of the STAPLEE evaluation and the timeframe the community is interested in completing the strategy: H - High 1-3 years; M - Medium 3-5 years; and L - Low 5+years.

Table 5-7. Prioritization of the White County Mitigation Strategies

	Priority Ranking												
Code	White County	Carmi	Enfield	Crossville	Norris City	Springerton	Phillipstown	Grayville	Carmi-White CUSD #5	Grayville CUSD #1	Norris-City-Omaha-Enfield CUSD #3	Wabash Ohio Valley Special Education District (WOVSED)	Wayne-White Electric Co-Op
AH1	M	H	-	H	H	L	L	-	-	-	H	-	-
AH2	M	-	L	-	-	-	L	H	-	-	-	-	-
AH3	H	H	-	H	-	-	-	-	-	-	-	-	-
AH4	L	H	-	-	-	-	-	-	H	-	M	-	-
AH5	-	H	-	-	H	-	-	-	-	-	-	-	-
AH6	-	H	-	-	H	-	-	-	-	-	M	-	-
AH7	-	H	-	-	H	-	-	-	-	-	H	-	-
AH8	-	-	-	-	H	-	-	-	-	-	-	-	-
AH9	-	-	-	H	H	-	-	H	-	-	-	-	-
AH10	-	H	-	-	-	-	-	-	-	-	-	H	-
AH11	-	-	-	-	-	-	-	-	-	-	-	-	-
AH12	-	H	-	-	-	-	-	-	-	-	-	-	-
AH13	-	H	L	-	-	-	-	-	-	-	-	M	-
AH14	-	H	-	-	-	-	-	-	-	-	-	-	-
AH15	-	H	-	-	-		-	-	-	-	-	-	-
AH16	-	H	-	-	-	-	-	H	-	-	-	-	-
AH17	-	H	-	-	-	-	-	-	-	-	-	-	-
AH18	-	-	-	-	-	-	-	-	-	-	M	-	-
AH19	-	-	-	-	-	-	-	-	-	-	H	-	-
AH20	-	-	-	-	-	-	-	-	-	-	-	-	M
AH21	-	-	-	-	-	-	-	-	-	-	-	-	H
AH22	-	-	L	-	-	-	-	-	-	-	-	-	-
AH23	-	-	-	-	-	-	-	-	H	-	-	H	-
ST1	H	H	-	-	-	-	-	H	-	H	-	-	-

Code	Priority Ranking												
	White County	Carmi	Enfield	Crossville	Norris City	Springerton	Phillipstown	Grayville	Carmi-White CUSD #5	Grayville CUSD #1	Norris-City-Omaha-Enfield CUSD #3	Wabash Ohio Valley Special Education District (WOVSED)	Wayne-White Electric Co-Op
ST2	H	H	-	-	H	L	-	H	-	-	-	-	-
ST3	H	H	-	-	-	-	-	-	-	-	-	-	-
ST4	-	H	-	-	H	-	-	-	-	-	-	-	M
ST5	-	-	-	-	-	-	-	-	-	M	-	-	-
ST6	-	-	-	-	-	-	-	L	-	-	H	-	-
ST7	-	-	-	-	-	-	-	L	M	-	H	-	-
ST8	-	-	-	-	-	-	-	M	-	-	-	-	-
EQ1	H	-	-	-	-	-	-	-	-	-	M	-	-
EQ2	H	-	-	-	-	-	-	-	-	-	-	-	-
EQ3	H	-	-	-	-	-	-	-	-	-	-	-	-
EQ4	H	H	-	H	M	-	-	-	-	-	-	-	-
EQ5	-	H	-	-	M	-	-	-	-	H	M	-	-
EQ6	-	-	-	-	-	-	-	-	-	H	-	-	-
HAZ1	H	H	-	-	H	-	-	M	-	H	M	-	-
HAZ2	H	H	-	-	-	-	-	M	-	H	-	-	-
HAZ3	-	-	-	-	H	-	-	-	-	-	M	-	-
HAZ4	-	M	-	-	-	-	-	-	-	-	-	-	-
F1	H	-	-	-	-	-	-	-	-	-	-	-	-
F2	H	H	-	-	-	-	-	-	-	-	-	-	-
F3	H	H	-	-	-	-	-	-	-	-	-	-	-
F4	H	-	-	-	-	-	-	H	-	-	-	-	-
F5	M	-	-	-	-	-	-	-	-	-	-	-	-
F6	M	H	-	-	-	-	-	-	-	-	-	-	-
F7	H	H	-	-	-	-	-	-	-	-	H	-	-
F8	H	-	-	-	-	-	-	-	-	M	H	-	-
F9	H	-	-	-	-	-	-	-	-	-	-	-	-
F10	M	-	-	-	-	-	-	-	-	-	-	-	-
F11	H	-	-	-	-	-	-	-	-	-	-	-	-
F12	H	-	-	-	-	-	-	-	-	-	-	-	-
F13	M	H	-	H	-	-	-	-	-	-	-	-	-
F14	-	H	-	-	-	-	-	-	-	-	-	-	-
F15	-	H	-	-	-	-	-	-	-	-	-	-	-
F16	-	-	-	-		-	-	-	-		-	-	M
WS1	H	H	-	-	-	-	-	L	-	H	M	-	-
WS2	M	H	-	-	-	-	-	L	-	-	-	-	-
WS3	-	-	-	-	-	-	-	-	-	M	-	-	-
WS4	-	-	-	-	-	-	-	-	-	-	-	-	M
H1	-	-	-	-	-	-	-	H	-	-	-	-	-

Section 6. Plan Implementation and Maintenance

6.1 Implementation through Existing Programs

Throughout the planning process, the White County Planning Team worked to identify existing hazard mitigation policies, develop mitigation goals, and create a comprehensive range of mitigation strategies specific to each jurisdiction. This work provides a blueprint for reducing the potential loses identified in the Risk Assessment (Section 4). The ultimate goal of this plan is to incorporate the mitigation strategies proposed into ongoing planning efforts within the County. The White County Emergency Management Agency will be the local champion for the mitigation actions. The White County Board and the city and village councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified action.

Continued public involvement is also critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by the White County Emergency Management Agency and forwarded to the Planning Team for discussion. Education efforts for hazard mitigation will be an ongoing effort of White County. 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 White County Emergency Management Agency.

6.2 Monitoring, Evaluation, and Updating the MHMP

Throughout the five-year planning cycle, the White County Emergency Management Agency will reconvene the Planning Team to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held in 2022 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 the occurrence of a declared disaster 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.

As part of the update process, the Planning Team 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 team will also review the risk assessment portion of the plan to determine if this information should be updated or modified. The plan revision will also reflect changes in local development and its relation to each hazard. 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 White County Board.

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.

Definitions

100-year Floodplain	Areas subject to inundation by the 1-percent-annual-chance flood event.
Critical Facility	A structure, because of its function, size, service area, or uniqueness, that has the potential to cause serious bodily harm, extensive property damage, or disruption of vital socioeconomic activities if it is destroyed or damaged or if its functionality is impaired. This includes, but are not limited to, water and wastewater treatment facilities, municipal buildings, educations facilities, and non-emergency healthcare facilities.
Community Rating System (CRS)	A voluntary program for National Flood Insurance Program (NFIP) participating communities. The goals of the CRS are to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management.
Comprehensive Plan	A document, also known as a "general plan," covering the entire geographic area of a community and expressing community goals and objectives. The plan lays out the vision, policies, and strategies for the future of the community, including all the physical elements that will determine the community's future developments.
Disaster Mitigation Act of 2000 (DMA 2000)	The largest legislation to improve the planning process. It was signed into law on October 30, 2000. This new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur.
Essential Facility	A subset of critical facilities that represent a substantial hazard to human life in the event of failure. This includes (but not limited to) hospital and fire, rescue, ambulance, emergency operations centers, and police stations.
Federal Emergency Management Agency	An independent agency created in 1979 to provide a single point of accountability for all federal activities related to disaster mitigation and emergency preparedness, response, and recovery.
Hazard	A source of potential danger or adverse condition.
Hazard Mitigation	Any sustained action to reduce or eliminate long-term risk to human life and property from hazards.

Hazard Mitigation Grant Program (HMPG)	Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration.
Hazus-MH	A geographic information system (GIS)-based disaster risk assessment tool.
Multi-Hazard Mitigation Planning	Identify policies and actions that can be implemented over the long term to reduce risk and future losses from various hazardous events.
National Flood Insurance Program	Administered by the Federal Emergency Management Agency, which works closely with nearly 90 private insurance companies to offer flood insurance to property owners and renters. In order to qualify for flood insurance, a community must join the NFIP and agree to enforce sound floodplain management standards.
Planning Team	A group composed of government, private sector, and individuals with a variety of skills and areas of expertise, usually appointed by a city or town manager, or chief elected official. The group finds solutions to community mitigation needs and seeks community acceptance of those solutions.
Risk Priority Index	Quantifies risk as the product of hazard probability and magnitude so Planning Team members can prioritize mitigation strategies for high-risk-priority hazards.
Risk Assessment	Quantifies the potential loss resulting from a disaster by assessing the vulnerability of buildings, infrastructure, and people.
Strategy	A collection of actions to achieve goals and objectives.
Vulnerability	Describes how exposed or susceptible to damage an asset is. Vulnerability depends on an asset's construction, contents, and the economic value of its functions.

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
EAP – Emergency Action Plan
EMA – Emergency Management Agency
EPA – Environmental Protection Agency

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
IDNR – Illinois Department of Natural Resources
IDOT – Illinois Department of Transportation
IEMA – Illinois Emergency Management Agency
ISO – Insurance Service Office
ISGS – Illinois State Geological Survey
ISWS– Illinois State Water Survey

M MHMP – Multi-Hazard Mitigation Plan

N NCDC – National Climatic Data Center
NEHRP – National Earthquake Hazards Reduction Program
NFIP – National Flood Insurance Program
NID – National Inventory of Dams
NOAA – National Oceanic and Atmospheric Administration
NSFHA – Non-Special Flood Hazard Area

P PA – Public Assistance
PHMSA– Pipeline and Hazardous Materials Safety Administration
PPM – Parts Per Million

R RPI – Risk Priority Index

S SIU – Southern Illinois University Carbondale
SPC – Storm Prediction Center
STAPLEE – Social, Technical, Administrative, Political, Legal, Economic, and Environmental

U USGS – United States Geological Survey

Appendices

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Appendix A. MHMP Meeting Minutes

Formal Mitigation Planning Meetings

Meeting 1 – November 20th, 2014 & February 26th, 2015

Meeting 2 – March 9th, 2016

Meeting 3 – October 12th, 2016

Outside Meetings

See Attached Outside Meeting Minutes and Sign-in Sheets

Meeting 1 – November 20th, 2014

White County Multi-Hazard Mitigation Plan Meeting 1

Chairman: Jim Totten (EMA Coordinator)

Plan Directors: Southern Illinois University and Greater Wabash Regional Planning Commission

Meeting Date: November 20th, 2014

Meeting Time: 1:30 pm

Place: University of Illinois Extension – 1715 College Ave, Carmi, IL

Attendance: see attached

Introduction to the Multi-Hazard Mitigation Planning Process

The planning team was welcomed by Prof. Nicholas Pinter, project director from SIU. Prof. Pinter gave an overview of the planning process and discussion of schedule and milestones. He explained that the objective of this project is to update White County's 2009 Multi-Hazard Mitigation Plan (MHMP) to meet the requirements of the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA). The grant requires a 25% match from the county but **will be met by sweat equity by an accumulation of time spent at the meetings, on research assignments, surveys, along with the time spent reviewing and producing the planning document**.

The first task of the meeting was to assemble a list of disaster-related threats facing the community. A power point presentation was presented by Amanda Damptz, project manager at SIU. Amanda discussed the historical disasters that have occurred in White County. Amanda also covered the significant natural hazard events that occurred during 2009 through 2013 (the life span the 2009 MHMP). This information was used to guide the Hazard Ranking Exercise that the County and each participating jurisdiction must complete.

The next task of the meeting was to assemble a list of disaster-related threats facing White County. Using the hazards ranked in the 2009 MHMP, the Planning Team evaluated each hazard based on the probability/likelihood each hazard would occur and the impact/severity it would have on White County.

Each jurisdiction within the county is responsible for filling out a separate Risk Assessment and submit it to SIU. Another meeting will be held due to lack of attendance.

Meeting was adjourned.

White County PDMP First Meeting
November 20, 2014 at 1:30 pm
Carmi, IL

Milage

	Name	Representing	Phone Number	Address	Email Address	
1	James Totten	White County EMA	618 383-1883	1400 Roser Dr Carmi, IL 62821	jctotten@frontier.com	
2	DOUG MAIER	WHITE CO. SHERIFF	618-383-1591	108 N MAIN CROSS CARMI IL	sheriff@whitecounty-il.gov	
3	David JORDAN	City of Grayville	618-231-0457	413 Hagedorn Rd, Grayville	bisonll@nwcable.net	
4	JASON CARTER	CARMI POLICE DEPT	618-382-4677	108 N MAIN CROSS ST CARMI IL 62821	carmipolice@gmail.com	
5	David Kaytor	WOVSED	618-378-2131	NORRIS CITY PO BOX 320	dskaytor@wovsed.org	14
6	Roy Kissel	Village of Norris City N.C. FPD	618 5592240	406 S. Division	villnc@hamiltoncomm.net	24
7	SANDRA IRVINE	CITY OF CARMI	384 2001	225E MAIN ST 62821	ULEDG@SITYOFCARMI.com	
8						
9						
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11						
12						
13						
14						
15						

Meeting 1 Redo – February 26th, 2015

White County Multi-Hazard Mitigation Plan Meeting 1 Redo

Chairman: Jim Totten (EMA Coordinator)

Plan Directors: Southern Illinois University and Greater Wabash Regional Planning Commission

Meeting Date: February 26th, 2015

Meeting Time: 2:00 pm

Place: University of Illinois Extension – 1715 College Ave, Carmi, IL

Attendance: see attached

Introduction to the Multi-Hazard Mitigation Planning Process

The planning team was welcomed by Amanda Damptz, project manager from SIU. Amanda explained that the first meeting held in November had low attendance and this Redo Meeting was an attempt to gather more information. She gave an overview of the planning process and discussion of schedule and milestones. She explained that the objective of this project is to update White County's 2009 Multi-Hazard Mitigation Plan (MHMP) to meet the requirements of the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA). The grant requires a 25% match from the county but **will be met by sweat equity by an accumulation of time spent at the meetings, on research assignments, surveys, along with the time spent reviewing and producing the planning document**.

The first task of the meeting was to assemble a list of disaster-related threats facing the county. A power point presentation was presented. Amanda discussed the historical disasters that have occurred in White County. Amanda also covered the significant natural hazard events that occurred during 2009 through 2013 (the life span the 2009 MHMP). This information was used to guide the Hazard Ranking Exercise that each participating jurisdiction must complete.

Using the hazards ranked in the 2009 MHMP, the Planning Team evaluated each hazard based on the probability/likelihood each hazard would occur and the impact/severity it would have in their individual communities.

The next meeting will be the public meeting where SIU will present the results of the risk assessment, describe the GIS and Hazus models. This which will give the public a chance to voice their opinions regarding the plan. After the public meeting the team will meet and review the Risk Assessment. Meeting was adjourned.

White County PDMP First Meeting
February 26, 2015 at 2 pm
U of I Extension, Carmi, IL

	Name	Representing	Phone Number	Address	Email Address	Job Description	Milage
1	Rob Spencer	L.W.F.P.D.	375-1815	110 Sparta Rd	r_spencer38@yahoo	Chief	17
2	Sarah Emery	Grayville CUSD#1	375 7114	738 W. North St.	semery@gcusd.com	Superintendent	20
3	Roy A. Kissel	Village of Norris City NC Fire Prot. Dist.	378-3611	406 S. Division St	villna@hamiltonam.net	Mayor	62
4	Gary Dillman	Dillman Services, Inc	382-4720	121 Council ST.	gdillman@dillmanservices.com	OWNER	2
5	DAVID DOSHER	WHITE CO.	383-6421	448 C.R. 1580 N. ENFIELD	DAVIDDOSHER@gmail.com	WHITE CO BOARD	16
6	BRIAN RAY	White County	382-4811	1103 EAST MAIN ST CARMI IL 62821	wcounty@frontier.com	County Engineer	
7	SHEILA IRVINE	CITY OF CARMI	384-2001	225 E MAIN CARMI, IL 62821	IKEDG@CITYOFCARMI.COM	ADMINISTRATION EARNING DEV	
8	JEFF POLLARD	CITY OF CARMI	382-8118	225 E. MAIN CARMI IL 62821	MAYOR@CITY OF CARMI.COM	MAYOR	
9	MIKE BUCKMAN	CITY OF CARMI	382-5555	225 E. MAIN CARMI IL. 62821	SUPERVISOR@CITYOFCARMI.COM	SUPERVISOR	
10	Chris Hopfinger	Wayne White Elec	842-2196	1501 W Main Fairfield IL 62837	chopfinger@wwcec.com	System Eng.	
11	James Totten	White Co EMA	618-384-4701	1400 Roser Drive Carmi, IL 62821	jetotten@frontier.com	Coordinator	1
12	James RENSHAW CFM	City of Carmi	618 384 7510	916 SYCAMORE ST CARMI	Jdr709@MSN.COM	FLOOD PLAIN MANGER	
13	Amanda Dampa	SIU	618 453 7349	1259 Lincoln Dr Carbondale	adampa12@siu.edu	Researcher	0
14	Tim Kropp	SIU	631-905-5772	1259 Lincoln Drive Carbondale	timKropp@siu.edu	research	0
15	Kara Kuykendall	GWRPC	6184453362	Grayville	KaraKuykendall@gmail.com	grant writer	
	Name	Representing	Phone Number	Address	Email Address	Job Description	

Meeting 2 – March 9th, 2016

White County Multi-Hazard Mitigation Plan Meeting 2

Chairman: Jim Totten (EMA Coordinator)

Plan Directors: Southern Illinois University and Greater White Regional Planning Commission

Meeting Date: March 9th, 2016

Meeting Time: 6:00 p.m.

Place: University of Illinois Extension – 1715 College Ave, Carmi, IL

Attendance: see attached

Public Meeting and County Risk Assessment

Prof. Nicholas Pinter opened the meeting by explaining that the planning team is here today to update the 2009 White County Multi-Hazard Mitigation Plan. He introduced the planning partners: Southern Illinois University and Greater Wabash Regional Planning Commission. A PowerPoint presentation was present that included: historic accounts of natural disasters that have affected White County and the results from the risk assessment report.

A draft of the White County Mitigation Plan was also given to each planning team members for review. It was explained by Prof. Pinter that each planning team member should review the plan and consider the risk assessment before attending the next meeting. The next meeting will involve developing mitigation strategies to address each ranked hazard.

Meeting was adjourned.

White County PDMP Meeting
March 9, 2016 at 6 pm
U of I Extension 1715 College Avenue
Carmi, IL 62821

	Name	Representing	Phone Number	Address	Email Address	Job Description	Milage
1	KaraKrykendall	BWRPC	6184453612	Albion	Karakrykendall@msn.com	Grant	34
2	Tim Knapp	SIU	6319055772	Carbondale	timknapp@siu.edu	Student	120
3	Levi Milliron	SIU	765 860 1386	Carbondale	millironk15@siu.edu	Project Mgr.	120
4	SARAH EMERY	Grayville CUSD1	618-375 7114	738 W North Grayville	semery@gcusd.com	Supt	15/60
5	WES TROUT	WHITE CTY BRD	6183847635	CROSSVILLE	62844 WTROUT1399 @CROSSTELCE.COM	CHAIRMAN	7
6	SANDRA IRVINE	CARMI	3828118	CARMI		ADMIN ASST.	30
7	Rick Irvin	Grayville	812-480-8565	Grayville	IDV7546@Hotmail.com		30
8	MIKE BUCHMAN	CARMI	618-383-1555	CARMI	—	SUPERVISOR	5
9	Tom HARBOUR	Enfield	618-838-2543	Enfield		Mayor	10
10	Nancy B Russell	Carmi FD/EMA	618-518-7574	Carmi	nstyb1178@yahoo.com	Driver	3
11	LARRY Hite	Fire/EMA	618-384-7346	CARMI	LGH.LPH@Hotmail.com	Fire Chief	6
12	DONALD PAINTER	CARMI FIRE/EMA	618-383-4773	CARMI	K9DWD@HOTMAIL.COM	FIRE FIGHTER	2
13	Christine Totten	Carmi EMA	6181384-4761	Carmi	jctotten@frontier.com	EMA	1
14	James Totten	White County EMA	618 383-1883	Carmi	JimTotten@frontier.com	EMA Director	1
15	Ronald Pratesch	Carmi fire/EMA	618 384-7097	Carmi	Ronald Pratesch@Yahoo.Com	firefighter	1
	Name	Representing	Phone Number	Address	Email Address	Job Description	

White County PDMP Meeting
March 9, 2016 at 6 pm
U of I Extension 1715 College Avenue
Carmi, IL 62821

	Name	Representing	Phone Number	Address	Email Address	Job Description	Milage
1	DAVID DOSHER	WHITE CO.	618 240-8290	488 C.R. 1580 N. ENFIELD	DAVIDDOSHE@GMAIL	WHITE CO. BOARD	17
2	MARK W Blythe	white co	618 383 2019	104 40th CARM.			1½
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	Name	Representing	Phone Number	Address	Email Address	Job Description	

Meeting 3 – October 12th, 2016

White County Multi-Hazard Mitigation Plan Meeting 3

Chairman: Jim Totten (EMA Coordinator)

Plan Directors: Southern Illinois University and Greater Wabash Regional Planning Commission

Meeting Date: October 12, 2016

Meeting Time: 10:00 a.m.

Place: U of I Extension – 1715 College Ave, Carmi, IL

Attendance: see attached

This meeting consisted of a brainstorming session in which the planning team met with SIU and GWRPC to provide local knowledge that identified and prioritized mitigation strategies and projects that can address the threats identified in the risk assessments. Each participant was given a handout for their jurisdiction to fill out mitigation strategies specific to each hazard.

GWRPC will work with the County to get all forms completed and turned in for every jurisdiction.

Meeting was adjourned.

White County PDMP Meeting
October 12, 2016 at 10 am

U of I Extension, Carmi, IL

	Name	Representing	Phone Number	Address	Email Address	Job Description	Milage
1	RANDALL GUESTELLE	CITY OF CARMI	(618) 383-1556	225 E MAIN CARMI, IL	guestelle@iecccdy	SAFETY DIR.	—
2	SANDRA IRVINE	City of Carmi	384 2001	225 E MAIN CARMI	WEPCO@CITYOFCARMI.COM	ADMIN/ E.D.	
3	MIKE BUCKMAN	"	383-1559	"	SUPERVISOR @ CITY OF CARMI	CITY SUPERVISOR	
4	Roy Kissel	Village of Norris City	378-3611	406 S. Division	villne@clearwave.com	Mayor	
5	Wes Trout	White County	3847635	506 2ND CARMI	WTROUT1859@EGYPTE.COM	EMA DIRECTOR	
6	BRIAN RAY	White County Hwy	841-0027	949 C. Rd 3000E Norris City IL 62869	wcounty@frontier.com	County Engineer	
7	SARAH EMERY	Grayville CUSD1	618-375-7114	728 W North St Grayville, IL 62844	semery@gcusd.com	Supt	
8	Matt Vollman	NCOE Schools	618-378-3222	409 E Third St. Norris City, IL 62869	mvollman@ncoeschools.org	Supt	
9	James Totten	White County EMA Director	618-383-1883	1400 Rose Drive Carmi, IL 62821	jctotten@frontier.com	IEMA Director	
10							
11							
12							
13							
14							
15							
	Name	Representing	Phone Number	Address	Email Address	Job Description	

Appendix B. Local Press Release and Newspaper Articles

February 9, 2016

Press Release- For Immediate Release

For more information contact:

Kara Kuykendall, Grant Writer, Greater Wabash Regional Planning Commission

(618) 445-3612

The White County Hazard Mitigation Steering Committee will host a public meeting at 5:30 p.m. on Wednesday, March 9, at the White County Extension Office on College Avenue in Carmi, Illinois.

The Federal Emergency Management Agency (FEMA) requires each unit of government in the United States to have a FEMA-approved Multi-Hazard Mitigation Plan. In the pursuance of compliance, White County and Southern Illinois University – Carbondale have worked to identify potential natural hazards and to produce a mitigation plan to address the hazards. The partnership has resulted in a Draft Multi-Hazard Mitigation Plan (MHMP). The draft plan seeks to identify potential natural hazards for White County and establish mitigation measures that are intended to reduce or eliminate the negative impact that a particular hazard may have on the county.

The MHMP steering committee is interested in receiving public input on the draft plan. Anyone who has questions or would like to provide input should attend the meeting on March 9 or contact Kara Kuykendall, Grant Writer, Greater Wabash Regional Planning Commission, 618-445-3612 or karakuykendall@msn.com

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REEDER: LISTEN TO VOTERS

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SPORTS PAGE 9

THE CARMI TIMES

WWW.CARMITIMES.COM THURSDAY, FEBRUARY 25, 2016

VOLUME 66 • NO 36 *Serving Carmi and White County.* $1.25

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Legion Dance

Dance Saturday night Feb 27 at the Carmi American Legion music by DJ Eddie Sullivan from 8:00 pm to 11:30 pm. All dance proceeds go to Veterans Programs.

4-H pork chop dinner

White County 4-H Extension Support Committee is having a Pork Chop Dinner Fundraiser Saturday, March 19th 4-7pm at White County Fairgrounds Floral Hall.

Tickets are $10 and carryout is available. The menu includes pork chops, mashed potatoes, green beans, homemade dessert and drink.

We are hoping everyone will help support this worthy cause.

For more information call Liz Masterson at the White County Extension Office 896-5860 or H.C.E. for tickets call Ruth Norris 618-378-3891, Fran Mathany 618-383-6114, or Doris Stinson 618-382-2580.

Mabel K. Toops Scholarship

Applications are now available from the Mabel K. Toops Scholarship Trust beginning March 1st thru April 1st for all Grayville High School seniors and Grayville High School graduates attending a Junior College. Applications are available at Grayville High School and German American Bancorp. Applications must be returned to Grayville High School Office no later than 3:30 pm, April 1st, 2016 or postmarked by April 1st, 2016 and mailed to: German American Bancorp, Trustee, c/o Patti R. Evans, Vice-President & Trust Officer, P.O. Box 5189 Evansville, IN 47716-5189.

House Fire Claims One

By MINDY HARTHE

At 10:17 a.m. on Tuesday, February 23, Greg Childers' neighbor spotted smoking coming from his home at 510 Montgomery Circle in Carmi and notified emergency services. Childers, 66, was found deceased near a side door inside the home.

Upon the arrival of emergency personnel, flames arose from the building. As the fireman fought down the flames, Childers' body was discovered near the side door, suggesting a failed attempt to escape. While not official, preliminary findings suggest death by asphyxiation from smoke inhalation.

No foul play is suspected and Larry Hite, Carmi Fire Chief, stated, "At this time, it (the fire) does not appear suspicious." The fire has been turned over to the Illinois State Fire Marshal's Office and Illinois State Police crime scene investigators. The two entities were brought in for examination of the remains of the home. White County Coroner Chris Marsh said it appeared as through careless smoking was probably the cause of the fire.

FIRE/PHOTO/MINDY HARTHE

Firefighters battle a blaze at 510 Montgomery Circle on Tuesday morning. The house fire claimed the life of Greg Childers.

Childers was a retired businessman, formerly operating a Southern Illinois beverage distributorship called Triangle Wholesale.

Hazard Mitigation Steering Committee

The White County Hazard Mitigation Steering Committee will host a public meeting at 6:00 p.m. on Wednesday, March 9, at U of I Extension, 1715 College Ave. Carmi, IL.

The Federal Emergency Management Agency (FEMA) requires each unit of government in the United States to have a FEMA-approved Multi-Hazard Mitigation Plan. In the pursuance of compliance, White County and Southern Illinois University – Carbondale have worked to identify potential natural hazards and to produce a mitigation plan to address the hazards. The partnership has resulted in a Draft Multi-Hazard Mitigation Plan (MHMP). The draft plan seeks to identify potential natural hazards for White County and establish mitigation measures that are intended to reduce or eliminate the negative impact that a particular hazard may have on the county.

The MHMP steering committee is interested in receiving public input on the draft plan. Anyone who has questions or would like to provide input should attend the meeting on March 9th or contact Kara Kuykendall, Grant Writer, Greater Wabash Regional Planning Commission, 618-438-3600 or karakuykendall@ymail.com.

SIC food service sanitation and safety class

The SIC White County Center will be offering a food service sanitation and safety class (FOS 112X) on Monday, March 28, from 9:00 a.m. – 5:00 p.m. The class is a study of personal hygiene and the principles involved in maintaining sanitary standards necessary to comply with regulations for a food service operation. Instructor for the class is Tim Hosford. Cost for in-district students is $97, and payment is due at the time of registration, which needs to be completed prior to March 28 to reserve a seat in the class. If interested, stop by the Carmi campus located at 2700 College Drive to register. Office hours are Monday through Wednesday from 9:00 a.m. – 4:00 p.m.

Small Business Organization Endorse Reis

OLNEY, IL - State Representative David Reis (R-Rts. Marie) has received a very selective primary election endorsement from the National Federation of Independent Business/Illinois (NFIB). With this endorsement Rep. Reis earns the title "Guardian of Small Business." "Jobs, jobs, jobs," said Reis. "More than anything, that's what we need in Southern Illinois. That is why I keep fighting to make it easier, not more difficult, for small business to get off the ground and for local employers."

"Most all elected officials like to talk about how important small business owners are to the state's economic recovery, but only some of them actually take the tough votes to help Illinois' job creators," said Jim Clarke Mauck, NFIB/Illinois State Director. "No better our highest honor, the 'Guardian of Small Business,' to those legislators who score 80 percent or better on our voting record. The list of Guardians are those who see truly working to help create an economy that allows small business owners to be successful and grow. Rep. Reis understands better than anyone it's going to take more than words – it is going to take good sound public policy – to help stimulate small businesses to start hiring again and turn our state around," said Mauck.

"I am honored to receive the NFIB's endorsement," concluded Reis. "As State Representative in the south District, I will continue to fight for small business who create jobs. That starts by lowering taxes, streamlining the permitting process, and reducing intrusive government regulations."

Crossville Walk'n Roller society

The Crossville Walk'n Roller, Relay for Life Team, has sent out packets for the Dodgeball Tournament. If you did not receive one, and would like to enter the double elimination tournament, please contact Trish Pringle at 618-383-1889 or at tpring16@gmail.com. The fee is $75 for a team of up to 10 players with 6 playing at a time. The deadline for entering and registering is March 16th. The packet and fee should be in by that date. The first 32 teams will be in the competition on March 19th with registration check-in at 2:00 p.m. and the random drawing for bracket placement at 3:00 p.m. and games starting at around 3:15 p.m. There will be first and second place trophies for each division: Junior (14-18 years) and Adult (18+ years and up). There will also be a Basket Raffle with approximately 6-8 baskets, a 50/50 Drawing, baked goods, concessions of giant hot dogs, BBQ nachos, chips, candy bars, sodas, Gatorade, water, and V-8 juice. A park is across the road with a playground and a few tables. There is also a couple sets of bleachers to sit and relax and let the kids play. Come and support a worthy cause and have a fun day with family and friends.

First Apostolic Church

Reverend J. R. Holtzinger, from Ohio, will be preaching the 28 of February. Service starts at 6 P.M. of First Apostolic Church in New Haven. Pastor Todd Holtzclaw and congregation welcomes the public to worship with them.

THURSDAY FRIDAY SATURDAY

OBITUARIES www.carmitimes.com/obituaries

To Subscribe Call 618-382-4176

Appendix C. Adopting Resolutions

See Attached Adopting Resolutions

Appendix D. Historical Hazards

See Attached Large Format Map and Newspaper Clippings

Appendix E. List of Essential Facilities

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

Fire Station Facilities

Facility Name	Address	City	Comments
Carmi Fire Department	501 S. Third St	Carmi	
Crossville Fire Department	103 W. Main St	Crossville	
Enfield Fire Department	201 W. Main St	Enfield	
Little Wabash Fire Protection District	122 S Court St	Grayville	
Fairfield Rural Fire Protection	912 Loy St	Mill Shoals	
Norris City Fire Protection District	102 E. Wabash St	Norris City	

Ambulance / First Responders

Facility Name	Address	City
White County Ambulance Service / White County E9-1-1	314 E. Cherry St	Carmi
Crossville First Responders	103 W. Main St	Crossville
Enfield First Responders	115 E. Main St	Enfield
Grayville Ambulance Service	101 S. Main Street	Grayville
Norris City Ambulance Service	208 S. Division St	Norris City

Police Station Facilities

Facility Name	Address	City
Carmi Police Department	108 N Main Cross St	Carmi
White County Sheriff Department	108 N Main Cross St	Carmi
Illinois State Police District #19	IL Highway 14	Carmi
Crossville Police Department	107 W Main St	Crossville
Enfield Police Department	115 E. Main St	Enfield
Grayville Police Department	101 S. Main Street	Grayville
Norris City Police Department	103 E. Main St	Norris City

School Facilities

Facility Name	Address	City	Comments
Jefferson School	713 4th St	Carmi	Grades 2-3; Carmi-White County CUSD 5; 197 Students
Lincoln School	113 10th St	Carmi	Grades PK-1; Carmi-White County CUSD 5; 266 Students
Washington Attendance Center	205 W Main St	Carmi	Grades 4-6; Carmi-White County CUSD 5; 280 Students
Carmi-White County Junior High School	205 W Main St	Carmi	Grades 7-8; Carmi-White County CUSD 5; 198 Students
Carmi-White County High School	800 W Main St	Carmi	Grades 9-12; Carmi-White County CUSD 5; 390 Students
Booth Elementary School	N Birch St	Enfield	Grades PK-8; Norris City-Omaha-Enfield CUSD 3; 139 Students
Wells Elementary School	704 W North St	Grayville	Grades PK-6; Grayville CUSD 1; 204 Students
Grayville Junior Senior High School	728 W North St	Grayville	Grades 7-12; Grayville CUSD 1; 135 Students
Norris City-Omaha Elementary School	580 Us-45	Norris City	Grades PK-8; Norris City-Omaha-Enfield CUSD 3; 411 Students
Norris City High School	205 E Eubanks St	Norris City	Grades 9-12; Norris City-Omaha-Enfield CUSD 3; 220 Students

Medical Care Facilities

Facility Name	Address	City	Comments
Egyptian Health Department	1705 College Avenue	Carmi	Public Health Department
The Guardian Center	207 East Main Street	Carmi	Mental Health (outpatient)
Supportive Living of Wabash	532 Abelson Drive	Carmi	49 apartment supportive living facility, must be 65 years of age.
Wabash Christian Retirement Center	216 College Boulevard	Carmi	11 independent living garden homes, 49 supportive living apartments, and a 158-bed skilled nursing and rehabilitation center.
Carmi Community Health Center	1400 West Main	Carmi	Primary Care, Ancillary, Specialty, and Dental Services, hospital referrals, and preventative healthcare.
Wabash Christian Therapy & Medical Clinic	1112 Oak St	Carmi	Independent, full-service outpatient rehabilitation clinic.
Wabash and Ohio Valley Special Education District	800 South Division Street	Norris City	Diagnostic, counseling, and instruction for handicapped children 0-21; early childhood classes; speech and language services, physical and occupational therapy.

Appendix F. Critical Facilities Map

See Attached Large Format Map of Critical Facilities.