

Williamson County, Illinois Multi-Hazard Mitigation Plan

A 2015 Update of the 2009 Countywide MHMP



FEMA



SIU
Southern
Illinois
University
CARBONDALE

Multi-Hazard Mitigation Plan
Williamson County, Illinois

Adoption Date: -- _____ --

Primary Point of Contact

Kelly Huddleston
Coordinator
Williamson County Emergency Management
407 N. Monroe, Suite 370
Marion, IL 62959
Phone: (618) 998-2123
Email: Kelly.wcema@williamsoncountyil.gov

Secondary Point of Contact

Pat Creek
Assistant Coordinator
Williamson County Emergency Management
407 N. Monroe, Suite 370
Marion, IL 62959
Phone: (618) 998-2123
Email: pat@wcema.com

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Williamson County Board

Jim Marlo, Chairman

Brent Gentry

Ron Ellis

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Section 1. Introduction

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

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

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

Williamson County completed their first Multi-Hazard Mitigation Plan in 2009. Throughout the five-year planning cycle, the Williamson County Emergency Management Agency and Mitigation Planning Team reconvened to monitor, evaluate, and update the plan on an annual basis. Southern Illinois University Carbondale (SIU), Greater Egypt Regional Planning and Development Commission (Greater Egypt) and Williamson 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 Williamson 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, Greater Egypt and hosted by the Williamson County Emergency Management Agency. At these meetings, various tasks were completed by SIU, Greater Egypt, and the Williamson 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 Greater Egypt 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 twenty-eight 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.

<u>Participating Jurisdictions</u>			
Williamson County	Freeman Spur	Carterville CUSD #5	John A. Logan College
Cambria	Herrin	Crab Orchard CUSD #3	Rend Lake Conservancy District
Carbondale	Hurst	Giant City CCSD #130	Southern Illinois Healthcare
Carterville	Johnston City	Herrin CUSD #4	The Villas of Holly Brook
Crainville	Marion	Johnston City CUSD #1	Lighthouse Shelter
Creal Springs	Pittsburg	Marion CUSD #2	Family Crisis Center
Energy	Spillertown	New Simpson Hill District #32	Egyptian Area Agency on Aging

2.3 Planning Team Information

Kelly Huddleston, Williamson 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.

Williamson County Planning Team Members

Jurisdiction	Name	Title
Williamson County	Kelly Huddleston	EMA Coordinator
	Pat Creek	Assistant EMA Coordinator
	Jim Marlo	County Chairman
	Brent Gentry	County Commissioner
	Ron Ellis	County Commissioner
	Amanda Barnes	County Clerk
	Bennie Vick	Sheriff
	Jeremy Norris	Fire Chief
	Celeste Sollers	Director Economic Development
	Doug Kimmel	Airport Director
	Greg Smothers	County Engineer
	Jeff Robinson	Supervisor of Assessments
	Alex Simpson	GIS Specialist
Cambria	Steven Gottschalk	Village President
Carbondale	Mike Hertz	EMS Coordinator
Carterville	Ron Rains	Fire Chief
	Brad Robinson	Mayor
Crainville	Ron Mitchell	Mayor
Creal Springs	Joyee Rich	Mayor
Energy	Brad Graul	Village Trustee
Freeman Spur	Curt Spaven	Mayor
Herrin	Steve Frattini	Mayor
Hurst	Duke Woolsey	Mayor
Johnston City	Jim Mitchell	Mayor
	Timothy Ditch	City Clerk
Marion	Gail West	City Administrator
	Dawn Tondini	Police Chief
Pittsburg	Keith Violett	Mayor
	Kyle Violett	Village Clerk
Spillertown	Eric L. Johns	Village Trustee
Rend Lake Conservancy District	Robert Clodi	Project Manager
Lake of Egypt	Kirby Crites	Fire Chief
	Alan Hughes	President LEAPO
	Leroy Pfaltzgraff	Volunteer LEAPO
Franklin-Williamson Bi-County Health Dept.	Ronda Koch	Director of Emergency Preparedness
Illinois Department of Public Health	Linda Angarola	Region 5 EMS Coordinator
Southern Illinois Healthcare	Mike Maddox	Regional Disaster Preparedness Coordinator
	Woddy Thorne	VP Community Affairs
Carterville CUSD #5	Keith Liddell	Superintendent
Crab Orchard CUSD #3	Derek Hutchins	Superintendent

Jurisdiction	Name	Title
Giant City CCSD #130	Belinda Hill	Superintendent
Herrin CUSD #4	Mark Collins	Superintendent
Marion CUSD #2	Keith Oates	Superintendent
New Simpson Hill District #32	Kathy Anderson	Superintendent
Johnston City CUSD #1	Terry Milt	Superintendent
John A. Logan College	Donald Priddy	Director of Emergency Planning
Crab Orchard National Wildlife Refuge	Kevin Reichert	Facilities Manager
	Beth Kerley	Contract Compliance Specialist
Egyptian Area Agency on Aging	John M. Smith	Executive Director
Family Crisis Center	Peggy Russell	Executive Director
Lighthouse Shelter	Verne Lemasters	Building/Maintenance Coordinator
	Larry Bemesserfer	EMA Volunteer
Villas of Holly Brook	Howard Saver	Executive Director

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 Marion, Illinois on September 3rd, 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.

The Williamson County Planning Team assembled for four formal meetings. Each meeting was approximately two hours in length. Appendix A includes the minutes for each meeting. During these meetings, the Planning Team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects for the future, and assisted with preparation of the public participation information.

Planning Meetings

MEETING 1 Sept 2nd, 2014

MEETING 2 Dec 8th, 2014

MEETING 3 May 18th, 2015

MEETING 4 July 29th, 2015

2.4 Public Involvement

The Williamson County EMA solicited public input throughout the planning process and a public meetings was held on December 8th, 2014 to review the county's risk assessment. Appendix A contains the minutes

from the public meeting. Appendix B contains press releases and/or articles sent to local newspapers throughout the MHMP development process to inform the public of meetings.

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
Ryan Buckingham	Franklin County	EMA Coordinator
Derek Misener	Jackson County	EMA Coordinator
Steve Lueker	Jefferson County	EMA Coordinator
David Searby	Perry County	EMA Coordinator

2.6 Review of Technical Documents

The Williamson 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	Illinois Environmental Protection Agency
<i>Developing the Mitigation Plan (April 2003)</i>	<i>2014 303d Listed Waters and Watershed Maps</i>
<i>Mitigation Ideas (January 2003)</i>	Illinois State Water Survey
<i>Local Mitigation Planning Handbook</i>	<i>Climate Data</i>
<i>Flood Insurance Study (August 2008)</i>	Illinois Department of Commerce and Economic Opportunity
United State Census Bureau	<i>Community Profiles</i>
<i>County Profile Information</i>	Greater Egypt Regional Planning and Development Commission
<i>2010 Census Data</i>	<i>Comprehensive Economic Development Strategy 2010-2014</i>
<i>American Community Survey (2009-2013)</i>	Williamson County
NOAA National Climatic Data Center	<i>2013 Assessment Records</i>
<i>Climate Data</i>	<i>2013 Countywide GIS Parcel Database</i>
NOAA/National Water Service Storm Prediction Center	<i>2009 Multi-Hazard Mitigation Plan</i>
<i>Severe Weather Data</i>	Franklin-Williamson Bi-County Health Department
Illinois Emergency Management Agency	<i>Hazard Vulnerability Analysis Report (2012)</i>
<i>2013 Illinois Natural Hazard Mitigation Plan</i>	

2.7 Adoption by Local Government

Upon IEMA and FEMA approval, the Planning Team presented and recommended the plan to the County Commissioners for formal adoption. The plan was formally adopted by the Cumberland 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.

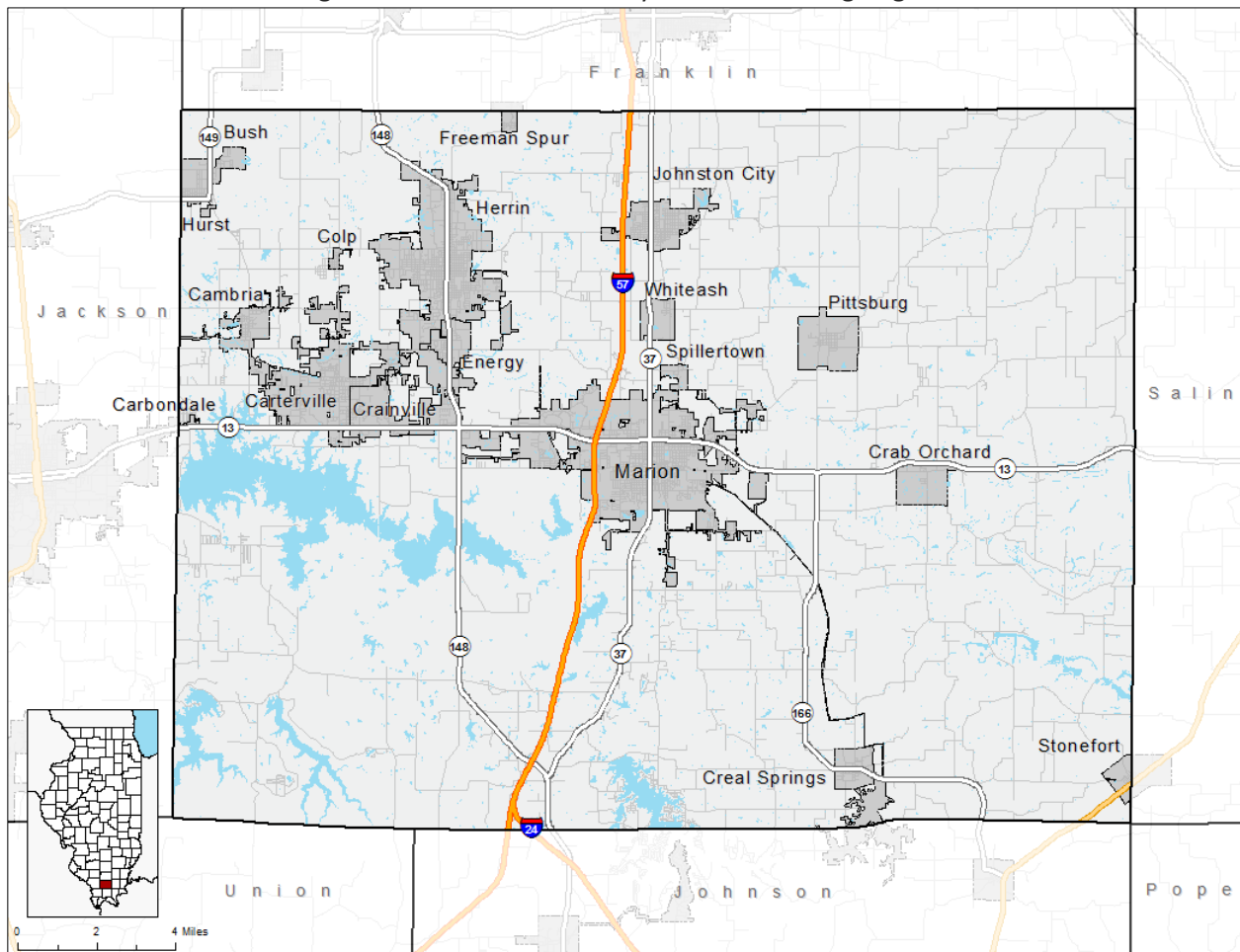
Section 3. County Profile

3.1 County Background

Williamson County originated when Franklin County was divided to create a second county during the late 1830s. The division of Williamson and Franklin Counties became official on February 28, 1839. Williamson County was named after Hugh Williamson, an internationally renowned scholar best known for representing North Carolina at the Constitutional Convention. Marion, named for Revolutionary War hero General Francis Marion, was chosen to be the county seat.

Williamson County is located in the center of the southern tip of Illinois. It is bounded on the north by Franklin County; on the south by Johnson and Union Counties; on the east by Saline County; and on the west by Jackson County. Its relation to major urban areas is as follows: 120 miles southeast of St. Louis, MO; 180 miles south-southeast of Springfield, IL; 310 miles south-southwest of Chicago, IL. Figure 3-1 shows the location of Williamson County.

Figure 3-1. Williamson County and Surrounding Region



Williamson County is one the most rapidly growing counties in southern Illinois. The major sources of economic activity include public administration, manufacturing, distribution centers, health services, retail trade, and tourism. A few of the top private employers in the county include Pepsi, Ameren, and John A. Logan College. Nearly a quarter of Williamson County consists of public land, which draws a large number of tourists who contribute significantly to the local economy. The largest area of public land within the county is Crab Orchard National Wildlife Refuge, managed by the U.S. Fish and Wildlife Service. In addition to the refuge, the extreme southern portion of Williamson County is located within the Shawnee National Forest, which is managed by the National Park Service.

Sources:

Adams, James N. (compiler), Keller, William E., ed., Illinois Place Names, Springfield: Illinois.

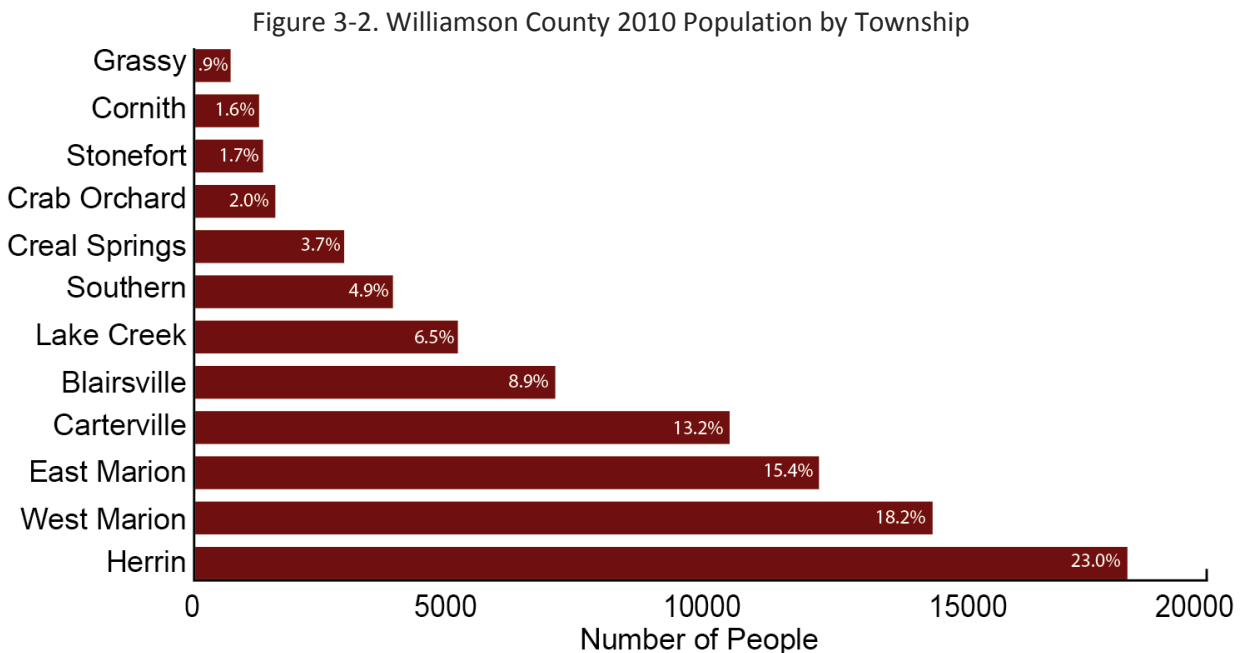
State Historical Society, 1989, pp. 609; Milo Erwin, History of Williamson Co, IL, 1876.

Goodspeed Publishing Co, History of Gallatin, Saline, Hamilton, Franklin and Williamson Counties, Illinois, 1967.

State of Illinois, Origin and Evolution of Illinois Counties, 1982.

3.2 Demographics

According to the 2010 U.S. Census, Williamson County's population is 66,357, an increase of 2.8% from 2007. As of July 1st 2013, Williamson County's population estimate is 66,924 (American Community Survey, 2013). The population is spread through 12 townships: Blairsville, Carterville, Corinth, Crab Orchard, Creal Springs, Grassy, Herrin, Lake Creek, Southern, Stonefort, East Marion and West Marion. Figure 3-2 displays the breakdown of population by township from the 2010 Census.



3.3 Economy and Industry

Williamson County is strategically located along Interstate 57 and 24, and is home to a bustling business corridor along Route 13. Manufacturing, education, health and social services continue to drive the

industrial sectors in Williamson County (American Community Survey 2009-2013). Education, Retail Trade, and Arts & Entertainment represent the largest sectors, employing 53% of the workforce. Williamson County's major employers include Aisin, John A. Logan College, and Heartland Regional Medical Hospital. The 2013 annual per capita income in the county is \$20,527, compared to an Illinois average of \$29,666. Table 3-1 lists the major employers and the approximate number of employees in Williamson County.

Table 3-1. Williamson County's Major Employers

Employer	Industry	Approximate Number of Employees
Aisin	Manufacturing	965
Herrin Hospital	Healthcare	935
John A. Logan College	Education	800
Heartland Regional Medical Center	Healthcare	650
Pepsi MidAmerica	Manufacturing	600
Veterans Administration	Healthcare	600
Southern IL Power Co-op	Utilities	500
Blue Cross Blue Shield	Insurance	450
Walmart	Retail	450
Marion Unit School District #2	Education	450
General Dynamic Corporation	Manufacturing	420
Shawnee Health Service	Health/Social Services	365
Ameren	Utilities	350
US Department of Justice	Public Administration	350
Wisconsin Physicians Services	Insurance	300
Herrin Unit School District #4	Education	250
Rent One Park	Recreation	250
Verizon	Utilities	200
Cartersville Unit School District #5	Education	152
United Parcel Service	Transportation	150
Menards	Retail	150
Johnston City Unit School District #1	Education	110
Crisp Container	Manufacturing	100
Home Depot	Retail	100
Crab Orchard Unit School District #3	Education	50

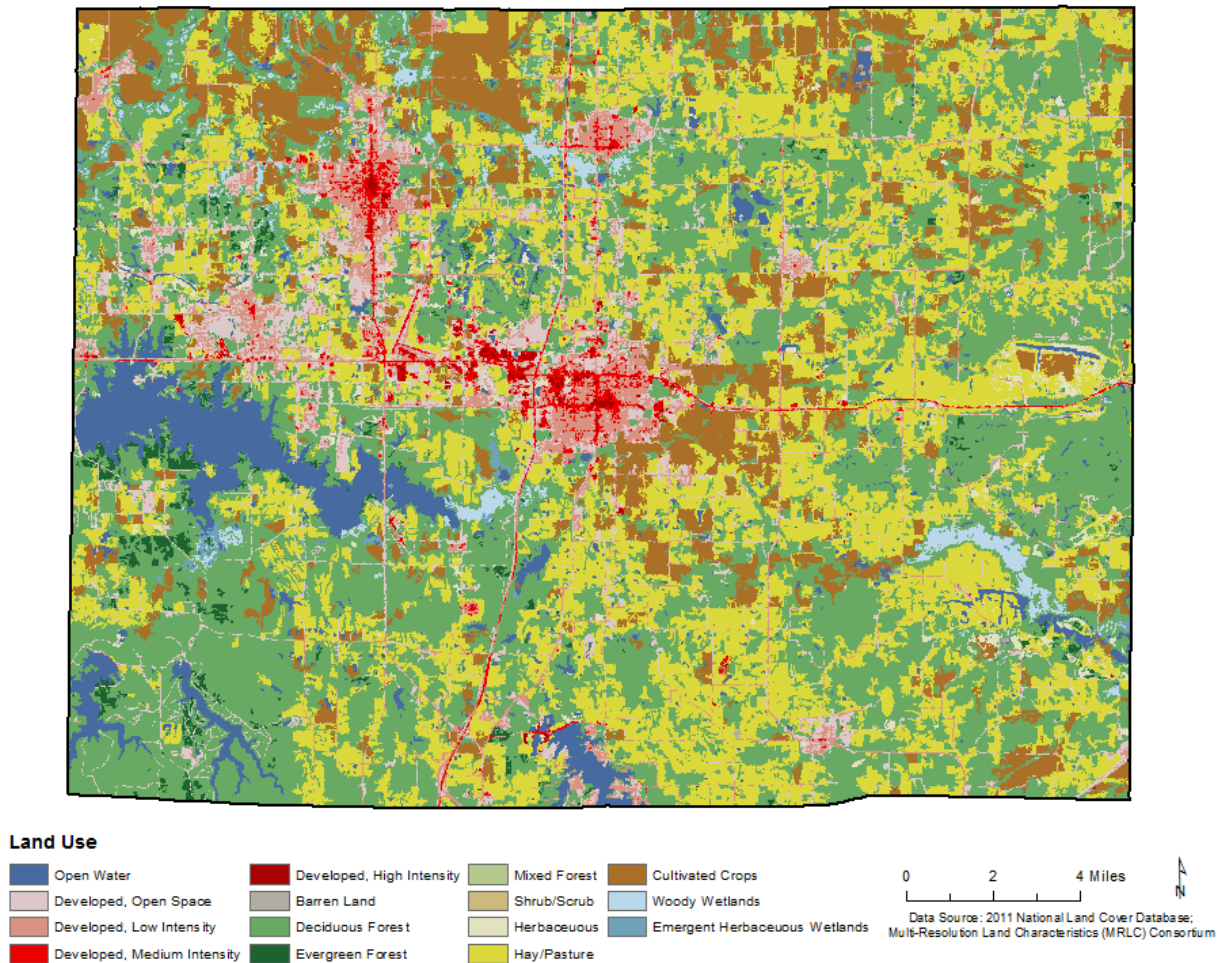
3.4 Land Use and Development Trends

Today, Williamson County's single largest land use is agricultural, followed by deciduous forest and low/medium intensity urban development (National Land Cover Database, 2011). Figure 3-3 depicts the 2011 land use within Williamson County. Agricultural lands are found almost everywhere in Williamson County where the purpose of the land includes, but not limited to, farming, farmsteads, dairying, pasturage, horticulture, floriculture, and animal and poultry husbandry. Deciduous forest cover is primarily found along Carb Orchard, Little Grassy, and Devil's Kitchen Lake. Significant urban development is concentrated within the center of the county and includes the Cities of Marion, Herrin and Cartersville.

Pre-European settlement, Williamson County was densely forested with few areas of prairie. Since settlement, agriculture, strip mining, and urbanization have dramatically altered the county's land cover. Today, agriculture comprises the county's predominate land use. This is not due to great agricultural capabilities of the land as a major agricultural producer or because of maximum economic development potential resting in agricultural pursuits; rather it is a result of the existence of large volumes of land that

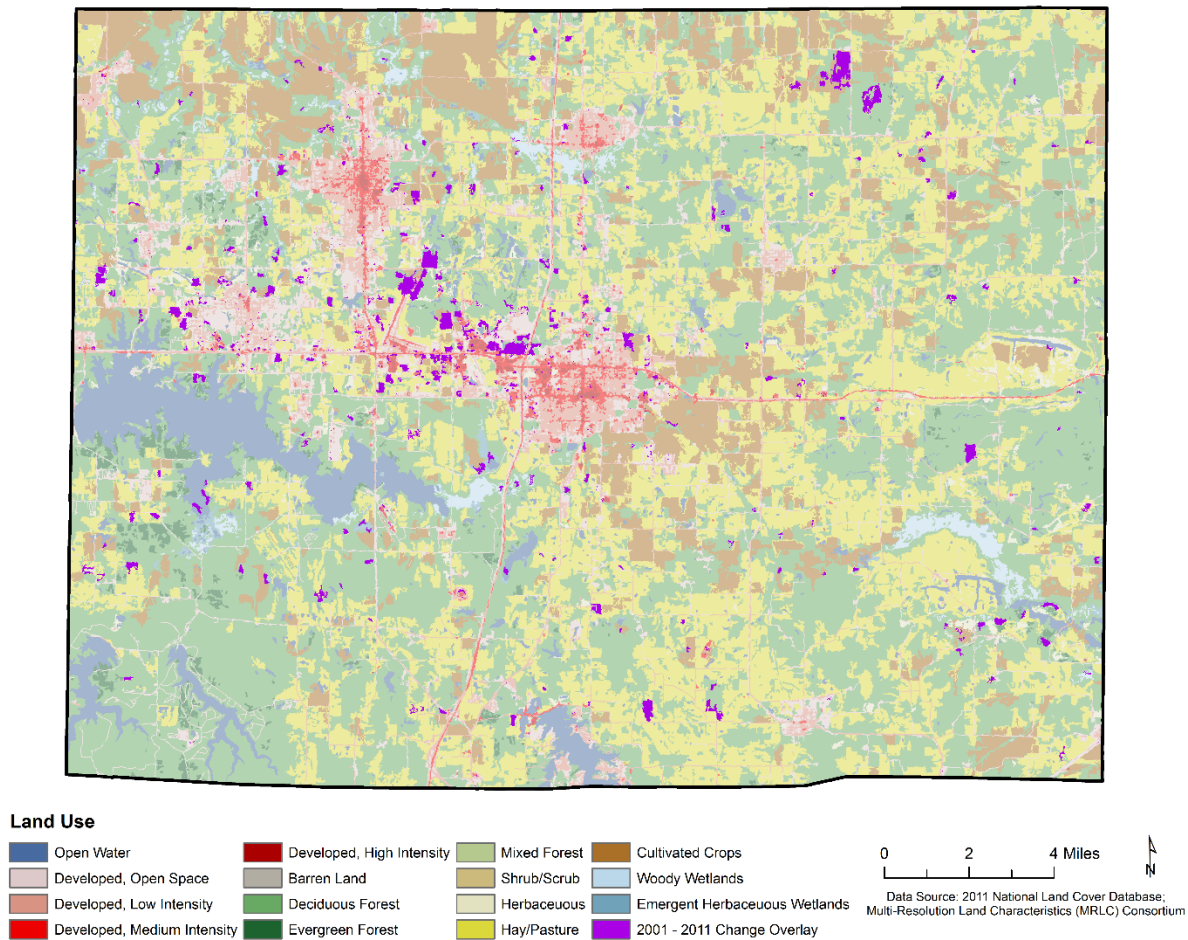
cannot rationally be occupied by major urban uses within the foreseeable future. As a result many agricultural uses have only limited agricultural potential. Therefore, these areas are classed in the category of their highest and best use— agricultural use. The eastern portions of the county are the primary areas of agriculture use. Additional scattered areas are located within the urban core in segments that need not be utilized for urban expansion. These agricultural areas become the overflow areas of future growth. Corn is the primary crop, followed by soybeans, winter wheat, hay, and oats.

Figure 3-3. Land Use in Williamson County



The National Land Cover Database was analyzed to determine land cover change across Williamson County from 2001 to 2011. Figure 3-4 depicts the National Land Cover Database 2011 land cover with change areas highlighted in magenta. The analysis revealed that approximately 12.19 square kilometers (km²) of the total land area (1,150.77 km²) changed. The highest portion of land cover changes occurred in regions around the City of Marion with development in all four classes (i.e., open space, low intensity, medium intensity, and high intensity).

Figure 3-4. Land Use with Highlighted Change (2001-2011) in Williamson County



In recent years, residential land use has experienced significant expansion in Herrin, Marion, and around Lake of Egypt. New subdivisions in Herrin have recently been constructed along Stotlar and Hurricane Roads; Lake of Egypt area is experiencing rising land values from lakeside subdivision growth; and Marion, along with nearby communities Carterville and Crainville, has been the focal point of residential development in Williamson County with the construction of several new residential developments.

Commercial land use has historically been, and continues to be, concentrated within the business districts of the incorporated municipalities of the county. However, most of the recent commercial growth has occurred in the northwest portion of Marion near the I-57 and Illinois Route 13 interchange. In this area a minor league ball park, several new hotels, retail stores, car dealerships, restaurants, and shopping mall have all been constructed within the last 10 years. Construction of a new interchange in the county is expected to contribute to further commercial development.

Industrial land use has been concentrated within the REDCO and Robert L. Butler industrial parks located in Marion. Companies found within these industrial areas include General Dynamic Corporation, Minova, USA, Inc., Aisin facilities, Pepsi Mid America, and Circuit City Distribution Center.

Coal mining was an important industry in the Southern Illinois Region between the 1930s and 1980s. From 1990 through today, the importance of coal mining to the region and Williamson County has significantly lessened due to more stringent air quality. Regardless, Southern Illinois' coal mining history, particularly strip mines, left an indelible mark on Williamson County. In areas that were strip mined, particularly prior to the Surface Mine Reclamation Action of 1977, the land has been left unsuitable for agriculture or significant commercial or residential development. These areas often contain large piles of mine spoil—large, deep pits filled with water that alter surface water drainage. In Williamson County abandoned strip mines are generally found in a narrow band (10 miles wide) along Illinois Route 13 and across the entire county.

Public land use in Williamson County includes schools, parks, playgrounds, public utilities, and transportation facilities. The major areas of public land use include the Shawnee National Forest and Crab Orchard National Wildlife Refuge. Other important areas of public land use include the Lake of Egypt and Marion Fairgrounds.

3.5 Climate

The climate in Williamson County is generally characterized by hot dry summers and cool wet winters. The variables of temperature, precipitation, and snowfall can vary greatly from one year to the next. In summer, the average low is 63.1°F and the average high is 86.8°F. However, daily maximum temperatures often exceed 90°F for the period of time (several weeks) between June and September. Also during these months, it is not uncommon for daily maximum temperatures to exceed 100°F for a few to several days.

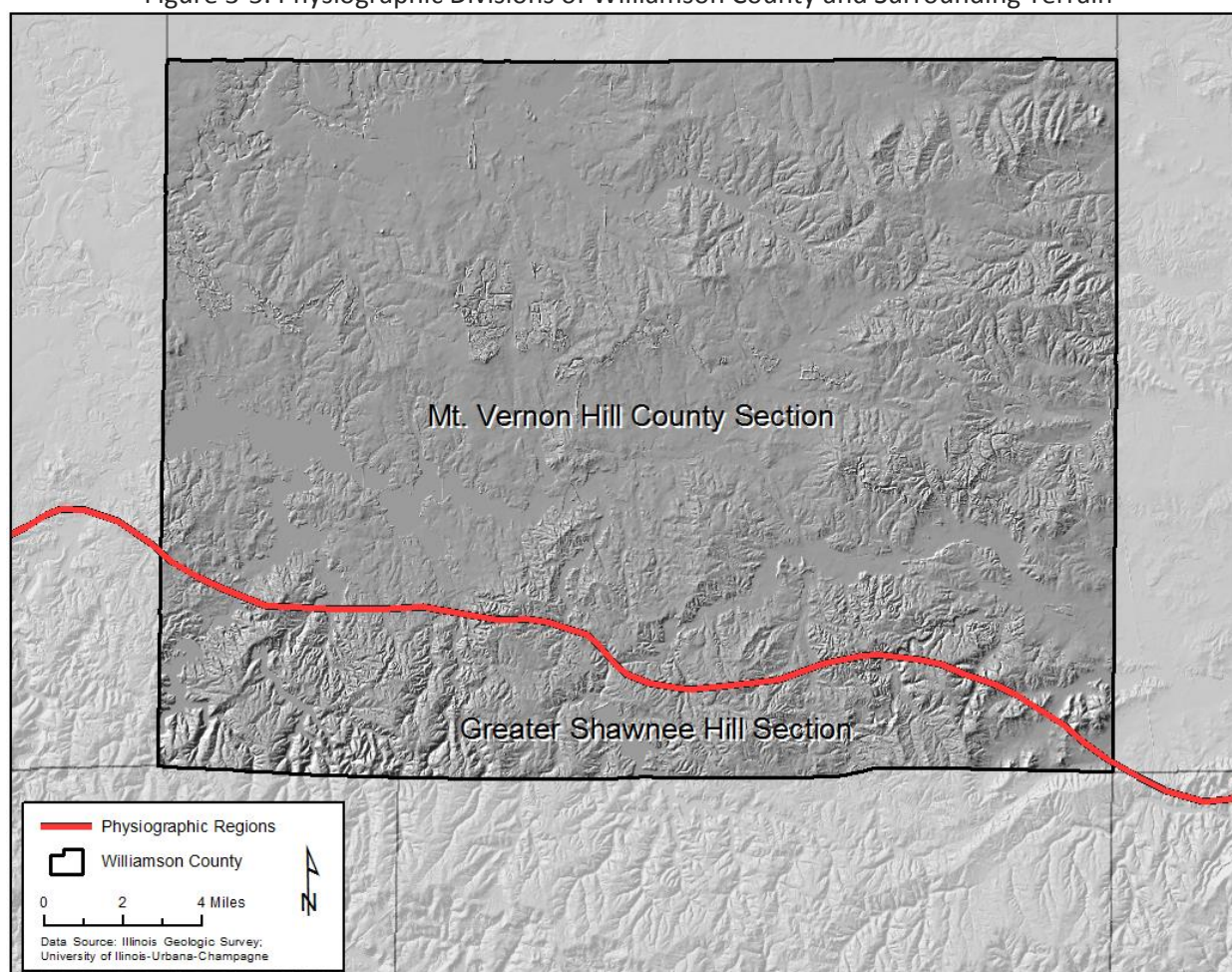
During the fall and into the spring, freezing temperatures can occur any time between October and April. The average low and high temperatures in January are 24.2°F and 45.3°F, respectively. Average annual precipitation is 45.85 inches (NCDC data from 1971 to 2000). While the winters are generally cool, i.e. temperatures are above freezing most days, extended periods (days to a couple of weeks) of sub-freezing high temperatures often occur and are sometimes accompanied by significant amounts of ice and snow.

3.6 Topography

Williamson County is located within the Till Plains and Shawnee Hills physiographic divisions of Illinois. Figure 3-5 depicts the physiographic divisions within Williamson County. The northern three-quarters of Williamson County are located in the Mt. Vernon Hill Country sub-division of the Till Plains. The topography of the Mt. Vernon Hill Country is characterized by low rolling hills and broad alluvial valleys along major streams. The southern quarter of the county lies within the unglaciated Shawnee Hill Division, which is characterized by broad, rolling uplands that are dissected by relatively narrow and deep streams valleys containing steep sided ridges and bluffs.

The highest elevation(s) (~ 650 feet above mean sea level) in Williamson County are found in the southwestern corner of the county in the Shawnee Hills. The lowest elevation(s) (~370 feet above sea level) are found in the northwest corner of the county along the Big Muddy River Valley near the village of Bush.

Figure 3-5. Physiographic Divisions of Williamson County and Surrounding Terrain



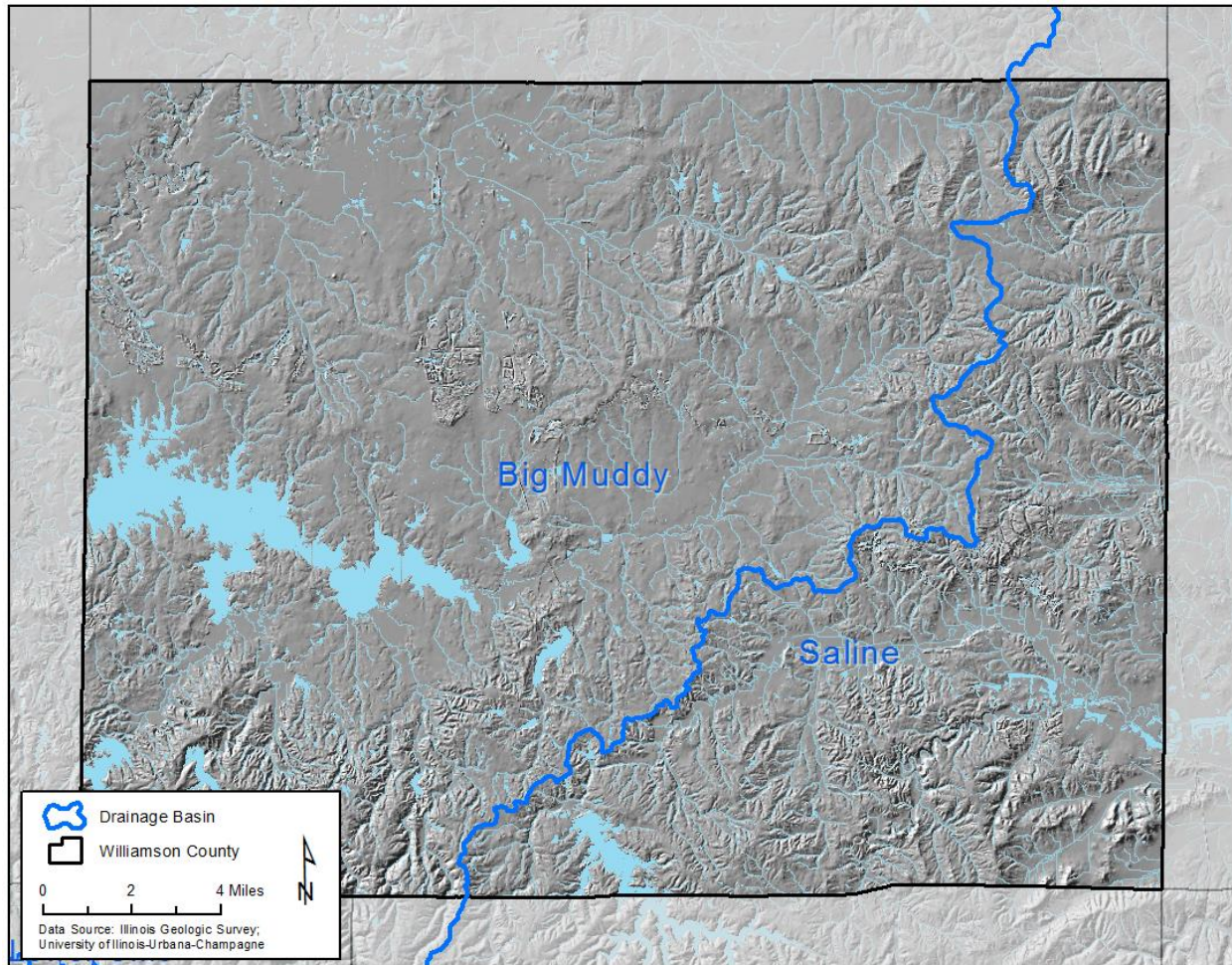
3.7 Major Lakes, Rivers, and Watersheds

Williamson County has several water bodies, with Crab Orchard Lake being the most significant. Of the 102 Illinois Counties, Williamson County ranks seventh in most acres covered by open water. Geographically Williamson County lies on the divide between the Ohio and Mississippi River Basins. A large portion of the county drains westward into the Mississippi River through Carb Orchard Creek and Big Muddy River. The two major watersheds that drain the county are the Saline River and Big Muddy. Figure 3-6 depicts the hydrologic units within Williamson County.

The Saline Watershed drains the eastern third of the county and empties into the Ohio River near Shawneetown, IL. Major streams within the Saline watershed include Prairie Creek, Brushy Creek, South Fork Saline River, and Maple Branch. The major lake within this watershed is Lake of Egypt.

The Big Muddy Watershed drains the western two-thirds of the county and empties into the Mississippi River near Grand Tower, IL. Major streams within the Big Muddy Watershed includes the Big Muddy River, Crab Orchard, Grassy, Hurricane, and Pond Creek. There are eight significant lakes within the Big Muddy Watershed: Arrowhead, Johnston City, Herrin Old, Herrin New, Crab Orchard, Little Grassy, Devil's Kitchen, and Marion reservoir.

Figure 3-6. Major drainage basins in Williamson 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 Williamson 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

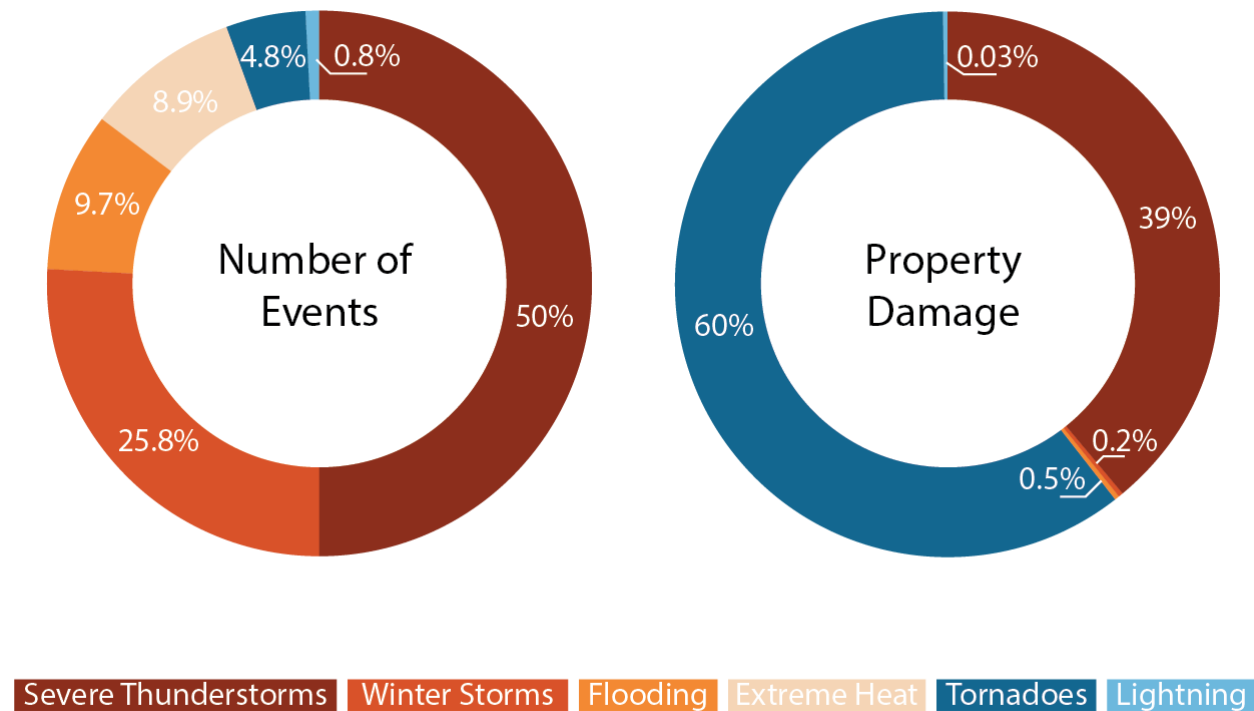
To assist the Planning Team, historical storm event data from the National Climatic Data Center (NCDC) was compiled. NCDC records are estimates of damages reported to the National Weather Service from various local, state, and federal sources. However, these estimates are often preliminary in nature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

The NCDC database included 41,640 reported meteorological events in Williamson 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 Williamson County. Figures 4-1 summarize the relative frequency of NCDC reported meteorological hazards and the percent of total damage associated with each hazard for Williamson 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 Williamson County

Hazards	Time Period		Number of Events	Property Damage (Millions of Dollars)	Deaths	Injuries
	Start	End				
Severe Thunderstorm	1966	2014	207	\$179.5	0	23
Winter Storm	1996	2014	107	\$1.1	1	3
Flooding	1996	2014	40	\$2.17	1	0
Extreme Heat	1997	2014	37	\$0	1	15
Tornado	1957	2014	20	\$278	10	207

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



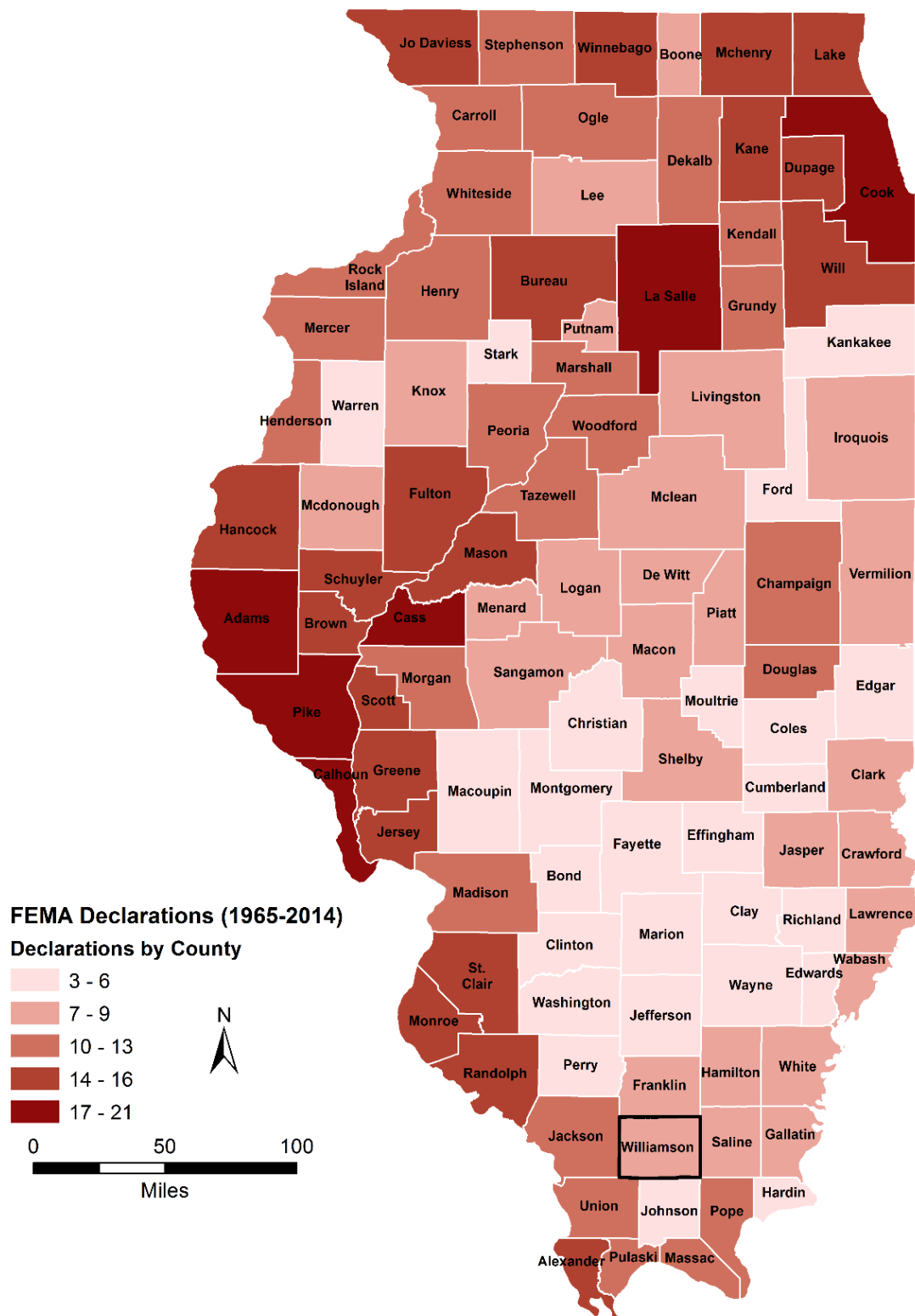
4.1.3 FEMA Disaster Information

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

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

Declaration Number	Date of Declaration	Description
1991	6/7/2011	Severe Storms and Flooding
1850	7/2/2009	Severe Storms, Flooding, and Tornadoes
3230	9/7/2005	Hurricane Katrina Evacuation
3199	2/1/2005	Record/Near Record Snow
1416	5/21/2002	Severe Storms, Tornadoes and Flooding
1112	5/6/1996	Severe Storms and Flooding
660	6/5/1982	Severe Storms and Tornadoes

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 Williamson 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. The Williamson County Planning Team identified disease epidemic / pandemic as a prioritized public health hazard. This plan includes a section devoted to disease epidemic / pandemic but it should be noted that it is not included in the ranked list of hazards.

<u>Williamson County Hazard List</u>
TORNADOES
EARTHQUAKES
SEVERE THUNDERSTORMS
WINTER STORMS
FLOODING
HAZARDOUS MATERIALS RELEASE
DAM / LEVEE FAILURE
DROUGHT /EXTREME HEAT
GROUND 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. Williamson County Hazard Priority Index and Ranking

Hazard	Probability	Magnitude/Severity	Risk Priority Index	Rank
Tornadoes	4	4	16	1
Earthquakes	2	8	16	2
Severe Storms	4	2	8	3
Winter Storm	3	1.5	4.5	4
Flooding	2	2	4	5
Hazardous Materials Release	2	2	4	6
Dam / Levee Failure	2	4	8	7
Extreme Heat	3	1	3	8
Ground Failure	2	1	2	9

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	Severe Storms	Winter Storms	Flooding	HAZMAT	Dam / Levee Failure	Extreme Heat / Drought	Ground Failure	Pandemic /Epidemic
Cambria	1	3	2	4	5	9	8	6	7	10
Carbondale	2	1	4	6	5	7	3	8	9	-
Carterville	2	1	3	6	4	5	-	-	-	-
Crainville	1	2	3	4	5	6	7	-	-	-
Creal Springs	1	2	3	4	5	6	7	8	9	-

Jurisdiction	Tornadoes	Earthquakes	Severe Storms	Winter Storms	Flooding	HAZMAT	Dam / Levee Failure	Extreme Heat / Drought	Ground Failure	Pandemic /Epidemic
Energy	2	1	3	4	8	5	9	7	6	-
Freeman Spur	1	2	3	4	5	6	-	7	8	-
Herrin	1	2	3	4	5	6	7	8	9	-
Johnston City	1	4	2	3	8	7	9	5	6	-
Lake of Egypt	1	2	3	4	5	6	7	8	9	-
Marion	1	2	3	4	5	6	7	8	-	-
Pittsburg	1	2	3	4	5	6	7	8	-	-
Spillertown	1	2	3	4	5	6	7	8	9	-
Rend Lake	2	1	6	7	4	3	-	-	-	5
Southern Illinois Health Care	1	2	4	3	5	6	8	7	9	-
John A Logan College	2	1	3	6	4	5	-	-	-	-
Carterville CUSD #5	2	1	4	7	5	6	-	-	3	-
Crab Orchard CUSD #3	1	2	3	5	4	6	-	-	7	-
Giant City CUSD #130	2	6	3	1	-	5	-	4	-	-
Herrin CUSD #4	2	1	5	3	4	6	7	8	9	-
Marion CUSD #2	1	2	3	4	5	6	7	8	9	-
New Simpson Hill CUSD #32	1	2	3	5	6	4	8	7	9	-

4.2 Vulnerability Assessment

4.2.1 Asset Inventory

Processes and Sources for Identifying Assets

At 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. Williamson 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 Williamson County. Essential facilities are a subset of critical facilities. Appendix E include a comprehensive list of the essential facilities in Williamson County and Appendix F displays a large format map of the locations of the critical facilities within the county.

Table 4-7. Williamson County's Essential Facilities

Facility	Number of Facilities
Care Facilities	10
Emergency Operations Centers	1

Facility	Number of Facilities
Fire Stations	20
Police Stations	14
Schools	32

Facility Replacement Costs

Table 4-8 identifies facility replacement costs and total building exposure. Williamson 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. Williamson County's Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure
Residential	25,927	\$2,933,382,483
Commercial	2,027	\$1,237,564,380
Industrial	61	\$424,658,540
Total:	28,015	\$4,595,605,403

Future Development

Williamson 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 of Marion near the I-57 – Route 13 Interchange and along the Route 13 west of I-57, which includes the incorporated areas of Herrin, Carterville, and Crainville.

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 Williamson 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
Severe Thunderstorm	Historical Records
Winter Storms	Historical Records
Flooding	Hazus-MH
Hazmat Release	GIS-based
Levee / Dam Failure	Historical Records
Drought / Extreme Heat	Historical Records
Ground Failure	GIS-based

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.



1982 F4 Tornado in Marion
(c/o Williamson County EMA)

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

The most recent recorded event occurred on April 3rd, 2014 when storms formed near a warm front that was draped across southeast Missouri, southern Illinois, and western Kentucky. A brief tornado touched down in the Pulleys Mill area between Creal Springs and Lake of Egypt. Most damage was from an uprooted tree and roofing torn off of two barns. Winds were estimated to be as high as 95 mph.

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

Location or County*	Date	EF-Scale	Deaths	Injuries	Property Damage
Williamson	12/18/1957	4	0	10	\$2,500,000
Williamson	4/3/1968	1	0	0	\$25,000
Williamson	6/2/1973	2	0	0	\$250,000
Williamson	5/29/1982	4	10	181	\$250,000,000
Williamson	11/19/1991	3	0	16	\$25,000
Marion	6/12/1998	1	0	0	\$100,000
Pulleys Mill	10/18/2004	1	0	0	\$25,000
Wolf Creek	2/29/2012	2	0	0	\$100,000

Location or County*	Date	EF-Scale	Deaths	Injuries	Property Damage
Creal Springs	10/31/2013	1	0	0	\$40,000
Pulleys Mill	4/3/2014	1	0	0	\$10,000
Total:			10	207	\$278,000,000

*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 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 Williamson 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 Williamson County Planning Team's risk assessment.

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
4	x	4	=	16

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 essential infrastructure in Williamson County.

Essential Facilities

All essential facilities are vulnerable to tornadoes. Essential 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 essential 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 essential 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

One tornado scenario was conducted for Williamson County through the Village of Crainville, and Cities of Carterville and Marion. The following analysis quantifies the anticipated impacts of tornadoes 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 historical path based upon the F4 tornado event that runs for 12.5 miles through the Cities of Marion and Carterville and Village of Crainville. 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 historical tornado path was used 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 historical tornado path.

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

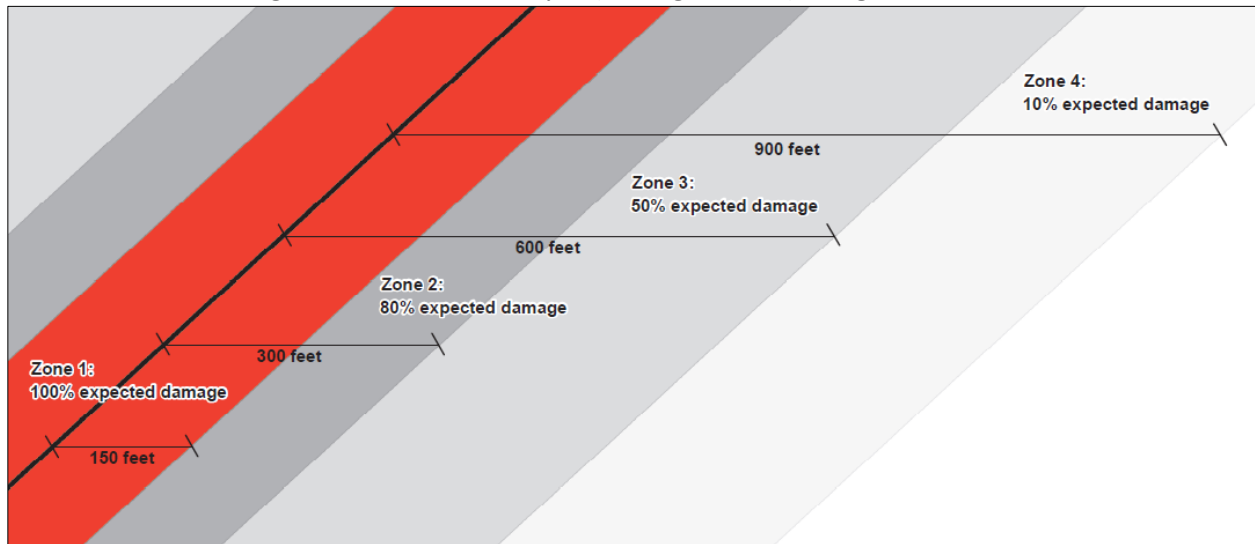
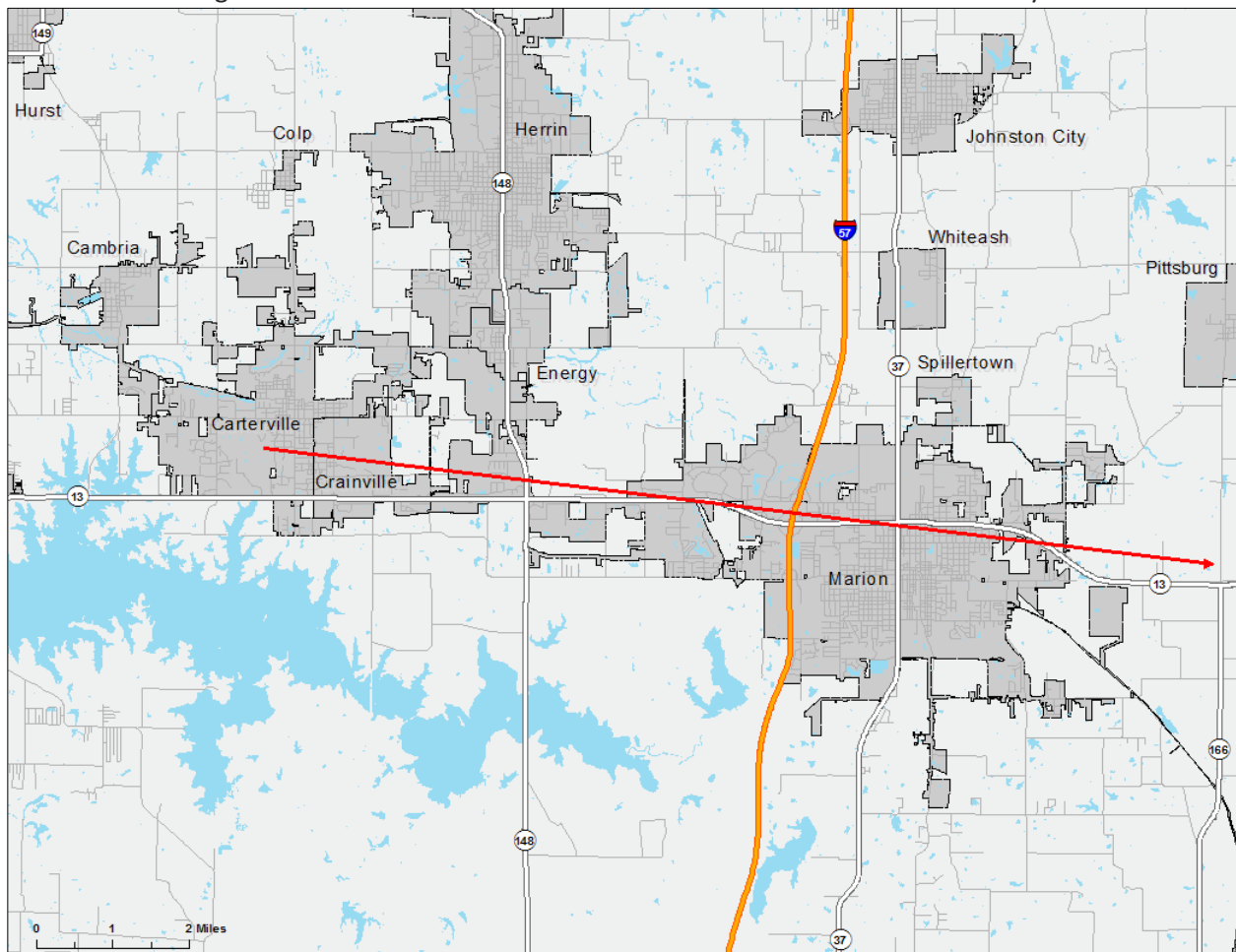


Figure 4-4: Modeled Historical EF4 Tornado Track for Williamson County



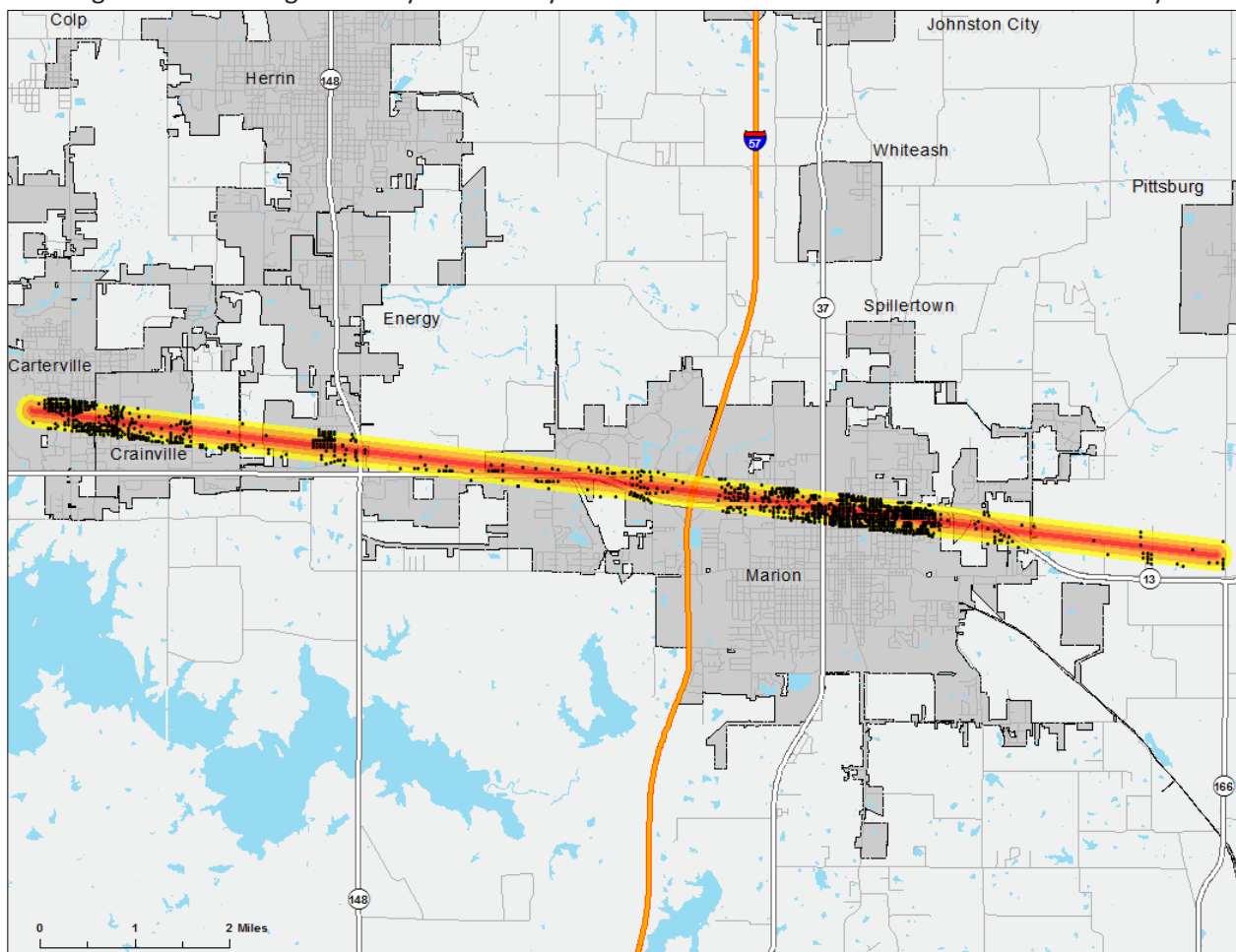
Modeled Impacts of the EF4 Tornado

The GIS analysis estimates that the modeled EF4 tornado would damage 1,444 buildings. The estimated building losses are over \$43,678,413. The building losses are an estimate of building replacement costs multiplied by the damage percent. Table 4-14 and Figure 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	\$11,767,500	\$8,638,488	\$12,706,350	\$2,620,227
Commercial	\$1,768,950	\$1,092,672	\$2,943,645	\$933,441
Industrial	\$236,160	\$0	\$970,980	\$0
Total:	\$13,772,610	\$9,731,160	\$16,620,975	\$3,553,668

Figure 4-5. Building Inventory Affected by the EF4 Tornadoes Modeled for Williamson County



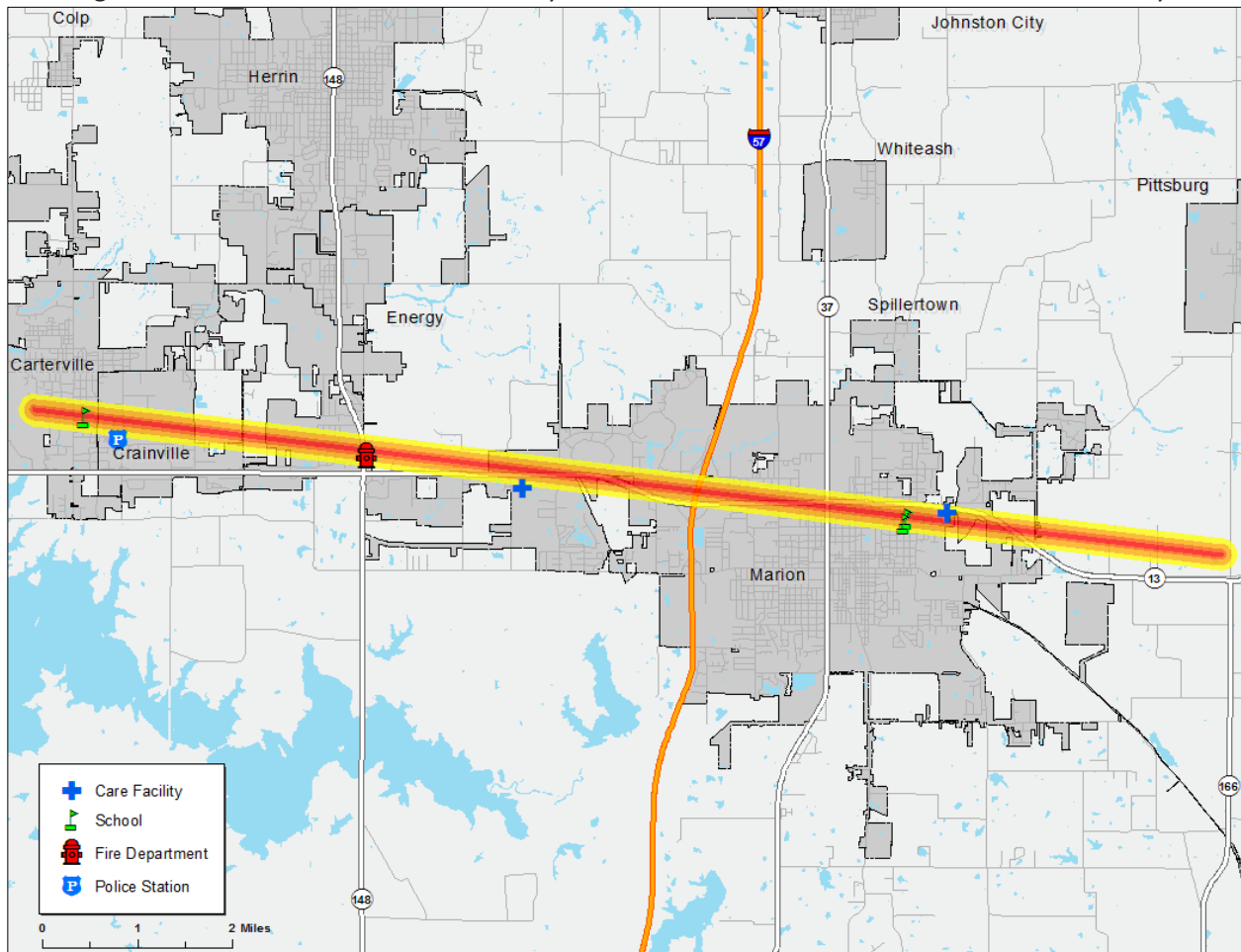
Essential Facilities Damage

There are seven essential facility located within 900 feet of the EF4 tornado path in the Marion, Carterville and Crainville area. The model predicts that two care facilities, three schools, one fire and police stations would experience damage. 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 Williamson County

Essential Facility	Facility Name
Care Facilities	Fountains Care Facility
	Heartland Regional Medical Center
Schools	School For Hearing Impaired
	Cartersville High School
	Jefferson School
Fire Departments	Williamson County Fire Department Station #6
Police Station	Crainville Police Department

Figure 4-6. Essential Facilities Affected by the EF4 Tornadoes Modeled for Williamson County



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 Williamson County. All essential facilities in the county are at risk. Appendix E include a list of the essential facilities in Williamson 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, near the city of Marion near the I-57 – Route 13 Interchange and along the Route 13 west of I-57. Additional warning sirens can warn the community of approaching storms to ensure the safety of Williamson 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. Magnitude in the earthquake hazard analysis. Table 4-16 provides a comparison of magnitude and intensity, and Table 4-17 provides qualitative descriptions of intensity, for a sense of what a given magnitude might feel like.

Table 4-16: 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 4-17: Abbreviated Modified Mercalli Intensity Scale

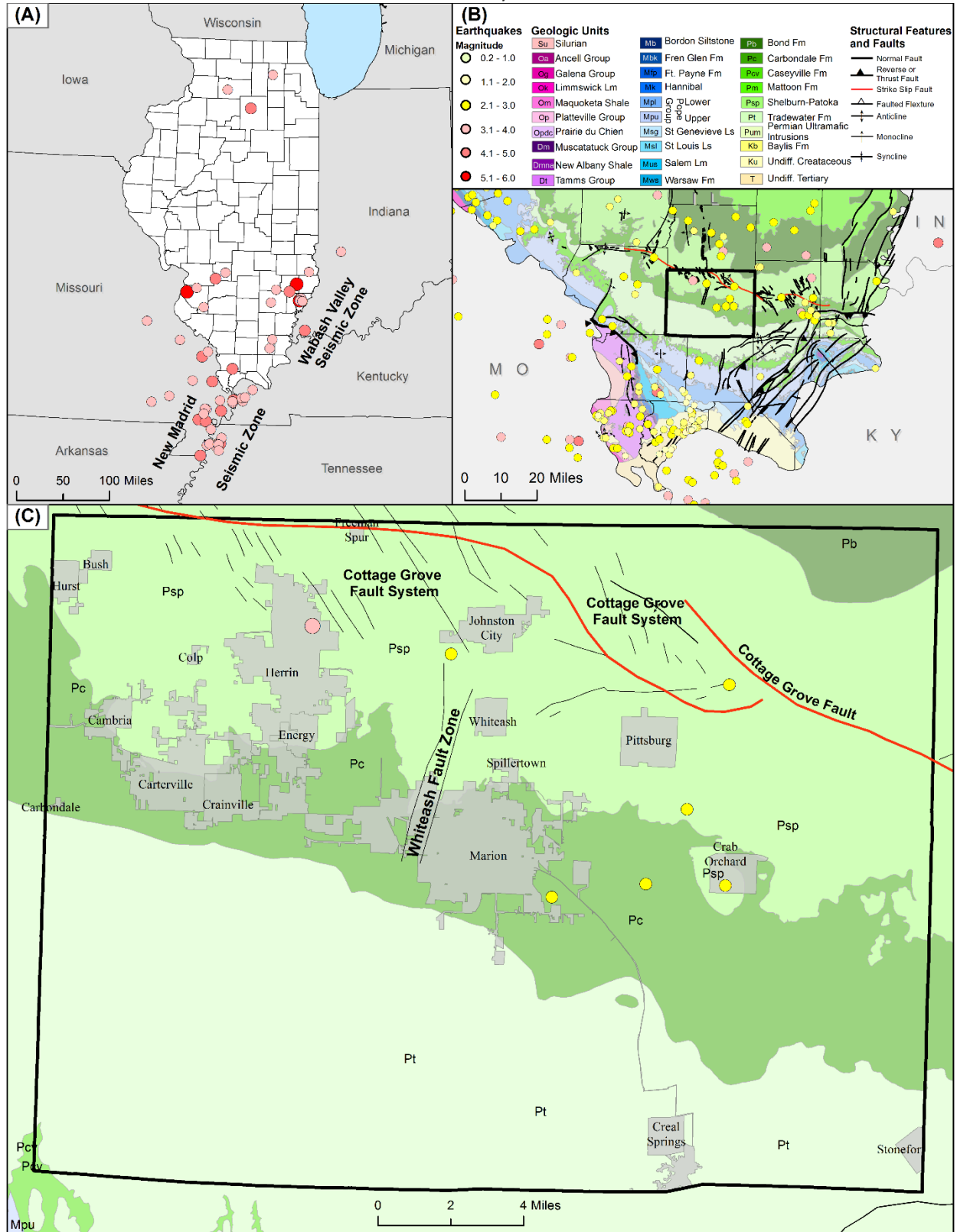
Mercalli Intensity	Description
I	Not felt except by a very few under especially favorable conditions.
II	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it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

Previous Occurrences for Earthquakes

Historically, the most significant seismic activity in Illinois is associated with New Madrid Seismic Zone. The New Madrid Seismic Zone produced three large earthquakes in the central U.S. with magnitudes estimated between 7.0 and 7.7 on December 16, 1811, January 23, 1812, and February 7, 1812. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment (sand blows) over an area >10,500 km², 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 km² (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 Williamson 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.

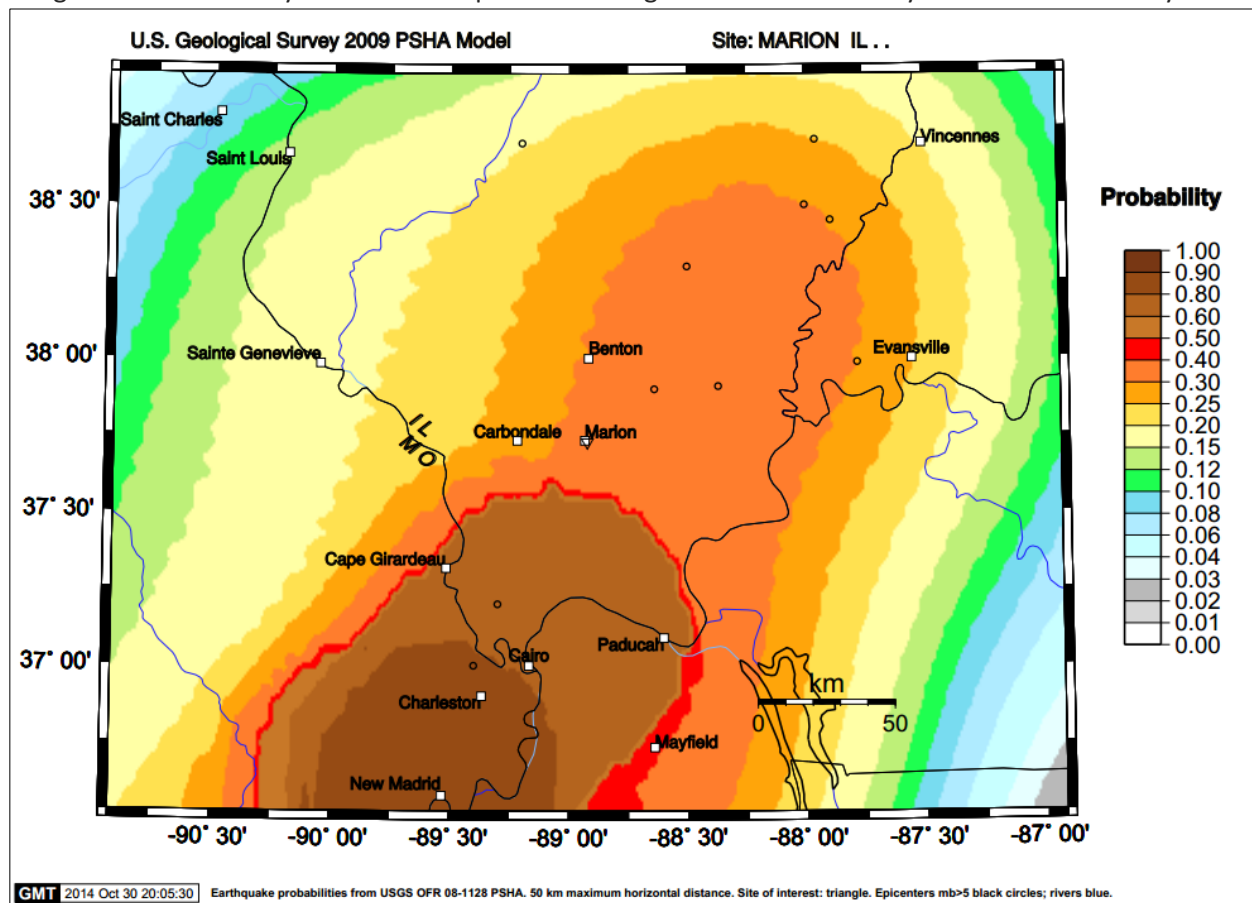
Figure 4-7. Notable Earthquakes in Illinois with Geologic and Earthquake Epicenters in Williamson County



Geographic Location for Earthquake Hazard

Williamson County is situated in a region susceptible to earthquakes. The two most significant zones of seismic activity in Illinois are the New Madrid Seismic Zone and the Wabash Valley Fault System. Since 1974, the epicenters of seven small earthquakes (M2.2-M3.4) have been recorded in Williamson County (see Figure 4-7(C)). The local seismic activity has been focused along and near the Cottage Grove Fault System and other smaller adjacent fault zones such as the White Ash Fault Zone and Rend Lake Fault Zone. The seismogenic potential of these structures is unknown, and the geologic mechanism related to the minor earthquakes is poorly understood. While large earthquakes ($>M7.0$) experienced during the New Madrid Events of 1811 and 1812 are unlikely in Williamson County, moderate earthquakes ($\leq 6.0M$) in or in the vicinity of Williamson County are probable. The USGS estimates the probability of a moderate M5.5 earthquake occurring in Williamson County within the next 500-years at approximately 3% (see Figure 4-8).

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



Hazard Extent for Earthquake Hazard

Earthquake effects are possible anywhere in Williamson 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 Williamson County are possible, but large (>M7.0) earthquakes that cause catastrophic damage are unlikely. According to the Williamson County Planning Team's assessment, earthquakes are ranked as the number two hazard.

<u>Risk Priority Index</u>			
Probability	x	Magnitude	= RPI
2	x	8	= 16

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 essential infrastructure in Williamson County.

Essential Facilities

All essential facilities are vulnerable to earthquakes. Essential 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 essential 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 essential 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 probabilistic earthquake scenario was performed to provide a reasonable basis for earthquake planning in Williamson 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 5.5 500-year probability event in Williamson 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 M5.5 500-Year Probabilistic Scenario

The results of the M5.5 500-year probabilistic earthquake scenario are depicted in Tables 4-18, 4-19, and Figure 4-9. Hazus-MH estimates that approximately 4,968 buildings will be at least moderately damaged. This is 15% of the total number of buildings in the Williamson County. It is estimated that 238 buildings would be damaged beyond repair.

The total economic losses are approximately \$256.19 million dollars. It is estimated that 22% 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 58% of the total loss.

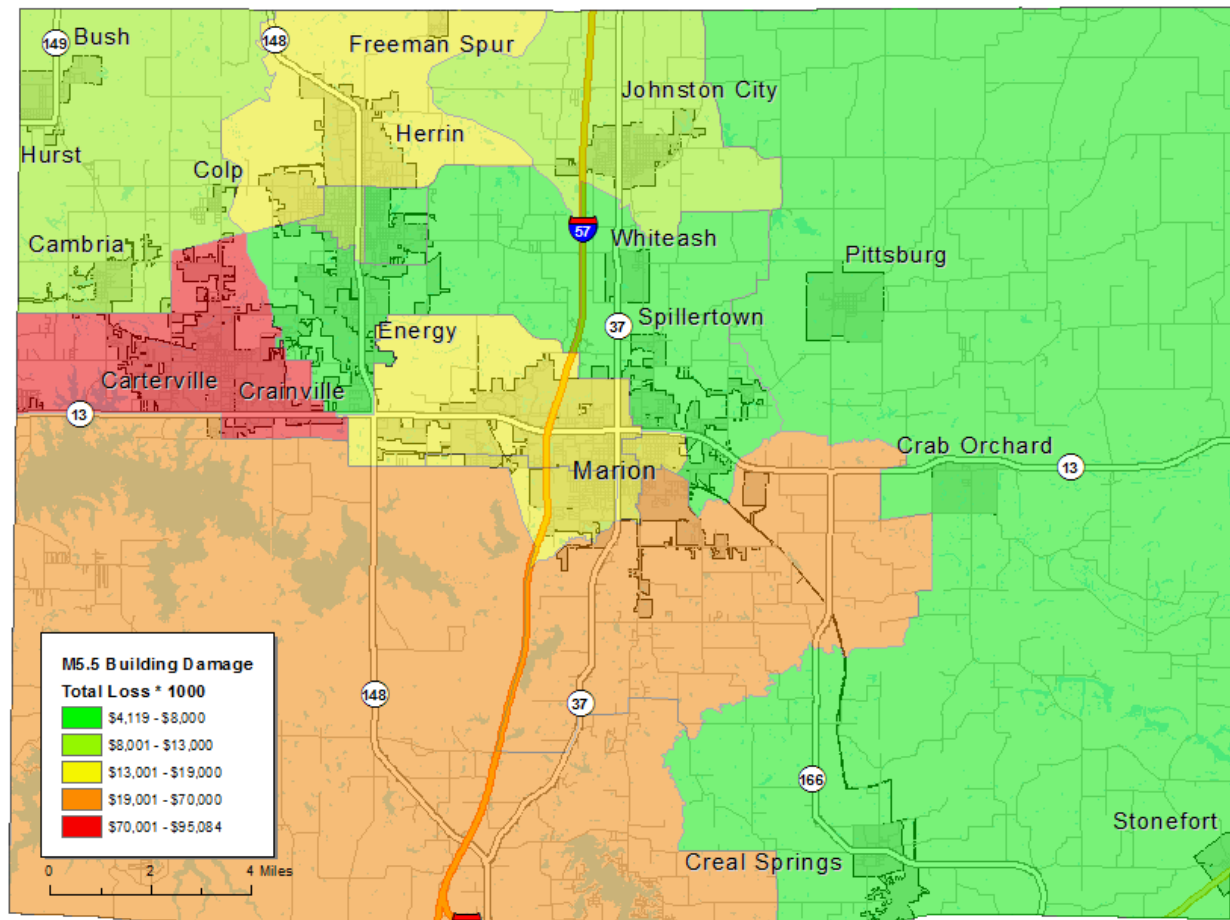
Table 4-18: M5.5 500-Year Probabilistic Earthquake Damage Estimates by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	82	0.38	24	0.37	24	0.66	11	0.99	2	0.95
Commercial	950	4.44	264	4.02	220	5.98	84	7.9	21	8.83
Educational	29	0.13	9	0.13	8	0.21	3	0.28	1	0.37
Government	32	0.15	8	0.12	7	0.20	2	0.23	1	0.29
Industrial	242	1.13	73	1.11	65	1.77	25	2.4	6	2.47
Other Residential	6,147	28.72	1,970	30.08	1,374	37.45	462	43.59	91	38.20
Religion	127	0.59	35	0.54	26	0.70	9	0.89	2	0.99
Single Family	13,793	64.45	4,167	63.62	1,946	53.03	464	43.72	114	47.89
Total:	21,402		6,550		3,670		1,060		238	

Table 4-19: M5.5 500-Year Probabilistic 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	\$0.53	\$9.07	\$0.31	\$1.07	\$10.98
	Capital-Related	\$0.00	\$0.22	\$7.57	\$0.18	\$0.30	\$8.28
	Rental	\$3.32	\$2.50	\$4.02	\$0.11	\$0.49	\$10.44
	Relocation	\$12.28	\$3.42	\$6.06	\$0.61	\$4.25	\$26.65
	Subtotal:	\$15.60	\$6.67	\$26.72	\$1.21	\$6.11	\$56.34
Capital Stock Losses	Structural	\$17.14	\$4.81	\$7.41	\$1.79	\$3.77	\$34.92
	Non-Structural	\$60.22	\$20.30	\$21.49	\$5.58	\$11.11	\$118.71
	Content	\$19.62	\$4.84	\$11.11	\$3.65	\$5.82	\$45.05
	Inventory	\$0.00	\$0.00	\$0.31	\$0.80	\$0.08	\$1.19
	Subtotal:	\$96.98	\$29.95	\$40.32	\$11.82	\$20.78	\$199.85
	Total:	\$112.58	\$36.62	\$67.04	\$13.03	\$26.89	\$256.19

Figure 4-9. Williamson County M5.5 500-Year Probabilistic 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 4-20, 4-21, and Figure 4-10. Hazus-MH estimates that approximately 1,013 buildings will be at least moderately damaged. This is over 3% of the total number of buildings in the Williamson County. It is estimated that 0 buildings would be damaged beyond repair.

The total economic losses are approximately \$124.67 million dollars. It is estimated that 9% 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 52% of the total loss.

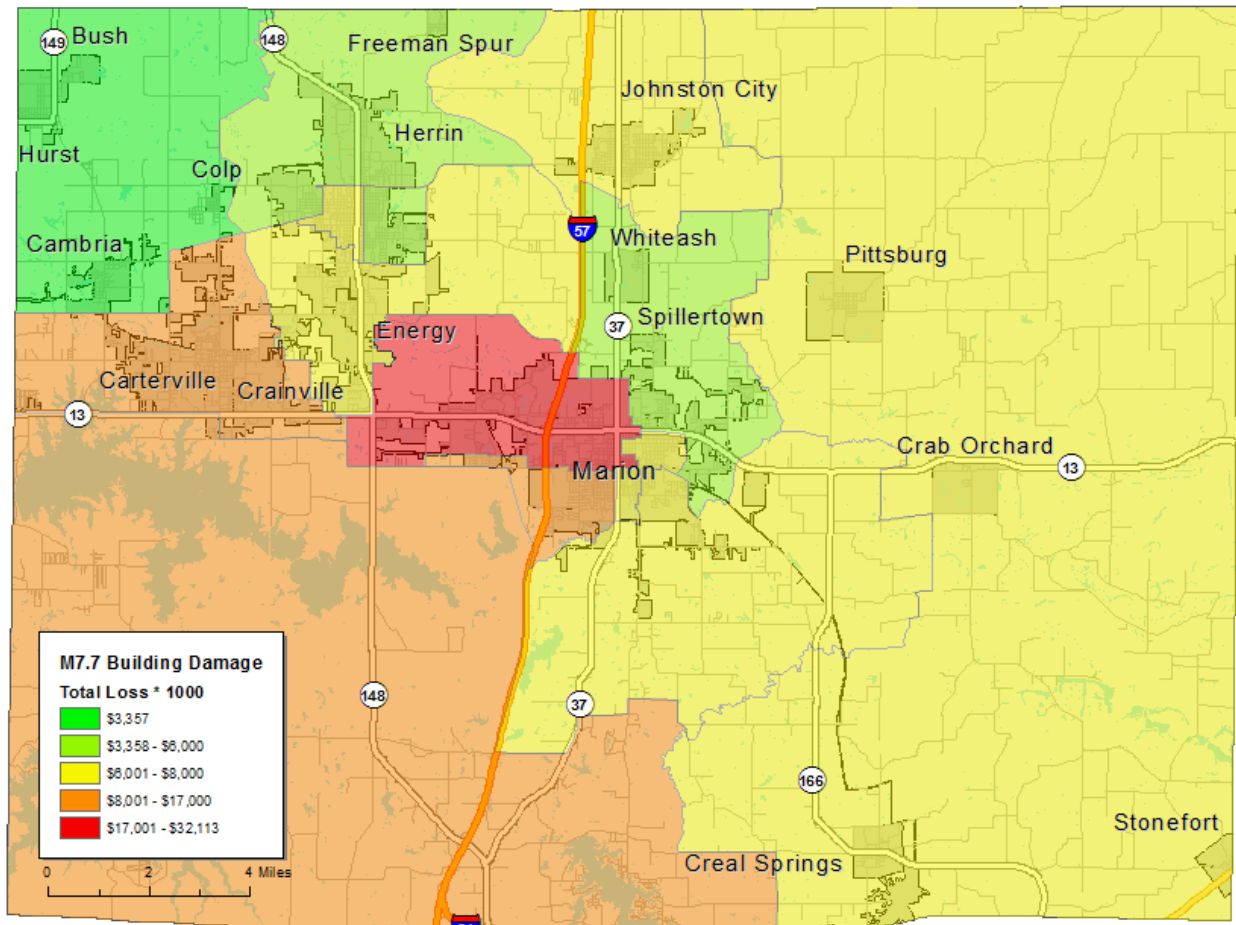
Table 4-20: New Madrid M7.7 Earthquake Damage Estimates by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	102	0.38	30	0.62	11	1.15	1	2.09	0	1.22
Commercial	1,129	4.18	308	6.32	96	9.76	5	17.33	0	11.47
Educational	37	0.14	9	0.19	2	.23	0	0.23	0	0.32
Government	40	0.15	9	0.18	2	.23	0	0.23	0	0.24
Industrial	298	1.10	84	1.71	28	2.87	2	5.24	0	3.19
Other Residential	7,583	28.05	1,909	39.12	540	54.88	13	43.88	0	20.95
Religion	154	0.57	36	0.74	10	1.01	0	1.58	0	1.50
Single Family	17,687	65.44	2,494	51.11	294	29.86	9	29.42	0	61.10
Total:	27,030		4,879		983		30		0	

Table 4-21: 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	\$0.04	\$2.15	\$0.06	\$0.21	\$2.47
	Capital-Related	\$0.00	\$0.02	\$1.85	\$0.04	\$0.05	\$1.95
	Rental	\$0.33	\$0.36	\$1.32	\$0.03	\$0.06	\$2.10
	Relocation	\$1.08	\$0.70	\$1.70	\$0.16	\$0.49	\$4.13
	Subtotal:	\$1.41	\$1.12	\$7.02	\$0.29	\$0.81	\$10.65
Capital Stock Losses	Structural	\$2.34	\$1.07	\$1.87	\$0.38	\$0.57	\$6.22
	Non-Structural	\$25.85	\$11.16	\$16.59	\$4.39	\$4.91	\$62.91
	Content	\$17.42	\$4.73	\$13.77	\$3.37	\$4.47	\$43.75
	Inventory	\$0.00	\$0.00	\$0.35	\$0.72	\$0.06	\$1.14
	Subtotal:	\$45.61	\$16.96	\$32.58	\$8.86	\$10.01	\$114.02
	Total:	\$47.02	\$18.08	\$39.60	\$9.15	\$10.82	\$124.67

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 4-22, 4-23, and Figure 4-11. Hazus-MH estimates that approximately seven buildings will be at least moderately damaged. Zero buildings would be damaged beyond repair.

The total economic losses are approximately \$11.61 million dollars. It is estimated that 1% 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 50% of the total loss.

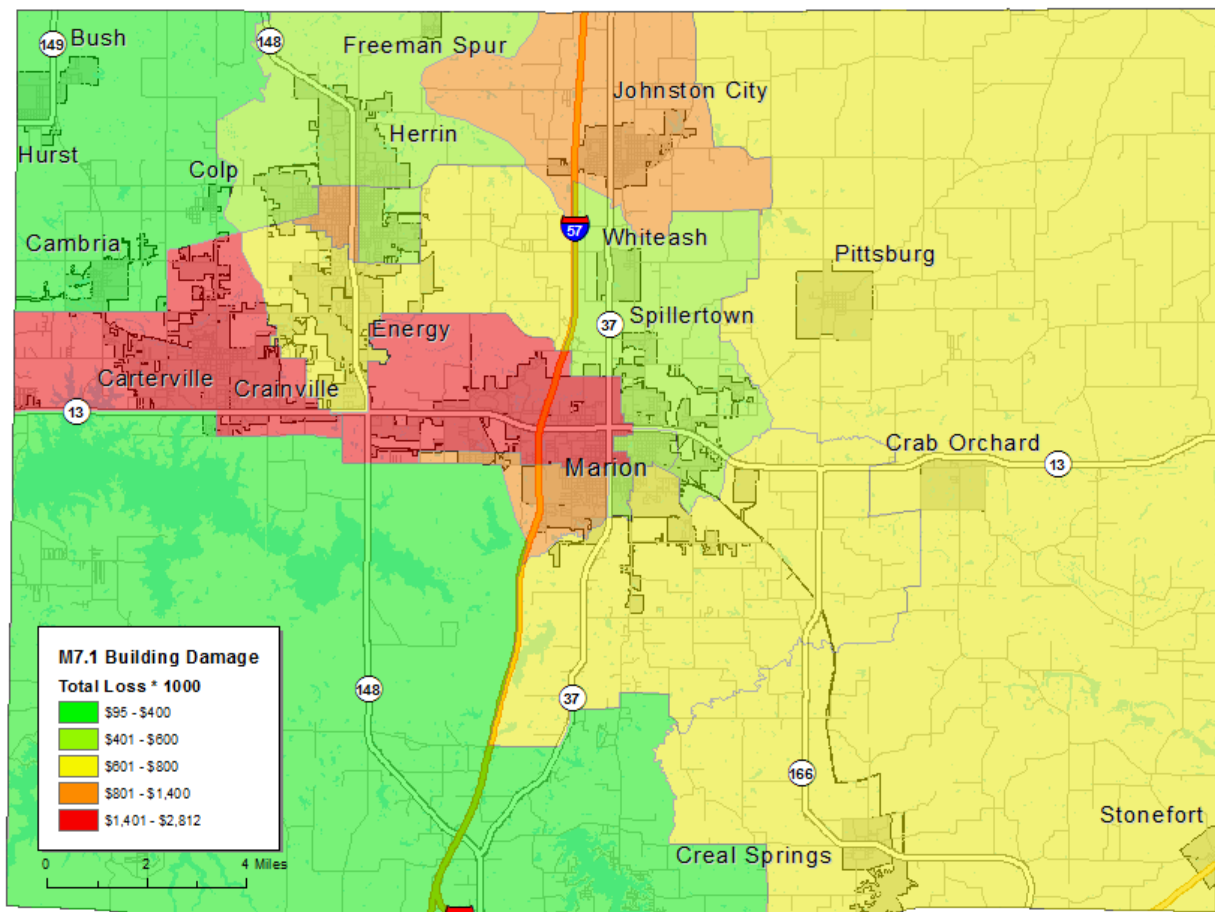
Table 4-22: Wabash Valley 7.1 Magnitude Earthquake Damage Estimates by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	143	0.44	1	0.61	0	1.00	0	0.00	0	0.00
Commercial	1,530	4.67	8	5.92	1	9.13	0	0.00	0	0.00
Educational	49	0.15	0	0.20	0	0.24	0	0.00	0	0.00
Government	5	0.15	0	0.15	0	0.19	0	0.00	0	0.00
Industrial	409	1.25	2	1.60	0	2.57	0	0.00	0	0.00
Other Residential	9,981	30.45	60	45.10	3	44.14	0	0.00	0	0.00
Religion	199	0.61	1	0.83	0	1.12	0	0.00	0	0.00
Single Family	20,420	62.29	60	45.59	3	41.61	0	0.00	0	0.00
Total:	32,781		132		7		0		0	

Table 4-23: 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	\$0.00	\$0.02	\$0.00	\$0.00	\$0.02
	Capital-Related	\$0.00	\$0.00	\$0.01	\$0.00	\$0.00	\$0.02
	Rental	\$0.00	\$0.01	\$0.02	\$0.00	\$0.00	\$0.03
	Relocation	\$0.01	\$0.00	\$0.01	\$0.00	\$0.00	\$0.03
	Subtotal:	\$0.01	\$0.01	\$0.06	\$0.00	\$0.00	\$0.10
Capital Stock Losses	Structural	\$0.04	\$0.02	\$0.02	\$0.00	\$0.01	\$0.09
	Non-Structural	\$2.41	\$1.08	\$1.90	\$0.54	\$0.58	\$6.50
	Content	\$1.74	\$0.49	\$1.62	\$0.39	\$0.54	\$4.78
	Inventory	\$0.00	\$0.00	\$0.04	\$0.09	\$0.01	\$0.14
	Subtotal:	\$4.19	\$1.59	\$3.58	\$1.02	\$1.14	\$11.51
	Total:	\$4.20	\$1.60	\$3.64	\$1.02	\$1.14	\$11.61

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



Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

New construction, especially essential 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 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.



Trees downed across I-57 in Williamson County after the May 2009 Derecho (c/o NOAA)

Previous Occurrences of Thunderstorm Hazards

The National Climatic Data Center (NCDC) database reported 72 hailstorms in Williamson County since 1950. Hailstorms occur nearly every year in the late spring and early summer months. The most recent reported occurrence was in April of 2014, when a powerful low pressure system across the plains states steered warmth and moisture northward for nearly two days. Hail was reported in Marion. Table 4-24 lists the significant hail storms (such as those that cause death, damage or injury) in Williamson County.

Table 4-24: Selected NCDC-Recorded Hail that Caused Damage, Death, or Injury in Williamson County

Location or County*	Date	Deaths	Injuries	Property Damage
Hudgens	5/5/1999	0	0	\$50,000
Herrin	5/25/2002	0	0	\$300,000
Marion	5/2/2002	0	0	\$2,000,000
Total:		0	0	\$2,350,000

*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 3 lightning events in Williamson County. The most recent reported event was in June 2011 where high pressure over the Great Lakes and low pressure over the central Plains resulted in a southeast wind flow of warmer and more unstable air. Numerous thunderstorms occurred near the leading edge of the warmer and more unstable air. In Marion, a lightning strike shattered an antenna into three pieces. The antenna was located on top of a tower at the sheriff's department. The sheriff office's 911 telephone capability and radio system were both damaged. Table 4-25 identifies NCDC-recorded lightning that caused damage, death, or injury in Williamson County.

Table 4-25: Selected NCDC-Recorded Lightning that Caused Damage, Death, or Injury in Williamson County

Location or County*	Date	Deaths	Injuries	Property Damage
Williamson	6/14/2011	0	0	\$50,000
Williamson	6/14/2011	0	0	\$80,000
Total:		0	0	\$130,000

*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 69 wind storms in Williamson County. The most damaging wind event in southern Illinois was the May 2009 Derecho. Peak wind gusts were measured over 80 mph at Marion and Carbondale, IL. The Williamson County airport near Marion reported a peak gust of 86 mph. There was extensive damage at the airport, including hangar buildings. Extensive tree and power line damage occurred in the Murphysboro, Carbondale, and Marion area of Southern Illinois. Numerous structures were damaged. Table 4-26 identifies selected NCDC-recorded wind storms that caused major damage (over \$100,000), death, or injury in Williamson County.

Table 4-26: Selected NCDC-Recorded Wind Storms that Caused Major Damage (over \$100,000), Death, or Injury in Williamson County

Location or County*	Date	Deaths	Injuries	Property Damage
Cambria	1/3/2000	0	0	\$100,000
Marion	1/3/2000	0	0	\$100,000

Location or County*	Date	Deaths	Injuries	Property Damage
Williamson	9/14/2008	0	0	\$500,000
Carterville	5/8/2009	0	23	\$175,000,000
Herrin	7/11/2010	0	0	\$100,000
Hafer	4/19/2011	0	0	\$100,000
Total:		0	23	\$175,900,000

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

Risk Identification for Thunderstorm Hazard

Based on historical information, the occurrence of future high winds, hail, and lightning is highly likely. The County should expect high winds, hail, and lightning of widely varying magnitudes in the future. According to the Williamson County Planning Team's assessment, severe thunderstorms are ranked as the number three hazard.

<u>Risk Priority Index</u>				
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 essential infrastructure in Williamson County.

Essential Facilities

All essential facilities are vulnerable to severe thunderstorms. An essential 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 essential 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 essential 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 NCD, Williamson County has incurred approximately \$180 million in damages relating to thunderstorms, including hail, lightning, and high winds since 1950. NCD 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 Williamson County incurs property damages of approximately \$280,000 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, near the city of Marion near the I-57 – Route 13 Interchange and along the Route 13 west of I-57. Additional warning sirens can warn the community of approaching storms to ensure the safety of Williamson County residents and minimizing property damage.

4.3.5 Winter Storm Hazard

Hazard Definition of Winter Storm Hazard

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

Ice 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



View of West Main Street in Marion during a winter storm in 2013 (c/o The Southern Illinoisan)

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 107 winter storm and extreme cold events for Williamson County since 1950. The most recent reported event occurred in April of 2014 when temperatures plummeted across southern Illinois with breezy conditions leading to wind chill values falling into the 28°F-32°F range following a high pressure system from the Ohio Valley. The coldest observed temperature was 28 degrees at the Mount Vernon airport. Other lows included 31 degrees at the Carbondale airport and at Metropolis, IL. Table 4-27 identifies NCDC-recorded winter storm events that caused damage, death, or injury in Williamson County.

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

Location or County*	Date	Deaths	Injuries	Property Damage
Williamson	1/2/1999	0	0	\$50,000
Williamson	12/25/2004	1	0	\$0
Williamson	3/4/2008	0	0	\$30,000
Williamson	2/12/2008	0	0	\$500,000
Williamson	1/28/2009	0	0	\$500,000
Williamson	2/7/2011	0	3	\$0
Total:		1	3	\$1,080,000

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

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
3	x	1.5	=	4.5

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 essential infrastructure in Williamson County.

Essential Facilities

All essential facilities are vulnerable to winter storms. A essential 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 essential 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 essential 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 NCD, Williamson County has incurred approximately \$1.1 million in damages relating to winter storms since 1950. NCD 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 Williamson County

incurs property damages of approximately \$30,000 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.

4.3.6 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 NCDL database reported 40 flooding events in Williamson County. The most recent recorded event was in April 2014 when thunderstorms intensified within a zone of strong southerly low level winds that provided abundant warmth and moisture. The strong moisture feed contributed to torrential downpours that produced flash flooding in a number of counties. Major street flooding was reported in Marion. A large amount of running water was over some streets. Table 4-28 identifies NCDL-recorded flooding events that caused damage, death, or injury in Williamson County.

Table 4-28: NCDC-recorded Flooding Events that caused Death, Damage or Injury in Williamson County

Location or County*	Date	Deaths	Injuries	Property Damage
Marion	5/11/1996	0	0	\$1,000,000
Marion	4/28/1996	0	0	\$500,000
Crab Orchard	6/30/1998	0	0	\$50,000
Williamson	4/16/1998	0	0	\$40,000
Williamson	1/22/1999	0	0	\$70,000
Marion	8/3/2000	1	0	\$0
Williamson	12/17/2001	0	0	\$10,000
Williamson	11/15/2005	0	0	\$10,000
Williamson	11/15/2005	0	0	\$4,000
Herrin	7/4/2006	0	0	\$2,000
Cambria	3/21/2008	0	0	\$375,000
Freeman	5/26/2011	0	0	\$75,000
Carterville	5/10/2011	0	0	\$30,000
Scottsboro	4/4/2014	0	0	\$5,000
Total:		1	0	\$2,171,000

*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 has been several structures in Williamson County that has 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 $\geq 25\%$ 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 Williamson County. Records indicate that there are 19 repetitive loss structures within the county. The total amount paid for building replacement and building contents for damage to these repetitive loss structures is \$978,789. Table 4-29 describes the repetitive loss structures for each jurisdiction.

Table 4-29: Repetitive Loss Structures for each Jurisdiction in Williamson County

Jurisdiction	Number of Properties	Total Paid
Marion	18	\$971,538.19
Johnston City	1	\$7,251.67
Total:	19	\$978,789.86

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 riverine flooding in Williamson County are Crab Orchard Creek, the Big Muddy River, South Fork of the Saline River, and Little Grassy Creek. However, only riverine flooding along the Crab Orchard Creek and the Big Muddy River affect incorporated areas of Marion. Riverine flooding along the Big Muddy River and a few of its tributaries can affect limited areas of Johnston City, Freeman Spur,

Herrin, Bush, and Hurst. Outside the incorporated areas of Williamson County, riverine floods can cause secondary road closures and flooding of agricultural lands. However, unless the flooding is a large event, most residential/urban areas and major roads and highways are not affected. During these large events, Crab Orchard Creek can cause the closure of Route 148 south of Marion and Old Route 13. Lake Creek, a small tributary to the Big Muddy River, can cause the closure of Route 37 between White Ash and Johnston City.

Flash flooding in Williamson County typically occurs or is best documented in urban/developed areas. For example, in the city of Marion, members of the Planning Team identified a recurring area of flash flooding on the south side of town. This area is bounded on the north by Everet Street, on the south by Boyton and Market Streets, on the east by Illinois Route 37, and on the west by Future Street. Flash flooding has also been documented in Carterville and Herrin by the NCDC.

Hazard Extent for Flooding

All floodplains are susceptible to flooding in Williamson 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 13% of Williamson County

Vulnerability Analysis for Flooding

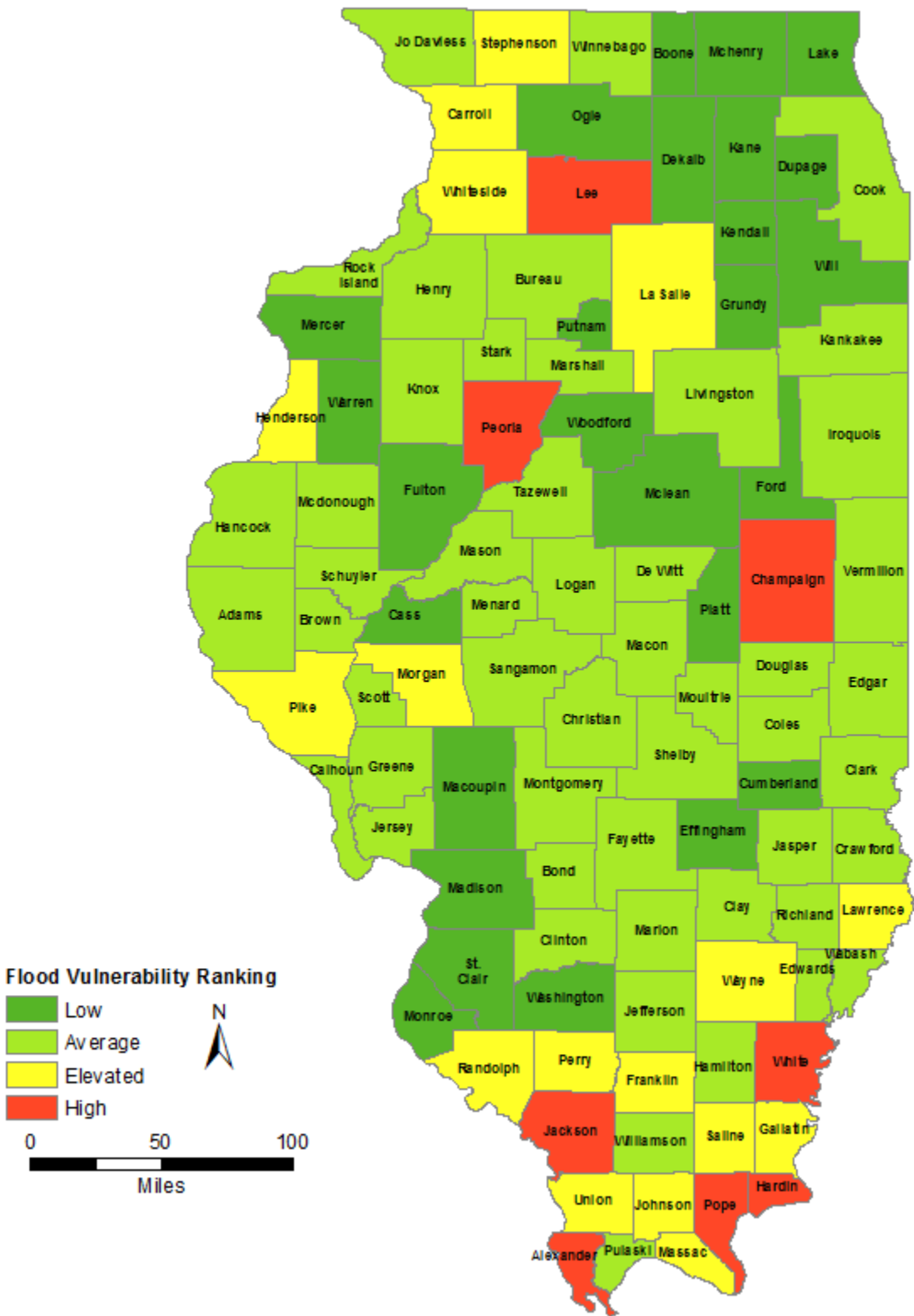
The 2013 Illinois Hazard Mitigation Plan analyzed a variety potential natural hazards including vulnerability to flooding. A Flood Vulnerability Index (FVI) was calculated for all counties and jurisdictions in Illinois. FVI combines Hazus-based estimates of flood exposure and loss with the widely utilized 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 4-12 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. Williamson County has an Average Flood Vulnerability Rating and ranks 45 out of the 102 Counties in Illinois in terms of loss estimation according to Hazus-MH for floods.

Table 4-30 lists the jurisdictional Flood Vulnerability Ratings for Williamson County. The jurisdictions of Cambria, Carterville, Freeman Spur, Johnston City, and Marion all surpass an average Flood Vulnerability Rating.

Table 4-30 Jurisdictional Flood Vulnerability Ranking for Williamson County

Jurisdiction	State Ranking	Flood Vulnerability Rating
Cambria	212	Elevated
Carbondale	170	Elevated
Carterville	296	Average
Energy	294	Average
Freeman Spur	33	Elevated
Herrin	276	Average
Johnston City	205	Elevated
Marion	144	Elevated

Figure 4-12. County Flood Vulnerability Rating for Illinois



Because all floodplains are susceptible to flooding in Williamson 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 Williamson County is probable. According to the Risk Priority Index (RPI) and County input, flooding is ranked as the number five hazard.

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
2	x	2	=	4

Essential Facilities

All essential 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 essential facilities in Williamson 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 Williamson County by utilizing a detailed building inventory database created from assessor and parcel data.

According to this analysis, there are 746 buildings located in the Williamson County 100-year floodplain. The estimated damage to these structures is \$38,150,363. There are an additional 1500 tax-exempt structures without an assessed value that fall within the floodplain. These structures were not used in the HAZUS-MH analysis but can still have damage due to flooding. It should be noted that the results should

be interpreted as degrees of loss rather than exact number of buildings exposed to flooding. Figure 4-13 depicts the building inventory within the 100-year floodplain and Table 4-31 shows the loss estimates by occupancy class.

Figure 4-13. Building Inventory Located within the 100-year Floodplain in Williamson County

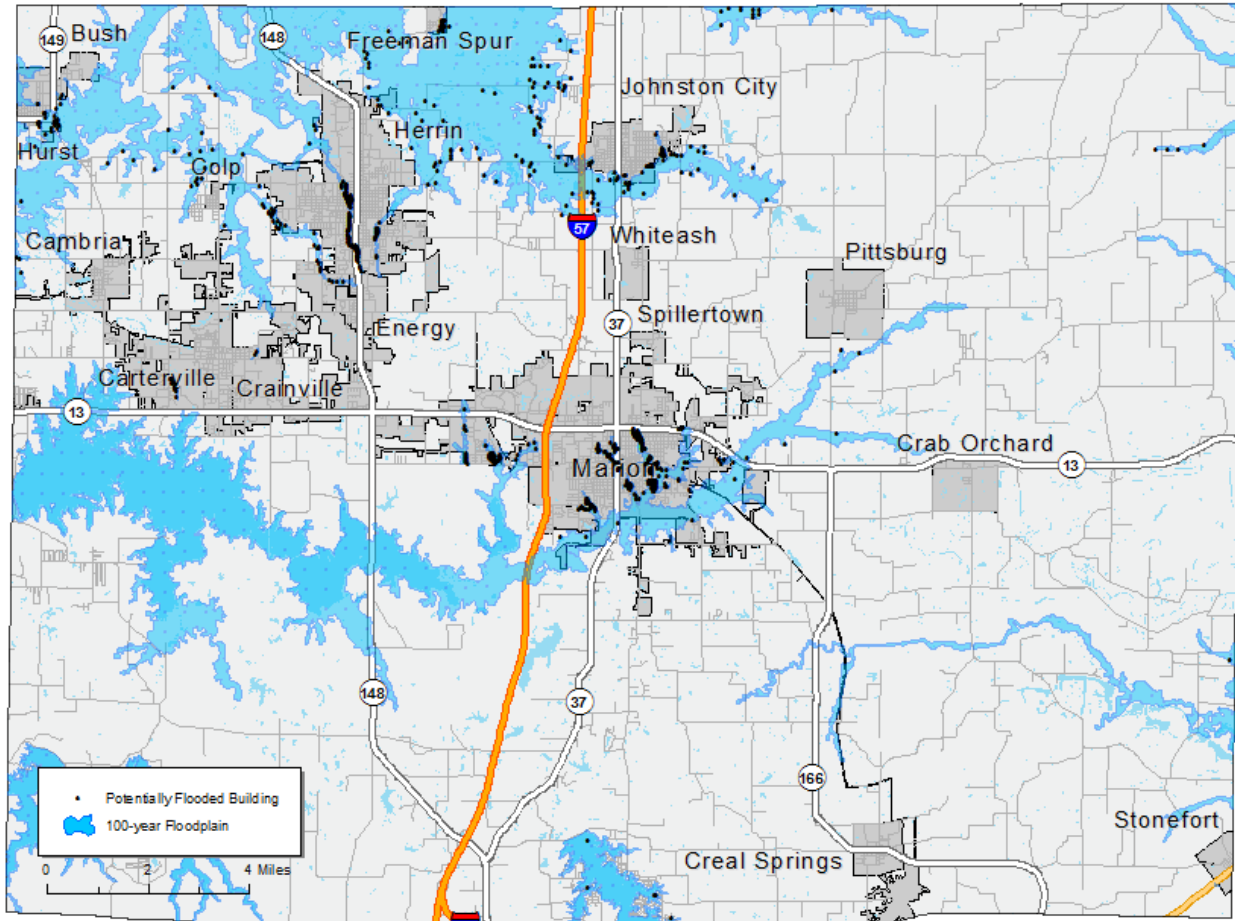


Table 4-31: Estimated Flood Losses within the 100-year Floodplain

Occupancy Class	Number of Structures	Estimated Building Related Losses
Residential	669	\$16,911,783
Commercial	76	\$21,009,340
Industrial	1	\$229,239
Total:	746	\$38,150,363

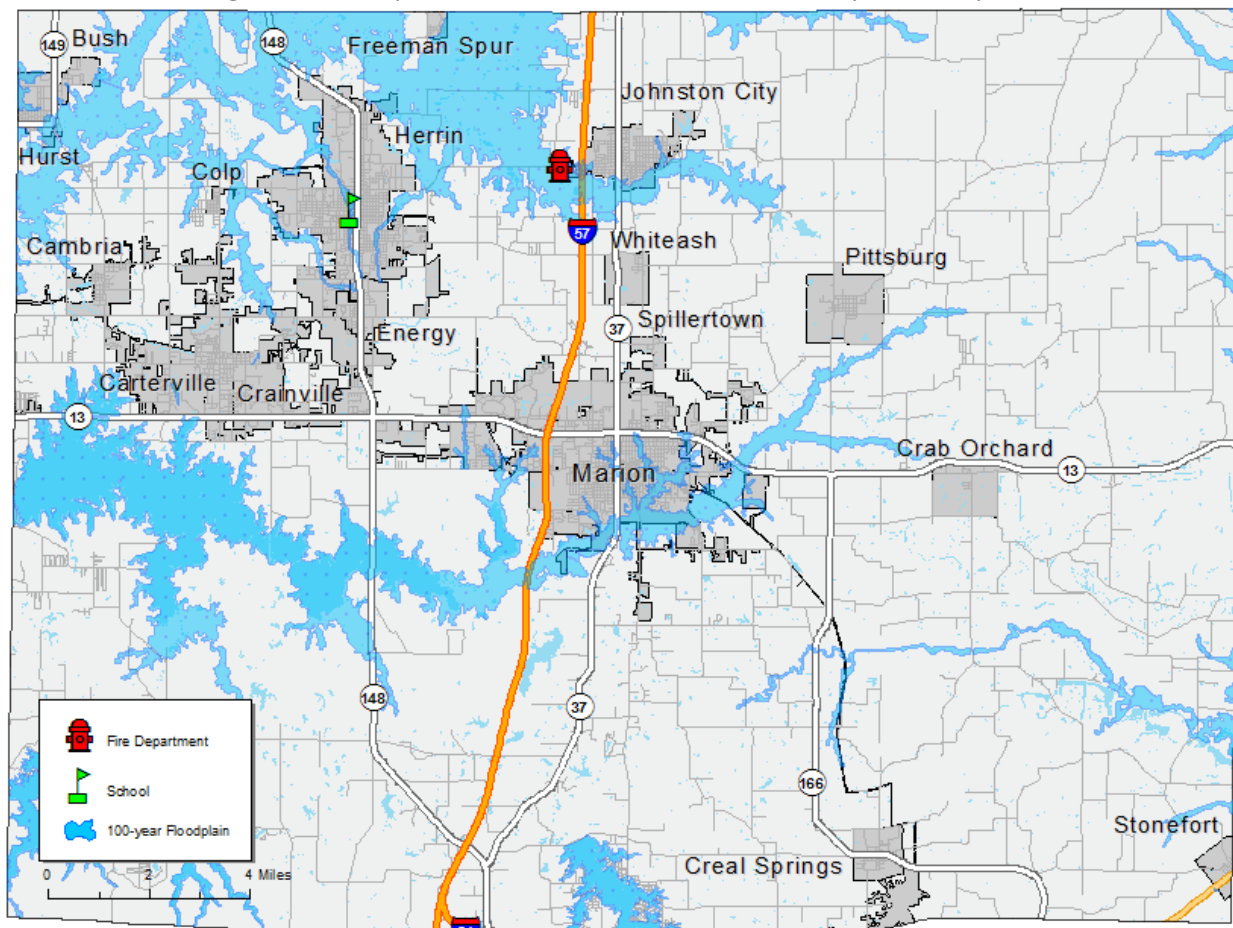
Essential Facilities Damage

The analysis identified two essential facilities that are subject to flooding. Table 4-32 and Figure 4-14 identified the essential facilities within the 100-year floodplain.

Table 4-32: Essential Facilities within the 100-year Floodplain

Essential Facility	Facility Name
School	Our Lady of Mount Carmel School
Fire Departments	Williamson County Fire Department Station #5

Figure 4-14. Map of Essential Facilities within the 100-year Floodplain



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 Williamson County. Table 4-8 includes the building exposure for Williamson County. All essential facilities in the county are at risk. Appendix E includes a list of the essential facilities in Williamson 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 within 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 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

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

Geographic Location of Hazardous Materials Storage and Transportation Hazard

Hazardous material hazards are countywide and are primarily associated with the transport of materials via highway, railroad, and/or river barge.

Hazard Extent of Hazardous Materials Storage and Transportation Hazard

The extent of the hazardous material hazard varies both in terms of the quantity of material being transported as well as the specific content of the container.

Risk Identification of Hazardous Materials Storage and Transportation Hazard

Based on input from the Planning Team, future occurrence of hazardous materials accident in Williamson County is likely. According to the Risk Priority Index (RPI) and County input, hazardous materials release is ranked as the number six hazard.

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
2	x	2	=	4

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 essential infrastructure in Williamson County.

Essential Facilities

All essential facilities and communities within the county are at risk. An essential 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 essential 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 essential 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 chlorine release at intersection of Interstate-57 and Highway 13 in Marion. The Williamson County Planning Team selected the chlorine scenario because of significant truck traffic along major transportation routes within a relatively densely populated area.

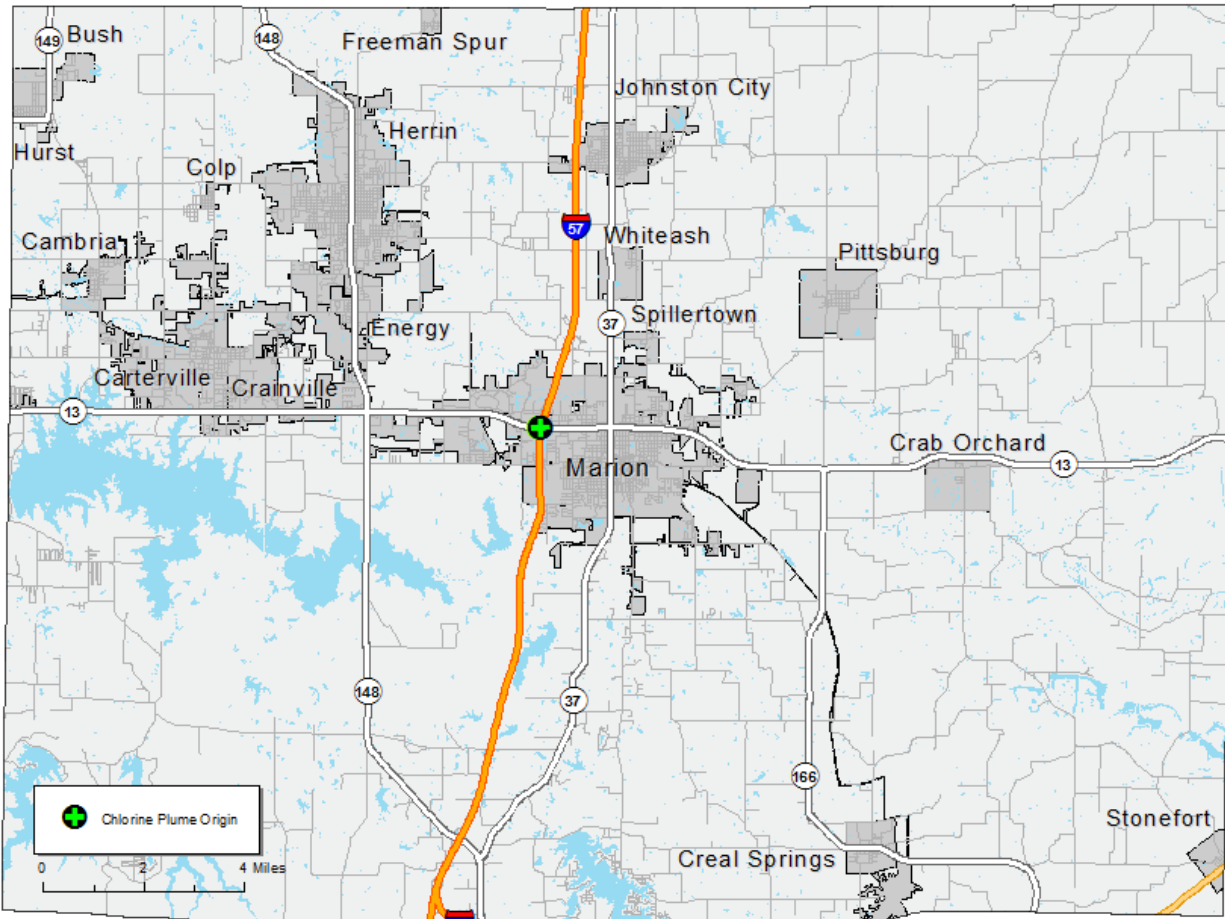
ALOHA is a computer program designed for response to chemical accidents, as well as emergency planning and training. Ammonia, chlorine, and propane are common chemicals used in industrial operations and are found in either liquid or gas form. Rail and truck tankers haul ammonia, chlorine, and propane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

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

For the chlorine scenario, SIU assumed average atmospheric and climatic conditions for the fall season with a breeze from the west. SIU considered the seasonal conditions upon the request of the Planning Team and obtained average monthly conditions for the City of Marion from NOAA's Monthly Weather

Summary. Figures 4-15 depicts the plume origin of the modeled hazardous chemical release in Williamson County. The ALOHA atmospheric modeling parameters for the chlorine release, depicted in Figure 4-16, were based upon a west wind speed of 5 miles per hour. The temperature was 68°F with 75% humidity and a cloud cover of five-tenths skies. SIU used average weather conditions for the month of June reported from NOAA for wind direction, wind speed, and temperature to simulate fall conditions.

Figure 4-15: ALOHA Modeled Hazardous Chemical Plume Origin in Williamson 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 chlorine in this tank is in its liquid state. This release was based on a leak from a 2.5-inch-diameter hole, 12 inches above the bottom of the tank. According to these ALOHA parameters, this scenario would release approximately 10,400 pounds of material per minute. Figure 4-16 shows the plume modeling parameters in greater detail.

Figure 4-16: ALOHA Modeling Parameters for Chlorine Release

SITE DATA:
 Location: MARION, ILLINOIS
 Building Air Exchanges Per Hour: 0.30 (user specified)
 Time: September 22, 2014 1440 hours CDT (using computer's clock)

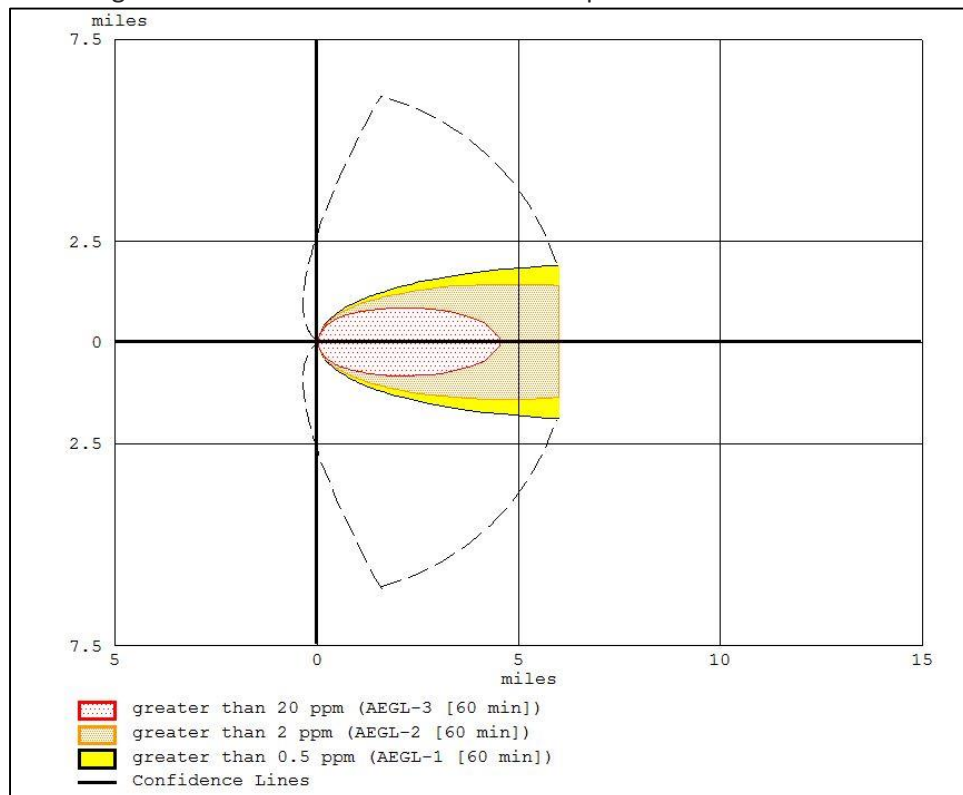
CHEMICAL DATA:
 Chemical Name: CHLORINE Molecular weight: 70.91 g/mol
 AEGL-1 (60 min): 0.5 ppm AEGL-2 (60 min): 2 ppm AEGL-3 (60 min): 20 ppm
 IDLH: 10 ppm
 Ambient Boiling Point: -29.8° F
 Vapor Pressure at Ambient Temperature: greater than 1 atm
 Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

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

SOURCE STRENGTH:
 Leak from hole in horizontal cylindrical tank
 Non-flammable chemical is escaping from tank
 Tank Diameter: 8 feet Tank Length: 33 feet
 Tank Volume: 12,408 gallons
 Tank contains liquid Internal Temperature: 68° F
 Chemical Mass in Tank: 73.0 tons Tank is 100% full
 Circular Opening Diameter: 2.5 inches
 Opening is 12 inches from tank bottom
 Release Duration: 23 minutes
 Max Average Sustained Release Rate: 10,400 pounds/min
 (averaged over a minute or more)
 Total Amount Released: 138,122 pounds
 Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

Using the parameters in Figure 4-16, approximately 10,400 pounds of material would be realized per minutes. The image in Figure 4-17 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 4-17: ALOHA Generate Plume Footprint of Chlorine Scenario



The red buffer (20 ppm) extends no more than 4.5 miles from the point of release after one hour. The orange buffer (2 ppm) and yellow buffer (0.5 ppm) extends no more than six 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.

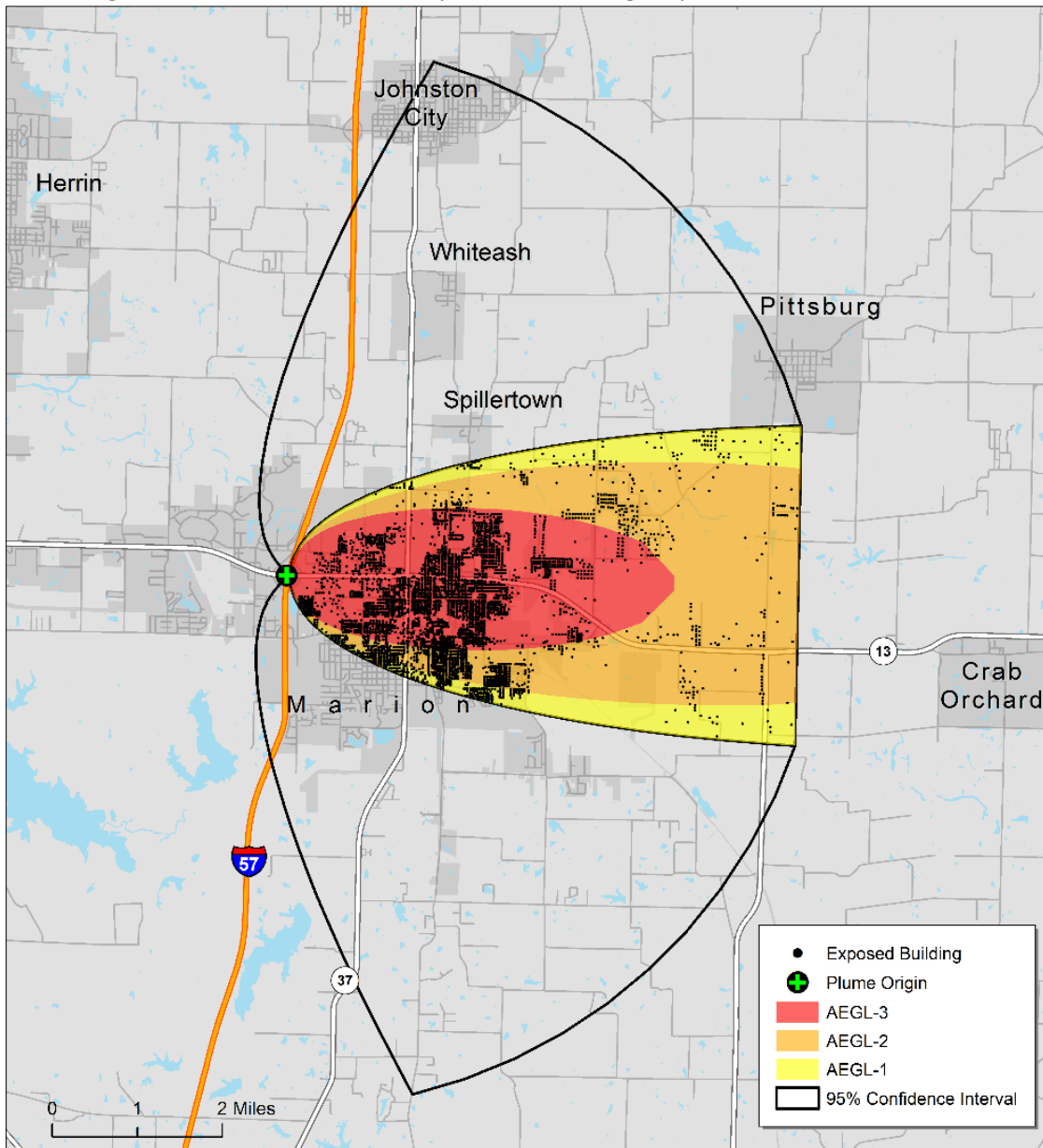
Results for Chlorine Release

An estimate of property exposed to the chlorine spill was calculated by using the building inventory and intersecting these data with each of the AEGL levels (AEGL 3: ≥ 20.0 ppm, AEGL 2: ≥ 2.0 ppm and AEGL 1: ≥ 0.5 ppm). The Williamson County assessment and parcel data was utilized for this analysis. There are 4,983 building within the chlorine 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 chlorine release. Table 4-33 lists the total amount of building exposure to each AEGL zone. Figure 4-18 depicts the chlorine spill footprint and location of the buildings exposed. The GIS overlay analysis estimates that the full replacement cost of the buildings exposed to the chlorine plume is approximately \$480 million.

Table 4-33: Estimated Building Exposure as a Result of the Chlorine Release

Occupancy	Building Exposure			Number of Buildings		
	AEGL 1	AEGL 2	AEGL 3	AEGL 1	AEGL 2	AEGL3
Residential	\$31,921,620	\$88,554,330	\$206,182,140	465	1070	2742
Commercial	\$2,766,630	\$12,960,090	\$129,418,530	20	76	603
Industrial	\$0	\$1,295,160	\$4,516,470	0	3	4
Total:	\$34,688,250	\$102,809,580	\$340,117,140	485	1149	3349

Figure 4-18: ALOHA Plume Footprint and Buildings Exposed to Chlorine Release



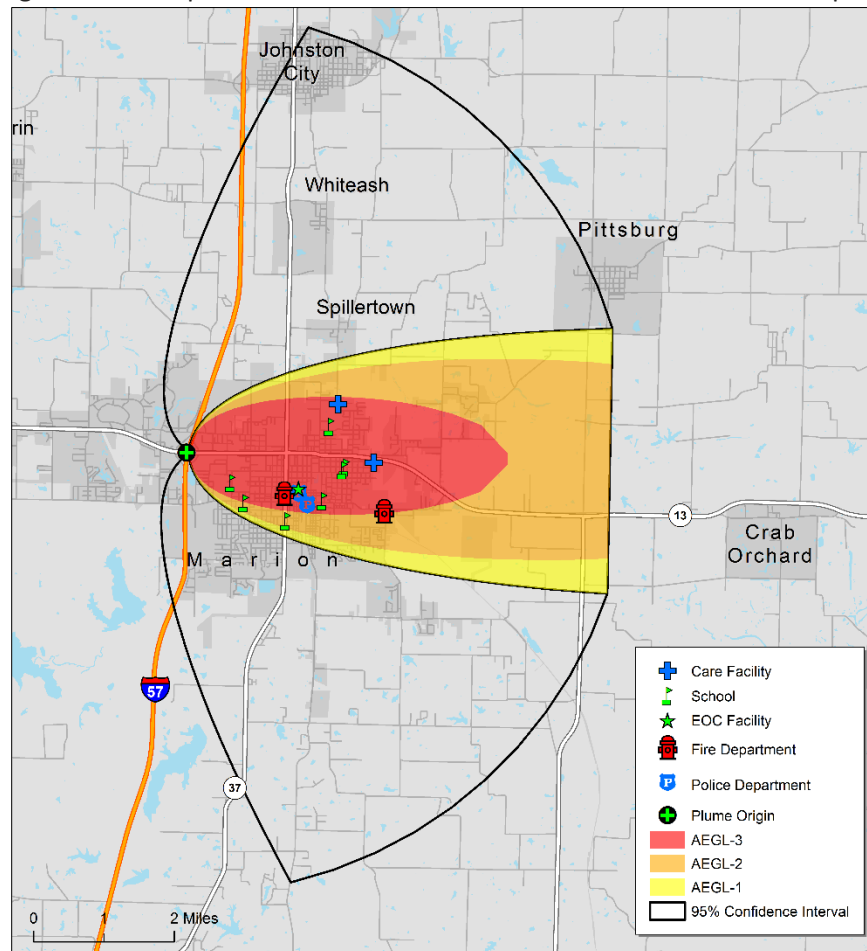
Essential Facilities Damage

There are 14 essential facilities within the limits of the chlorine scenario. Most are located in the confines of the >2 ppm concentration level. Table 4-34 and Figure 4-19 identifies the affected facilities.

Table 4-34: Essential Facilities within the Chlorine Plume Footprint

Essential Facility	Facility Name
Care Facility	Fifth Season Residential
	Fountains Care Facility
Schools	High School Extension Center
	School for Hearing Impaired
	Learning Center
	Jefferson School
	Lincoln School
	Marion Jr. High School
	Washington School
EOC Facility	Williamson County EMA
Fire Departments	Marion Fire Department
	Williamson County Fire Dept. Station #1
Police Departments	Marion City Police
	Williamson County Sherriff's Office

Figure 4-19: Map of Essential Facilities within the Chlorine Plume Footprint



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

Williamson County is expected to see future economic expansion near the city of Marion near the I-57 – Route 13 Interchange and along the Route 13 west of I-57. These areas are particularly vulnerable to chemical releases because of transportation of hazardous materials.

Suggestion for Community Development Trends

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

4.3.8 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 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 Williamson County mitigation Planning Team, there are no records or local knowledge of any dam or levee failure in the county.

Geographic Location of Dams and Levees in Williamson County

The U.S. Army Corps of Engineers maintains the National Inventory of Dams (NID) which identified 30 dams in Williamson County. Table 4-35 list of the dams located in Williamson County and their respective classification level. According to NID records, seven dams in Williamson County are classified as high hazard and eight dams have Emergency Action Plans (EAP). An EAP is not required by the State of Illinois but is strongly recommended by the Illinois Department of Natural Resources.

Table 4-35: Dams in Williamson County

Dam Name	Stream/River	Class	EAP
Johnston City Sewage Lagoon Dam	Lake Creek	II	No
Pleasant Valley Lake Dam	Wolf Creek	III	No
Knights Of Pythias Lake Dam	Trib. South Fork Saline River	III	No
Durst Lake Dam	Trib. Crab Orchard Creek	III	No
Madison Lake Dam	Trib. Hurricane Creek	III	No
Marion Country Club Lake Dam	Trib. South Fork Saline River	III	No
Freeman United Fresh Water Lake Dam	Trib. Lake Creek	II	No
Lake Of Egypt Dam	South Fork Saline River	I	Yes
Marion Reservoir Dam	Limb Branch	II	Yes
Belford Lake Dam	Trib. Little Cana Creek	III	No
Zeigler Coal Lake 5 Dam	Trib. Lake Creek	II	No
Sweet Lake Dam	Trib. Lake Creek	II	No
Teal Lake Dam	Trib. Limb Branch	III	No
Johnston City Lake Dam	Trib. Lake Creek	II	No
Herrin Reservoir 2 Dam	Middle Wolf Creek	-	No
Sipco South Fly Ash Pond Dam	Trib. Lake Of Egypt	III	No
Freeman United, Orient 4, East Slurry Dam	Trib. Lake Creek	I	Yes
Bleyer Lake Dam	Trib. Caney Branch Creek	III	No
Martel Lake Dam	Trib. Lake Creek	III	No
Freeman United, Orient 4, Auxiliary Slurry	Trib. Lake Creek	III	No
Marion New Lake Dam	Sugar Creek	I	Yes
Southern IL Power Fly Ash Disposal Pond	Trib. Little Saline Creek	III	No
Little Grassy	Little Grassy Creek	I	Yes
Devil's Kitchen	Grassy Creek	I	Yes
Crab Orchard	Crab Orchard Creek	I	Yes
Visitor's Center Dam	Unknown	I	Yes
Orient No.4	Unknown	II	No
Orient No.4	Unknown	II	No
Orient No.4	Unknown	II	No
Orient No.4	Unknown	II	No
Orient No.4	Unknown	II	No

A review of the US Army Corps of Engineers National Levee Database and Williamson County records indicated no state or federal levees within Williamson County.

Hazard Extent for Dam and Levee Failure

Dams are assigned a low (III) hazard potential classification 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 (II) 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 (I) 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, seven dams in Williamson County are classified as high hazard and eight 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.

Accurate mapping of the risks of flooding behind levees depends on knowing the condition and level of protection the levees actually provide. FEMA and the U.S. Army Corps of Engineers are working together to make sure that flood hazard maps better reflect the flood protection capabilities of levees and that the maps accurately represent the flood risks posed to areas situated behind them. Levee owners—usually states, communities, or private individuals or organizations such as local levee districts—are responsible for ensuring that the levees they own are maintained to their original design level and condition. In order to be considered creditable flood protection structures on FEMA’s flood maps, levee owners must provide documentation to prove that the levee meets design, operation, and maintenance standards for protection against the 1% annual probability (100-year) flood.

Risk Identification for Dam and Levee Failure

Based on operation and maintenance requirements and local knowledge of the dams and levees in Williamson County, the probability of failure is low. However, if a high-hazard dam failed, the magnitude and severity of the damage could be great. The warning time and duration of the dam failure event would be very short. Based on input from the Planning Team, future occurrence of hazardous materials accident in Williamson County is likely. According to the Risk Priority Index (RPI) and County input, dam and levee failure is ranked as the number seven hazard.

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
2	x	4	=	8

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 Williamson 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.

Essential Facilities

All essential 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 essential 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 4.3.6 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; there for all buildings and infrastructure are vulnerable. Table 4-8 includes the building exposure for Williamson County. All essential facilities in the county are at risk. Appendix E include a list of the essential facilities in Williamson 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.

4.3.9 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 Williamson 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 37 drought/heat wave events in Williamson County since 1950. The most recent recorded event occurred one afternoon in August 2013. Heat indices topped out between 105 and 110 degrees at most airport observing sites. The heat index reached 107 at Carbondale, IL. Table 4-36 identifies NCDC-recorded drought/heat wave events that caused damage, death, or injury in Williamson County.

Table 4-36: NCDC-recorded Extreme Heat Events that caused Death, Damage or Injury in
Williamson County

Location or County*	Date	Deaths	Injuries	Property Damage
Williamson	7/28/1997	0	6	\$0
Williamson	6/29/1998	1	0	\$0
Williamson	8/5/2002	0	6	\$0
Williamson	7/26/2005	0	3	\$0
Total:		1	15	\$0

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 Williamson County Planning Team's assessment, drought and/or extreme heat are ranked as the number eight hazard.

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
3	x	1	=	3

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 essential infrastructure in Williamson County. Even though the exact areas affected are not known, a discussion of the potential impact are detailed below.

Essential Facilities

All essential facilities are vulnerable to drought. An essential 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 essential 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 essential 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, Williamson County has not incurred damages relating to drought and extreme heat events 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.

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

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.

4.3.10 Ground Failure

Hazard Definition

According to the USGS, the term ground failure is generally referred to landslides, liquefaction, lateral spreads, and any other consequence of shaking that affects the stability of the ground. In Illinois, ground failure is typically associated with subsidence of the land surface related to soluble rock (karst), sink holes, or underground mining.

Subsidence Related to Karst Features

Subsidence can occur on land located over soluble bedrock. The land over such bedrock often has topography characteristic of past subsidence events. This topography is termed “karst.” Karst terrain has unique landforms and hydrology found only in these areas. Bedrock in a karst areas are typically limestone, dolomite, or gypsum. In Illinois, limestone and dolomite (carbonate rocks) are the principle karst rock types. 9% of Illinois has carbonate rock types close enough to the ground surface to have a well-developed karst terrain. The area in Illinois in which the karst terrain is most developed is the southern and southwestern part of the state (Panno, et al., 1997). The karst feature most associated with subsidence is the sinkhole.

Sinkhole Formation and Collapse

A sinkhole is an area of ground that has no natural external surface drainage—when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes

can vary from a few feet to hundreds of acres and from less than one to more than 100 feet deep. Typically, sinkholes form slowly, so that little change is seen during a lifetime, but they also can form suddenly when a collapse occurs. Such a collapse can have a dramatic effect if it occurs in a populated setting.

Sinkholes form where rainwater moves through the soil and encounters soluble bedrock. The bedrock begins to dissolve along horizontal and vertical cracks and joints in the rock. Eventually, these cracks become large enough to start transporting small soil particles. As these small particles of soil are carried off, the surface of the soil above the conduit slump down gradually, and a small depression forms on the ground surface. This depression acts like a funnel and gathers more water, which makes the conduit still larger and washes more soil into the conduit.

Sudden collapse of a sinkhole occurs where the soil close to the ground surface does not initially slump down, but instead forms a bridge. Beneath that surface cover, a void forms where the soil keeps washing into the conduit. These voids are essentially shallow caves. Over time, the void enlarges enough that the weight of the overlying bridge can no longer be supported. The surface layer then suddenly collapses into the void, forming a sinkhole.

The process of forming a conduit and a soil bridge usually takes years to decades to form. However this natural process can be aggravated and expedited by human activities. Since the process of forming a sinkhole depends on water to carry soil particle down into the karst bedrock, anything that increases the amount of water flowing into the subsurface can accelerate sinkhole formation process. Parking lots, streets, altered drainage from construction, and roof drainage are a few of the things that can increase runoff.

Collapses are more frequent after intense rainstorms. However, drought and altering of the water table can also contribute to sinkhole collapse. Areas where the water table fluctuates or has suddenly been lowered are more susceptible to sinkhole collapse. (White, 1988)

Underground Mining and Subsidence

Underground mines have been used extensively in Illinois to extract coal, lead, zinc, fluorites, shale, clay stones, limestone, and dolomite. When mining first began in Illinois, land over mined areas was sparsely populated. If the ground subsided, homes or other structures were seldom damaged. As towns and cities expanded over mined-out areas, subsidence damage to structures became increasingly more common. The most common underground mines in Illinois are coal mines. A recent study in Illinois has found that about 333,100 housing units were located over or adjacent to 839,000 acres mined for coal (Bauer, 2008).

Illinois has abundant coal resources. All or parts of 86 of 102 counties in the state have coal-bearing strata. As of 2007, about 1,050,400 acres (2.8% of the state) have been mined. Of that total, 836,655 acres are underground mines (Bauer, 2008). Illinois ranks first among all U.S. states for reserves of bituminous coal (Illinois Coal Association, 1992).

There are two fundamental underground mining methods used in Illinois: high-extraction methods such as long-wall and low-extraction room-and pillar mining. High-extraction methods remove almost all of the coal in localized areas. For modern mining practices, subsidence associated with high-extraction methods is planned and regulated by state and

federal authorities. The subsurface subsides above the mine within several days or weeks after the coal has been removed. Subsidence of the over-burden above the mined-out area can continue up to seven years after subsurface removal, depending on the local geologic conditions (Bauer, 2008). The initial ground movements associated with this mining, which tend to be the largest, diminish rapidly after a few months. After subsidence has decreased to a level that no longer causes damage to structures, the land may be suitable for development. The maximum amount of subsidence is proportional to the amount of material extract and the depth between the mining and the surface. In general, over the centerline of the mine panel, subsidence can be 60 to 70% of the extract material (e.g., 10ft of material extracted would cause a maximum subsidence of six to seven feet; Bauer, 2006).

For low-extraction techniques such a room-and-pillar mining, miners create openings (rooms) as they work. Enough of the coal layer is left behind in the pillars to support the ground surface. In Illinois this system of mining extracts 40% to 55% of the coal resources in modern mines and up to 75% in some older mines. Based on current state regulations, room-and-pillar mines in operation after 1983 that do not include planned subsidence must show that they have a stable design. Although these permitting requirements have improved overall mine stability, there are no guarantees that subsidence will not occur above a room-and-pillar mine in the future. In general, if coal or other mined resources has been removed from an area, subsidence of the overlying material is always a possibility (Bauer, 2006).

In Illinois, subsidence of the land surface related to underground mining undertakes two forms: pit subsidence or trough (sag) subsidence. Pit subsidence structures are generally six to eight feet deep and range from two to 40 feet in diameter. Pit subsidence mostly occurs over shallow mines that are <100 feet deep and where the overlying bedrock is <50 feet thick and composed of weak rock materials such as shale. The pit is produced when the mine roof collapses and the roof fall void works its way to the surface. These structures form rapidly. If the bedrock is only a few feet thick and the surface material are unconsolidated (loose), these material may fall into adjacent mine voids, producing a surface hole deeper than the height of the collapse mine void. Pit subsidence can cause damage to a structure if it develops under the corner a building or support post of a foundation or other critical location. Subsidence pits should be filled to ensure that people or animals don't fall into these structures (Bauer, 2006).

Trough (or "sag") subsidence forms a gentle depression over a broad area. Some trough subsidence may be as large as a whole mine panel (i.e. several hundred feet long and a few hundred feet wide). Several acres of land may be affected by a single trough event or feature. As discussed above, the maximum vertical settlement is 60% to 70% of the height of material removed (e.g., two to six feet). Significant troughs may develop suddenly (in a few hours or days) or gradually over a period of years. Troughs originate over places in mines where pillar have collapsed, producing downward movement at the ground surface. These failures can develop over mines of any depth. Trough subsidence produce an orderly pattern of tensile features (tension cracks) surrounding a central area of possible compression features. The type and extent of damage to surface structures relate to their orientation and position within a trough. In the tension zone, the downward-bending movements that develop in the ground may damage buildings, roads, sewer and water pipes, and other utilities. The downward bending of the ground surface causes the soil to crack, forming the tension cracks that pull structures apart. In the relatively smaller compression zone, roads may buckle and foundation

walls may be pushed inward. Buildings damaged by compressional forces typically need their foundations rebuilt and leveled (Bauer, 2006).

Previous Occurrences of Ground Failure

Mine subsidence impacting the residents of southern Illinois, and specifically Williamson County, have been documented in the local and regional press for several decades. One example of subsidence impacting residents of Herrin was reported in the Chicago Tribune in December 14, 1990. This article reported that several homes were damaged by a rapid mine subsided which formed a depression of up to about 3.5 ft. This subsidence was also caused a water main break, which resulted in minor flooding of two homes (Tackett, 1990). In adjacent Jackson County, a sudden mine subsidence caused a portion of U.S. Route 51 to sink up eight feet, causing an injury accident on December 24, 2001. An Illinois Department of Transportation field maintenance technician reported that similar collapses have occurred along other state roads throughout the region (Homan, 2001).

Geographic Location for Ground Failure

Illinois is usually associated with either underground mining or collapse of soil into crevice in underling soluble bedrock. Areas at risk for subsidence can be determined from detailed mapping of geologic conditions or detailed mine maps.

Hazard Extent for Ground Failure

The extent of ground failure hazard in Williamson County is a function of where current development is located relative to (1) areas of past and present underground mining, and (2) areas of soluble bedrock.

Risk Identification for Drought and/or Extreme Heat

Based on historical information and the underlying geology of Williamson County, the occurrence of future ground failure is likely. According to the Williamson County Planning Team's assessment, ground failure is ranked as the number nine hazard.

<u>Risk Priority Index</u>				
Probability	x	Magnitude	=	RPI
2	x	1	=	2

Vulnerability Analysis for Ground Failure

Nearly all of Williamson County is underlain by insoluble bedrock, and therefore subsidence from this mechanism should not be a concern. However an extremely small area of the southwestern corner of the county is underlain by carbonate bedrock. Nearly all of Williamson County is underlain by rock units which contain coal and the region has a rich history in mining. 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 essential infrastructure in Williamson County.

Essential Facilities

Any essential facility built above highly soluble bedrock could be vulnerable to ground failure. An essential facility will encounter the same impacts as any other building within the affected area. These impacts include damages ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations can cause cracking of critical structural elements. Table 4-7 lists the types and number of essential 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 essential facilities, ranging from cosmetic to structural. Buildings may sustain minor cracks in walls due to a small amount of settling, while in more severe cases, the failure of building foundations causes cracking of critical structural elements.

Infrastructure

In the area of Williamson County potentially affected by ground failure, the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with land collapsing directly beneath them in a way that undermines their structural integrity. The impacts to these items include broken, failed, or impassable roadways; broken or failed utility lines (i.e. loss of power or gas to community); and railway failure from broken or impassable railways. In addition bridges could fail or become impassable causing risk to traffic.

GIS-based Analysis of Ground Failure

This section provides an overview of the ground failure hazards in Illinois in general and a discussion of the potential subsidence risk for Williamson County. Ground failure in Illinois is usually associated with either underground mining or collapse of soil into crevice in underlying soluble bedrock. Areas at risk for ground failure can be determined from detailed mapping of geologic conditions or detailed mine maps. Figure 4-20 displays data sources that compiled from the Illinois State Geologic Survey (ISGS) and Illinois Department of Natural Resources (IDNR) to assess the risk of ground failure in Williamson County.

Figure 4-20. Distribution of Bedrock with Potential Coal Bearing Strata, Karst, Sinkholes and Mining Efforts

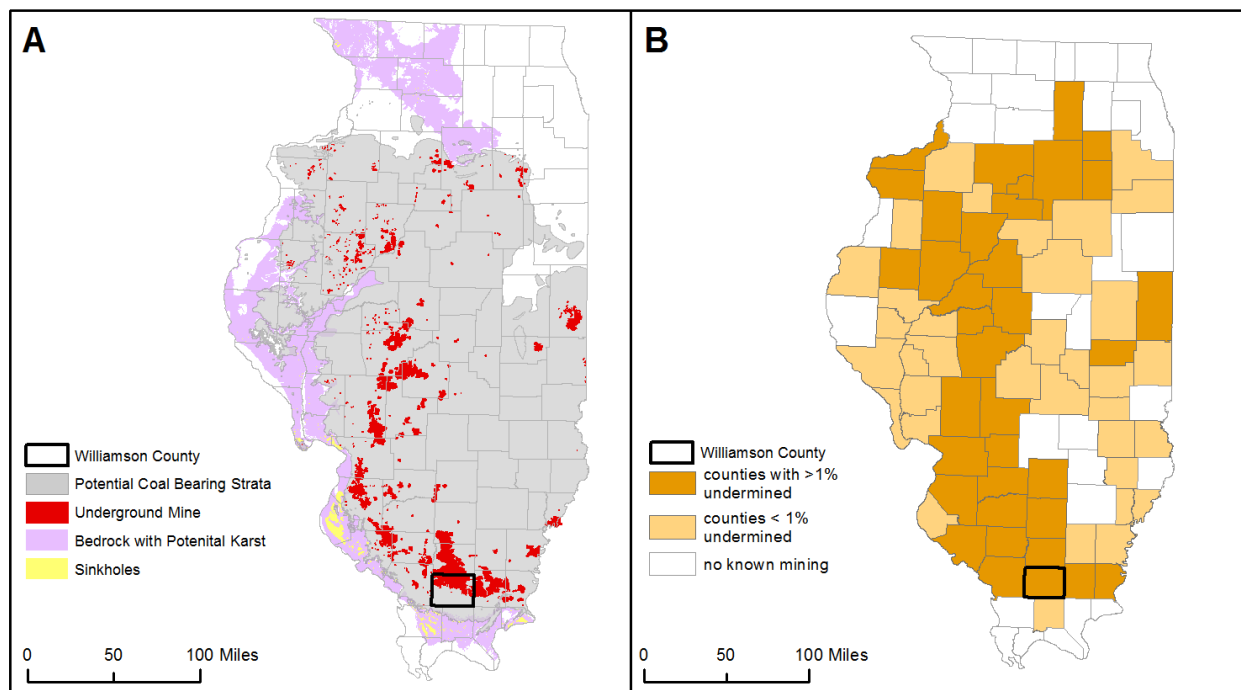
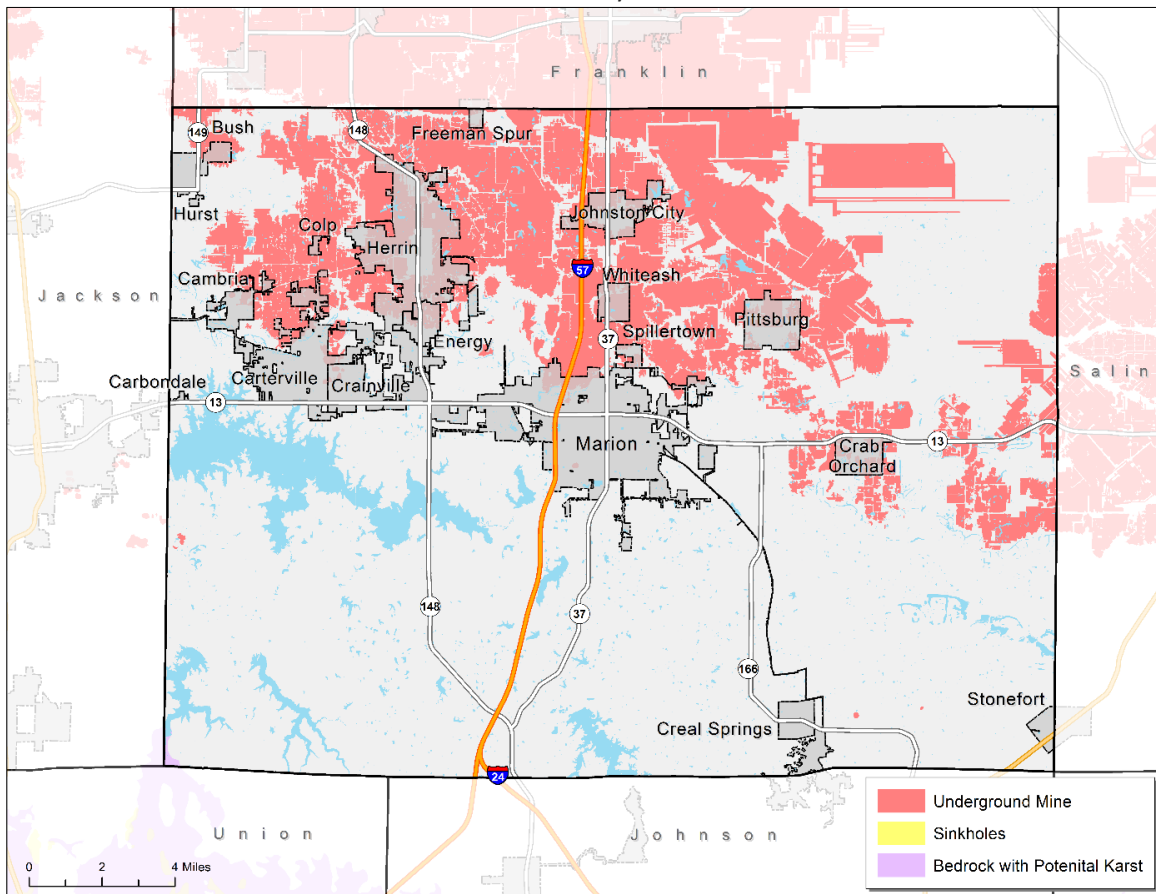


Figure 4-21(a) shows statewide distribution of bedrock with karst potential, coal bearing strata, sink holes. Figure 4-21(b) shows the counties which are 0, <1% and >1% undermined. Nearly all of Williamson County is underlain by rock units which contain coal and is >1% undermined. The Mine Subsidence Insurance Act of 1979 created subsidence insurance as part of an Illinois homeowner's policy. Homeowners in any of the Illinois counties undermined by approximately 1% or more automatically have mine subsidence insurance as a part of their policy, unless coverage is waived in writing. Mine subsidence insurance is especially important for homes located near or over mines that operated before the 1977 Surface Mine Control and Reclamation Act. The companies that operated these mines may no longer be in business (Bauer, 2006).

Figure 4-21 shows the distribution of bedrock with karst potential, coal bearing strata, sink holes, and underground mines in Williamson County. Analysis of the GIS data layer of active and abandoned coal mines in Illinois obtained from the IDNR revealed that 513 km² out of Williamson County's total 1150 km² (44.6%) have been undermined. The undermined areas are generally found north of Route 13 and underlie significant portions of incorporated communities of Bush, Cambria, Crainville, Energy, Herrin, Johnston City, Marion, Pittsburg, and Whiteash. Comparison of Williamson County local assessment and parcel data with IDNR GIS layer of active and abandoned underground-coal mines was performed. This analysis revealed that 8,251 out of the 28,051 or 29% of the buildings in the county were above undermined areas. No sinkholes have been mapped by the Illinois Geologic Survey in Williamson County.

Figure 4-21. Distribution of potential karst bedrock, sinkholes, and underground mines in Williamson County



Vulnerability to Future Assets/Infrastructure for Ground Failure

New buildings and infrastructure placed on undermined land or on highly soluble bedrock will be vulnerable to ground failure.

Suggestions of Community Development Trends

The majority of new development in Williamson County is along and near Route 13 west of the I-57 interchange. This area has not been undermined and there are no current plans to mine the areas by utilizing subsurface mining techniques. Thus, development in this area should not be impacted by ground subsidence.

4.3.11 Disease Outbreaks, Epidemics, and Pandemics

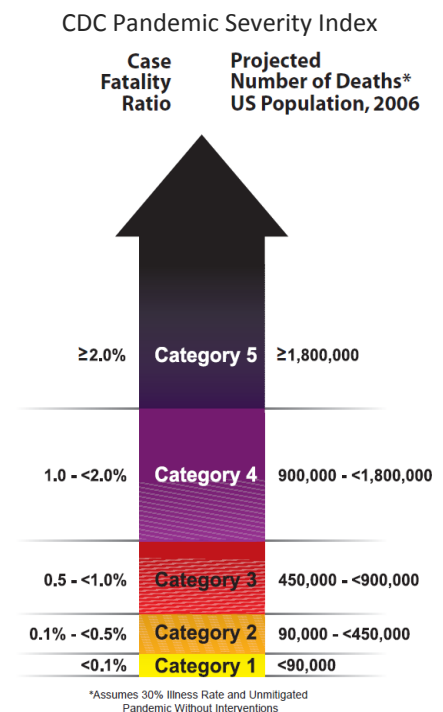
Hazard Definition

Disease outbreaks, epidemics, and pandemics can have devastating consequences on people and the community at large. These types of hazards have the potential of affecting a large number of people and posing significant harm with its ability to seriously diminish people's health and cause death. Dependent upon the situation, these public health hazards can last from days to years.

Disease Outbreaks occur when there is a sudden rise in a disease experienced by a community, region or during a season, despite measures to deter disease spread. Outbreaks could be a single case of a contagious disease, particularly if it is a novel disease or new to a community or reemerges after a long absence. An outbreak may be isolated to a single community or cover several countries.

Epidemics occur when an infectious disease spreads rapidly affecting people in several countries. Disease outbreaks have the potential of becoming epidemics. Epidemics are common occurrences in the world of the 21st century. According to the World Health Organization (WHO), every country on earth as experienced at least one epidemic since the year 2000. The 2003 Severe Acute Respiratory Syndrome (SARS) in Asia and the 2014-15 Ebola Virus Disease (EVD) both started out as outbreaks, but became epidemics. SARS ended up spreading to two dozen countries, infecting 8,098 people in which 774 people died. Some public health incidents start out as epidemics, such as Swine Flu (H1N1) and Avian Flu (H5N1) but result in global exposure (see Pandemic, below). Far more often, however, and with increasing regularity, epidemics strike at lesser geographic levels.

Pandemics are disease outbreaks/epidemics that spread worldwide. HIV/Aids is an example of one of the most destructive global pandemics in history. The number of people affected by a pandemic depends upon how severe the pandemic is. Pandemics are generally classified by severity level: mild, moderate, or severe. Pandemics can significantly impact segments of the population not usually affected by seasonal flu, for instance, healthy adults between the ages of 20 – 50, (see more information on difference between pandemic and seasonal flu later in this section). By infecting and causing death in large numbers of people, pandemics can also cause significant economic disruption and loss. Public health experts say it's not a matter of "if" a influenza pandemic will happen, but "when."



CDC Pandemic Severity Index -The number of people affected by a pandemic depends upon the severity of the pandemic. The Centers of Disease Control and Prevention (CDC) has developed a Pandemic Severity Index, with categories of increasing severity (Category 1 to Category 5). The Pandemic Severity Index uses a ratio to estimate the number of expected deaths. This index helps communities with pandemic preparedness and planning.

Previous Occurrences of Disease Outbreak, Epidemics, and Pandemic Hazard

Recently, the 2014 outbreak of the Ebola virus disease in several West African counties has prompted changes in the way the public health industry mitigates and responds to epidemics and pandemics. It is important to note that as of December 2014, only two imported cases, including one death, and two locally acquired cases in healthcare workers have been reported in the United States. Common epidemic and pandemic threats include (but not limited to) HIV/Aids, smallpox, tuberculosis, influenza, non-polio enteroviruses, and foodborne outbreaks. This plan will only highlight the most recent non-polio enteroviruses, influenza and foodborne illness records.

Non-Polio Enteroviruses are very common viruses that cause about 10 to 15 million infections in the United States each year. All populations are susceptible to non-polio enteroviruses, however there is an increased risk for infants, children, and teenagers due to a lack of immunity from previous exposures to the viruses. The infection is spread via close contact or touching surfaces with the infection. Those who become infected with the viruses do not get sick or come down with mild illnesses. Severe cases have the potential to infect the heart, brain or even paralyze.

One of the most recent non-polio enteroviruses cases occurred from mid-August to December 11th, 2014. The CDC confirmed a total of 1,149 people in 48 states and the District of Columbia with respiratory illness caused by Enterovirus D68 (EV-D68). This virus was first identified in California in 1962 and is one of the more than 100 non-polio enteroviruses. EV-D68 has been the most common type of enterovirus identified in 2014, leading to increases in illnesses among children and affecting those with asthma most severely.

Influenza Pandemics (pandemic flu) occurs when a new type of influenza (flu) virus emerges, affecting the health and lives of many people. As a serious respiratory illness, pandemic flu spreads quickly from person to person because people have not been exposed to the new flu strain. Once exposed, individuals may have little or no bodily resistance for fighting off the new, contagious type of flu. During the 20th century, there were three major influenza pandemics.

The 1918 Spanish flu was the deadliest flu pandemic, infecting 20% to 40% of the world's population. An estimated 50 million died from the Spanish flu, 675,000 of which were from the United States. This was a viral pandemic in which people could die quite suddenly. Instances occurred in which people reported being well in the morning, felt sick during the day and had died by evening. Many individuals fighting this virus succumbed to complications, such as pneumonia. Those most affected were adults between the ages of 20-50, health individuals that typically are not the hardest hit by influenza.

“Asian flu” of 1957 and “Hong Kong flu” of 1968 caused approximately 1 - 4 million deaths. The 1957 pandemic originated in China and was a category 2 on the pandemic severity index. Eventually, the Asian flu strain evolved, shifting initiating a milder 1968-69 Hong Kong flu pandemic infecting 500,000 people

The most recent pandemic was the H1N1 Flu Pandemic. On August 10th, 2010 the World Health Organization announced that the world is now in a post-pandemic period where the 2009 flu pandemic

flu is expected to continue to circulate seasonally worldwide, causing variable levels of disease and outbreaks. Table 4-37 displays the influenza pandemics since 1918.

Table 4-37. Influenza Pandemics since 1918

Name	Date	Subtype	Deaths in the United States
1918-1919	Spanish Flu	H1N1	675,000
1957-1958	Asian Flu	H2N2	69,800
1986-1969	Hong Kong Flu	H3N2	33,800
2009-2010	2009 Flu Pandemic / Swine Flu	H1N1/09	8,870 - 18,300
Total:			787,470 – 796,900

Source: [U.S. Department of Health & Human Services](#)

Seasonal Flu and Pandemic Flu are both influenza viruses that affect the upper respiratory system of people. Seasonal flu is the more common type of flu, emerging each year during the fall, winter, and spring months. Seasonal flu continually circulates among people during each flu season, changing slightly from year to year. Because of seasonal flu's continual presence among people, individuals are more likely to have acquired some bodily resistance, allowing them to fight off this flu strain better. Despite having acquired some immunity, the CDC estimates that from the 1976-77 season to the 2006-07 flu season, flu-associated deaths ranged from a low of about 3,000 to a high of about 49,000. FWBCHD and other health organizations offer seasonal flu vaccinations annually to protect people from this changing virus. Pandemic flu is a new type of virus, which means that people have little or no immunity to it. Pandemic flu spreads quickly from person to person and can produce serious illness, usually significantly more severe than seasonal flu.

Foodborne Disease is a common public health problem. The CDC estimates that each year roughly 1 in 6 Americans get sick by consuming contaminated foods or beverages. Many different disease-causing microbes, pathogens, or harmful toxins or chemicals can contaminate foods. There are eight known pathogens that account for the vast majority of illnesses, hospitalizations, and deaths. Nontyphoidal Salmonella, Toxoplasma, Listeria, and norovirus caused the most deaths. Table 4-38 identifies CDC-recorded death related foodborne outbreaks with reported cases in Illinois. Reported hospitalizations and deaths are national statistics for a given outbreak. Additional details of individual hazard events are on the CDC website.

The most severe confirmed outbreak of foodborne disease occurred in 2011 after a multistate outbreak of *Listeria monocytogenes* food poisoning linked to whole cantaloupes from Jensen Farms of Holly, Colorado. A total of 33 deaths and 143 hospitalizations were reported to the CDC from 28 States. Additionally, one woman pregnant at the time of illness had a miscarriage. Four people were infected in the State of Illinois.

Table 4-38. Confirmed Foodborne Disease Outbreaks with reported cases in Illinois. Hospitalizations and Deaths are National Statistics for a given outbreak.

Year	Genus Species	Food Vehicle	Total Hospitalizations	Total Deaths
2011	<i>Listeria monocytogenes</i>	Cantaloupe	143	33
2008	<i>Salmonella enterica</i>	Peanut Butter; Peanut Paste	166	9
2006	<i>E.coli</i> , Shiga toxin-producing	Spinach	103	5
2012	<i>Salmonella enterica</i> ; <i>Salmonella enterica</i>	Cantaloupe	94	3
2007	<i>Salmonella enterica</i>	Pot Pie	108	3

Year	Genus Species	Food Vehicle	Total Hospitalizations	Total Deaths
1998	Salmonella enterica	Tomato, Unspecified	16	3
2008	Salmonella enterica	Pureed Food Diet	1	2
2008	Salmonella enterica	Peppers, Jalapeno; Peppers, Serrano; Tomato, Unspecified	308	2
2003	Salmonella enterica	Honeydew Melon	13	2
2012	Salmonella enterica	Cantaloupe	11	1
2011	Salmonella enterica	Ground Turkey, Unspecified	50	1
2010	Shigella sonnei	Bread, Nine Grain; Tomatoes	13	1
2009	Salmonella enterica	Melon	4	1
2008	Norovirus Genogroup II	Lettuce Based Salads	3	1
2000	Salmonella enterica	Salmon, Unspecified; Seafood Dish, Unspecified	10	1
Total:			1,043	68

*CDC Foodborne Outbreak Online Database was last updated on 5/28/2014 to include 2012 outbreak data. Reporting agencies (state, local, territorial, and tribal health departments, and CDC) can modify their reports at any time, even months or years after an outbreak. Therefore, results from Foodborne Outbreak Online Database are subject to change.

Geographic Location for Disease Outbreak, Epidemics, and Pandemic Hazard

Because of the nature of pandemic disease, the entire country, continent, or whole world is at risk. An epidemic can occur over a short period of time and strike at lesser geographic levels. Therefore the entire county has the same risk of disease outbreak, epidemic, or pandemic hazard.

Hazard Extent for Disease Outbreak, Epidemics, and Pandemic Hazard

The extent of the hazard varies in terms of the physical characteristics of the disease outbreak, epidemic or the pandemic (e.g., the number of people infected and strength of the virus).

Risk Identification for Disease Outbreak, Epidemics, and Pandemic Hazard

Disease outbreaks, epidemics, and pandemics can occur within any area in the county; therefore, the entire county population and all critical infrastructure are 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 Williamson County. The Williamson County Planning Team identified disease outbreak, epidemic, and pandemic as a prioritized public health hazard. This plan includes a section devoted to disease outbreak, epidemic, and pandemic but it should be noted that it is not included in the ranked list of hazards.

Vulnerability Analysis

A less severe pandemic and/or more severe epidemic would likely result in dramatic increases in the number of hospitalizations and deaths. A severe pandemic would likely overwhelm the nation's critical healthcare services and impose significant stress on our nation's critical infrastructure (including but not limited to the airline and travel industry). Epidemic and pandemics can create a shortage of staff, facilities, equipment, hospital beds, and other supplies needed to cope with the number of people who get the pandemic flu. Alternative sites, such as schools, may serve as medical facilities.

Suggestions for Community Development Trends

The U.S. Department of Health & Human Services and the State of Illinois Department of Public Health provides guidance to communities, individuals, health professionals, businesses and schools on epidemic

and pandemic mitigation. Planning and preparedness information is disseminated via [Flu.gov](https://www.flu.gov). Various Fact sheets, tool kits, check lists and pre-pandemic planning guides are available. It is important that all entities in the county are prepared because the federal government cannot prepare for or respond to the challenge of a pandemic alone.

The Centers of Disease Control and Prevention (CDC) developed the 2007 Interim Pre-pandemic Planning Guide for local communities to mitigation against pandemic influenza. The goals are to limit the spread of a pandemic; mitigate disease, suffering, and death; and sustain infrastructure and lessen the impact on the economy and the functioning of society. A pandemic influenza mitigation framework was created and includes four mitigation interventions to help offset the effect on communities. Implementing these interventions require advance planning. As such, the CDC warns of second- and third-order consequence of the interventions which may require additional planning. Interventions include, but are not limited to:

1. Isolation and treatment (as appropriate) with influenza antiviral medications of all persons with confirmed or probable pandemic influenza. Isolation may occur in the home or healthcare setting, depending on the severity of an individual's illness and /or the current capacity of the healthcare infrastructure.
2. Voluntary home quarantine of members of households with confirmed or probable influenza case(s) and consideration of combining this intervention with the prophylactic use of antiviral medications, providing sufficient quantities of effective medications exist and that a feasible means of distributing them is in place.
3. Dismissal of students from school (including public and private schools as well as colleges and universities) and school-based activities and closure of childcare programs, coupled with protecting children and teenagers through social distancing in the community to achieve reductions of out-of-school social contacts and community mixing.
4. Use of social distancing measures to reduce contact between adults in the community and workplace, including, for example, cancellation of large public gatherings and alteration of workplace environments and schedules to decrease social density and preserve a healthy workplace to the greatest extent possible without disrupting essential services.
5. Additionally, one of the best and most effective mitigation strategies available to everyone is simply utilizing good hygiene practices, e.g., effectively washing hands frequently, effectively covering coughs and sneezes, and wiping down surfaces frequently shared by people, e.g., door knobs, counter surfaces, bathroom/kitchen faucet sink handles and bathroom toilet handles, etc.

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 Williamson 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 losses identified in the risk assessment (section 4).

5.1 Existing Hazard Mitigation Policies, Programs and Resources

This section documents each jurisdiction's 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 Williamson 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. The following are projects that have been successfully completed after Williamson County's 2009 Multi-Hazard Mitigation Plan was formally adopted.

Creal Springs Tornado Safe Room and Seismic Hardening

Marion Community Unit School District #2 applied for HMGP funds to add seismic hardening construction elements to a planned and construct a tornado safe room at the planned Adams School in Creal Springs. The total cost of the project was \$591,034. The School District incorporated seismic hardening elements into the new construction and added tornado safe room elements in the cafeteria. The new school completed construction and opened August 2012.

Lincoln School Tornado Safe Room

Marion Community Unit School District #2 received HMGP funds to construct a tornado safe room at Lincoln Elementary School in Marion. New construction of the cafeteria included tornado safe room elements. The total cost of the project was \$1,670,913.

Southern Illinois Hospital Seismic Retrofit

Following a major disaster declaration in August 2010, The Southern Illinois Hospital Service received HMGP funding to retrofit three hospitals with seismic-resistant materials and components. The total cost of the project is \$10,800,000. These retrofits will reduce the risk of damage and injury during major earthquakes and improve post-earthquake functionality of these healthcare facilities. Phase I of this project included seismic risk assessments of the three Southern Illinois Healthcare hospital campuses: St. Joseph Memorial Hospital (Jackson County), Memorial Hospital of Carbondale (Jackson County) and Herrin Hospital (Williamson County). Phase I deliverables included an engineering report, alternatives analysis, design engineering for selected alternatives and environmental review. Phase II will include implementation/construction of the eligible selected alternatives.

The Hill Water Tower and Pumping Station Project

The City of Marion received an investment from the Delta Regional Authority (DRA) to construction of a 500,000 gallon elevated water tower and pumping station to supply needed finished water storage and pressure to an area known as The Hill. The total project cost \$1,716,285 with an investment of \$148,966 from the DRA.

Marion/Rend Lake Water Main Extension

The Marion/Rend Lake Water Line project consisted of construction of 30,000 foot extension of potable water main from the Rend Lake Conservancy District to Marion, IL. Total Cost: \$4,645,922

Marion Septic System Upgrades

The City of Marion received a USDA grant to upgrade a septic system in 2010. The project removed an existing septic holding tank and replaced it with a new aerobic treatment unit. The total project award amount was \$35,225.

Community Development Assistance Program

Community Development Assistance Program (CDAP) grants are awarded to units of local government with populations of 50,000 or less that are not located within one of the six large urban counties that receive funds directly from the U.S. Department of Housing and Urban Development. The CDAP is a grant program that assists Illinois communities by providing grants to local governments to help them in financing economic development projects, public facilities and housing rehabilitation. Since 2009, Williamson County has received twenty-nine CDAP grants totaling \$6,234,050.

Of the twenty-nine CDAP grants, one grant was used to remove storm debris from critical drainage ways within the Village of Carterville. The debris was the result of the 2009 Derecho. Sixteen of the CDAP projects were to improve water, sanitary and storm-sewer systems. The remaining twelve grants were used to rehabilitate homes for low income families or housing units occupied by persons with mobility impairments.

Emergency Solutions Grant

The Illinois Emergency Solutions Grant (ESG) program provides funding to: (1) engage homeless individuals and families living on the street; (2) improve the number and quality of emergency shelters for homeless individuals and families; (3) help operate these shelters; (4) provide essential services to shelter residents, (5) rapidly re-house homeless individuals and families, and (6) prevent families and individuals from becoming homeless. Since 2009, Williamson County received ten ESG grants totaling \$408,712 to aid in shelter/services in Williamson County, including essential services and operations.

Energy Efficiency for Public Facilities

The Illinois Thermal Efficiency for Public Facilities Program provides grants to public sector entities for improving the energy efficiency of thermal equipment or processes. Measures include natural gas system efficiency improvements and geothermal systems. The incentives are available to units of local, state, and federal government, schools, community colleges and universities. In 2012, Carterville High School received \$61,592 to purchase above code energy efficiency measures such as heating and cooling components that will reduce building energy consumption.

Grant Management Program

The Illinois Grant Management Program provides grants to specific local governments, units of government, educational facilities and not-for-profit organizations by members of the General Assembly and the Governor for specific purposes to bolster the State's economy, promote a clean environment and improve the overall quality of life throughout the State of Illinois. Since 2009, Williamson County received sixteen grants under the Grant Management Program totaling \$1,709,250. The following communities utilized the Grant Management Program funds to complete hazard mitigation projects:

- The City of Carterville used grant funds for a portion of the costs associated with the purchase of an existing building in July 2012 to provide behavioral healthcare services.
- The Village of Colp used grants funded for the renovation of an existing water tower located at the corner of Madison and Andrew Springs Drive.
- The Village of Creal Springs used the grant funded to clean out drainage ditches and perform video monitoring of existing sewer mains.
- The Village of Energy used the grant funds to repair existing sanitary sewer lines in the areas of Mattingly Street in the Susan Subdivision, College Street and Illinois Route 148, and at the intersection of Hamilton Street and Illinois 148.
- Johnson City used the grant funds for a portion of the costs associated design and installation of water mains and related appurtenances to replace the existing water mains and related appurtenances in two separate locations within Johnston City.
- The City of Marion used grant funds to (1) replace a sixty-five year-old asbestos cement water main on South Second Street, and (2) make improvements to the Lighthouse Shelter, a homeless shelter that serves up to 50 men, women and families.
- The Village of Pittsburg used grant funds to purchase and install a stand-by power generator, with automatic transfer switch, for use at the Village Hall.

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 NFIP status, flood insurance policy and claim statistics, repetitive loss structures, and Community Rating System status.

NFIP Status

In Williamson County, seven out of the eleven listed communities participate in the NFIP. Table 5-1 includes a summary of information for Williamson County participation in the NFIP. The Village of Bush was mapped with a flood risk but was sanctioned in September 18, 1985. 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. Williamson County will continue to provide information to its non-participating jurisdictions regarding the benefits of the National Flood Insurance Program.

One community, Crainville, has an effective FIRM and participates in the NFIP. However, this community is 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 Williamson County's Participation in the NFIP

Community	Participate in the NFIP	Initial Flood Hazard Boundary Map Identified	Initial FIRM Identified	Current Effective FIRM Date
Williamson County	Yes	03/31/78	08/04/08	08/04/08
Bush	No	03/29/74	09/18/85	08/04/08
Carbondale	Yes	05/03/74	11/01/79	05/02/08
Cambria	No	-	08/04/08	08/04/08
Carterville	Yes	02/15/74	08/19/87	08/14/08(M)
Crainville	Yes	-	08/04/08	NSFHA
Energy	No	-	08/04/08	08/04/08
Freeman Spur	Yes	10/20/78	08/04/08	11/18/09(M)
Herrin	Yes	02/15/74	04/16/90	08/04/08
Hurst	Yes	03/15/74	09/18/85	08/04/08(M)
Johnston City	Yes	06/28/74	04/01/82	08/04/08
Marion	Yes	06/07/74	09/15/83	08/04/08
Stonefort	No	-	08/04/08	12/16/11

NFIP status and information are documented in the Community Status Book Report updated on 04/07/2015.

(M) – No Elevation Determined – All Zone A, C and X

Flood Insurance Policy and Claim Statistics

As of February 2015, 268 households paid flood insurance, insuring \$35,049,700 in property value. The total premiums collected for the policies amounted to \$185,021. Since the establishment of the NFIP in 1978, 107 flood insurance claims were filed in Williamson County, totaling in \$193,015 in payments. Table 5-2 summarizes the claims since 1978.

Table 5-2. Flood Insurance Claim Statistics for Williamson County

Community	Total Losses	Closed Losses	Open Losses	CWOP Losses	Payments
Williamson County	5	4	0	1	\$44,046.20
Bush	1	0	0	1	\$0
Carterville	1	1	0	0	\$3,279.16
Herrin	12	8	0	4	\$38,645.22
Hurst	2	2	0	0	\$1,975.14
Johnston City	2	2	0	0	\$3,990.12
Marion	177	151	0	26	\$1,611,976.96

NFIP policy and claim statistics since 1978 until the most recently updated date of 02/28/2015. 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 Lose Structures

There are several structures in Williamson 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 $\geq 25\%$ of the

market value of the structure at the time of each flood loss. Currently there are over 122,000 Repetitive Loss properties nationwide.

The Illinois Emergency Management Agency and Illinois Department of Natural Resources was contacted to determine the location of repetitive loss structures in Williamson County. Records indicate that there are nineteen repetitive loss structures within the county. The total amount paid for building replacement and building contents for damage to these repetitive loss structures is \$978,789.86. Table 5-3 describes the repetitive loss structures for each jurisdiction.

Table 5-3. Repetitive Loss Structures for each Jurisdiction in Williamson County

Jurisdiction	Number of Properties	Number of Losses	Total Paid
Marion	18	72	\$971,538.19
Johnston City	1	2	\$7,251.67
Total:	19	74	\$978,789.86

Community Rating System Status

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. In Illinois, 51 communities 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. Williamson County does not have any communities that participate in the CRS Program.

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 5-4 list Williamson 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 Williamson County Planning Team worked to identify gaps in the current list of ordinances and suggested changes/additions in Section 5.3.

Table 5-4: Williamson County Jurisdictional Ordinances

Community	Building	Electrical	Stormwater	Flooding	Subdivision	Fire	Land Use	Zoning
Williamson Co.	ICC IBC (Current)	-	Management Plan (1982)	State Model (Current)	Subdivision Control (1982)	Burning Ordinance (1981)	Comp. Plan (1964)	-
Bush	-	-	-	-	-	-	-	-
Cambria	-	-	-	-	-	-	-	-
Carterville	ICC IBC (Current)	ICC EC (Current)	-	State Model (Current)	-	Burning Ordinance	Comp. Plan (1966)	State Standards (Current)
Colp	-	-	-	-	-	-	Comp. Plan (1967)	-
Crainville	BOCA 2009 IBC	NFPA (Current)	State Standards (Current)	State Model (Current)	State Standards (Current)	State Standards (Current)	Comp. Plan (1968)	Municipal Code (Current)
Creal Springs	-	-	-	-	-	-	Comp. Plan (1967)	-

Community	Building	Electrical	Stormwater	Flooding	Subdivision	Fire	Land Use	Zoning
Energy	ICC IBC (Current)	-	-	-	State Standards (Current)	NFPA (Current)	-	-
Freeman Spur	Building Ordinance (2005)	-	-	State Model (Current)	-	Burning Ordinance (2005)	-	-
Herrin	ICC 2000 IBC	ICC 2000 EC	-	State Model (Current)	State Standards (Current)	State Standards (Current)	Comp. Plan (1963)	State Standards (Current)
Hurst	-	-	-	State Model (Current)	-	-	Comp. Plan (1967)	-
Johnston City	-	-	-	State Model (Current)	-	-	Comp. Plan (1964)	-
Marion	ICC 2009 IBC	NFPA 2008 EC	State Standards (2008)	State Model (Current)	City Standards (2013)	NFPA (2006)	Comp. Plan (1968)	State Standards (2013)
Pittsburg	NFPA 2000 Life Safety	-	-	-	-	Burning Ordinance (2005)	-	-
Spillertown	-	-	-	-	-	-	-	-
Stonefort	-	-	-	-	-	-	-	-

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. Table 5-5 displays each Fire Department's insurance rating and total number of employees.

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

Fire Department	Fire Insurance Rating	Number of Employees
Bush Fire Department	ISO 7	10
Cambria Fire Department	ISO 5	16
Cartersville Fire Department	ISO 6	21
Energy Fire Department	ISO 6	8
Herrin Fire Department	ISO 4	19
Hurst Fire Department	ISO 6	25
Johnston City Fire Department	ISO 4	14

Lake of Egypt Fire Protection District	ISO 7	38
Marion Fire Department	ISO 4	24
Pittsburg Fire Department	ISO 6	14
Stonefort Fire Department	ISO 6	11
Williamson County Fire Protection District	ISO 7	70

5.2 Mitigation Goals

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

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

Objective: Support compliance with the NFIP for each jurisdiction in Williamson 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 Williamson 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 5-6). 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 5-6. FEMA's STAPLEE Evaluation Criteria

S ocial	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community's social and cultural values.
T echnical	Mitigation actions are technically most effective if they provide a long-term reduction of losses and have minimal secondary adverse impacts.
A dministrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P olitical	Mitigation actions can truly be successful if all stakeholders have been offered an opportunity to participate in the planning process and if there is public support for the action.
L egal	It is critical that the jurisdiction or implementing agency have the legal authority to implement and enforce a mitigation action.
E conomic	Budget constraints can significantly deter the implementation of mitigation actions. Hence, it is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E nvironmental	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 5-7 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 Williamson 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 5-7. The mitigation strategies are arranged by hazard 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 5-7: Williamson County Multi-Jurisdictional Mitigation Strategies

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
ALL HAZARDS					
AH1	Promote Disaster Resilience Through Workshops, Education Materials, and Planning Guides <i>Various agencies have implemented forms of this strategy. Local resources have been used to target and inform the resident population. Pandemic education and outreach was conducted the year prior to the 2009 H1N1 pandemic and continued heavily throughout the response by Franklin-Williamson Bi-County Health Dept. (FWBCHD). Education and outreach continues by FWBCHD and various community partners. Local, state and federal sources have been used in past and current pandemic and other disaster education. Additional funding will be sought from local, state and federal sources.</i>	All	Ongoing	L, S, F	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., SIH, Schools
AH2	Develop Social Media Techniques to Provide Critical Weather Updates and Disseminate Critical Information <i>The Williamson County EMA and municipalities use their public access channels, websites, Twitter and Facebook pages to notify the public about hazard mitigation and critical weather updates. SIH and the Shawnee Preparedness and Response Coalition would like to develop communication tools and capacities, including social and digital media, to provide critical updates and information to community. All Williamson County School Districts continue to work with local weather stations to provide up-to-date information for students and families.</i>	Williamson County, Cambria, Carterville, Creal Springs, Herrin, Marion, SIH, School Districts	Ongoing	L	Williamson County EMA, SIH
AH3	Establish Liaison/Groups that Meets Regularly to Discuss Hazard Mitigation and Disaster Risk Reduction <i>Several groups meet on a regular basis to discuss hazard mitigation including: Williamson County LEPC, Disaster Risk Reduction Group, Franklin-Williamson Public Health and Medical Committee, Shawnee Preparedness and Response Coalition, Healthy Southern Illinois Delta Network, Shawnee Alliance for Seniors.</i>	All	Ongoing	L	Various Agencies
AH4	Enhance Emergency Communication System Infrastructure <i>The Williamson County EMA will oversee the implementation of this project. As of 2015, the County utilizes Next Generation 911, First net and 211. The City of Marion utilized GIS to enhance its emergency communication. SIH and Shawnee Preparedness and Response Coalition would like to develop and implement a region-wide back-up emergency communication system. Funding for the future has not been secured, but additional funding will be sought from Department of Homeland Security, State, and local resources. Implementation is forecasted to be complete within approximately three years.</i>	Williamson County, Marion, SIH	Ongoing / Proposed	L, S, F	Williamson County EMA, Marion EMA, SIH
AH5	Improve Communication Between Utility Companies <i>County and Local Agencies continue to maintain contact with utility companies before during and after hazardous events.</i>	All	Ongoing	L	Various Agencies
AH6	Distribute/Program NOAA Weather Radios <i>The Franklin-Williamson Bi-County Health Department distributed weather radios to Faith Based Organizations (FBO). The Health Dept. has plans to continue FBO outreach within the next five years. Crainville, Creal Springs and Marion would like to distribute weather radios to village residents. Future funding has not been secured. Implementation, if funding is available, is forecasted to be initiated within approximately 3-5 years.</i>	Williamson County, Crainville, Creal Springs, Marion	Ongoing / Proposed	L, S, F, P	Franklin-Williamson Bi-County Health Dept., Creal Springs, Marion
AH7	Improve EMA Training, Staff, Resources, And Equipment <i>The County EMA and Marion EMA oversees the implementation of this project. Funding has not been secured for future training, but additional funding will be sought from Department of Homeland Security, State and Local resources.</i>	Williamson County, Marion	Ongoing	L, S, F	Williamson County EMA

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
AH8	Maintain Centralized Geographical Database Including Natural Hazard/Risk Assessment <i>The County EMA and City of Marion IT Specialists/GIS Dept. oversees this project. After each mitigation plan update, the geographical database is updated to include new information about hazard events and the number of structures within the 100-year floodplain.</i>	Williamson County, Marion	Ongoing	L	Williamson County Supervisor of Assessments / GIS Dept., Marion IT Specialist / GIS Dept.
AH9	Develop/Maintain Comprehensive Plan to Incorporate Natural Hazards <i>Williamson County and its incorporated jurisdiction participate in the 5 year renewal of the Multi-Hazard Mitigation Plan. The next update process will take place in 2020 and the county will seek federal funds to update the plan.</i>	All	Ongoing / Proposed	L, F	Williamson County EMA
AH10	Develop a Vulnerable Population List <i>Williamson County does not have a comprehensive vulnerable population list, which was deemed too labor-intensive to compile and to keep updated. Williamson County does have a vulnerable population registry that is housed with WC EMA and managed by a local civic organization. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) has a list of resources identified within the community that may be helpful in addressing functional/access needs. FWBCHD shall explore the vulnerable population list project underway with the Disaster Risk Reduction Steering Committee in Jackson County with assistance from Southern Illinois University.</i>	Williamson County, SIH, Villas of Holly Brook, Lighthouse Shelter, Family Crisis Center, Egyptian Area Agency on Aging	Ongoing	L	Franklin-Williamson Bi-County Health Dept., SIH
AH11	Develop Mutual Aid Agreements <i>The County works with local emergency agencies to maintain mutual aid agreements. Several fire agencies in Williamson County are members of the MABAS-IL. MABAS (Mutual Aid Box Alarm System) - a statewide, non-discriminatory mutual aid response system for fire, EMS and specialized incident operational teams. The MABAS system defines a resource response plan to any location within the state when the Governor orders a Declaration of Disaster. Several law enforcement agencies in Williamson County are members of ILEAS (Illinois Law Enforcement Alarm System) - a statewide law enforcement mutual aid system. The City of Carterville is a member of IPWMAN (Illinois Public Works Mutual Aid Network) – a statewide network of public works related agencies whose principal purpose is to provide mutual aid response and recovery assistance to each other when confronted with natural or man-made emergencies and disasters.</i>	All	Ongoing	L	Williamson County EMA
AH12	Create an Alternative Emergency Operations Center <i>Funding has not been secured, but additional funding will be sought from Federal, State, and Local resources.</i>	Williamson County, Marion	Proposed	L, S, F	Williamson County EMA, Marion EMA
AH13	Retrofit/Harden Critical Facilities and Utilities <i>The County EMA and Marion EMA will oversee the implementation of this project. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) will seek federal funding to harden the FWBCHD building. The Village of Herrin would like to harden the Public Works Facility. SIH would like to retrofit existing facilities to serve surge healthcare needs in the event of mass casualties. Funding has not been secured as of 2015. Implementation, if funding is available from PDM or HMGP, is forecasted to be initiated within approximately one year.</i>	All	Proposed	L, S, F	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH
AH14	Identify and Procure Backup Potable Water Supplies <i>Williamson County will partner with Greater Egypt Regional Planning and Development Commission to seek out potential funding sources to procure a back-up potable water supply.</i>	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg, Spillertown, Rend Lake Conservancy District	Proposed	S, F	Williamson County EMA, Greater Egypt Regional Planning Commission, Rend Lake Conservancy District

Williamson County Multi-Hazard Mitigation Plan

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
AH15	Construct Additional Community Safe Rooms <i>The County EMA will oversee the implementation of this project. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) will seek federal funding to install a tornado safe room in the FWBCHD building. The Village of Cambria would like to utilize the community center as an additional safe room/heating/cooling shelter. SIH would like to retrofit existing clinics, physician offices, and other SIH facilities to serve as storm safe rooms. Local resources will be used to evaluate the cost benefit of the shelters and define specific locations. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years.</i>	All	Proposed	L, F	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH
AH16	Create Additional Heating / Cooling Shelters <i>Additional shelters are opened on an as need basis at various locations within the county. The Villages of Cambria, Creal Springs, and Herrin would like to utilize the community centers as an additional safe room/heating/cooling shelter.</i>	Williamson County, Cambria, Creal Springs, Herrin, Marion	Ongoing	L, S	Williamson County EMA, Marion EMA, Cambria Fire Dept./Water Dept.
AH17	Equip Critical Facilities with Back-Up Generators <i>The County EMA will oversee the implementation of projects for County facilities. The Village of Cambria would like to equip the community center with a back-up generator. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years.</i>	All	Proposed	L, F	Williamson County EMA, Marion EMA, Cambria Water Dept. Superintendent
AH18	Acquire Portable Lighting for Mass Casualty Preparation <i>The County EMA will oversee the implementation of this project. SIH and the Shawnee Preparedness and Response Coalition would like to purchase an adequate number of light towers to use for mass casualty care. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 3-5 years.</i>	Williamson County, SIH	Proposed	S, F	Williamson County EMA, SIH
AH19	Acquire Hazard Event Training Trailer <i>The County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 5 years.</i>	Williamson County	Proposed	L	Williamson County EMA
FLOODING / DAM AND LEVEE FAILURE					
F1	Maintain Participating Status in the NFIP by Enforcing a Flood Damage Prevention Ordinance <i>The Williamson County EMA is responsible for the general administration of the Williamson County Flood Damage Prevention Ordinance. Each participating jurisdiction has a representative responsible for the administration of the individual Flood Damage Prevention Ordinances.</i>	Williamson County, Carbondale, Carterville, Crainville, Freeman Spur, Herrin, Hurst, Johnston City, Marion	Ongoing	L	Williamson County EMA and City/Village Building Services
F2	Improve Public Awareness on the NFIP, Buyout Programs, and Flood Mitigation <i>The Williamson County EMA website, Twitter and Facebook pages are used to notify the public about flood mitigation. Williamson County will also continue to educate communities that do not participate in the NFIP on the benefits of joining.</i>	Williamson County	Ongoing	L	Williamson County EMA
F3	Institute a Buyout Plan for Repetitive Loss Properties or Flood Prone Properties <i>The Williamson County EMA will oversee the implementation of buyout and relocation projects in the county. Future funding has not been secured, but additional funding will be sought from federal, state and local resources. Implementation is forecasted to begin within approximately 3-5 years.</i>	Williamson County, Carbondale, Carterville, Crainville, Freeman Spur, Herrin, Hurst, Johnston City, Marion	Proposed	L, S, F	Williamson County EMA
F4	Flood Proof or Elevate Critical Facilities and Utilities <i>The Williamson County EMA will oversee the implementation of this project in the county. Funding has not been secured, but additional funding will be sought from state and local resources. Implementation is forecasted to begin within approximately 3-5 years.</i>	Williamson County, Carbondale, Carterville, Crainville, Freeman Spur, Herrin, Hurst, Johnston City, Marion	Proposed	L, S, F	Williamson County EMA

Williamson County Multi-Hazard Mitigation Plan

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
F5	Culvert Replacement <i>The Williamson County Highway Dept. will oversee the implementation of projects on County roads and bridges. Village/Townships will be responsible for their respective projects. Funding has not been secured, but additional funding will be sought from state and local resources. Implementation is forecasted to begin within approximately 1-3 years.</i>	Williamson County, Cambria, Carbondale, Cartersville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg, Spillertown	Proposed	L, S, F	Williamson County Highway Dept. or City/Village/Townships Street Depts.
F6	Elevate Low-Lying Roads <i>The Williamson County Highway Dept. will oversee the implementation of projects on County roads. Village/Townships will be responsible for their respective projects. Funding has not been secured, but additional funding will be sought from state and local resources. Implementation is forecasted to begin within approximately 1-3 years.</i>	Williamson County, Cambria, Carbondale, Cartersville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg, Spillertown	Proposed	L, S, F	Williamson County Highway Dept. or City/Village/Townships Street Depts.
F7	Retrofit Water Supply Systems <i>Williamson County EMA and Rend Lake Conservancy District would oversee this project. Implementation, if HMA funding is available, is forecasted to be initiated within approximately one- three years.</i>	Williamson County, Cambria, Carbondale, Cartersville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Marion, Pittsburg, Spillertown, Rend Lake Conservancy District	Proposed	L, S, F	Williamson County EMA, Rend Lake Conservancy District
F8	Maintain a List of Floodprone Structures <i>The County EMA and Marion IT Specialists / GIS Dept. oversee this project. After each mitigation plan update, the geographical database is updated to include new information about flood hazards and number of structures in the floodplain.</i>	Williamson County, Marion	Ongoing	L	Williamson County EMA and Supervisor of Assessments / GIS Dept., Marion IT Specialists / GIS Dept.
F9	Conduct a Watershed Analysis of Runoff and Drainage Systems to Predict Insufficient Capacity in Storm Drains/Natural Creek Systems <i>The Greater Egypt Regional Planning and Development Commission is current conducting a watershed study for Hurricane Creek in Williamson County.</i>	Williamson County	Ongoing	L, S	Greater Egypt Regional Planning Commission
F10	Develop Dam / Levee Failure Emergency Action Plans <i>The County EMA and Marion EMA will oversee the implementation of this project. Currently eight out of thirty-one dams in Williamson County have emergency action plans.</i>	Williamson County, Marion	Proposed	L	Williamson County EMA, Marion EMA
TORNADO / SEVERE THUNDERSTORMS					
ST1	Construct Additional Community Safe Rooms <i>The County EMA will oversee the implementation of this project. Local resources will be used to evaluate the cost benefit of the shelters and define specific locations. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years. The Franklin-Williamson Bi-County Health Dept. aims to add a safe room to their facility within the next 3-5 years with the help of federal funding, if available.</i>	All	Proposed	L, S, F	Williamson County EMA, Franklin-Williamson Bi-County Health Dept.
ST2	Install Lightening Detection System <i>As of 2015, the county installed two lightening detection systems at the Herrin and Marion School sport complex. The County EMA will oversee the implementation of future project for county facilities and schools. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 3 years.</i>	Williamson County, All School Districts	Proposed	L, S, F	Williamson County EMA

Williamson County Multi-Hazard Mitigation Plan

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
ST3	Provide Jurisdiction-wide Siren Warning Coverage <i>The Village of Cambria has jurisdiction-wide coverage with manual activation. The City of Carterville has three sirens that are strategically placed to cover Carterville, Crainville, and Clop. The Villages of Crainville, Creal Springs, Pittsburg, Johnston City, and John A. Logan College would like to seek funding to provide jurisdiction-wide siren coverage.</i>	Williamson County, Cambria, Carterville, Crainville, Creal Springs, Johnston City, Marion, Pittsburg, John A. Logan College	Ongoing / Proposed	L, S, F	Williamson County EMA, Marion EMA
ST4	Retrofit Structures to Withstand High Winds <i>The County EMA will oversee the implementation of this project for county-owned facilities. SIH would like to install wind resistant (storm rated) glass and / or shutters in hospitals, clinics, and physician offices owned by SIH. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years.</i>	All	Proposed	L, S, F	Williamson County EMA, SIH
EARTHQUAKES					
EQ1	Map And Assess Community Vulnerability to Seismic Hazards <i>The County EMA and Marion IT Specialists / GIS Dept. oversee this project with assistance from SIU. After each mitigation plan update, the geographical database is updated to include new information about earthquake hazard events.</i>	Williamson County	Ongoing	L, F	Williamson County EMA, Marion IT Specialists / GIS Dept.
EQ2	Install Automatic Shutoff Valves <i>Williamson County will seek federal funding, if HMA funding is available, to install automatic shutoff valves in the Williamson County facilities. The Franklin-Williamson Bi-County Health Dept. (FWBCHD) will seek federal funding to install automatic shutoff valves in the FWBCHD buildings. SIH would like to continue to retrofit all SIH hospitals and clinic with stabilization and back up equipment in the event of an earthquake.</i>	Williamson County, Crainville, Creal Springs, Marion, Pittsburg, SIH	Proposed	L, F	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., Marion EMA, SIH
EQ3	Develop/Update Earthquake Emergency Action Plan <i>The Williamson County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Giant City CCSD #130 has an earthquake emergency action plan in place. In addition, Giant City CCSD #130 has a long term care plan for students in the event of a large scale earthquake. Additional planning could be done to produce a more robust plan.</i>	Williamson County, Marion, Giant City CCSD #1130	Proposed	L	Williamson County EMA, Marion EMA, Giant City CCSD #130
EQ4	Adopt the 2009 International Building Code for the Design of Building Retrofits for Seismically Vulnerable Buildings <i>The County and City of Marion currently enforces the IBC but would like to investigate adopting stricter standards in the event of an earthquake.</i>	Williamson County, Marion	Proposed	L	Williamson County EMA, Marion EMA, Board of Commissioners
EQ5	Retrofit Water Supply Systems <i>Williamson County EMA would oversee this project. Implementation, If HMA funding is available, is forecasted to be initiated within approximately one- three years.</i>	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnson City, Marion, Pittsburg, Spillertown, Rend Lake Conservancy District	Proposed	L, S, F	Williamson County EMA
EQ6	Retrofit/Harden Critical Facilities to Protect Against Damages from Earthquakes <i>The County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if HMA funding is available, is forecasted to be initiated within approximately 3-5 years. SIH and The Franklin-Williamson Bi-County Health Dept. would like to continue to retrofit all hospitals and clinics with stabilization and back up equipment in the event of an earthquake.</i>	All	Proposed	L, S, F	Williamson County EMA, Franklin-Williamson Bi-County Health Dept., SIH

Williamson County Multi-Hazard Mitigation Plan

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
HAZARDOUS MATERIALS RELEASE					
HAZ1	Develop/Update HAZMAT Emergency Response Plan <i>The Williamson County LEPC reviews and updates the emergency action plan on an annual basis. SIH has an HAZMAT emergency response plan and updates it on an as need basis. Giant City CCSD #130 has an emergency evacuation plan in place (including shut down of all air/heat units).</i>	Williamson County, SIH, Giant City CCSD #130	Ongoing	L	Williamson County LEPC, SIH, Giant City CCSD #130
HAZ2	Conduct a Hazardous Materials Commodity Flow Study <i>The Williamson County EMA will utilize neighboring county commodity flow studies (if available).</i>	Williamson County	Proposed	L	Williamson County EMA
HAZ3	Equip Critical Facilities with Centralized Positive-Pressure HVAC Systems <i>The County EMA and Marion EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 5 years.</i>	Williamson County, Marion, All School Districts	Proposed	S, F	Williamson County EMA, Marion EMA
HAZ4	Acquire HAZMAT Protective Gear <i>The Carterville Police Dept. has 5 Hazardous Materials Technicians trained for HAZMAT incidents and is a member of ILEAS which supplies HAZMAT equipment and gear. John A. Logan College has a significant amount of hazardous materials on campus and will seek funding to purchase appropriate gear for its first responders in the event of hazardous materials release. As SIH updates their hazmat response plan they will seek to purchase additional response equipment as necessary.</i>	Carterville, Herrin, John A. Logan College, SIH	Ongoing / Proposed	L, S	Carterville Police and Fire Depts., John A. Logan College, SIH
DROUGHT / EXTREME HEAT					
H1	Develop/Enforce Water Use Restrictions During Periods of Drought or Burn Ordinances <i>The County and several jurisdictions currently have burn ordinances in place or enforce water restrictions during periods of drought to conserve water supplies.</i>	Williamson County, Carbondale, Carterville, Crainville, Creal Springs Energy, Freeman Spur, Herrin, Johnston City, Marion, Pittsburg	Ongoing	L	County/ Village/City Board of Commissioners
H2	Retrofit Water Supply Systems <i>The County EMA will oversee the implementation of this project. Funding has not been secured as of 2015. Implementation, if funding is available, is forecasted to be initiated within approximately 5 years.</i>	Williamson County, Cambria, Carbondale, Carterville, Crainville, Creal Springs, Energy, Freeman Spur, Herrin, Hurst, Johnston City, Spillertown, Rend Lake Conservancy District	Proposed	L, S, F	Williamson County EMA, Marion EMA
H3	Educate Farmers on Soil and Water Conservation Practices <i>The Williamson County Farm Bureau continues to educate farmers on soil and water conservations practices.</i>	Williamson County	Proposed	S	Williamson County Farm Bureau
GROUND FAILURE					
GF1	Map and Assess Community Vulnerability to Ground Failure Hazards <i>The County EMA and Marion IT Specialists / GIS Dept. oversee this project with assistance from SIU. After each mitigation plan update, the geographical database is updated to include new information about ground failure hazard events.</i>	Williamson County, Marion	Ongoing	L, F	Williamson County EMA, Marion IT Specialist / GIS Dept.
GF2	Maintain a List of Buildings Constructed Over Underground Mines <i>The County EMA and Marion IT Specialists / GIS Dept. oversee this project with assistance from SIU. After each mitigation plan update, the geographical database is updated to include new information about ground failure hazard events.</i>	Williamson County, Marion	Ongoing	L	Williamson County EMA, Marion IT Specialist / GIS Dept.

Code	Mitigation Strategy	Jurisdictions Involved	Status	Funding Source*	Responsible Organization or Agency
GF3	Stabilize Areas Vulnerable to Ground Failure <i>The Villages of Crainville and Creal Springs would like to seek federal funding to stabilize areas vulnerable to ground failure.</i>	Crainville, Creal Springs	Proposed	L, F	Crainville, Creal Springs
WINTER STORMS					
WS1	Install Signs that Direct Traffic Towards Shelters and Safe Travel Routes <i>The Williamson County EMA and Marion EMA install signs on an as-needed basis at various locations within the county during critical times.</i>	Williamson County, Marion	Ongoing	L	Williamson County EMA, Marion EMA
WS2	Establish a Network of 4WD/Off-road Vehicles to Access Stranded People <i>The County EMA oversees this project. Additional funding will be sought to increase the network of 4WD/Off-road vehicles in the County.</i>	Williamson County, Crainville, Creal Springs, Marion	Ongoing / Proposed	L, S	Williamson County EMA
WS3	Purchase Deicing Chemicals <i>The Village of Cambria purchases deicing chemicals on an annual basis. The Villages of Crainville, Creal Springs, Herrin and Johnston City would like to seek funding to purchase deicing chemicals.</i>	Cambria, Crainville, Creal Springs, Herrin, Johnston City	Ongoing	L, S	City/Village Utility and Street Depts.
DISEASE EPIDEMICS / PANDEMICS					
EP1	Educate Community on Pandemics and How to Mitigation their Impacts <i>Potential funding sources includes: Illinois Department of Public Health, U.S. Dept. of Health and Human Services, and various Private foundations</i>	Williamson County	Ongoing	S, F	Franklin-Williamson Bi-County Health Dept.
EP2	Purchase Software/Develop Website which Allows the Public to Pre-Register to Receive Mass Prophylaxis Medications <i>Potential funding sources includes: Illinois Department of Public Health, U.S. Dept. of Health and Human Services, and various Private foundations</i>	Williamson County	Proposed	S, F, P	Franklin-Williamson Bi-County Health Dept.
EP3	Develop Technological Solutions for Schools to Report Large Numbers of School Absences <i>This strategy will limit the spread of disease, facilitate situational awareness and rapid cycle decision making for school closures, parenting messaging, etc. Potential funding sources includes: Illinois Department of Public Health, U.S. Dept. of Health and Human Services, and various Private foundations.</i>	Williamson County	Proposed	S, F, P	Franklin-Williamson Bi-County Health Dept.

*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 5-8 displays the priority ranking for each mitigation strategy. Each code refers to a specific mitigations strategy listed in Table 5-7. 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 5-8. Prioritization of the Williamson County Multi-Jurisdictional Mitigation Strategies

Code	Priority Ranking*																											
	Williamson County	Cambria	Carbondale	Cartersville	Crainville	Creal Springs	Energy	Freeman Spur	Herrin	Hurst	Johnston City	Marion	Pittsburg	Spillertown	Southern Illinois Healthcare	Rend Lake Conservancy Dist.	Cartersville CUSD #5	Crab Orchard CUSD #3	Giant City CCSD #130	Herrin CUSD #4	Johnston City CUSD #1	Marion CUSD #2	New Simpson Hill District #32	John A. Logan College	The Villas of Holly Brook	Lighthouse Shelter	Family Crisis Center	Egyptian Area Agency on Aging
AH1	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AH2	H	L	-	H	-	H	-	-	H	-	-	H	-	-	H	-	H	H	H	H	H	H	H	H	-	-	-	-
AH3	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AH4	H	-	-	-	-	-	-	-	-	-	-	H	-	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-
AH5	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AH6	M	-	-	-	M	H	-	-	-	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AH7	H	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AH8	H	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AH9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
AH10	H	-	-	-	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-	H	H	H	H
AH11	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AH12	H	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AH13	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AH14	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	H	-	-	-	-	-	-	-	-	-	-	-	-
AH15	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	H	H	H	H	H	H	H	H	H	H	H	H
AH16	M	M	-	-	-	H	-	-	H	-	-	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AH17	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
AH18	M	-	-	-	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-
AH19	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F1	H	-	H	H	H	-	-	H	H	H	H	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F2	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F3	H	-	H	H	H	-	-	H	H	H	H	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F4	H	-	H	H	H	-	-	H	H	H	H	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Code	Priority Ranking*																											
	Williamson County	Cambria	Carbondale	Cartersville	Crainville	Creal Springs	Energy	Freeman Spur	Herrin	Hurst	Johnston City	Marion	Pittsburg	Spillertown	Southern Illinois Healthcare	Rend Lake Conservancy Dist.	Cartersville CUSD #5	Crab Orchard CUSD #3	Giant City CCSD #130	Herrin CUSD #4	Johnston City CUSD #1	Marion CUSD #2	New Simpson Hill District #32	John A. Logan College	The Villas of Holly Brook	Lighthouse Shelter	Family Crisis Center	Egyptian Area Agency on Aging
F5	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F6	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F7	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	H	-	-	-	-	-	-	-	-	-	-	-	-
F8	H	-	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F9	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F10	L	-	-	-	-	-	-	-	-	-	-	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ST1	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	H	H	H	H	H	H	H	H	H	H	H	H
ST2	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	H	H	H	H	H	H	H	H	-	-	-	-
ST3	H	H	-	H	H	H	-	-	-	-	H	-	H	-	-	-	-	-	-	-	-	-	-	H	-	-	-	-
ST4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	H	-	M	M	M	M	M	M	M	M	M	M	M	M
EQ1	L	-	-	-	-	-	-	-	-	-	-	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQ2	L	-	-	-	H	H	-	-	-	-	-	L	L	-	H	-	-	-	-	-	-	-	-	-	-	-	-	-
EQ3	L	-	-	-	-	-	-	-	-	-	-	L	-	-	-	-	-	-	H	-	-	-	-	-	-	-	-	-
EQ4	L	-	-	-	-	-	-	-	-	-	-	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EQ5	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	H	-	-	-	-	-	-	-	-	-	-	-	-
EQ6	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
HAZ1	H	-	-	-	-	-	-	-	-	-	-	-	-	-	H	-	-	-	H	-	-	-	-	-	-	-	-	-
HAZ2	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HAZ3	L	-	-	-	-	-	-	-	-	-	-	L	-	-	-	-	M	M	M	M	M	M	M	M	-	-	-	-
HAZ4	-	-	-	H	-	-	-	-	M	-	-	-	-	-	H	-	-	-	-	-	-	-	-	H	-	-	-	-
H1	M	-	M	M	M	M	M	M	M	M	M	M	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H2	H	H	H	H	H	H	H	H	H	H	H	H	H	H	-	H	-	-	-	-	-	-	-	-	-	-	-	-
H3	M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GF1	L	-	-	-	-	-	-	-	-	-	-	L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[illegible]

*Ranking based on STAPLEE evaluation and estimated timeframe: H – High, M – Medium, and L – Low

Section 6. Plan Implementation and Maintenance

6.1 Implementation through Existing Programs

Throughout the planning process, the Williamson 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 losses 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 Williamson County Emergency Management Agency will be the local champion for the mitigation actions. The Williamson 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 actions.

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 Williamson County Emergency Management Agency and forwarded to the Planning Team for discussion. Education efforts for hazard mitigation will be an ongoing effort of Williamson 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 Williamson County Emergency Management Agency.

6.2 Monitoring, Evaluation, and Updating the MHMP

Throughout the five-year planning cycle, the Williamson 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 2020 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 Williamson 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, education 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.
Critical Facility	A subset of essential 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 (HMGP)	Authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, HMGP is administered by

Hazus-MH	FEMA and provides grants to states, tribes, and local governments to implement hazard mitigation actions after a major disaster declaration. 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 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
IDOT – Illinois Department of Transportation
IEMA – Illinois Emergency Management Agency

M MHMP – Multi-Hazard Mitigation Plan

N NCDC – National Climatic Data Center

NEHRP – National Earthquake Hazards Reduction Program
NFIP – National Flood Insurance Program
NOAA – National Oceanic and Atmospheric Administration

P PA – Public Assistance
PPM – Parts Per Million

R RPI – Risk Priority Index

S SIU – Southern Illinois University Carbondale
SPC – Storm Prediction Center

U USGS – United States Geological Survey

Appendices

Appendix A. MHMP Meeting Minutes.....	Error! Bookmark not defined.
Appendix B. Local Press Release and Newspaper Articles	Error! Bookmark not defined.
Appendix C. Adopting Resolutions	Error! Bookmark not defined.
Appendix D. Historical Hazards.....	Error! Bookmark not defined.
Appendix E. List of Essential Facilities.....	Error! Bookmark not defined.
Appendix F. Critical Facilities Map.....	Error! Bookmark not defined.

Appendix A. MHMP Meeting Minutes

Formal Mitigation Planning Meetings

Meeting 1 – September 2nd, 2014

Meeting 2 – December 8th, 2014

Meeting 3 – May 18th, 2015

Meeting 4 – July 29th, 2015

Outside Meetings

See Attached Outside Meeting Minutes and Sign-in Sheets

Meeting 1 – September 2nd, 2014



IEMA Multi-Hazard Mitigation Plan

Assembly of the Williamson County Planning Team Meeting 1

Chairman: Kelly Huddleston

Plan Directors: Southern Illinois University and Greater Egypt Regional Planning and Development Commission

Meeting Date: September 2nd, 2014

Meeting Time: 2:00pm

Place: Marion Pavilion, 1602 Sioux Dr., Marion, IL 62959

Planning Team/Attendance: 34

Introduction to the Multi-Hazard Mitigation Planning Process and Risk Assessment

The meeting is called to order

Kelly Huddleston, Williamson County EMA Coordinator, opened the meeting by explaining that the planning team is here today to update the 2009 Williamson County Multi-Hazard Mitigation Plan. She introduced the planning partners: Southern Illinois University and Greater Egypt Regional Planning and Development Commission.

A PowerPoint presentation was given by Prof. Nicholas Pinter and Amanda Dampitz. Prof. Pinter explained that this project is in response to the Disaster Mitigation Act of 2000. The project is funded by a grant awarded by FEMA. Once the project is completed, it opens the County and its participating jurisdictions up to additional Hazard Mitigation Assistance Funds. Prof. Pinter divided the planning process into four meetings. During Meeting 1, the focus will be on natural disasters that are relevant to the County. As a group, the planning team will complete a hazard ranking exercise. Identified hazards will be given a probability rating and ranked by their occurrence and potential level of risk. At Meeting 2, the public meeting, SIU will present historic accounts of natural disasters that have affected the area. The results from the risk assessment report will also be presented. Meeting 3 will consist of a brain storming session focused on disasters that were analyzed in the risk assessment report. FEMA requires that for every identified hazard, two strategies to mitigate the loss and damage must be in place. At Meeting 4, the planning team will review the plan prior to sending it to IEMA. IEMA will review the plan and make recommendation to it as they see fit, then it is submitted to FEMA for review and approval. Once approved by FEMA, the Planning Team will present the Mitigation Plan to the County Board for adoption. Participating Jurisdictions must either adopt the county plan or prepare its own plan, in order to access mitigation assistance from FEMA.

3000 West DeYoung Street · Suite 800B-3 · Marion, IL 62959 · Phone: 618.997.9351 · Fax: 618.997.9354 · www.greateregypt.org

SIU Staff Researcher, Amanda Dampitz, presented historic accounts of natural disasters that have affected the County. During her presentation, she fielded any questions relevant to each hazard. She stressed that this information should help guide the planning team when completing the hazard ranking exercise.

Prof. Pinter provided the planning team with a Hazard Ranking Exercise handout. The Planning Team was then asked to assess and rank the hazards that could potentially befall Williamson County using the risk priority index (RPI). The identified hazards were ranked as followed for Williamson County:

1. Tornadoes
2. Earthquakes
3. Severe Storms
4. Winter Storms
5. Flooding
6. Hazmat Release
7. Dam / Levee Failure
8. Extreme Heat / Drought
9. Landslide / Mine Failure

During the Hazard Ranking Exercise, several hazards (Pandemics/Communicable Diseases, Electromagnetic Pulses, and Terrorism) were identified by the planning team. SIU and Greater Egypt Planning Commission explained that threat for these hazards are real. However, the purpose of this process is to develop and maintain a mitigation/risk management plan in order to be eligible for FEMA's Hazard Mitigation Assistance funds. The additional hazards will be identified in the Mitigation Plan but not ranked.

Finally, representative from each jurisdiction present at the meeting completed the Hazard Ranking Exercise for their respective jurisdiction.

Meeting was adjourned

Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Campbell, Vernon	1	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Chief of Police	Johnston City, IL	
Carpenter, Tyler	TWC	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Regional Planner	Greater Egypt	1
Critch, Kirby		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Fire Chief	Lake Egypt Fire Protection District	
Dampier, Amanda	AD	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Staff Researcher & Project Manager	Natural Hazards and Research Mitigation Group- SIU	X
Gentry, Brent	21	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Commissioner	Williamson County	+
Gillespie, Kevin		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Marion Regional Emergency Response Coordinator	IL Department of Health	
Gotschalk, Steven W.		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village President	Cambridge, IL	

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Please print clearly

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Barnes, Amanda	AB	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	County Clerk & Recorder	Williamson County	8
Benedict, Larry	AB	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Volunteer EMA	The Lighthouse Shelter	10
Burton, Tom		☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Fire Chief	Johnston City, IL	10
Burter, Robert		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Marion, IL	

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Lemasters, Verne	VL	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Building/Maintenance Coordinator	The Lighthouse Shelter	4
Marfo, Jim	gm	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Commissioner	Williamson County	1
Mims, Cary	cm	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Executive Director	Greater Egypt	1
Mitchell, Jim		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Johnston City, IL	
Mitchell, Ronald	RM	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Village President	Crainville, IL	7
Morris, Jeremy	gm	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Fire Chief	Williamson County Fire Protection District	1
Oates, Keith	ko	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Marion Unit School District #2	4

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Grail, Brad		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village Trustee	Energy, IL	
Hertz, Mike	mh	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMS Coordinator	Carbonale, IL	14
Hill, Belinda		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Grant City School District #130	
Huddleston, Kelly	kh	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMA Coordinator	Williamson County	8
Hutchins, Derek	dh	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Crab Orchard Unit School District #3	20
Kimmel, Douglas	dk	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	Williamson County Airport	4
Koehl, Robin		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Administrator	Bi-County Health Department	

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Russell, Margaret (Cathy)	PR	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Executive Director	City of Lebanon Williamson County Family Crisis Center	25 mi
Simpson, Alex	AS	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	GIS Specialist	Williamson County Supervisor of Assessments Office	5
Smothers, Greg	GS	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	County Engineer	Williamson County Highway Department	8 mi
Sollers, Celeste	CS	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	Williamson County Economic Development	8 mi
Talley, Bruce	BT	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Fire Chief	Carterville Fire Department	10 mi
Violetti, Kyle	UV	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village Clerk	Pittsburg, IL	10 mi
Tondini, Dawn	DT	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Chief	Marietta, PA	5

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Pratzgraff, Leroy	PL	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Regional Coordinator	ILMA, Region 11	45
Priner, Nicholas (Prof)	NP	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Project Director	Lake of Egypt Association of Property Owners Natural Hazards Research and Mitigation Group-SIU	X
Pulley, Chris		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Regional Coordinator	ILMA, Region 11	35
Rich, Joyce A.	JR	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Creel Springs, IL	35
Ritter, Victor		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Herrin, IL	35
Robinson, Jeff	JR	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Supervisor of Assessments	Williamson County Supervisor of Assessments Office	5 mi
Rogers, Curtis		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Police Chief	Crainville Police Department	

(September 2, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Bob Prusack bprusack@cedarvilleilms.org	BP	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Cedarville Census Supt.	Cedarville CUSD #5	Cedarville
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			

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Williamson County Multi-Hazard Mitigation Planning Meeting 1 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Pat Creek	PC	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Asst, Coordinator	ALCENA	1
Chris Wray		☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	LEAD Law Enforcement	JALC	3
Ronda Koch	RK	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Dr. Burgess Physician	FUSCH	
Howard Sauer	HS	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Exec Director	The Village Hwy Brook	3
Ron Ellis	RE	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Wm & Commissioner		4
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			

(September 2, 2014)

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Meeting 2 – December 8th, 2014



IEMA Multi-Hazard Mitigation Plan

Assembly of the Williamson County Planning Team Meeting 2

Chairman: Kelly Huddleston

Plan Directors: Southern Illinois University and Greater Egypt Regional Planning and Development Commission

Meeting Date: December 8nd, 2014

Meeting Time: 6:00pm

Place: Marion Pavilion, 1602 Sioux Dr., Marion, IL 62959

Planning Team/Attendance: 22

Public Meeting and County Risk Assessment

The meeting is called to order

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

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

Prof. Pinter then asked the audience for questions and comments. Several changes to the plan were suggested:

- Jim Marlo is the new County Board Chairman
- Add Herrin Hospital (935 employees) to Table 3-1 Williamson County's Major Employers
- Add Lake of Egypt to the Participating Jurisdictions
- Check the physical location of Cartersville High School
- Check the amount of damage reported by the NCDC database for the 1982 tornado

Project Manager Amanda Dampitz noted the changed and promised to make all corrections before the next meeting. Prof. Pinter thanked those who came and closed the presentation.

Meeting was adjourned

3000 West DeYoung Street · Suite 800B-3 · Marion, IL 62959 · Phone: 618.997.9351 · Fax: 618.997.9354 · www.greateregypt.org

Please print clearly

Williamson County Multi-Hazard Mitigation Planning Meeting 2- Public Attendance

[illegible]

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Campbell, Brad	BC	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Security, EMA	Herrin Hospital	7
Campbell, Vernon		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Chief of Police	Johnston City, IL	
Carpenter, Tyler		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Regional Planner	Greater Egypt	
Collins, Mark		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Superintendent	Herrin CUSD #4	
Creek, Pat	PC	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	EMA	Williamson County EMA	4
Crites, Kirby		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Fire Chief	Lake Egypt Fire Protection District	
Dampitz, Amanda		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Staff Researcher & Project Manager	Natural Hazards and Research Mitigation group, SIU	

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Please print clearly

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Barnes, Amanda		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	County Clerk & Recorder	Williamson County	
Belcher, John		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Coordinator	WCES	
Beneshterfer, Larry	LB	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Volunteer	The Lighthouse Shelter	9
Blackman, Claudia		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Volunteer	ARC	
Burchett, Kathleen		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Refuge Manager	US Dept. of the Interior - Crab Orchard NWR	
Burton, Tom		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Fire Chief	Johnston City, IL	
Butler, Robert		☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Mayor	Marion, IL	

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Hill, Beinda		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Grant City School District #130	
Huddleston, Kelly		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	BMA Coordinator	Williamson County	
Hutchins, Derek		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Crab Orchard Unit School District #3	
Kendrick, Tony	PK	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Representative	Creal Springs	35
Kerley, Beth		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Contract Compliance Specialist	Crab Orchard NWR	
Kimmel, Douglas		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	Williamson County Airport	
Koch, Ronda		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director of Emergency Preparedness	BH-County Health Department	

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Ellis, Ron		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Commissioner	Williamson County	
Frost, John		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Asst. Chief	Village of Carterville	
Gentry, Brent		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Commissioner	Williamson County	
Gillespie, Kevin		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Marion Regional Emergency Response Coordinator	IL Department of Health	
Gotschalk, Steven W.		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village President	Cambria, IL	
Grul, Brad 618-559-4098 BRADGRUL@MHS.COM	BS	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village Trustee	Energy, IL	5
Hertz, Mike	MH	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMS Coordinator	Carbondale, IL	14

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Murrah, Bryan		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Deputy	Williamson County Sheriff	
Murrah, Tom		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Patrolman	City of Herrin	
Cares, Keith		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Marion Unit School District #2	
Oldham, Paul		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Assistant Superintendent	ROE 21	
Flahagraff, Leroy		☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Representative	Lake of Egypt Association of Property Owners	45
Pinter, Nicholas (Prok)		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Project Director	Natural Hazards Research and Mitigation Group-SIU	
Pressator, Bob		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Carterville CUSD #5	

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Lemasters, Verne		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Building/ Maintenance Coordinator	The Lighthouse Shelter	
Leuchtenberg, Mike		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Lieutenant	WCCPD	
Maddox, Mike	MB	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	Disaster Preparedness Coordinator	Southern Illinois Healthcare	44
Marlo, Jim		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Commissioner	Williamson County	
Mitt, Terry		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Superintendent	Johnson City CUSD #1	
Mitchell, Jim		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Johnson City, IL	
Mitchell, Ronald		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village President	Cranville, IL	

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Sanders, Amy		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Assistant Superintendent	Marion Unit School District #2	
Searty, David		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMA Coordinator	Perry County	
Shryock, Rick		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMA Coordinator	City of Marion	
Simpson, Alex		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	GIS Specialist	Williamson County Supervisor of Assessments Office	5
Smith, Darrin		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Safety Coordinator	WCES	
Smothern, Greg	SS	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	County Engineer	Williamson County Highway Department	16 mi
Talley, Bruce	WBT	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Vol. Fire Inspector	Carterville Fire Department	20 mi

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Pulley, Chris	CP	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Regional Coordinator	IEMA, Region 11	4
Pursell, Matt		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Firefighter	Herrin Fire Department	
Reichert, Kevin		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Facilities Manager	Grab Orchard NWR	
Ritter, Victor	VR	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Herrin, IL	
Robinson, Jeff	JRL	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Supervisor of Assessments	Williamson County Supervisor of Assessments Office	10
Rogers, Curtis		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Police Chief	Cranville Police Department	
Russell, Margaret	MR	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	Executive Director	Williamson County Family Crisis Center	25

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
RICHARD GEORGE	RG	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	FIRE CHIEF	WCEMA	30
MARY HILL MCGEE	MM	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMERG. MGMT	WCEMA	30
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			
		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			

(December 8, 2014)

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Williamson County Multi-Hazard Mitigation Planning Meeting 2 Attendance

Name and Contact Information (email or phone)	Your Initials	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Thorne, Woody	WT	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Vice President of Community Affairs	SIH	40
Thornorton Amanda,		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	Heartland Regional Hospital	
Tondin, Dawn		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Chief of Police	Marion Police Department	
Violet, Kyle		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village Clerk	Pittsburg, IL	
Weisner, Sandy		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	Little Egypt ARC	
Wills, Curtis		☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Lead Law Enforcement	John A. Logan College	
SAVER, Howard	HS	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Executive Director	me 11/6 of Hill Brook	5

(December 8, 2014)

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Meeting 3 – May 18th, 2015



IEMA Multi-Hazard Mitigation Plan

Assembly of the Williamson County Planning Team Meeting 3
Chairman: Kelly Huddleston

Plan Directors: Southern Illinois University and Greater Egypt Regional Planning and Development Commission

Meeting Date: May 18th, 2015

Meeting Time: 10:00am

Place: Williamson County Administration Building, 407 N Monroe, Marion, IL 62959

Planning Team/Attendance: 28

Developing Mitigation Strategies

The meeting is called to order.

Amanda Damptz opened the meeting by explaining that the planning team is here today to update the 2009 Williamson County Multi-Hazard Mitigation Plan. She introduced the planning partners: Southern Illinois University and Greater Egypt Regional Planning and Development Commission. A PowerPoint presentation was present that included: the current status of the mitigation planning efforts, FEMA's Hazard Mitigation Assistance Program, Hazard Mitigation Ideas and other potential funding sources.

During the PowerPoint, Ms. Damptz explained that regionally Southern Illinois has received \$87 million in Hazard Mitigation Assistance Grants as a result of the Hazard Mitigation Planning Efforts. A few examples include: Jackson County's Reed Station Mobile Home Acquisition, SIH's Seismic Retrofit, Creal Springs School Hardening, Rend Lake Water Main Bypass, and West Frankfort Treatment Plant Relocation.

In addition to FEMA's HMA program, there are several granting agencies the County and its municipalities can investigate to help offset the cost of future hazard mitigation projects. A few examples include: USDA Rural Development Grants, Illinois Department of Commerce and Economic Opportunity, and Illinois Dept. of Natural Resources.

Finally, the County and its municipalities broke out into their respective groups to develop mitigation strategies specific to their jurisdiction. SIU will gather the information and compile it into the plan draft. At the next meeting, the planning team will be able to review and make any changes necessary to the listed mitigation strategies.

Meeting was adjourned.

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Please print clearly

Williamson County Multi-Hazard Mitigation Planning Meeting 3 Attendance

(May 18, 2015)

Name and Contact Information (email or phone)	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
LEROY PHILLIPS	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	LEAP REP	Carle Clinic CUSD#3	40
Derek Huddleston derek.huddleston@coaud3.com	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Subordinator		16
Jeff Mark jmark@marion-ill.org	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Asst. Coordinator	Williamson County EMA	
Pat Creek pat@wccm4.com	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	CHIEF	CAMBRIA POLICE DEPT.	30
NATHAN WRIGHT nath.wright@gmail.com	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	Tyler & Leann Carter Police	
Dor Friddy dorfriddy@valc.edu	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Planner	Greene Egypt	
Tyler Carpenter	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen			

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Williamson County Multi-Hazard Mitigation Planning Meeting 3 Attendance

Name and Contact Information (email or phone)	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Ronda Koch	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Dir. of Em. Prep.	FWB Bi Co Health	N/A
Mike Leuthers	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	WCFPD	Williamson Fire	0/100
Melanie Sanders	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	RN MGR Hennepin	Hennepin	1
Lucas Webb	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	ED at MC Henn Hospital	Henn Hospital	—
Lucas Webb e.s.h. net	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	SEA	SIN	—
Amanda Dampitz	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Derby	WCSO	—
Brian Mullatt	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Mayor	Hampton	—
Steve Foran	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen			

(May 18, 2015)

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Williamson County Multi-Hazard Mitigation Planning Meeting 3 Attendance

Name and Contact Information (email or phone)	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Mike Horst	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Cyprin / EMS coord	City of Columbus	15
Peggy Russell	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	Executive Director	Williamson County Emergency Services	15
Kyle Violett	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	Village Clerk	Village of Pittsburg	17
Amanda Barnes	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	County Clerk	Williamson Co Court	0
Jim McNis	☐ As a Public Employee ☒ As a Private Employee ☐ As an Interested Citizen	Village Trustee	Village of Cambridge	15
Ally Simpson	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Police Commissioner	Williamson Co	0
997-2132	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	GIS	Williamson Co	0
Steve Foran	☐ As a Public Employee ☐ As a Private Employee ☒ As an Interested Citizen	Mayor	City of Columbus	30

(May 18, 2015)

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Williamson County Multi-Hazard Mitigation Planning Meeting 3 Attendance

Name and Contact Information (email or phone)	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip distance to attend this meeting
SMITH, SHERMAN	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	County Eng.	Williamson Co.	4 mi
Chris Pally	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Regional Corridor	ECMAA	4 mi
Beau McFarlin	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	EMS Coordinator	Hartland Regional	3 mi
Brent Gentry	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Community	Will Co.	
JEFFERY ROBINSON	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	SUPervisor of Maintenance	Williamson Co	—
Tavi Olden	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Assistant Regional Supervisor	Regional Office of Education	
Kelly Huddleston	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	WCEM		—

(May 18, 2015)

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Meeting 4 – July 29th, 2015

**HEMA Multi-Hazard Mitigation Plan**

Assembly of the Williamson County Planning Team Meeting 4
 Chairman: Kelly Huddleston
 Plan Directors: Southern Illinois University and Greater Egypt Regional Planning and Development Commission

Meeting Date: July 29th, 2015

Meeting Time: 5:00pm

Place: Williamson County Administration Building, 407 N Monroe, Marion, IL 62959

Planning Team/Attendance: 8

Developing Mitigation Strategies

The meeting is called to order.

Amanda Dampitz opened the meeting by explaining that the planning team is here today to review the final draft of the 2015 Williamson County Multi-Hazard Mitigation Plan Update. She introduced the planning partners: Southern Illinois University and Greater Egypt Regional Planning and Development Commission. A PowerPoint presentation was present that included: the current status of the mitigation planning efforts, FEMA's Hazard Mitigation Assistance Program, and Plan Review Basics.

During the PowerPoint, Ms. Dampitz walked the planning team through the critical components of the mitigation plan and asked for feedback/corrections. All comments and corrections were noted. Ms. Dampitz will make all changes and return the digital version of the plan to the County.

Meeting was adjourned.

Please print clearly

Williamson County Multi-Hazard Mitigation Planning Meeting

Name and Contact Information (email or phone)	Your Reason for Attending (check only ONE box)	Job Title(s)	Employer(s)	Roundtrip Mileage to attend this meeting
Eric Johns ejohns@hernhs.org	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Village Trustee	Village of Spillertown	11A 4m
Larry Blemstedder 618-579-8529	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	MAINTENANCE	LIBRARY SHERIDAN	3 miles
Rick Gedde 618-579-6917	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	WCE MA	WCE MA	20 miles
Pat Creek pat@wce.ma	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	WCE MA	WCE MA	23 miles
Bruce Thibault 618-925-6391	☐ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	ASST COORD.	WCE MA	23 miles
Tyler Cooper	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Librarian	Great Egypt	X
Kelly Huddleston	☒ As a Public Employee ☐ As a Private Employee ☐ As an Interested Citizen	Director	WCE MA	11A

(July 29 2015)

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Appendix B. Local Press Release and Newspaper Articles

WSIU  **PUBLIC BROADCASTING**

Carbondale | WUSI 90.3FM • Olney | WVSI 88.9FM • Mt Vernon | WSIU TV 8 • Carbondale | WUSI

Home News Music Programs Television Community SIRIS

WSIU News Updates

Morning Conversation
Hazard Mitigation Meetings

Morning Conversation 9:30 AM WED DECEMBER 3, 2014

Hazard Mitigation Meetings

[Share](#) [Tweet](#) [+1](#) [E-mail](#) [Comments](#) [Print](#)

By **JENNIFER FULLER**

WSIU's Jennifer Fuller talks with Dr. Nicholas Pinter about upcoming hazard mitigation public meetings in Jackson and Williamson County.

[Listen](#)
5:24

Morning Conversation (12/3/2013): Hazard Mitigation

The Southern
ILLINOISAN

40°
Overcast
Weekly Forecast

News Sports Opinion Crime & Court Obits Life Towns Scene618 Calendar

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Williamson County Multi-Hazard Mitigation Planning Meeting

Mon, Dec 8 2014, 6:00 pm - 9:00 pm CST

[Recommend](#) [Tweet](#) [+1](#) [Share](#) [Print](#) [Email](#) [Star](#)

The Williamson County Emergency Management Agency, in collaboration with Southern Illinois University Carbondale and the Greater Egypt Regional Planning and Development Commission, is administering the Multi-Hazard Mitigation Plan for Williamson County.

During this meeting, SIU will present the draft detailed risk assessment to the planning team. The planning team will identify and prioritize mitigation strategies and projects that can address the threats identified in the risk assessment.

Following the brainstorming exercise, the general public will be encouraged to ask questions and provide input to the planning process.

Website: <http://www.wcema.com/>

HAZARD MITIGATION PUBLIC MEETING PLANNED TONIGHT

The Williamson County Multi-Hazard Mitigation Plan (MHMP) Steering Committee will host a public information meeting at 6 p.m. Monday, Dec. 8, at The Pavilion in Marion, 1602 Sioux Dr.

Through a grant funded by FEMA, the county has formed an alliance with SIU and the Greater Egypt Planning Commission to identify potential natural hazards and produce an update to the 2009 MHMP.

The public is invited to attend this meeting to learn about the MHMP process and provide input regarding natural hazards that occur in Williamson County. For more information, refer to the Williamson County EMA website (www.wcema.com).



LONGFELLOW HOSTS CRAFT WORKSHOP

Longfellow School hosted its "Elf's Workshop" Thursday night. Students were able to buy tickets and create various kinds of crafts for the Christmas season.

JESSICA MILES / DAILY REPUBLICAN

Staff report

The Williamson County Board plans a special meeting this morning at 9 a.m. to discuss issues related to the dissolution of the Village of Whitesh.

Whitesh residents vote 57-18 to dissolve the village in the Nov. 4 elections.

That brings local governance of the village's 250 residents into the county's responsibility.

The village had money in its coffers at the time of the vote, but also had debts, including an outstanding bill to Johnston City for the sewer service it provided the village and repayment of USDA Rural Development loan for infrastructure.

Representatives of the village, the federal government and nearby communities that supply services to the Whitesh area are all expected to attend the meeting.

The Williamson County Board meets in its chamber at the county administration building. The meeting is open to the public.

Organization seeks to change the minds of millennials

By Jessica Miles
Staff Writer

They have begun by starting a film and TV show to teach about the ways in which adults can change the ways they teach about making money. In...

Anderson said they believe a lot of the mindset is a result of the economic crisis and because of the lack of trust...

An organization with roots in Mar...

City Council to discuss tax increase

Staff report

The Marion City Council meets this evening at 7 p.m. The meeting includes a hearing on a proposed property tax increase. Council members are expected to vote on...

GOVERNMENT			
Benton City Council: 7 p.m., city hall.	Council: 6:30 p.m., city hall.	7 p.m., city hall.	Organization Policy Committee: 1 p.m., Greater Egypt Regional Planning and Development Commission office, Marion.
Bush Village Board: 6 p.m., village hall.	Grand Tower Township Board: 6 p.m., township hall.	Mount Vernon planning and zoning committee: 7 p.m., city hall.	Sparta City Council: 7 p.m., city hall.
Campbell Hill Village Board: 6 p.m., community center.	Herrin City Council: 6 p.m., city hall.	Mount Vernon Park and Recreation Board: 6 p.m., community building.	Stonefort Village Board: 6 p.m., village hall.
Carbondale Human Relations Commission: 6 p.m., civic center.	Herrin school board: 6 p.m., unit office.	Mount Vernon Township high school board: 5:30 p.m., school.	Vergennes Village Board: 7 p.m., community center.
Carbondale Park Board: 5:30 p.m., civic center.	Hurst City Council: 6 p.m., city hall.	Mount Vernon Tree Board: 4:30 p.m., community building.	Vienna grade school board: 7 p.m., board room, school.
Carrier Mills-Stonefort library board: 7 p.m., library, Carrier Mills.	Jackson County Finance Committee: 4:30 p.m., courthouse, Murphysboro.	North City Village Board: 7 p.m., village hall.	West City Village Board: 6 p.m., village hall.
Christopher City Council: 6:30 p.m., city hall.	Jackson County Soil and Water Conservation District board: 7 p.m., USDA Service Center building, Murphysboro.	Pinckneyville Cemetery Board of Managers: noon, city hall.	West Frankfort library board: 7 p.m., library.
Corinth Water District board: 6:30 p.m., district office, Thompsonville.	Johnson County Board: 3:30 p.m., conference room, Vienna.	Pinckneyville City Council: 7:30 p.m., city hall.	West Frankfort Planning Commission: 6:30 p.m., city hall.
Crescent Springs City Council: 7 p.m., city hall.	Johnson County Housing Authority board: 3:30 p.m., housing office, Vienna.	Pittsburg Village Board: 6:30 p.m., village hall.	Williamson County Board: 9 a.m., administrative building, Marion.
De Soto Township Board: 8 p.m., village hall.	Johnston City Library board: 7 p.m., library.	Rick Warren library board: 4 p.m., library, Elkhart.	Williamson County Emergency Management Agency Multi-Hazard Mitigation Planning Committee: 6 p.m., The Pavilion, Marion.
Dowell Village Board: 7 p.m., village hall.	Johnston City Planning Commission: 6 p.m., United Methodist Church.	Sesser library board: 5:30 p.m., library.	
Du Quoin City Council: 6 p.m., city hall.	Marion City Council: 7 p.m., city hall.	Sesser-Vallier school board: 5:30 p.m., school, Sesser.	
Evansville Village Board: 7 p.m., village hall.	Metropolis City Council:	Southern Illinois Metropolitan Planning	

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.

Emergency Operations Center Facilities

Facility Name	Address	City
Williamson County EOC	107 North Monroe Street	Marion

Fire Station Facilities

Facility Name	Address	City
Bush Fire Station	504 Poplar Street	Bush
Cambria Fire Department	103 South Maple	Cambria
Cartersville Fire Department	300 North Division Street	Cartersville
City of Stonefort Fire Station	202 Cedar Street	Stonefort
Energy Fire Department	210 Front Street	Energy
Herrin Fire Department	401 South Park Avenue	Herrin
Hurst Fire Department	121 King Street	Hurst
Johnston City Police & Fire Department	600 Washington Street	Johnston City
Lake of Egypt Fire Station #1	13205 Lakeview Drive	Creal Springs
Lake of Egypt Fire Station #4	11708 Lake of Egypt Road	Marion
Lake of Egypt Fire Station #5	7913 Grassy Road	Marion
Marion Fire Department	204 North Court	Marion
Pittsburg Volunteer Fire Department	109 South Lodge Street	Pittsburg
Williamson County Fire Dept-Station #1	1505 East Main Street	Marion
Williamson County Fire Dept-Station #2	1205 North Division Street	Cartersville
Williamson County Fire Dept-Station #3	9366 Paulton Road	Marion
Williamson County Fire Dept-Station #4	20938 Corinth Road	Thompsonville
Williamson County Fire Dept-Station #5	1600 West Broadway Blvd	Johnston City
Williamson County Fire Dept-Station #6	3232 South Park Avenue	Herrin
Williamson County Fire Dept- Station #7	410 West Blue Avenue	Creal Springs

Police Station Facilities

Facility Name	Address	City
Cambria Police Department	105 South Maple Street	Cambria
Cartersville Police Department	127 West Illinois Avenue	Cartersville
Crainville Police Department	1205 North Main Street	Crainville
Creal Springs Police Department	507 Walnut Street	Creal Springs
Energy Police Department	210 North Pershing Street	Energy
Freeman Spur Police Department	19072 Freeman Spur Road	Freeman Spur
Herrin Police Department	321 North 4 th Street	Herrin
Hurst Police Department	213 North Bush Avenue	Hurst
John A Logan College Police	700 Logan College Drive	Cartersville
Johnston City Police Department	500 Washington Avenue	Johnston City
Marion City Police	1001 West DeYoung	Marion
Pittsburg Police Department	302 West Avery Avenue	Pittsburg
Spillertown Police Department	102 Community Drive	Marion
Williamson County Sheriff's Department	200 West Jefferson Street	Marion

School Facilities

Facility Name	Address	City	Comments
Adams School	5470 Lake Of Egypt Rd	Creal Springs	Grades PK-8; Marion CUSD 2; 256 Students
Cartersville High School	1415 W Grand Ave	Cartersville	Grades 9-12; Cartersville CUSD 5; 570 Students
Cartersville Intermediate School	300 School St	Cartersville	Grades 4-6; Cartersville CUSD 5; 516 Students
Cartersville Jr High School	816 S Division St	Cartersville	Grades 7-8; Cartersville CUSD 5; 316 Students

Facility Name	Address	City	Comments
Crab Orchard Elementary School	19189 Bailey St	Marion	Grades PK-8; Crab Orchard CUSD 3; 365 Students
Crab Orchard High School	19189 Bailey St	Marion	Grades 9-12; Crab Orchard CUSD 3; 150 Students
Herrin CUSD 4 Elementary School	5200 Herrin Rd	Herrin	Grades 2-5; Herrin CUSD 4; 731 Students
Herrin District Office	516 North 10 th Street	Herrin	
Herrin High School	700 N 10th St	Herrin	Grades 9-12; Herrin CUSD 4; 746 Students
Herrin Middle School	700 S 14th St	Herrin	Grades 6-8; Herrin CUSD 4; 559 Students
High School Extension Center	712 North Carbon Street	Marion	
Jefferson Elementary School	1108 Grand Ave	Johnston City	Grades PK-2; Johnston City; 284 Students
Jefferson Elementary School	700 E Boulevard St	Marion	Grades K-5; Marion CUSD 2; 268 Students
John A. Logan College	700 Logan College Road	Carterville	Higher Education
Johnston City High School	1500 Jefferson Ave	Johnston City	Grades 9-12; Johnston City CUSD 1; 329 Students
Learning Center	409 South Court Street	Marion	
Lincoln Elementary School	400 Morningside Dr	Marion	Grades PK-5; Marion CUSD 2; 599 Students
Lincoln Elementary School	20163 Corinth Rd	Pittsburg	Grades 3-4; Johnston City CUSD 1; 125 Students
Longfellow Elementary School	1400 W Hendrickson St	Marion	Grades PK-5; Marion CUSD 2; 360 Students
Marion High School	1501 S Carbon St	Marion	Grades 9-12; Marion CUSD 2; 1,139 Students
Marion Jr High School	1609 W Main St	Marion	Grades 6-8; Marion CUSD 2; 792 Students
Marion Seventh Day Adventist School	9314 Old Route 13	Marion	
North Side Primary Center	601 N 17th St	Herrin	Grades PK-1; Herrin CUSD 4; 25 Students
Our Lady-Mount Carmel School	300 West Monroe Street	Herrin	
Project Echo	900 Washington Avenue	Johnston City	
School for Hearing Impaired	801 East Reeves	Marion	
SIU Administration Building 2	5601 Old Route 13	Carterville	Higher Education
Tri-C Elementary School	1405 W Grand Ave	Carterville	Grades K-3; Carterville CUSD 5; 684
Unity Christion School	100 East College Street	Energy	
Washington Elementary School	100 E 12th St	Johnston City	Grades 5-8; Johnston City CUSD 1; 453 Students
Washington Elementary School	420 E Main St	Marion	Grades PK-5; Marion CUSD 2; 581 Students
Williamson County Early Childhood Cooperative (WCECC)	500 Plaza Drive	Carterville	Grade PK

Medical Care Facilities

Facility Name	Address	City	Comments
Chestnut Manor	1404 South 14 th Street	Herrin	
Fifth Season Residential	401 East Reichert Drive	Marion	
Fountain Care Facility	1301 East DeYoung Street	Marion	
Friendship Care Center	1900 North Park Avenue	Herrin	
Heartland Regional Medical Center	3333 West DeYoung Street	Marion	96-bed facility
Herrin Hospital	201 South 14 th Street	Herrin	114 acute care beds
Parkway Manor	3116 Williamson County Parkway	Marion	
Shawnee Christian Nursing Center	1901 North 13 th Street	Herrin	
Veteran's Administration Hospital	2401 West Main Street	Marion	55 acute care beds
Veterans Administration Nursing Home	2309 West Main Street	Marion	60 bed Community Living Center

Appendix F. Critical Facilities Map

See Attached Large Format Map of Critical Facilities.