Multi-Hazard Mitigation Plan

Huntington County

Huntington County
Emergency
Management Agency
332 East State Street
Huntington, IN 46750

Region III-A Economic
Development District & Regional
Planning Commission
217 Fairview Boulevard
Kendallville, IN 46755

The Polis Center
IUPUI
1200 Waterway Boulevard
Suite 100
Indianapolis, IN 46202

Hazard Mitigation Plan

Huntington County, Indiana

Adoption Date: -- ________________________ --

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Section 1 - Public Planning Process

1.1 Narrative Description

Hazard Mitigation is defined as any sustained action to reduce or eliminate long-term risk to human life and property from hazards. The Federal Emergency Management Agency (FEMA) has made reducing hazards one of its primary goals; hazard mitigation planning and the subsequent implementation of resulting 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 a requirement 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.

The Northeast Indiana Economic Development District (Region III-A), The Polis Center, and Huntington County have joined efforts to develop this mitigation plan, realizing that the recognition of and the protection from hazards impacting the county and its residents contribute to future community and economic development. The team will continue to work together to develop and implement mitigation initiatives developed as part of this plan.

In recognition of the importance of planning in mitigation activities, FEMA created Hazards USA Multi-Hazard (HAZUS-MH), a powerful geographic information system (GIS)-based disaster risk assessment tool. This tool enables communities of all sizes to predict the estimated losses from floods, hurricanes, earthquakes, and other related phenomena and to measure the impact of various mitigation practices that might help reduce those losses. The Indiana Department of Homeland Security has determined that HAZUS-MH should play a critical role in Indiana's risk assessments. The Polis Center (Polis) at Indiana University Purdue University Indianapolis (IUPUI) and the Indiana Geological Survey at Indiana University are assisting Huntington County planning staff with performing the hazard risk assessment.

1.2 Planning Team Information

The Huntington County Multi-Hazard Mitigation Planning Team is headed by Brandon Taylor, who is the primary point of contact. Members of the planning team include representatives from various county departments and cities and towns. Table 1-1 identifies the planning team individuals and the organizations they represent.

Table 1-1: Multi-Hazard Mitigation Planning Team Members

Name	Title	Organization	Jurisdiction
Jerry Helvie	Commissioner	Huntington County Commissioners	Huntington County
Tom Wuensch	Fire Chief	Andrews Fire Department	Town of Andrews
Jim Paul	Firefighter	Mt.Etna Fire Department	Town of Mt.Etna
Tim Ford	Firefighter	Warren Fire Department	Town of Warren
Duane Brumbaugh	Fire Chief	Markle Fire Department	Town of Markle

Name	Title	Organization	Jurisdiction
Jeff Caley	Deputy Fire Chief	Huntington City Fire Department	City of Huntington
Rob Miller	Council Member	Huntington County Council	Huntington County
Troy Karshner	Council Member	Roanoke Town Council	Town of Roanoke
Brandon Taylor	Director	Huntington County Emergency Management	Huntington County

The Disaster Mitigation Act (DMA) planning regulations and guidance stress that planning team members must be active participants. The Huntington County MHMP committee members were actively involved on the following components:

- Attending the MHMP meetings
- Providing available GIS 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

An MHMP kickoff meeting was held at the Huntington County Jail on April 21, 2009. Representatives of The Polis Center explained the rationale behind the MHMP program and answered questions from the participants. The Polis Center also provided an overview of HAZUS-MH, described the timeline and the process of the mitigation planning project, and presented Huntington County with a Memorandum of Understanding (MOU) for sharing data and information.

The Huntington County Multi-Hazard Mitigation Planning Committee met on April 21, 2009, May 26, 2009, October 20, 2009, December 7, 2009, and February 23, 2010. These meetings were held in Huntington, Indiana in the county jail. Each meeting was approximately two hours in length. The meeting agendas, minutes, and attendance sheets are included in Appendix A. During these meetings, the planning team successfully identified critical facilities, reviewed hazard data and maps, identified and assessed the effectiveness of existing mitigation measures, established mitigation projects, and assisted with preparation of the public participation information.

1.3 Public Involvement in Planning Process

An effort was made to solicit public input during the planning process and a public meeting was held during the formation of the plan on October 20, 2009. Appendix A contains the agendas and minutes from the public meeting. Appendix B contains articles published by the local newspaper throughout the public input process.

1.4 Neighboring Community Involvement

The Huntington County planning team invited participation from various representatives of county government, local city and town governments, community groups, local businesses, and universities. The team also invited participation from adjacent counties to obtain their involvement in the planning process. Details of neighboring stakeholders' involvement are summarized in Table 1-2.

Table 1-2: Neighboring Community Participation

Person Participating	Neighboring Jurisdiction	Organization	Participation Description
Sherry Johnson	Wells County	Emergency Management Agency	Reviewed draft of plan and offered comments/revisions
Bernie Beier	Allen County	Emergency Management Agency	Reviewed draft of plan and offered comments/revisions
Bruce Bender	Grant County	Emergency Management Agency	Reviewed draft of plan and offered comments/revisions
Cathy Broxon-Ball	Whitley County	Emergency Management Agency	Reviewed draft of plan and offered comments/revisions
Bob Brown	Wabash County	Emergency Management Agency	Reviewed draft of plan and offered comments/revisions

1.5 Review of Technical and Fiscal Resources

The MHMP planning team has identified representatives from key agencies to assist in the planning process. Technical data, reports, and studies were obtained from these agencies. The organizations and their contributions are summarized in Table 1-3.

Table 1-3: Key Agency Resources Provided

Agency Name	Resources Provided
Indiana Department of Homeland Security	Provided repetitive loss information
Indiana Department of Natural Resources, Division of Water	Digital Flood maps and levee information
Indiana Geological Survey	GIS data, digital elevation models

1.6 Review of Existing Plans

Huntington County and its associated local communities utilized a variety of planning documents to direct community development. These documents include land use plans, master plans, emergency response plans, municipal ordinances, and building codes. The MHMP planning process incorporated the existing natural hazard mitigation elements from previous planning efforts. Table 1-4 lists the plans, studies, reports, and ordinances used in the development of the plan.

Table 1-4: Planning Documents Used for MHMP Planning Process

Author(s)	Year	Title	Description	Where Used
Huntington County EMA	2003	Comprehensive Hazard Analysis and Strategic Preparedness Plan	Identifies specific hazards in Huntington County and identifies preparedness activities	Sections 3, 4, and 5
Huntington County EMA	2003	Comprehensive Emergency Management Plan	Establishes the basis for a coordinated response and outline agency specific functions	Sections 3, 4, and 5
Huntington County Local Emergency Planning Committee	2008	LEPC Hazardous Materials Plan	Hazardous Material Transportation and Facility Specific Plans and Policies	Sections 4 and 5
Huntington County Emergency Management	2008	Crisis Communications Plan	Outlines Public Information Strategies and Policies	Section 5

Author(s)	Year	Title	Description	Where Used
Salamonie Dam Safety Plan	2008	US Army Corps of Engineers	Immediate Reference Material in the event of a dam failure of near failure emergency	Sections 4 and 5
J. Edward Roush Dam Safety Plan	2006	US Army Corps of Engineers	Immediate Reference Material in the event of a dam failure of near failure emergency	Sections 4 and 5

Section 2 - Jurisdiction Participation Information

The jurisdictions included in this multi-jurisdictional plan are listed in Table 2-1.

Table 2-1: Participating Jurisdictions

Jurisdiction Name
Town of Andrews
City of Huntington
County of Huntington
Town of Markle*
Town of Mount Etna
Town of Roanoke
Town of Warren

**Markle is split between Huntington and Wells Counties*

2.1 Adoption by Local Governing Body

The draft plan was made available on February 23, 2010 to the planning team for review. Comments were then accepted. The Huntington County hazard mitigation planning team presented and recommended the plan to the County Commissioners, who adopted it on *<date adopted>*. Resolution adoptions are included in Appendix C of this plan.

2.2 Jurisdiction Participation

It is required that each jurisdiction participates in the planning process. Table 2-2 lists each jurisdiction and describes its participation in the construction of this plan.

Table 2-2: Jurisdiction Participation

Jurisdiction Name	Participating Member	Participation Description
Huntington County	Jerry Helvie	Member, MHMP
Huntington County	Brandon Taylor	Member, MHMP
Huntington County	Brian Topp	Member, MHMP
Andrews	Tom Wuensch	Member, MHMP
Mount Etna	Jim Paul	Member, MHMP
Warren	Tim Ford	Member, MHMP
Markle	Duane Brumbaugh	Member, MHMP
Huntington (City)	Jeff Caley	Member, MHMP
Roanoke	Troy Karshner	Member, MHMP

All members of the MHMP team actively participated in the development of the plan by attending the meetings, providing available GIS data and historical hazard information, reviewing and providing comments on the draft plans, coordinating and participating in the public input process, and/or coordinating the formal adoption of the plan by the county.

Section 3 - Jurisdiction Information

Organized on December 2, 1834, Huntington County was named for Samuel Huntington, President of the Continental Congress. The city of Huntington was appointed county seat in 1848 and grew 180% from 1848–1870.

Huntington County consists of 12 townships: Clear Creek, Dallas, Huntington, Jackson, Jefferson, Lancaster, Polk, Rock Creek, Salamonie, Union, Warren, and Wayne.

Sources: http://www.countyhistory.com/huntington/start.html; http://www.huntingtoncounty.org/history/history.htm

3.1 Topography

Huntington County is located in the northeastern portion of the state. It is bounded by the following counties: Allen to the northeast, Grant to the southwest, Wabash to the west, Wells to the southeast, and Whitley to the north. The county is generally level to moderately sloping in the southern part and nearly level to strongly sloping in the northern part. In areas that are dissected by the Wabash, Salamonie, and Little Rivers and their tributaries, the land is strongly sloping to very steep. Elevation at the highest point, in the northwest corner of the county, is approximately 912 feet; the lowest elevation, on the west edge near where the Wabash River flows from the county, is 660 feet.

Source: Natural Resources Conservation Service, Indiana Online Soil Survey Manuscripts

3.2 Climate

In Huntington County, mid-summer temperatures can be excessively hot and the winter snowfall can vary greatly from one year to the next. Humidity averages 60% for the mid-afternoon and rises during the evening with dawn humidity around 80%. The possibility for sunshine is 75% during the summer and 45% during the winter. Rainfall is moderately heavy and averages 35 inches annually, falling mostly during the spring and summer months. The average seasonal snowfall is 30 inches. The prevailing wind is from the south-southwest at an average speed of 10 miles per hour.

Sources: http://www.city-data.com/city/Huntington-Indiana.html

3.3 Demographics

Huntington County has a population of 37,570. According to STATS Indiana, from 1990–2000, Huntington County experienced a population increase of 7.5%. The population is spread through 12 townships including Clear Creek, Dallas, Huntington, Jackson, Jefferson, Lancaster, Polk, Rock Creek, Salamonie, Union, Warren, and Wayne. The largest town in Huntington County is Huntington, which has a population of approximately 16,521. The breakdown of population by incorporated areas is included in Table 3-1.

Table 3-1: Population by Community

Community	2008 Population	% of County
Andrews	1,245	3.3%
Huntington	16,521	44.0%
Markle	651	1.7%
Mount Etna	106	0.3%
Roanoke	1,482	3.9%
Warren	1,309	3.5%

Source: STATS Indiana, 2008

3.4 Economy

STATS Indiana reported for 2007 that 87.2% of the workforce in Huntington County was employed in the private sector. The breakdown is included in Table 3-2. Manufacturing represents the largest sector, employing approximately 21.7% of the workforce and generating approximately 34.0% of the earnings. The 2007 annual per capita income in Huntington County is $29,458 compared to an Indiana average of $33,215.

Table 3-2: Industrial Employment by Sector

Industrial Sector	% of County Workforce (2007)
Agriculture, forestry, fishing, hunting, and mining	4.2%
Construction	4.5%
Manufacturing	21.7%
Wholesale trade	3.7%
Retail trade	11.0%
Transportation, warehousing and utilities	4.4%
Information	2.4%
Arts, entertainment, recreation, accommodation and food services	1.1%
Other services(except public administration)	16.9%
Public administration	8.6%

Source: STATS Indiana, 2007

3.5 Industry

Huntington County's major employers and number of employees are listed in Table 3-3. The largest employer is Huntington Community Schools, which has nearly 1,000 employees. UT Electronic Controls is the second largest, with 656 full-time employees.

Table 3-3: Major Employers

Company Name	Location	Established	Employees	Type of Business
Manufacturing				
UT Electronic Controls	Huntington	1990	656	Printed circuit boards
Bendix Commercial Systems	Huntington	1980	400	Vehicle Air Brake System
Schenkles Dairy	Huntington	1930	177	Dairy Products
Good Humor/Breyers	Huntington	1909	170	Ice Cream

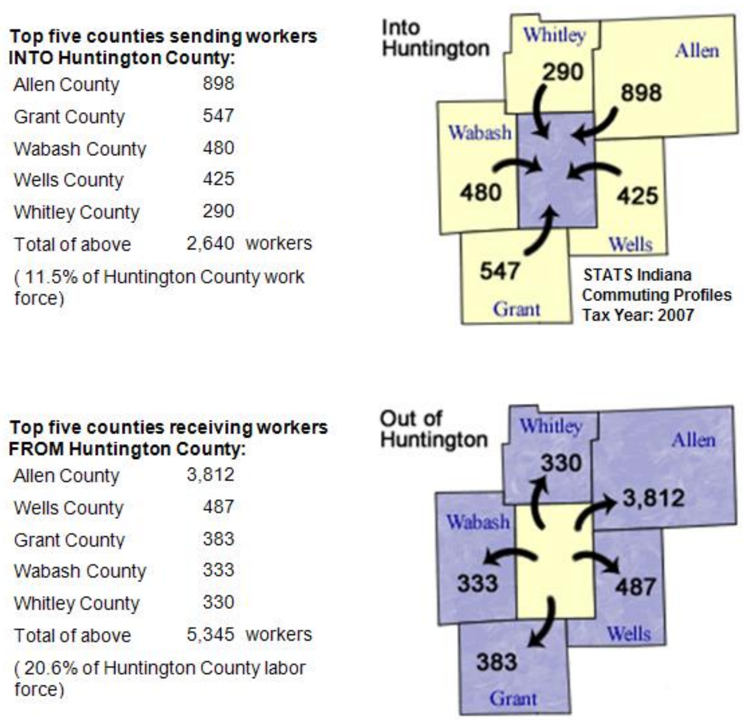
Company Name	Location	Established	Employees	Type of Business
Square D	Huntington	1966	170	Electrical Switchgear
Wayne Metals	Markle	1940	140	Fabricated Metal Products
Transwheel	Huntington	1992	130	Automotive Products
Wabash Technologies	Huntington	1934	88	Electronic Products
PHD, Inc.	Huntington	1959	70	Pump Equipment
Transportation				
Hiner Transport	Huntington	2003	70	Trucking
Dayton Freight	Markle	1992	75	Trucking
Other				
Huntington Community Schools	Huntington	1965	1000	Educational Services
Heritage Pointe	Warren	1910	360	Retirement Community
Parkview Huntington Hospital	Huntington	1997	285	Medical
Pathfinder Services	Huntington	1952	266	Family Services
Our Sunday Visitor	Huntington	1912	280	Religious Publishing
Unilever	Huntington	N/A	150	Ice Cream Products

Source: Region 3A RPC

Commuter Patterns

According to STATS Indiana information from 2007, Huntington County has approximately 25,954 residents who are in the work force. Of these, approximately 19,837 work in the county. Roughly 6,117 residents commute outside the county for work and 3,155 non-residents commute into the county to work. Figure 3-1 depicts the commuting patterns into and out of the top five surrounding jurisdictions.

Figure 3-1: Commuter patterns into and out of Huntington County



3.6 Land Use and Development Trends

Huntington County has several new developments planned in the near future. The new developments include Riverforks Industrial Park, a 2.56-acre industrial lot in Huntington; Markle Industrial Park, Warren Industrial Park; several new tax increment financing districts created in 2008; U.S. Army Corps of Engineers Recreational Reservoirs/Dam, managed by the Indiana Department of Natural Resources; Little River/Wabash & Erie Canal Heritage Trail; U.S. 24 Hoosier Heartland Corridor, a four-lane road construction project from Roanoke to I-469; improvements to Huntington Municipal Airport; and three other proposed new industrial parks.

The new developments are expected to create an increasing trend in population, traffic, and recreational activity within the county.

3.7 Major Lakes, Rivers, and Watersheds

The Salamonie, Wabash, and Little Wabash Rivers all traverse through Huntington County. Huntington Lake and Salamonie Lake are also significant bodies of water in the county.

A list of 14-digit Hydrologic Unit Code (HUC) watersheds is included in Table 3-4.

Table 3-4: Watersheds

Watershed Name	HUC Code
Wabash River-Griffin Ditch	05120101070060
Rock Creek-Stites Ditch	05120101080040
Mossburg Ditch-Palmer/Stevens Ditches	05120101080050
Rock Creek-Whitelock Ditch	05120101080060
Rock Creek-Eikenberry Ditch	05120101080070
Wabash River-Huntington Lake Dam	05120101090010
Wabash River-Huntington Waterworks	05120101090020
Little River-Allen	05120101100030
Aboite Creek-Big Indian/Little Indian Creeks	05120101100060
Little River-Calf/Cow Creeks	05120101100070
Eightmile Creek-Pleasant Run Ditch	05120101110050
Flat Creek-Headwaters (Wells)	05120101120010
Little River-Flat Creek (lower)	05120101120020
Little River-Bull Creek	05120101120030
Little River-Mud Creek	05120101120040
Little River-Flint Creek	05120101120050
Clear Creek-Headwaters (Huntington)	05120101130010
West Branch-Brown Ditch	05120101130020
Clear Creek-Clear Creek Church	05120101130030
Clear Creek-NW Trib/Prigrims Rest Cemetary	05120101130040
Wabash River-Silver Creek-Nieman Creek	05120101140010
Loon Creek	05120101140020
Wabash River-Rager Creek-Possum Hollow	05120101140030
Salamonie River-Morrison Ditch	05120102030080
Black Creek-Van Buren	05120102030100

Watershed Name	HUC Code
Salamonie River-Weasel Creek/Detamore Ditch	05120102040010
Salamonie River-Lancaster	05120102040020
Richland Creek-Prairie Creek/Pond Creek	05120102040030
Majencia Creek-Headwaters	05120102040040
Majencia Creek-Little Majencia Creek	05120102040050
Salamonie Reservoir-Upper/Mt. Etna	05120102040060
Rush Creek-Logan/Small Rush Creeks	05120102040070
Salamonie River-Salamonie Dam/Back Creek	05120102040080
Mississinewa River-Hummel Creek	05120103060010
Metocinah Creek-Jocinah Creek	05120103060030
Eel River-Simonton Creek	05120104040040
Pony Creek-Headwaters	05120104040060

Source: U.S. Geological Survey HUC14 Watersheds, 2006

Section 4 - Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including loss of life, property damage, disruption to local and regional economies, and the expenditure of public and private funds for recovery. Sound mitigation must be based on sound 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 of the community could be affected by a disaster, and the impact on community assets. A risk assessment consists of three components—hazard identification, vulnerability analysis, and risk analysis.

4.1 Hazard Identification/Profile

4.1.1 Existing Plans

The plans identified in Table 1-3 did not contain a risk analysis. These local planning documents were reviewed to identify historical hazards and help identify risk. To facilitate the planning process, DFIRM maps were used for the flood analysis.

4.1.2 National Hazard Records

4.1.2.1 National Climatic Data Center (NCDC) Records

To assist the planning team, historical storm event data was compiled from the National Climatic Data Center (NCDC). 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 events.

The NCDC data included 219 reported events in Huntington County between January 1, 1950 and December 31, 2008. A summary table of events related to each hazard type is included in the hazard profile sections that follow. A full table listing all events, including additional details, is included as Appendix D. In addition to NCDC data, Storm Prediction Center (SPC) data associated with tornadoes, strong winds, and hail were plotted using SPC recorded latitude and longitude. These events are plotted and included as Appendix E. The list of NCDC hazards is included in Table 4-1.

Table 4-1: Climatic Data Center Historical Hazards

Hazard
Tornadoes
Severe Thunderstorms
Drought/Extreme Heat
Winter Storms
Flood/Flash flood

4.1.2.2 FEMA Disaster Information

In the past decade, FEMA has declared a number of emergencies and disasters for the state of Indiana. Emergency declarations allow states access to 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). Huntington County has received federal aid for both PA and IA funding for seven declared disasters since 1998. Figure 4-1 depicts the disasters and emergencies that have been declared for Huntington County within the past decade. Table 4-2 lists more specific information for each declaration.

Figure 4-1: FEMA-Declared Emergencies and Disasters in Huntington County (1998-2009)

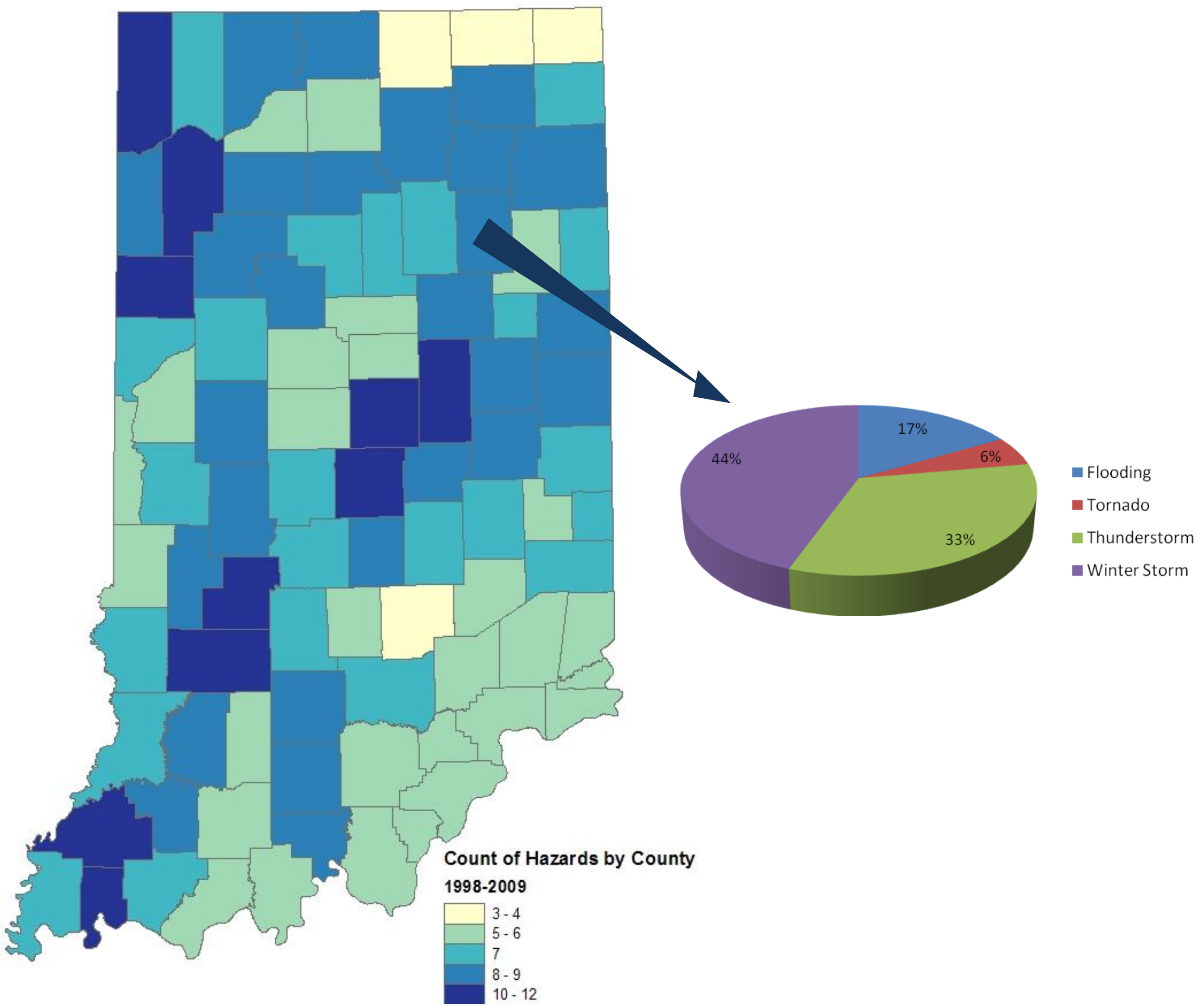


Table 4-2: FEMA-Declared Emergencies in Huntington County (1998-2009)

Date of Incident	Date of Declaration	Disaster Description	Type of Assistance
1/01/99 – 1/31/99	1/15/99	Severe Winter Storms	Public
12/11/00 – 12/31/00	1/24/01	Severe Winter Storms	Public
7/04/03 – 8/06/03	7/11/03	Severe Storms, Tornadoes, and Flooding	Individual and Public
5/25/04 – 6/25/04	6/3/04	Severe Storms, Tornadoes, and Flooding	Individual
1/01/05 – 2/11/05	1/21/05	Severe Winter Storms and Flooding	Individual
2/12/07 – 2/14/07	3/12/07	Severe Winter Storms	Public
06/06/08 – 06/27/08	06/08/08	Severe Storms and Flooding	Individual

4.1.3 Hazard Ranking Methodology

During Meeting #2, held on May 26, 2009, the planning team reviewed historical hazards information and participated in a risk analysis using a projector and Excel spreadsheet. The spreadsheet listed the compiled NCDC data for each community.

The spreadsheet calculated the probability rating (Low, Medium, High) of each hazard based on the number of events that have occurred in the county within the past 50 years. Throughout the planning process, the MHMP team had the opportunity to update the NCDC data with more accurate local information. For example, the NCDC records often list the locations of hazards such as floods under the county, not accounting for how the individual communities were affected. In such situations, the probability rating assigned to the county was applied to all jurisdictions within the county.

Team consensus was also important in determining the probability of hazards not recorded by NCDC, e.g. dam and levee failure and hazardous materials spills. The probabilities for these hazardous events were determined by the planning team's estimation, derived from local experience and records, of the number of historical events that have occurred within the past 50 years. The probability ratings are based on the following guidelines:

- Low = 0-5 events
- Medium = 6-15 events
- High = 16+ events

After improving the NCDC data with additional local data, the team determined each hazard's potential impact on the communities. The impact rating (Minimal, Moderate, Significant) was based on the following guidelines.

- Minimal = Few injuries
Critical facilities shut down for 24 hours
Less than 15% of property damage
- Moderate = Multiple injuries
Critical facilities shut down for 1-2 weeks
At least 30% of property damaged
- Significant = Multiple deaths
Critical facilities shut down for more than 1 month
More than 50% of property damaged

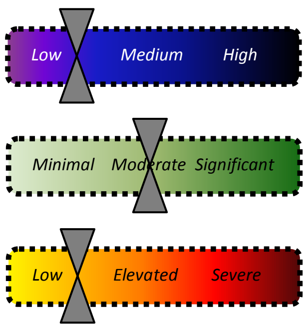
Finally, the overall hazard risk was determined by multiplying probability and impact. It is important to consider both probability and impact when determining risk. For example, if an asteroid were to collide with Earth, the impact would be extreme; but the probability of an asteroid strike (has not happened in billions of years) is so negligibly small that the overall risk is extremely low. There has never been a situation in human history in which a person was killed by a meteor. In contrast, other potentially damaging events like thunderstorms and floods are relatively less severe, but have occurred regularly in many places.

Each hazard addressed within the plan will use sliding scales to represent the probability, impact, and overall risk ratings. The scales will be depicted as follows:

Probability

Impact

Hazard Risk



The planning team identified tornadoes, flooding, and hazardous materials spills as the three most significant hazards affecting Huntington County. The county's hazard rankings are listed in Table 4-3.

Table 4-3: Huntington County Hazards

HAZARD CATEGORIES	HAZARD PROBABILITY Probability Rating	HAZARD IMPACT	HAZARD RISK
	(Low, Medium, High)	*(Minimal, Moderate, Significant)*	*(Low, Elevated, Severe)*
HUNTINGTON COUNTY			
Tornado	High	Significant	Severe
Flood	High	Moderate	Severe
Dam/Levee Failure	Low	Significant	Elevated
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	High	Significant	Severe
Structural Failure & Fires	Low	Significant	Elevated
ANDREWS			
Tornado	High	Significant	Severe
Flood	High	Significant	Severe
Dam/Levee Failure	High	Significant	Severe
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low

HAZARD CATEGORIES	HAZARD PROBABILITY Probability Rating	HAZARD IMPACT	HAZARD RISK
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	Medium	Significant	Elevated
Structural Failure & Fires	Low	Significant	Elevated
HUNTINGTON (CITY)			
Tornado	High	Significant	Severe
Flood	High	Moderate	Severe
Dam/Levee Failure	High	Significant	Severe
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	High	Significant	Severe
Structural Failure & Fires	Low	Significant	Elevated
MARKLE			
Tornado	High	Significant	Severe
Flood	Low	Moderate	Low
Dam/Levee Failure	High	Significant	Severe
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	High	Significant	Severe
Structural Failure & Fires	Low	Significant	Elevated
MOUNT ETNA			
Tornado	High	Significant	Severe
Flood	Low	Minimal	Low
Dam/Levee Failure	Low	Minimal	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	Low	Minimal	Low
Structural Failure & Fires	Low	Minimal	Low
ROANOKE			
Tornado	High	Significant	Severe
Flood	High	Significant	Severe
Dam/Levee Failure	Low	Minimal	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	High	Significant	Severe

HAZARD CATEGORIES	HAZARD PROBABILITY	HAZARD IMPACT	HAZARD RISK
	Probability Rating		
Structural Failure & Fires	Low	Significant	Elevated
WARREN			
Tornado	High	Significant	Severe
Flood	Medium	Minimal	Low
Dam/Levee Failure	Low	Minimal	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Minimal	Low
Winter Weather (snow & ice)	High	Moderate	Severe
Drought/Extreme Heat	Low	Minimal	Low
Hazardous Materials Release	Medium	Significant	Elevated
Structural Failure & Fires	Low	Significant	Elevated

4.1.4 GIS and HAZUS-MH

The third step in this assessment is the risk analysis which quantifies the risk to the population, infrastructure, and economy of the community. Where possible, the hazards were quantified using GIS analyses and HAZUS-MH. This process reflects a level two approach to analyzing hazards as defined for HAZUS-MH. The approach includes substitution of selected default data with local data. This process improved the accuracy of the model predictions.

HAZUS-MH generates a combination of site-specific and aggregated loss estimates depending upon the analysis options that are selected and upon the input that is provided by the user. Aggregate inventory loss estimates, which include building stock analysis, are based upon the assumption that building stock is evenly distributed across census blocks/tracts. Therefore, it is possible that overestimates of damage will occur in some areas while underestimates will occur in other areas. With this in mind, total losses tend to be more reliable over larger geographic areas than for individual census blocks/tracts. It is important to note that HAZUS-MH is not intended to be a substitute for detailed engineering studies. Rather, it is intended to serve as a planning aid for communities interested in assessing their risk to flood-, earthquake-, and hurricane-related hazards. This documentation does not provide full details on the processes and procedures completed in the development of this project. It is only intended to highlight the major steps that were followed during the project.

Site-specific analysis is based upon loss estimations for individual structures. For flooding, analysis of site-specific structures takes into account the depth of water in relation to the structure. HAZUS-MH also takes into account the actual dollar exposure to the structure for the costs of building reconstruction, content, and inventory. However, damages are based upon the assumption that each structure will fall into a structural class, and structures in each class will respond in a similar fashion to a specific depth of flooding or ground shaking. Site-specific analysis is also based upon a point location rather than a polygon, therefore the model does not account for the percentage of a building that is inundated. These assumptions suggest that the loss estimates for site-specific structures as well as for aggregate structural losses need to be viewed as approximations of losses that are subject to considerable variability rather than as exact engineering estimates of losses to individual structures.

The following events were analyzed. The parameters for these scenarios were created though GIS, HAZUS-MH, and historical information to predict which communities would be at risk.

Using HAZUS-MH
1. 100-year overbank flooding
2. Earthquake scenarios

Using GIS
1. Tornado
2. Hazardous material release

4.2 Vulnerability Assessment

4.2.1 Asset Inventory

4.2.1.1 Processes and Sources for Identifying Assets

The HAZUS-MH data is based on best available national data sources. The initial step involved updating the default HAZUS-MH data using State of Indiana data sources. At Meeting #1 the planning team members were provided with a plot and report of all HAZUS-MH critical facilities. The planning team took GIS data provided by The Polis Center; verified the datasets using local knowledge, and allowed The Polis Center to use their local GIS data for additional verification. Polis GIS analysts made these updates and corrections to the HAZUS-MH data tables prior to performing the risk assessment. These changes to the HAZUS-MH inventory reflect a level two analysis. This update process improved the accuracy of the model predictions.

The default HAZUS-MH data has been updated as follows:

- The HAZUS-MH defaults, critical facilities, and essential facilities have been updated based on the most recent available data sources. Critical and essential point facilities have been reviewed, revised, and approved by local subject matter experts at each county.
- The essential facility updates (schools, medical care facilities, fire stations, police stations, and EOCs) have been applied to the HAZUS-MH model data. HAZUS-MH reports of essential facility losses reflect updated data.

The default aggregate building inventory tables have been replaced with the most recent Assessor records. Huntington County provided the parcel boundaries to The Polis Center, and Indiana Department of Local Government and Finance provided the Huntington County Assessor records. Records without improvements were deleted. Each parcel point was linked to an Assessor record based upon matching parcel numbers. The generated building inventory points represent the approximate locations (within a parcel) of building exposure. The parcel points were aggregated by census block. Parcel-matching results for Huntington County are listed in Table 4-4.

Table 4-4: Parcel-Matching for Huntington County

Data Source	Count
Assessor Records	22,681
County Provided Parcels	22,774
Assessor Records with Improvements	16,462
Matched Parcel Points	14,123

The following assumptions were made during the analysis:

- The building exposure is determined from the Assessor records. It is assumed that the population and the buildings are located at the centroid of the parcel.
- The algorithm used to match county-provided address and parcel point locations with the Assessor records is not perfect. The results in this analysis reflect matched parcel and address records only. The parcel-matching results for Huntington County are included in Table 4-4.
- Population counts are based upon 2.5 persons per household. Only residential occupancy classes are used to determine the impact on the local population. If the event were to occur at night, it would be assumed that people are at home (not school, work, or church).
- The analysis is restricted to the county boundaries. Events that occur near the county boundaries do not contain damage assessments from adjacent counties.

4.2.1.2 Essential Facilities List

Table 4-5 identifies the essential facilities that were added or updated for the analysis. Essential facilities are a subset of critical facilities. A complete list of critical facilities is included as Appendix F. A map of all critical facilities is included as Appendix G.

Table 4-5: Essential Facilities List

Facility	Number of Facilities
Care Facilities	7
Emergency Operations Centers	1
Fire Stations	4
Police Stations	6
Schools	13

4.2.1.3 Facility Replacement Costs

Facility replacement costs and total building exposure are identified in Table 4-6. The replacement costs have been updated by local data. Table 4-6 also includes the estimated number of buildings within each occupancy class.

The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

Table 4-6: Building Exposure

General Occupancy	Estimated Total Buildings	Total Building Exposure (X 1000)
Agricultural	1,625	$277,076
Commercial	644	$202,470
Education	11	$37,887
Government	89	$50,401
Industrial	105	$142,168
Religious/Non-Profit	208	$122,932
Residential	11,441	$1,282,515
Total	**14,123**	**$2,115,449**

4.3 Future Development

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

Because Huntington County is vulnerable to a variety of natural and technological threats, the county government—in partnership with state government—must make a commitment to prepare for the management of these types of events. Huntington County is committed to ensuring that county elected and appointed officials become informed leaders regarding community hazards so that they are better prepared to set and direct policies for emergency management and county response.

4.4 Hazard Profiles

4.4.1 Tornado Hazard

Hazard Definition for Tornado Hazard

Tornadoes pose a great risk to the State of Indiana and its citizens. Tornadoes can occur at any time during the day or night. They can also happen during any month of the year. The unpredictability of tornadoes makes them one of Indiana's most dangerous hazards. Their extreme winds are violently destructive when they touch down in the region's developed and populated areas. Current estimates place the maximum velocity at about 300 mph, but higher and lower values can occur. A wind velocity of 200 mph will result in a wind pressure of 102.4 pounds per square foot of surface area—a load that exceeds the tolerance limits of most buildings. Considering these factors, it is easy to understand why tornadoes can be so devastating for the communities they hit.

Tornadoes are defined as 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 very 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 classified according to the Fujita tornado intensity scale. The tornado scale ranges from low intensity F0 with effective wind speeds of 40 to 70 mph to F5 tornadoes with effective wind speeds of over 260 mph. The Fujita intensity scale is included in Table 4-7.

Table 4-7: Fujita Tornado Rating

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, sign boards 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.

Source: NOAA Storm Prediction Center

Previous Occurrences for Tornado Hazard

There have been several occurrences of tornadoes within Huntington County during the past few decades. The NCDC database reported 16 tornadoes/funnel clouds in Huntington County since 1950.

For example, in April 2004, a National Weather Service storm survey team found F0 damage to trees from east of Huntington to southeast of Roanoke. The tornado was skipping along a six-mile wide path and was 50 yards wide. On April 20, 2004 a warm front located across central Indiana in the afternoon began to move north in the evening as a strong southerly flow rode over the front, creating a favorable environment for rapid thunderstorm development.

The Huntington County NCDC recorded tornadoes are identified in Table 4-8. Additional details for NCDC events are included in Appendix D.

Table 4-8: Huntington County Tornadoes*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	7/8/1955	Tornado	F1	0	0	3K	0
Huntington	8/19/1961	Tornado	F	0	0	3K	0
Huntington	4/17/1963	Tornado	F2	0	0	250K	0
Huntington	7/1/1967	Tornado	F2	0	2	25K	0
Huntington	5/16/1968	Tornado	F3	0	3	3K	0
Huntington	5/15/1970	Tornado	F0	0	0	0K	0
Huntington	4/3/1974	Tornado	F2	0	0	0K	0
Huntington	11/10/1975	Tornado	F1	0	15	250K	0
Huntington	6/15/1985	Tornado	F2	0	0	25K	0
Huntington	10/8/1992	Tornado	F1	0	0	250K	0
Huntington	10/8/1992	Tornado	F1	0	0	250K	0
Huntington	5/3/1998	Tornado	F0	0	0	0	0
Huntington	5/26/2001	Tornado	F0	0	0	0	0
Plum Tree	7/4/2003	Tornado	F1	0	0	5K	0
Huntington	4/20/2004	Tornado	F0	0	0	25K	0
Huntington	4/20/2004	Tornado	F0	0	0	0	0

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

Geographic Location for Tornado Hazard

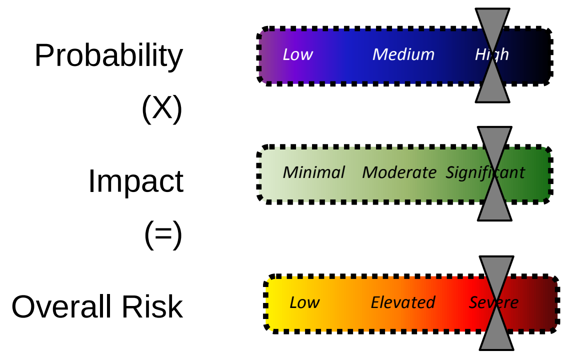
The entire county has the same risk for occurrence of tornadoes. They can occur at any location within the county.

Hazard Extent for Tornado Hazard

The historical tornadoes generally move from southwest to northeast across the county. The extent of the hazard varies both in terms of the extent of the path and the wind speed.

Risk Identification for Tornado Hazard

Based on historical information, the probability of a tornado is high. Tornadoes with varying magnitudes are expected to happen. In Meeting #2, the planning team determined that the potential impact of a tornado is significant; therefore, the overall risk of a tornado hazard for Huntington County is severe.



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 will consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Huntington County are discussed in Table 4-6.

Critical Facilities

All critical facilities are vulnerable to tornadoes. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts will vary based on the magnitude of the tornado, but can include structural failure, debris (trees or limbs) causing damage, 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 4-5 lists the types and numbers of all of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

The building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-6. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, debris (trees or limbs) causing damage, 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

During a tornado the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a tornado. 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 fail or become impassable causing risk to traffic.

An example scenario is described as follows to gauge the anticipated impacts of tornadoes in the county, in terms of numbers and types of buildings and infrastructure.

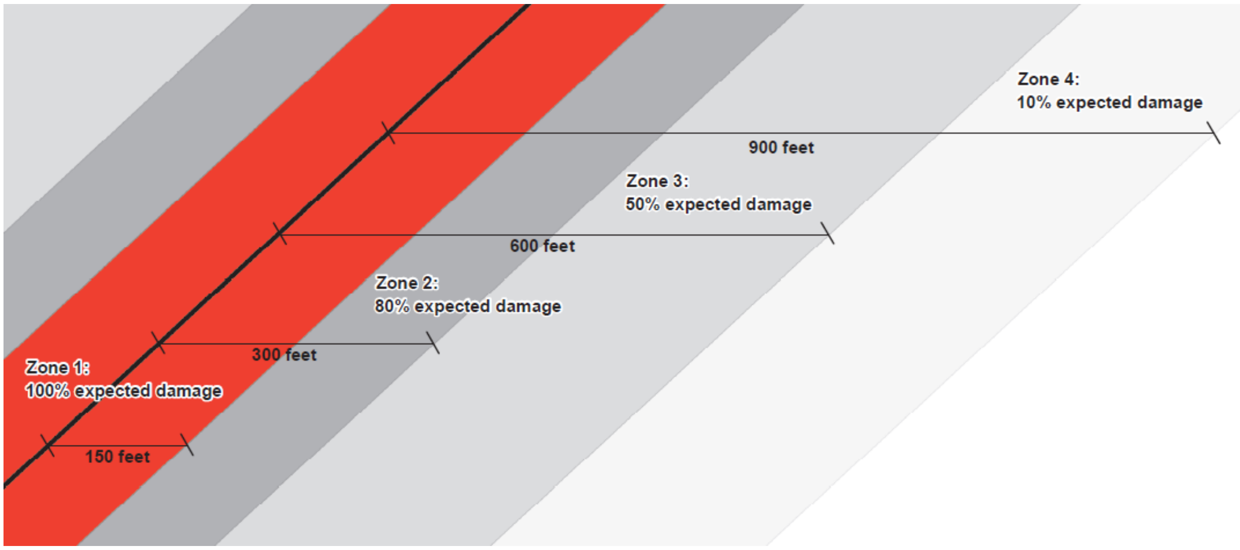
GIS overlay modeling was used to determine the potential impacts of an F4 tornado. The analysis used a hypothetical path based upon the F4 tornado event that runs 17.8 miles through the towns of Andrews, Huntington, and Roanoke. The selected widths were modeled after a recreation of the Fujita-Scale guidelines based on conceptual wind speeds, path widths, and path lengths. There is no guarantee that every tornado will fit exactly into one of these six categories. Table 4-9 depicts tornado damage curves as well as path widths.

Table 4-9: 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%

Within any given tornado path there are degrees of damage. The most intense damage occurs within the center of the damage path with decreasing amounts of damage away from the center. After the hypothetical path is digitized on a map the process is modeled in GIS by adding buffers (damage zones) around the tornado path. Figure 4-2 and Table 4-10 describe the zone analysis. The selected hypothetical tornado path is depicted in Figure 4-3, and the damage curve buffers are shown in Figure 4-4 and 4-5.

Figure 4-2: F4 Tornado Analysis Using GIS Buffers



An F4 tornado has four damage zones, depicted in Table 4-10. Total devastation is estimated within 150 feet of the tornado path. The outer buffer is 900 feet from the tornado path, within which buildings will experience 10% damage.

Table 4-10: F4 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: Hypothetical F4 Tornado Path in Huntington County

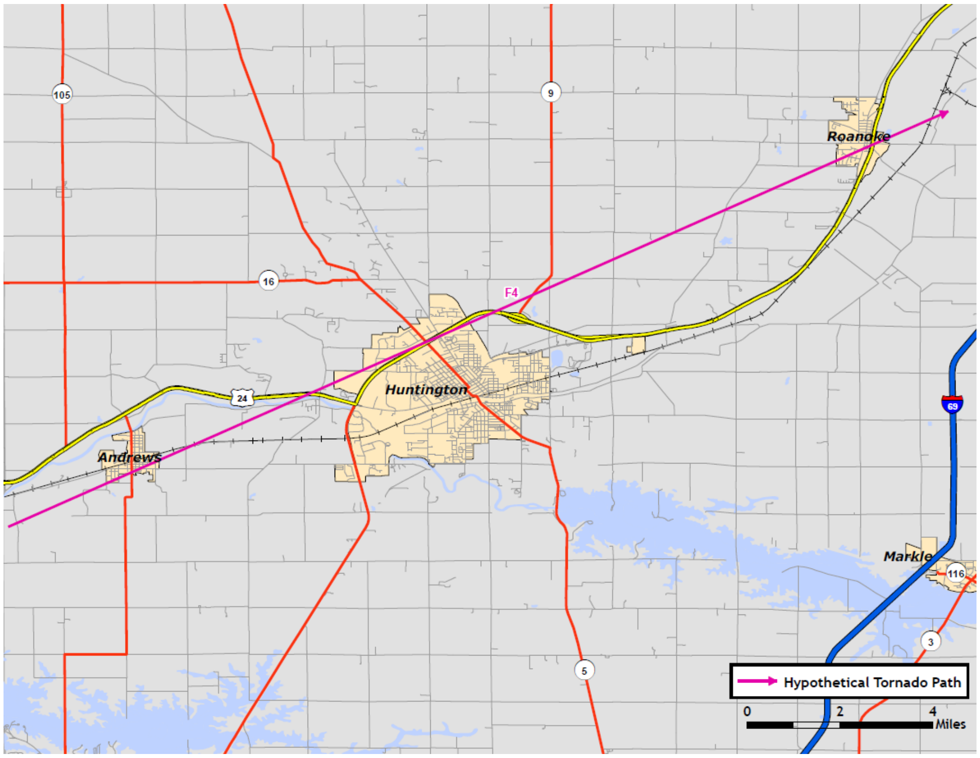


Figure 4-4: Modeled F4 Tornado Damage Buffers in Huntington

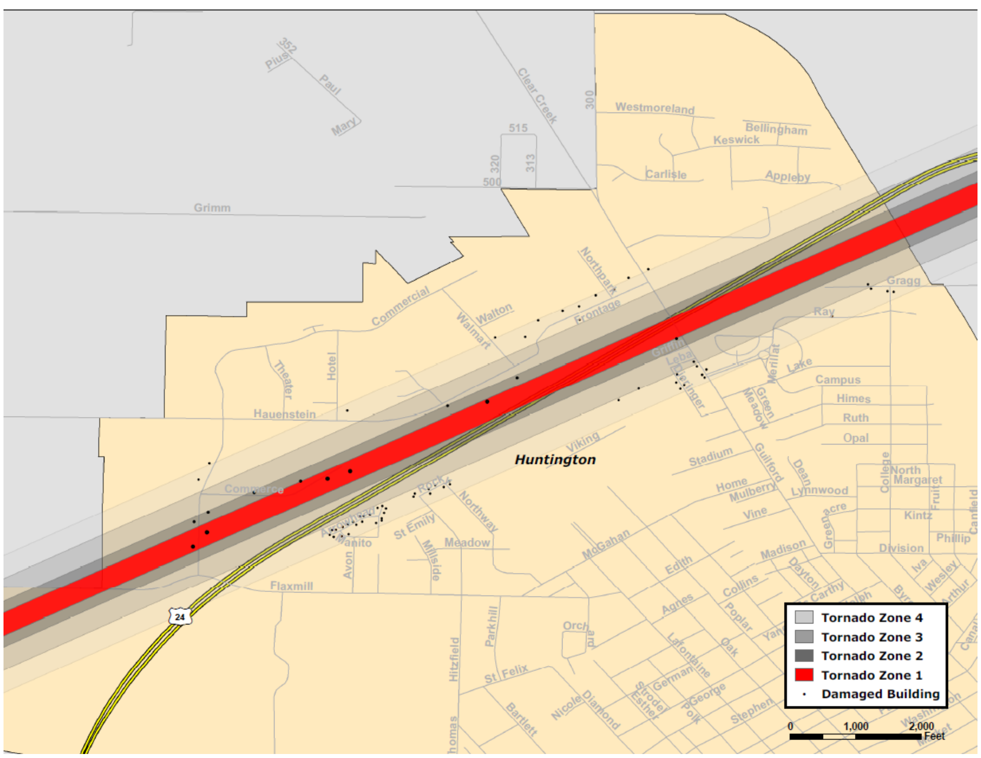
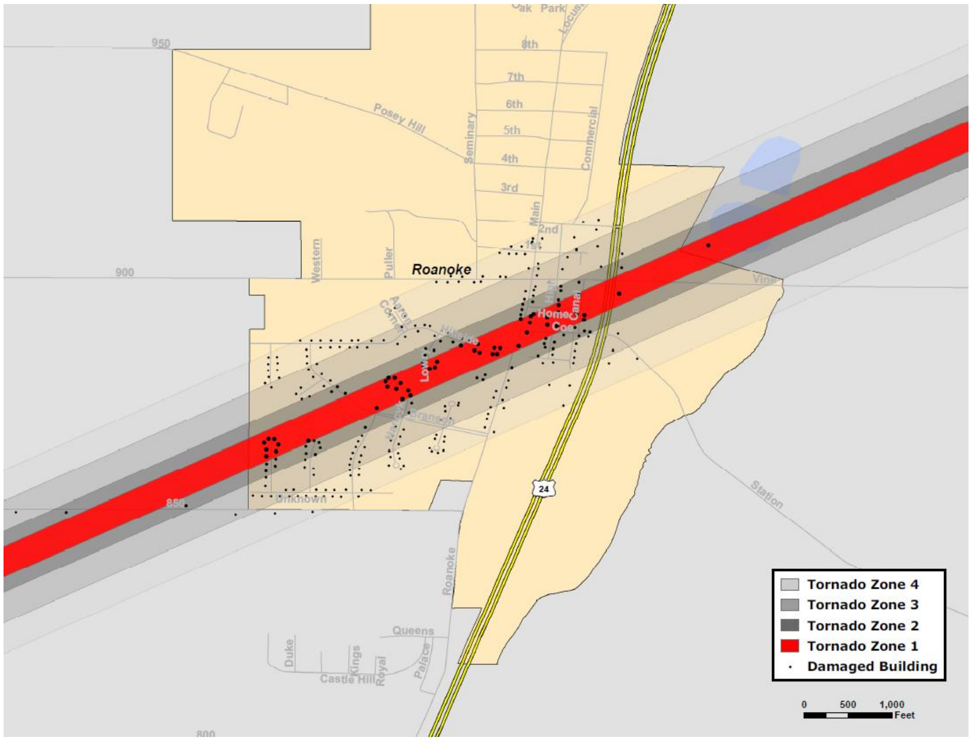


Figure 4-5: Modeled F4 Tornado Damage Buffers in Roanoke



The results of the analysis are depicted in Tables 4-11 and 4-12. The GIS analysis estimates that 677 buildings will be damaged. The estimated building losses were $61.7 million. The building losses are an estimate of building replacement costs multiplied by the percentages of damage. The overlay was performed against parcels provided by Huntington County that were joined with Assessor records showing property improvement.

The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

Table 4-11: Estimated Numbers of Buildings Damaged by Occupancy Type

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	87	94	180	195
Commercial	3	4	25	34
Industrial	3	3	0	2
Agriculture	3	8	11	5
Religious	3	1	3	3
Government	1	0	2	4
Education	0	0	2	1
Total	**100**	**110**	**223**	**244**

Table 4-12: Estimated Building Losses by Occupancy Type (X 1000)

Occupancy	Zone 1	Zone 2	Zone 3	Zone 4
Residential	$9,864	$8,292	$9,961	$2,295
Commercial	$1,166	$1,792	$7,521	$923
Industrial	$4,566	$1,846	$0	$374
Agriculture	$1,388	$1,208	$727	$55
Religious	$801	$81	$431	$82
Government	$44	$0	$3,752	$63
Education	$0	$0	$4,502	$11
Total	**$17,829**	**$13,219**	**$26,894**	**$3,803**

Critical Facility Damage

There are seven critical facilities located within 900 feet of the hypothetical tornado path. The model predicts that one medical care facility, one fire station, one police station, one school, one airport, one hazmat facility, and one waste water facility would experience damage. The affected facilities are identified in Table 4-13, and Figures 4-6 and 4-7show the geographic location of some facilities.

Table 4-13: Estimated Critical Facilities Affected

Name
Parkview Huntington Memorial Hospital
Andrews Elementary Schools
Roanoke Fire Department
Roanoke Police Department
The Wolf Den (Airport)
Square D Co. (Hazmat)
Roanoke Municipal WWTP

Figure 4-6: Critical Facilities within Tornado Path

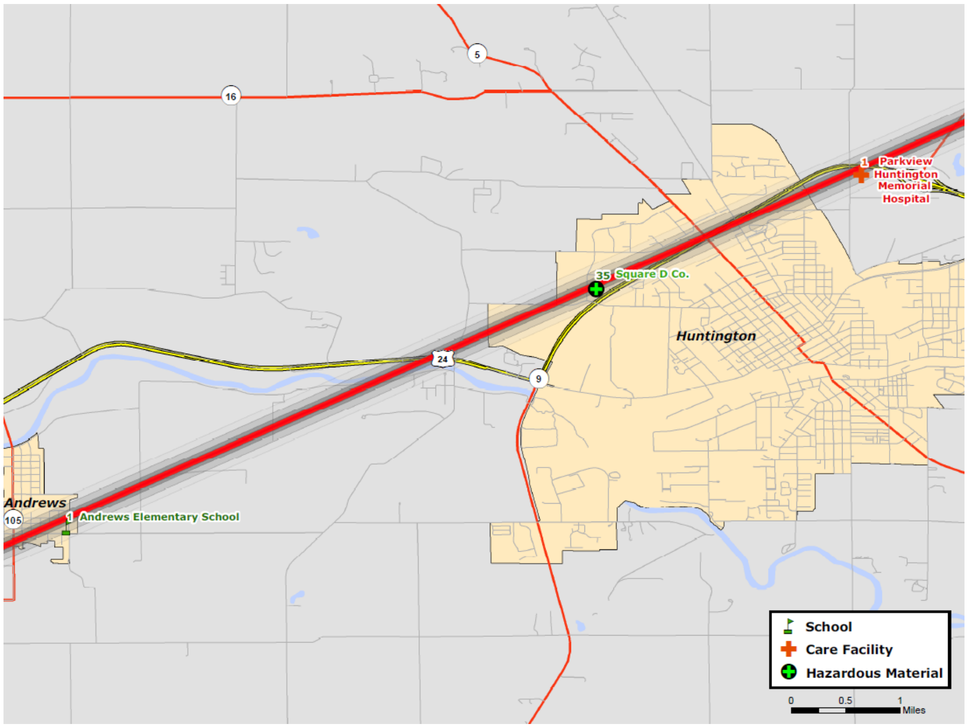
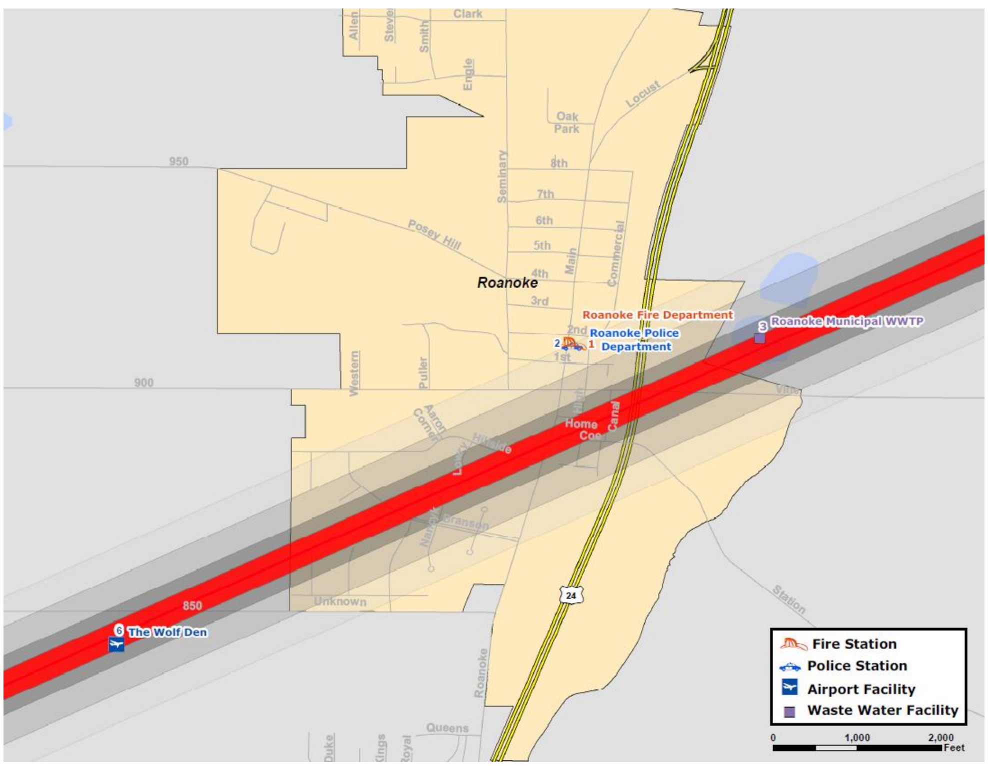


Figure 4-7: Critical Facilities within Tornado Path



Vulnerability to Future Assets/Infrastructure for Tornado Hazard

The entire population and buildings have been identified as at risk because tornadoes can occur anywhere within the State of Indiana, at any time of the day, and during any month of the year. Furthermore, any future development in terms of new construction within the county will be at risk. The building exposure for Huntington County is included in Table 4-6.

All critical facilities in the county and communities within the county are at risk. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Analysis of Community Development Trends

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction and those structures already in place need to be hardened to lessen the potential impacts of severe weather. Community warning sirens to provide warnings of approaching storms are also vital to preventing the loss of property and ensuring the safety of Huntington County residents.

4.4.2 Flood Hazard

Hazard Definition for Flooding

Flooding is a significant natural hazard throughout the United States. The type, magnitude, and severity of flooding are functions of the amount and distribution of precipitation over a given area, the rate at which precipitation infiltrates into the ground, the geometry and hydrology of the catchment, and flow dynamics and conditions in and along the river channel. Floods can be classified as one of two types: upstream floods or downstream floods. Both types of floods are common in Indiana. 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 damage over relatively localized areas, but they can be quite severe in the local areas where they occur. Urban flooding is a type of upstream flood. Urban flooding involves the overflow of storm drain systems and can be the result of inadequate drainage combined with heavy rainfall or rapid snowmelt. Upstream or flash floods can occur at anytime of the year in Indiana, 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 Indiana generally occurs during either the spring or summer.

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 for Flooding

The NCDC database reported 11 flood events in Huntington County since 1950. For example, in February 2008, local media outlets reported high water affecting portions of US 24 between Roanoke and Huntington, as well as State Road 114, west of US 24, on the Whitley/Huntington county line. A Roanoke firefighter spotted something in floodwaters, requested assistance and upon entering a boat and heading to the area, observed an elderly Warsaw, Indiana man sitting in his truck in waist deep water. The driver was hypothermic and difficult to understand from exposure to the cold floodwaters. He was taken to a local hospital for treatment.

The Huntington County NCDC recorded floods are identified in Table 4-14. Additional details for NCDC events are included in Appendix D. In addition, USGS stream gauge data of historical crests are listed in Appendix H.

Table 4-14: Huntington County Previous Occurrences of Flooding*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	3/7/1995	Flood	N/A	0	0	0	0
Roanoke	5/16/1996	Flash Flood	N/A	0	0	100K	10K
Huntington County	7/18/1996	Flash Flood	N/A	0	0	7.0M	100K
Huntington	7/23/1997	Flash Flood	N/A	0	0	0	0
Huntington	7/22/1998	Flood	N/A	0	0	1.5M	500K
Huntington	1/22/1999	Flood	N/A	2	0	3K	0
Roanoke	4/22/1999	Urban Fld	N/A	0	0	0	0
Huntington	6/24/2000	Flood	N/A	0	0	0	100K
Warren	7/5/2003	Flash Flood	N/A	0	0	150K	0
Huntington	7/6/2003	Flash Flood	N/A	0	0	0	0
Roanoke	2/5/2008	Flood	N/A	0	0	10K	0K

** 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.*

Previous Occurrences for Dam and Levee Failure

According to the Huntington County planning team, there is no record of certified dam or levee failure.

Repetitive Loss Properties

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

Indiana Department of Natural Resources (IDNR) and the Indiana Department of Homeland Security (IDHS) were contacted to determine the location of repetitive loss structures. Table 4-15 lists 2006 data including the total amount paid for building replacement and building contents for damages to these repetitive loss structures.

Table 4-15: Huntington County Repetitive Loss Structures

Jurisdiction	Occupancy Type	Number of Structures	Number of Losses	Total Paid
Andrews	Single-Family	1	2	$42,597.67
Huntington County	Single-Family	3	8	$135,653.91
Huntington County	Non-residential	1	3	$22,964.08
Roanoke	Single-Family	2	7	$59,239.18
Totals		**7**	**20**	**$260,454.84**

Geographic Location for Flooding

Most river flooding occurs in early spring and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Severe thunderstorms may cause flooding during the summer or fall, but tend to be localized.

Based on historical incidents, the primary sources of river flooding in Huntington County are the Salamonie, Wabash, and Little Wabash Rivers.

Flash floods, brief heavy flows in small streams or normally dry creek beds, also occur within the county. Flash flooding is typically characterized by high-velocity water, often carrying large amounts of debris. Urban flooding involves the overflow of storm drain systems and is typically the result of inadequate drainage following heavy rainfall or rapid snowmelt.

The IDNR recently digitized the paper FEMA Flood Insurance Rate Maps (FIRM). These digital files, although not official FIRMs, provided the boundary which was the basis for this analysis. The overbank flooding areas are depicted on the map in Appendix E. Flash flooding may occur countywide.

The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service provides information from gauge locations at points along various rivers across the United States. For Huntington County, data is provided for two points: Little River 5 E

Huntington and Salamonie River 2 NW Warren. Appendix H lists information pulled from the NOAA website, which includes flood categories, historical crests, and details about anticipated impacts to agricultural lands, dams, levees, and other built structures at significant flood crest levels.

Geographic Location for Dam and Levee Failure

The National Inventory of Dams identified five dams in Huntington County. The map in Appendix G illustrates the location of Huntington County dams. Table 4-16 summarizes the National Inventory of Dams information.

Table 4-16: National Inventory of Dams

Dam Name	River	Hazard	EAP
HUNTINGTON COLLEGE LAKE D.	Unnamed Tributary Flint Creek	S	N
TIMBER LAKE DAM	Unnamed Tributary Bull Creek	L	N
J. EDWARD ROUSH LAKE DAM	WABASH RIVER	H	Y
LAKE CLARE CONTROL STRUCTURE	Unnamed Tributary Clear Creek	L	N
WAHL-SHIN-CAH LAKE	Unnamed Huntington Reservoir #1	L	N

A review of the Indiana Department of Natural Resource's files identified no levees in Huntington County.

** The dams listed in this multi-hazard mitigation plan are recorded from historical IDNR data. Their physical presences were not confirmed; therefore, new or unrecorded structures may exist. A more complete listing can be found in Appendix G.*

Hazard Extent for Flooding

The HAZUS-MH flood model is designed to generate a flood depth grid and flood boundary polygon by deriving hydrologic and hydraulic information based on user-provided elevation data or by incorporating selected output from other flood models. HAZUS-MH also has the ability to clip a Digital Elevation Model (DEM) with a user-provided flood boundary, thus creating a flood depth grid. For Huntington County HAZUS-MH was used to extract flood depth by clipping the DEM with the IDNR FIRMs Base Flood Elevation (BFE) boundary. The BFE is defined as the area that has a 1% chance of flooding in any given year.

Flood hazard scenarios were modeled using GIS analysis and HAZUS-MH. The flood hazard modeling was based on historical occurrences and current threats. Existing IDNR flood maps were used to identify the areas of study. These digital files, although not official FIRMs, provided the boundary which was the basis for this analysis. Planning team input and a review of historical information provided additional information on specific flood events.

Hazard Extent for Dam and Levee Failure

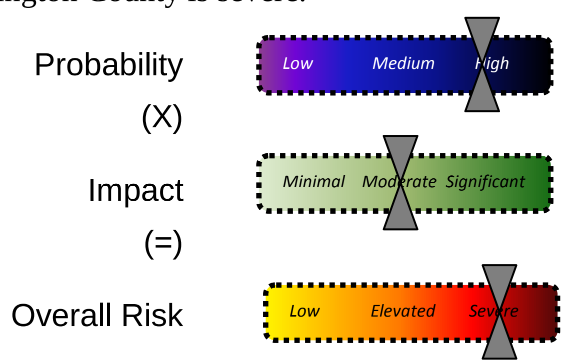
When dams are assigned the low (L) hazard potential classification, it means that failure or incorrect operation of the dam will result in zero human life losses and no low economic and/or environmental losses. Losses are principally limited to the owner's property. Dams assigned the significant (S) hazard classification are those dams in which failure or incorrect operation results in no probable loss of human life; however it can cause economic loss, environment damage, disruption of lifeline facilities, or impact other concerns. Dams classified as 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. Dams assigned the high (H) hazard potential classification are those dams in which failure or incorrect operation has the highest risk to cause loss of human life and significant damage to buildings and infrastructure.

According to the IDNR and the National Inventory of Dams, one dam is classified as high hazard dams, and one dam has an Emergency Action Plan (EAP). An EAP is not required by the State of Indiana but is recommended in the 2003 Indiana 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 clearly 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 in some cases private individuals or organizations—are responsible for ensuring that the levees they own are maintained according to their design. 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 one-percent-annual chance flood.

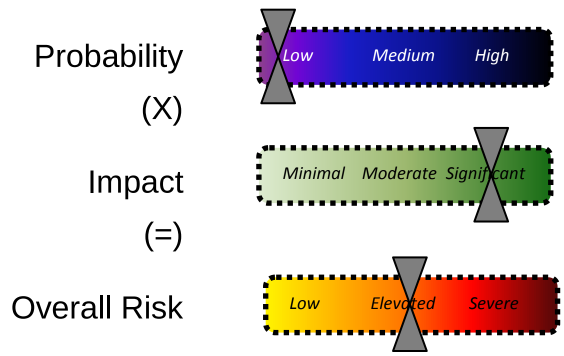
Risk Identification for Flood Hazard

Based on historical information, the probability of a flood is high. In Meeting #2, the planning team determined that the potential impact of a flood is moderate; therefore, the overall risk of a flood hazard for Huntington County is severe.



Risk Identification for Dam/Levee Failure

Based on historical information, the probability of dam/levee failure is low. In Meeting #2, the planning team determined that the potential impact of dam/levee failure is significant; therefore, the overall risk of dam/levee failure for Huntington County is elevated.



HAZUS-MH Analysis Using 100-Year Flood Boundary and County Parcels

HAZUS-MH generated the flood depth grid for a 100-year return period by clipping the IGS 1/3 ArcSecond (approximately 10 meters) Digital Elevation Model (DEM) to the Huntington County flood boundary. Next, HAZUS-MH utilized a user-defined analysis of Huntington County with site-specific parcel data provided by the county.

HAZUS-MH estimates the 100-year flood would damage 167 buildings at a replacement cost of $3.5 million. The total estimated numbers of damaged buildings are given in Table 4-17. Figure 4-8 depicts the Huntington County parcel points that fall within the 100-year floodplain. Figures 4-9 and 4-10 highlight damaged buildings within the floodplain areas in Huntington and Roanoke.

Table 4-17: Huntington County HAZUS-MH Building Damage

General Occupancy	Number of Buildings Damaged	Total Building Damage (x1000)
Residential	106	$2,727
Commercial	17	$247
Industrial	3	$25
Agricultural	39	$541
Religious	1	$43
Government	1	$2
Education	0	$0
Total	**167**	**$3,586**

Figure 4-9: Huntington County Buildings in Floodplain (100-Year Flood)

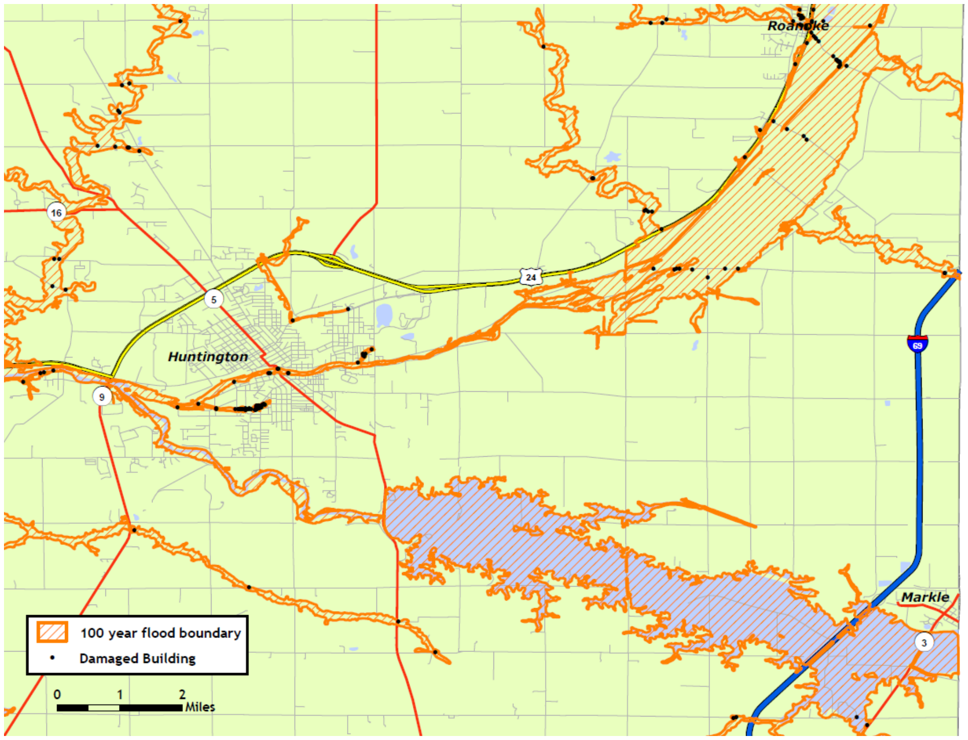


Figure 4-10: Huntington County Urban Areas (Huntington) Flood-Prone Areas (100-Year Flood)

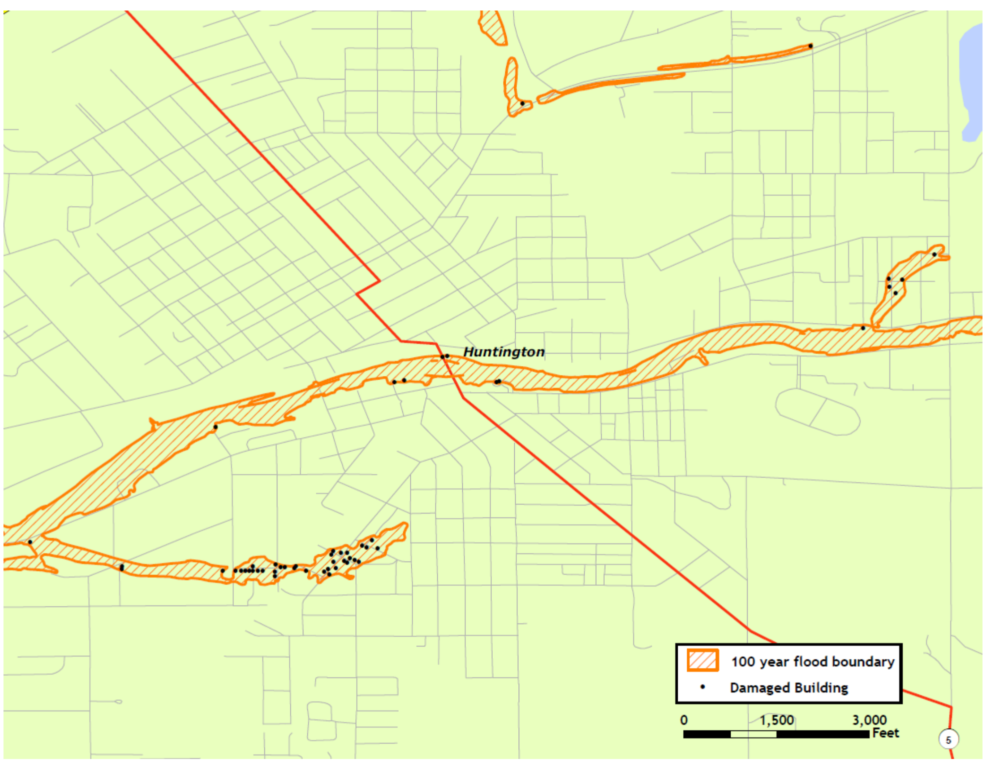
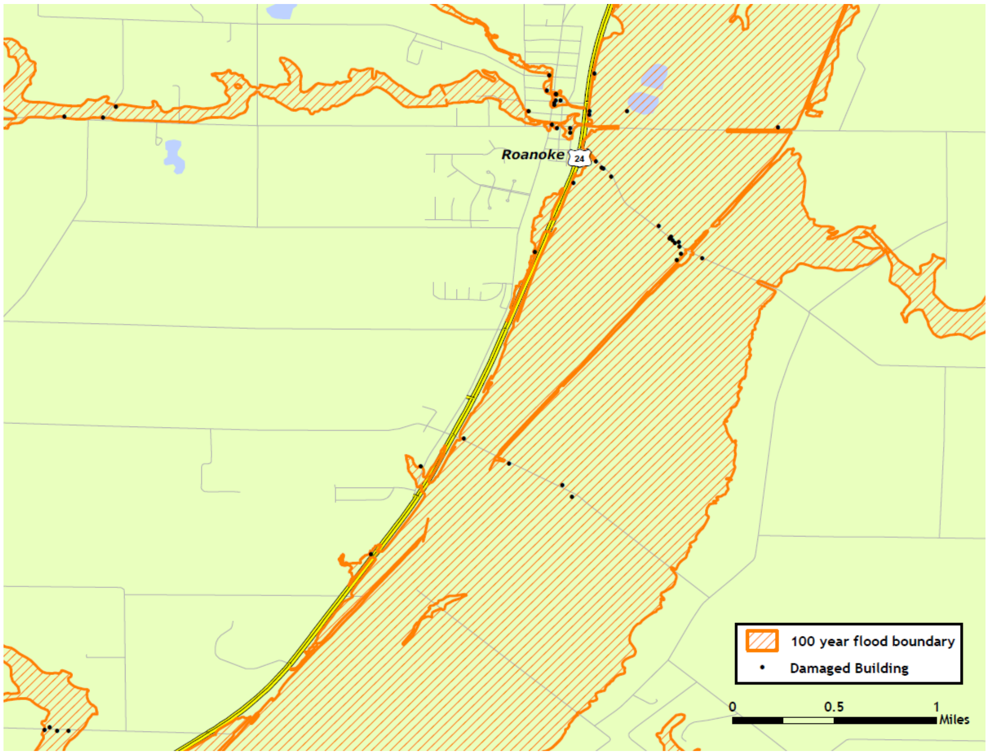


Figure 4-11: Huntington County Urban Areas (Roanoke) Flood-Prone Areas (100-Year Flood)



Critical Facilities

A critical 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 will no longer be able to serve the community). A complete list of all the critical facilities, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

The analysis identified two communication facility, one fire station, one police station, and one wastewater facility that may be subject to flooding. A list of the critical facilities potentially at risk to flooding within Huntington County is given in Table 4-18. A map of critical facilities potentially at risk to flooding is shown in Figures 4-12 and 4-13.

Table 4-18: Huntington County Damaged Critical Facilities

Facility Name
WOWO Communication Tower
WXKE Communication Tower
Roanoke Fire Department
Roanoke Police Department
Roanoke Municipal WWTP

Figure 4-12: Boundary of 100-Year Flood Overlaid with Critical Facilities

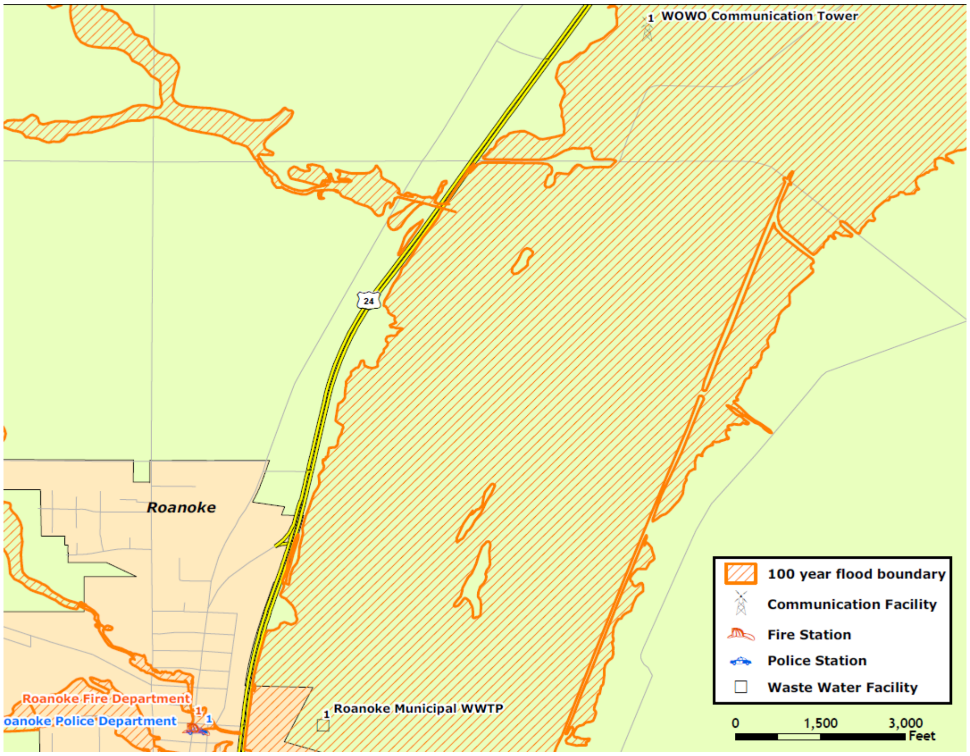
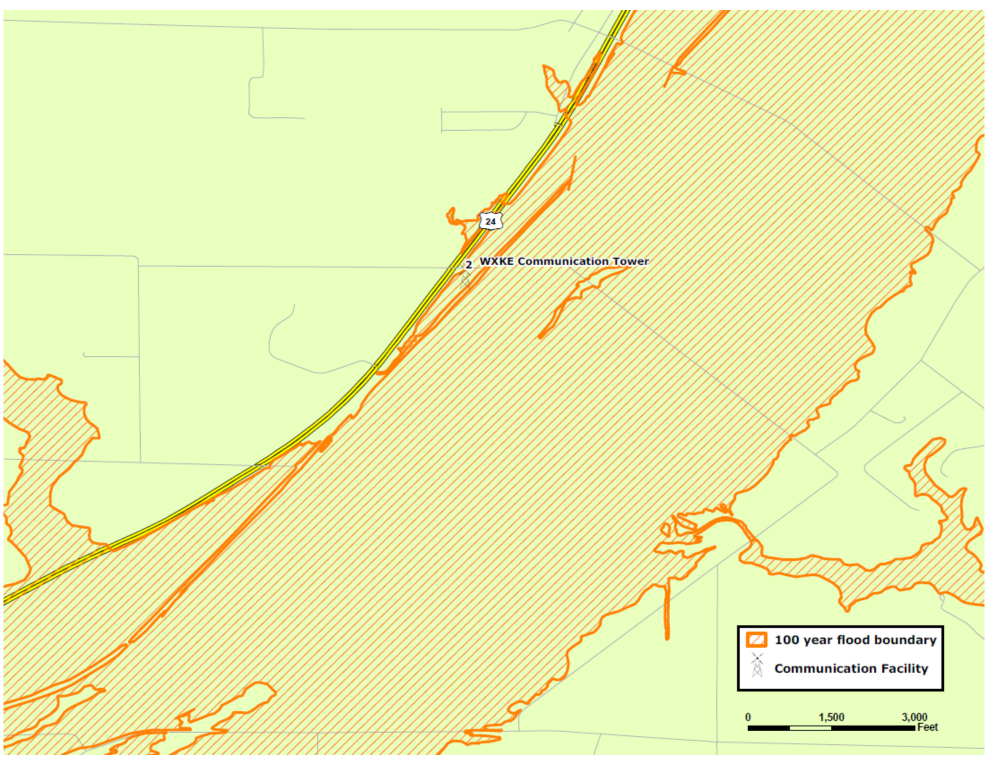


Figure 4-13: Boundary of 100-Year Flood Overlaid with Critical Facilities



Infrastructure

The types of infrastructure that could be 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 any number of these items could become damaged in the event of a flood. 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 fail or become impassable, causing a traffic risk.

Vulnerability Analysis for Flash Flooding

Flash flooding could affect any location within this jurisdiction; therefore, the entire county's population and buildings are vulnerable to a flash flood. These structures can expect the same impacts as discussed in a riverine flood.

Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Vulnerability Analysis for Dam and Levee Failure

An 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 "one-percent-annual chance" flood.

Vulnerability to Future Assets/Infrastructure for Flooding

Flash flooding may affect nearly every location within the county; therefore all buildings and infrastructure are vulnerable to flash flooding. Currently, the Huntington County planning commission reviews new development for compliance with the local zoning ordinance. At this time no construction is planned within the area of the 100-year floodplain. Therefore, there is no new construction which will be vulnerable to a 100-year flood.

Vulnerability to Future Assets/Infrastructure for Dam and Levee Failure

The Huntington County planning commission reviews new development for compliance with the local zoning ordinance.

Analysis of Community Development Trends

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

4.4.3 Earthquake Hazard

Hazard Definition for Earthquake Hazard

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together unable to release the accumulating energy. When the accumulated energy grows strong enough the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern United States. The most seismically active area is referred to as the New Madrid Seismic Zone. Scientists have learned that the New Madrid fault system may not be the only fault system in the Central U.S. capable of producing damaging earthquakes. The Wabash Valley fault system in Illinois and Indiana shows evidence of large earthquakes in its geologic history, and there may be other, as yet unidentified, faults that could produce strong earthquakes.

Ground shaking from strong earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area it may cause deaths, injuries, and extensive property damage.

The possibility of the occurrence of a catastrophic earthquake in the central and eastern United States is real as evidenced by history and described throughout this section. The impacts of significant earthquakes affect large areas, terminating public services and systems needed to aid the suffering and displaced. These impaired systems are interrelated in the hardest struck zones. Power lines, water and sanitary lines, and public communication may be lost; and highways, railways, rivers, and ports may not allow transportation to the affected region. Furthermore, essential facilities, such as fire and police departments and hospitals, may be disrupted if not previously improved to resist earthquakes.

As with hurricanes, mass relocation may be necessary, but the residents who are suffering from the earthquake can neither leave the heavily impacted areas nor receive aid or even communication in the aftermath of a significant event.

Magnitude, which is determined from measurements on seismographs, measures the energy released at the source of the earthquake. Intensity measures the strength of shaking produced by the earthquake at a certain location and is determined from effects on people, human structures, and the natural environment. Tables 4-19 and 4-20 list earthquake magnitudes and their corresponding intensities.

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

Table 4-19: 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 motor cars 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 motor cars 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, 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.

Table 4-20: Earthquake Magnitude vs. Modified Mercalli Intensity Scale

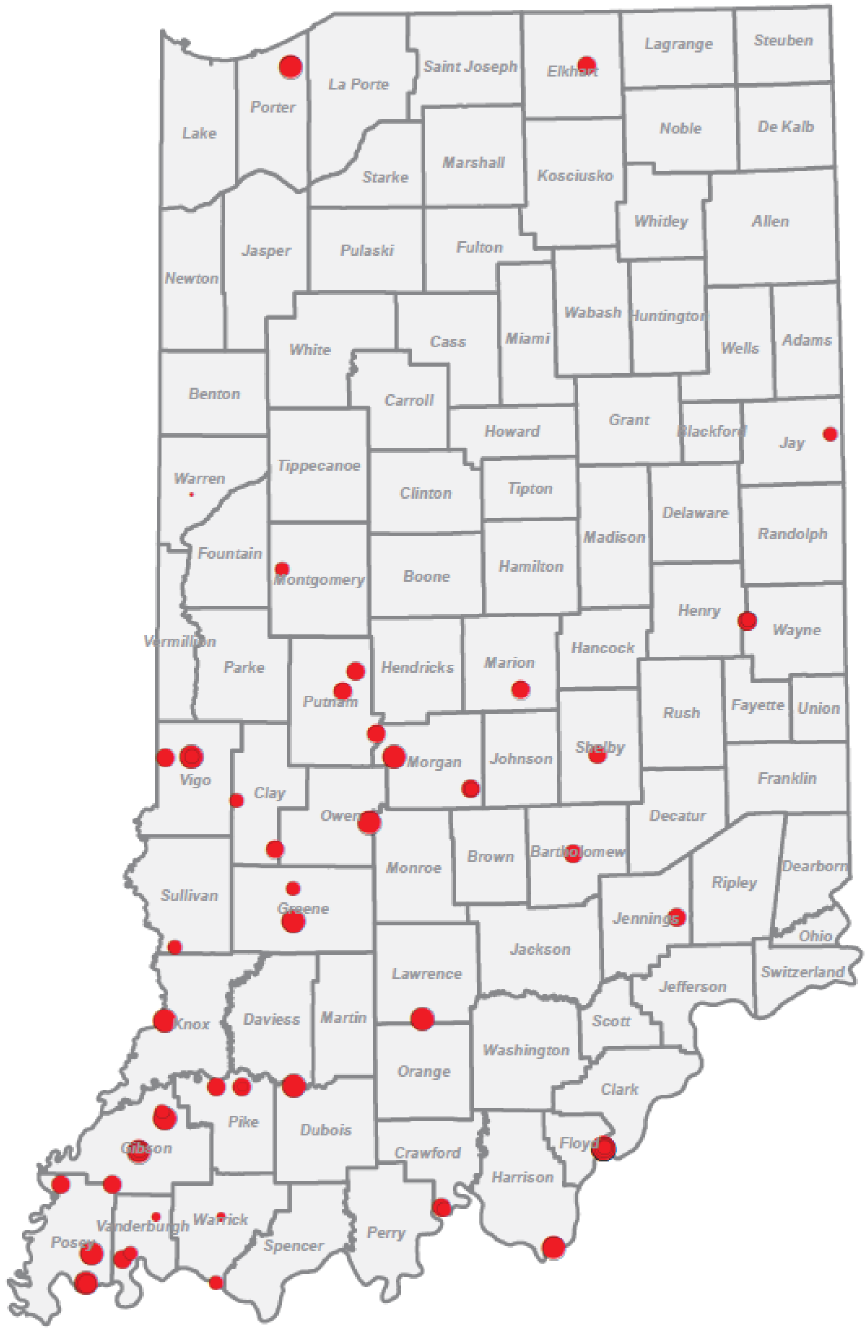
Earthquake Magnitude	Typical Maximum Modified Mercalli Intensity
1.0 - 3.0	I
3.0 - 3.9	II - III
4.0 - 4.9	IV - V
5.0 - 5.9	VI - VII
6.0 - 6.9	VII - IX
7.0 and higher	VIII or higher

Previous Occurrences for Earthquake Hazard

Approximately 40 earthquakes have occurred in Indiana for which reasonably accurate records exist. They vary in Moment Magnitude from a low of approximately M=2.0 to a high of M=5.2. The consensus of opinion among seismologists working in the Midwest is that a magnitude 5.0 to 5.5 event could occur virtually anywhere at any time throughout the region. The last earthquake to occur in Indiana—as of the date of this report—occurred on September 12, 2004 just north of Shelbyville and measured 3.6 in magnitude. The largest prehistoric earthquake documented in the state occurred at Vincennes 6,100 years ago. The size and physical character of sandblows formed during the quake show it to have had a Moment Magnitude of 7.4.

According to the Indiana Geological Survey (IGS), no earthquakes have been recorded with epicenters in Huntington County. Statewide historical epicenters outside of Huntington County are included in Figure 4-14, although information related to the impacts to Huntington County from these events is limited.

Figure 4-14: Historical Earthquake Epicenters



The most damaging Indiana earthquake originating within the state occurred on September 27, 1909 near the Indiana border between Vincennes and Terre Haute. Some chimneys fell, several building walls cracked, light connections severed, and pictures shook from the walls. It was felt throughout Indiana and parts of Iowa, Kentucky, Missouri, Arkansas, and probably in parts of Kansas, covering an area of 30,000 square miles.

Another damaging earthquake originating in Indiana occurred on April 29, 1899; it rated intensity VI to VII on the Modified Mercalli Scale. It was strongest in Jeffersonville and Shelbyville, and in Vincennes, chimneys crumbled and walls cracked. It was felt over an area of 40,000 square miles.

In 1876, twin shocks 15 minutes apart were felt over an area of 60,000 square miles. A shock in 1887 centered near Vincennes was felt over 75,000 square miles; an 1891 shock damaged property and frightened people in a church in Evansville.

Indiana has also suffered from damage caused by earthquakes originating in neighboring states. The worst occurred on November 9, 1968, and centered near Dale in southern Illinois. The shock, a magnitude of 5.3, was felt over 580,000 square miles and 23 states including all of Indiana. Intensity VII was reported from Cynthiana, where chimneys cracked, twisted, and toppled; at Fort Branch, where groceries fell from shelves and a loud roaring noise was heard; and in Mount Vernon, New Harmony, Petersburg, Princeton, and Stewartsville, all of which had similar effects. At Poseyville, "Fish jumped out of the rivers, ponds, and lakes."

Most recently, on April 18, 2008, an earthquake originating in Illinois within the Wabash Valley Seismic Zone caused minor structural damage to buildings in East Alton, Mount Carmel, and West Salem, Illinois, and a cornice fell from one building at Louisville, Kentucky. The earthquake, a magnitude 5.4, was felt widely throughout the central United States from Green Bay, Wisconsin south to Atlanta, Georgia and Tuscaloosa, Alabama and from Sioux City, Iowa and Omaha, Nebraska east to Akron, Ohio and Parkersburg, West Virginia, including all or parts of Alabama, Arkansas, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Mississippi, Missouri, Nebraska, North Carolina, Ohio, Tennessee, West Virginia, and Wisconsin. It was also felt in southern Ontario, Canada.

On November 7, 1958, an earthquake originating near Mt. Carmel, Illinois caused plaster to fall at Fort Branch. Roaring and whistling noises were heard at Central City, and the residents of Evansville thought there had been in an explosion or plane crash. It was felt over 33,000 square miles of Illinois, Indiana, Missouri, and Kentucky.

On March 2, 1937, a shock centering near Anna, Ohio threw objects from shelves at Fort Wayne and some plaster fell. Six days later, another shock originating at Anna brought pictures crashing down and cracked plaster in Fort Wayne and was strongly felt in Lafayette.

The great New Madrid earthquakes of 1811 and 1812 must have strongly affected the state, particularly the southwestern part, but there is little information available from these frontier times.

[The above history was abridged from Earthquake Information Bulletin, Volume 4, Number 4, July-August 1972 and from http://earthquake.usgs.gov/eqcenter/eqinthenews/2008/us2008qza6/#summary.]

1827 Jul 5 11:30 4.8M Intensity VI
Near New Harmony, Indiana (38.0N 87.5W)
The earthquake cracked a brick store at New Harmony, Indiana, and greatly alarmed some people. It was described as violent at New Madrid, Missouri, and severe in St. Louis. It also alarmed many in Cincinnati, Ohio and Frankfort, Kentucky.

1827 Aug 7 04:30 4.8M Intensity V
Southern Illinois (38.0N 88.0W)

1827 Aug 7 07:00 4.7M Intensity V
Southern Illinois (38.0N 88.0W)

1887 Feb 6 22:15 4.6M Intensity VI
Near Vincennes, Indiana (38.7N 87.5W)
This shock was strongest in southwest Indiana and southeast Illinois. Plaster was shaken from walls in Vincennes, west of Terre Haute, and in Martinsville; a cornice reportedly fell from a building in Huntington, Indiana. It was felt distinctly in Evansville, Indiana, but only slightly in the outskirts of St. Louis, Missouri. The shockwave was also reported in Louisville, Kentucky.

1891 Jul 27 02:28 4.1M Intensity VI
Evansville, Indiana (37.9N 87.5W)
A strong local earthquake damaged a wall on a hotel, broke dishes, and overturned furniture in Evansville. The shock also was strong near Evansville in Mount Vernon, and Newburgh Indiana; and at Hawesville, Henderson, and Owensboro, Kentucky.

1921 Mar 14 12:15 4.4M Intensity VI
Near Terre Haute, Indiana (39.5N 87.5W)
This earthquake broke windows in many buildings and sent residents rushing into the streets in Terre Haute. Small articles were overturned in Paris, Illinois, about 35 km northwest of Terre Haute.

1925 Apr 27 04:05 4.8M Intensity VI
Wabash River valley, near Princeton, Indiana (38.2N 87.8W)
Chimneys were downed in Princeton and in Carmi, Indiana; 100 km southwest chimneys were broken in Louisville, Kentucky. Crowds fled from the theaters in Evansville, Indiana. The affected area included parts of Indiana, Illinois, Kentucky, Missouri, and Ohio.

The above text was taken from http://earthquake.usgs.gov/regional/states/indiana/history.php

Geographic Location for Earthquake Hazard

Huntington County occupies a region susceptible to two earthquake threats: the threat of an earthquake along the Wabash Valley Fault System and the threat of an event near Anna in Shelby County Ohio. Return periods for large earthquakes within the New Madrid System are estimated to be 500 years; moderate quakes between magnitude 5.5 and 6.0 can recur within approximately 150 years or less. The Wabash Valley Fault System is a sleeper that threatens the entire state and may generate an earthquake large enough to cause damage as far north and east as central Michigan.

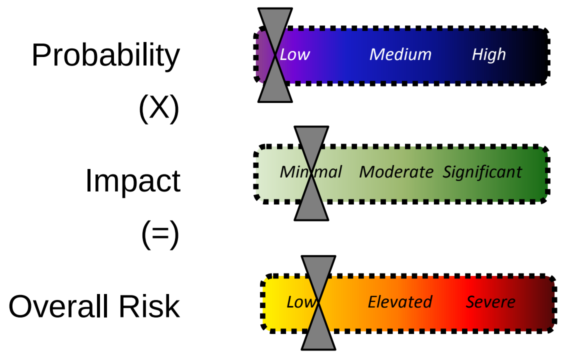
Hazard Extent for Earthquake Hazard

The extent of the earthquake is countywide. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. A National Earthquake

Hazards Reduction Program (NEHRP) compliant soils map was used for the analysis which was provided by IGS. The map identifies the soils most susceptible to failure.

Risk Identification for Earthquake Hazard

Based on historical information, the probability of an earthquake is low; however, USGS and IGS research and studies attest that future earthquakes in Huntington County are possible. In Meeting #2, the planning team determined that the potential impact of an earthquake is minimal; therefore, the overall risk of an earthquake hazard for Huntington County is low.



Vulnerability Analysis for Earthquake Hazard

This hazard could impact the entire jurisdiction equally; therefore, the entire county's population and all buildings are vulnerable to an earthquake and can expect the same impacts within the affected area. To accommodate this risk this plan will consider all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities are vulnerable to earthquakes. A critical facility would encounter many of the same impacts as any other building within the county. These impacts include structural failure and loss of facility functionality (e.g. a damaged police station will no longer be able to serve the community). A complete list of all of the critical facilities, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-6. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure and loss of building function which could result in indirect impacts (e.g. damaged homes will no longer be habitable causing residents to seek shelter).

Infrastructure

During an earthquake the types of infrastructure that could be impacted 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 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 fail or become impassable causing risk to traffic. Typical scenarios are described to gauge the anticipated impacts of earthquakes in the county in terms of numbers and types of buildings and infrastructure.

The Polis team contacted IGS to obtain existing geological information. Five earthquake scenarios—three based on deterministic scenarios and two based on probabilistic scenarios—were developed to provide a reasonable basis for earthquake planning in Huntington County.

The first deterministic scenario was a 7.1 magnitude epicenter along the Wabash Valley fault zone. Note that a deterministic scenario, in this context, refers to hazard or risk models based on specific scenarios without explicit consideration of the probability of their occurrences. Shake maps provided by FEMA were used in HAZUS-MH to estimate losses for Huntington County based on this event.

For the second deterministic scenario, the Anna, Ohio earthquake, the Polis team contacted the Ohio Geological Survey to obtain existing geological information and recommendations for earthquake scenarios. The Ohio Geological Survey suggested an epicenter near Anna, Ohio with a moment magnitude of 6.5. Because there is a statistical possibility for this event to occur, it is relevant to consider for planning purposes.

The third deterministic scenario was a Moment Magnitude of 5.5 with the epicenter located in Huntington County. This scenario was selected based upon the opinion of the IGS stating it could occur in the selected location and that it would therefore represent a realistic scenario for planning purposes.

Additionally, the analysis included two different types of probabilistic scenarios. These types of scenarios are based on ground shaking parameters derived from U.S. Geological Survey probabilistic seismic hazard curves. The first probabilistic scenario was a 500-year return period scenario. This scenario evaluates the average impacts of a multitude of possible earthquake epicenters with a magnitude that would be typical of that expected for a 500-year return period. The second probabilistic scenario allowed calculation of annualized loss. The annualized loss analysis in HAZUS-MH provides a means for averaging potential losses from future scenarios while considering their probabilities of occurrence. The HAZUS-MH earthquake model evaluates eight different return period scenarios including those for the 100-, 250-, 500-, 750-, 1000-, 1500-, 2000-, and 2500-year return period earthquake events. HAZUS-MH then calculates the probabilities of these events as well as the interim events, calculates their associated losses, and sums these losses to calculate an annualized loss. These analysis options were chosen because they are useful for prioritization of seismic reduction measures and for simulating mitigation strategies.

The following earthquake hazard modeling scenarios were performed:

- 7.1 magnitude earthquake on the Wabash Valley Fault System
- 6.5 magnitude earthquake epicenter near Anna, Ohio
- 5.5 magnitude earthquake local epicenter
- 500-year return period event
- Annualized earthquake loss

Modeling a deterministic scenario requires user input for a variety of parameters. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. Fortunately, a National Earthquake Hazards Reduction Program (NEHRP) soil classification map exists for Indiana. NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking. The IGS supplied soils map was used for the analysis. FEMA provided a map for liquefaction potential that was used by HAZUS-MH.

An earthquake depth of 10.0 kilometers was selected based on input from IGS. HAZUS-MH also requires the user to define an attenuation function unless ground motion maps are supplied. Because Huntington County has experienced smaller earthquakes, the decision was made to use the Central Eastern United States (CEUS) attenuation function. The probabilistic return period analysis and the annualized loss analysis do not require user input.

The building losses are broken into two categories: 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 7.1 Magnitude Earthquake Wabash Valley Scenario

The results of the 7.1 Wabash Valley earthquake are depicted in Table 4-21, Table 4-22, and Figure 4-15. HAZUS-MH estimates that approximately six buildings will be at least moderately damaged. This is less than 1% of the total number of buildings in the region. It is estimated that no buildings will be damaged beyond repair.

The total building related losses totaled $1.05 million; 5% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up more than 37% of the total loss.

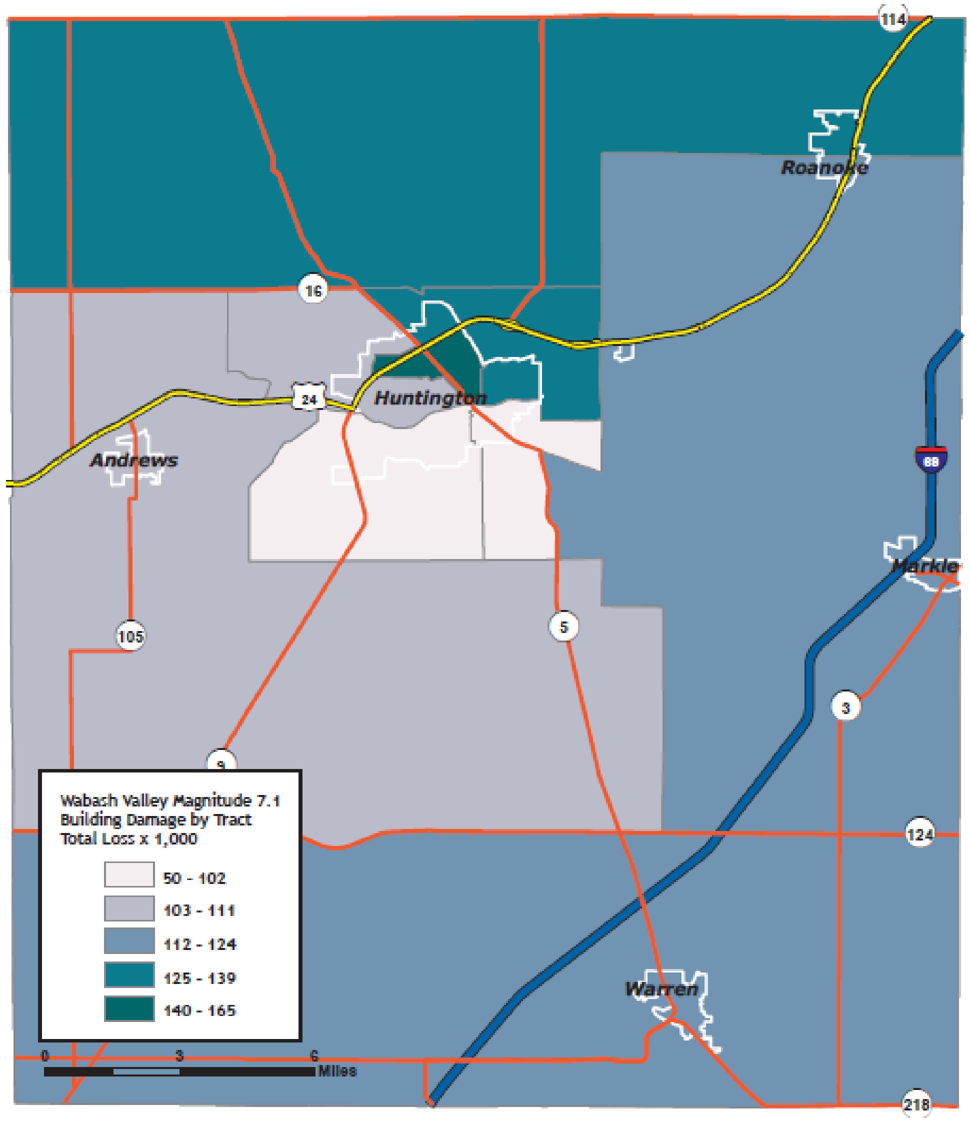
Table 4-21: Wabash Valley Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,606	11.46	17	17.91	1	21.96	0	0.00	0	0.00
Commercial	638	4.55	6	6.15	0	6.61	0	0.00	0	0.00
Education	11	0.08	0	0.13	0	0.13	0	0.00	0	0.00
Government	88	0.63	1	0.94	0	1.03	0	0.00	0	0.00
Industrial	104	0.74	1	1.09	0	1.34	0	0.00	0	0.00
Other Residential	912	6.50	16	17.04	1	15.08	0	0.00	0	0.00
Religion	205	1.47	2	2.51	0	2.80	0	0.00	0	0.00
Single Family	10,457	74.58	52	54.23	3	51.05	0	0.00	0	0.00
Total	14,021		95		7		0		0	

Table 4-22: Wabash Valley Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.00	0.01	0.00	0.01	0.02
	Capital-Related	0.00	0.00	0.01	0.00	0.00	0.01
	Rental	0.01	0.00	0.01	0.00	0.00	0.02
	Relocation	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.01	0.00	0.03	0.00	0.01	0.05
Capital Stock Loses							
	Structural	0.04	0.01	0.01	0.01	0.04	0.11
	Non_Structural	0.19	0.03	0.07	0.07	0.16	0.52
	Content	0.11	0.01	0.05	0.04	0.13	0.33
	Inventory	0.00	0.00	0.01	0.01	0.01	0.03
	Subtotal	0.33	0.04	0.14	0.13	0.35	0.99
	Total	0.34	0.05	0.17	0.14	0.36	1.05

Figure 4-15: Wabash Valley Scenario-Building Economic Losses in Thousands of Dollars



Wabash Valley Scenario—Essential Facility Losses

Before the earthquake, the region had 1,157 care beds available for use. On the day of the earthquake, the model estimates that only 578 care beds (50%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 97% of the beds will be back in service. By day 30, 100% will be operational.

Results for 6.5 Magnitude Earthquake Anna Ohio Scenario

The results of the initial analysis, the 6.5 Anna Ohio, are depicted in Table 4-23, Table 4-24, and Figure 4-16. HAZUS-MH estimates that approximately 328 buildings will be at least moderately damaged. This is more than 2% of the total number of buildings in the region. It is estimated that four buildings will be damaged beyond repair.

The total building related losses totaled $12.24 million; 18% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up more than 40% of the total loss.

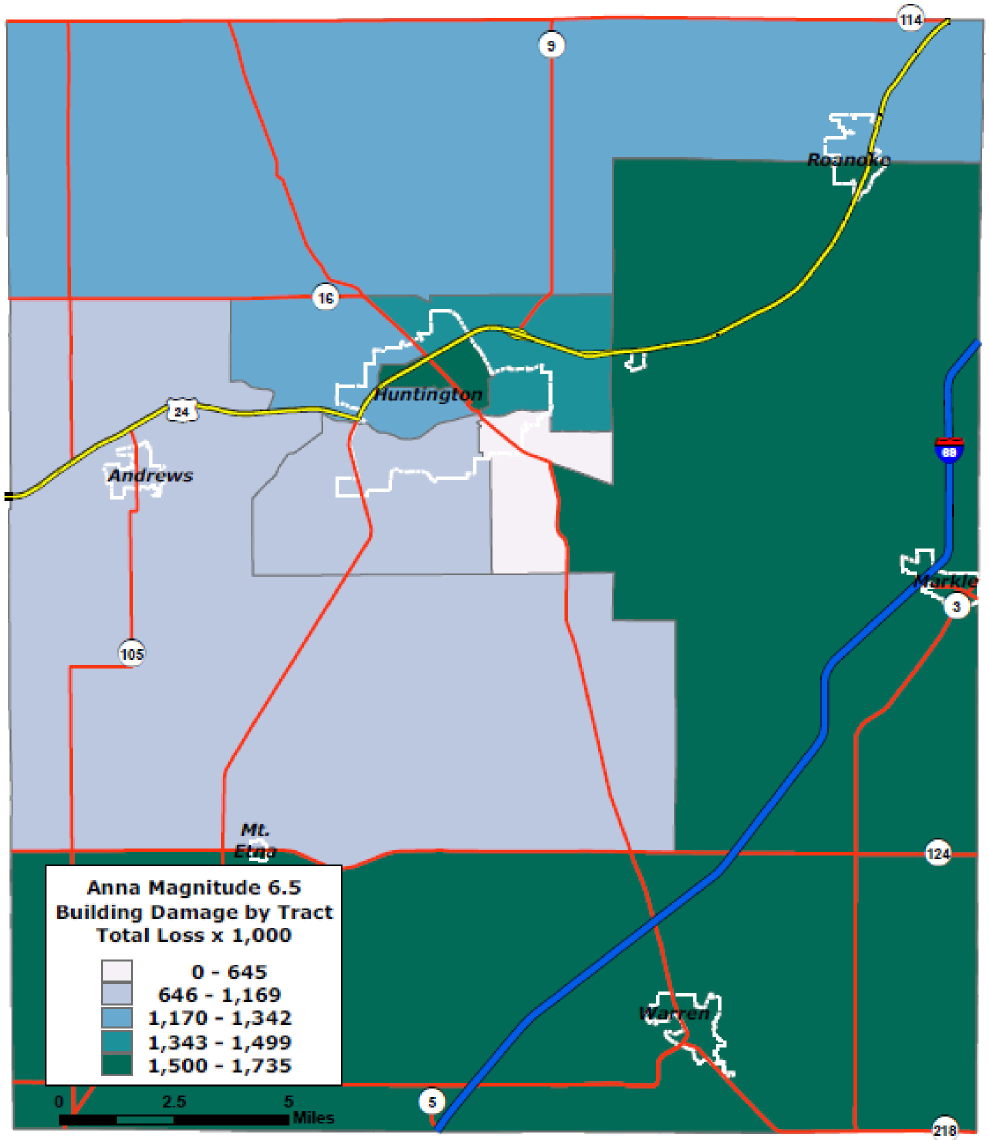
Table 4-23: Anna Ohio Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,416	10.90	131	16.18	65	23.28	12	27.49	1	18.64
Commercial	571	4.40	48	5.86	21	7.49	4	8.63	0	6.73
Education	10	0.08	1	0.09	0	0.12	0	0.12	0	0.15
Government	80	0.62	6	0.73	3	0.92	0	0.87	0	1.05
Industrial	92	0.71	8	1.03	4	1.48	1	1.74	0	1.09
Other Residential	800	6.17	85	10.48	40	14.39	3	6.47	0	4.36
Religion	183	1.41	16	1.96	7	2.58	1	3.12	0	3.24
Single Family	9,830	75.72	517	63.66	140	49.74	22	51.56	3	64.74
Total	**12,983**		**812**		**281**		**43**		**4**	

Table 4-24: Anna Ohio Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.03	0.42	0.06	0.16	0.67
	Capital-Related	0.00	0.01	0.41	0.03	0.06	0.52
	Rental	0.24	0.05	0.43	0.07	0.09	0.88
	Relocation	0.03	0.00	0.02	0.01	0.02	0.08
	Subtotal	**0.26**	**0.10**	**1.28**	**0.17**	**0.33**	**2.14**
Capital Stock Losses							
	Structural	1.01	0.12	0.39	0.22	1.51	3.25
	Non_Structural	2.53	0.29	0.54	0.42	1.18	4.96
	Content	0.59	0.05	0.25	0.19	0.66	1.73
	Inventory	0.00	0.00	0.02	0.07	0.06	0.15
	Subtotal	**4.14**	**0.45**	**1.21**	**0.90**	**3.40**	**10.09**
	Total	**4.40**	**0.55**	**2.49**	**1.07**	**3.73**	**12.24**

Figure 4-16: Anna Ohio Scenario-Building Economic Losses in Thousands of Dollars



Anna Ohio Scenario—Essential Facility Losses

Before the earthquake, the region had 1,157 care beds available for use. On the day of the earthquake, the model estimates that only 496 care beds (43%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 95% of the beds will be back in service. By day 30, 99% will be operational.

Results for 5.5 Magnitude Earthquake in Huntington County

The results of the initial analysis, the 5.5 magnitude earthquake with an epicenter in the center of Huntington County, are depicted in Tables 4-25 and 4-26 and Figure 4-17. HAZUS-MH estimates that approximately 2,988 buildings will be at least moderately damaged. This is more than 21% of the total number of buildings in the region. It is estimated that 131 buildings will be damaged beyond repair.

The total building related losses totaled $226.9 million; 10% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which comprised more than 49% of the total loss.

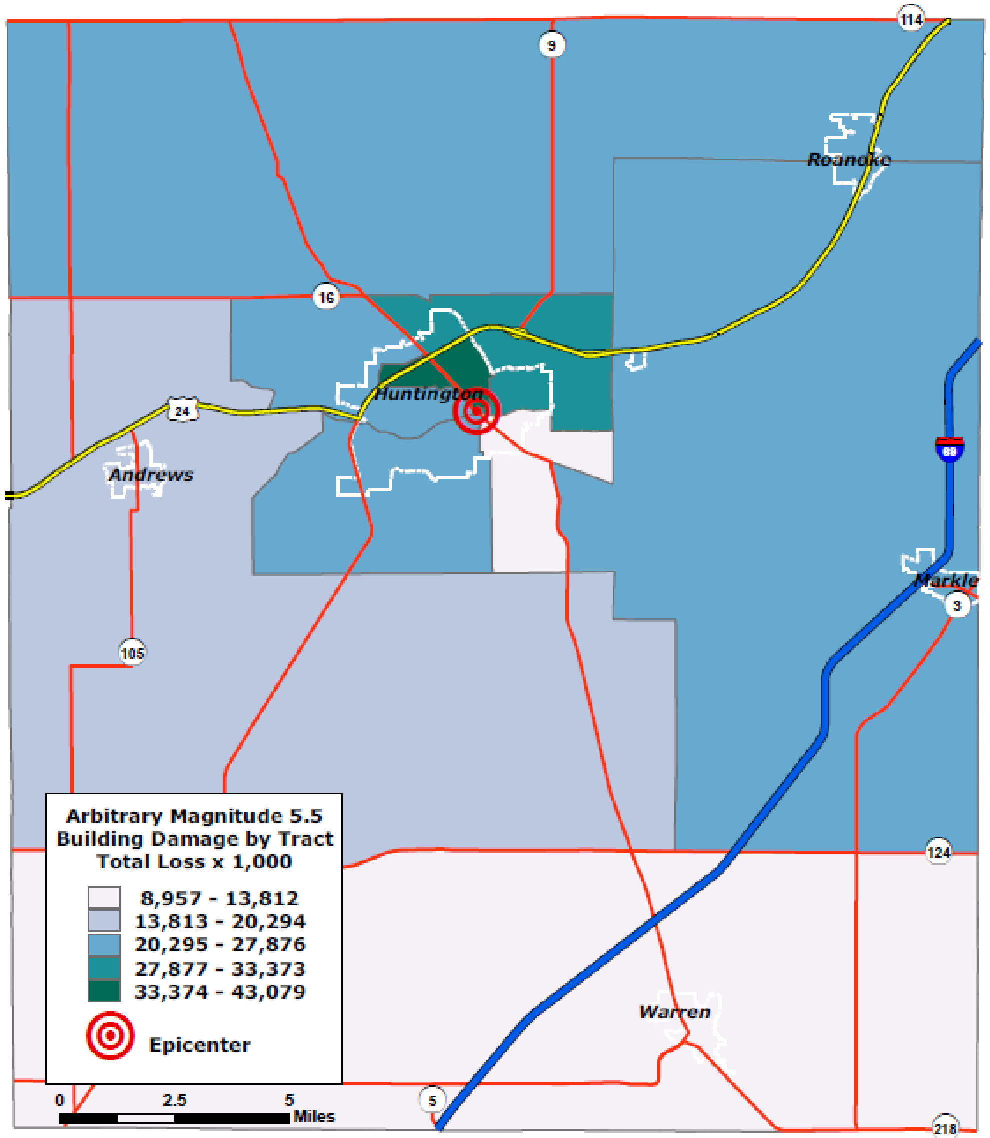
Table 4-25: Huntington County 5.5M Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	871	11.86	322	8.49	301	13.41	113	18.44	18	13.87
Commercial	306	4.16	147	3.89	131	5.85	49	8.03	10	7.86
Education	5	0.06	3	0.07	3	0.12	1	0.16	0	0.20
Government	43	0.59	20	0.52	19	0.84	6	0.97	2	1.24
Industrial	46	0.63	22	0.59	24	1.08	10	1.71	2	1.44
Other Residential	444	6.04	239	6.30	195	8.67	45	7.40	7	5.21
Religion	117	1.59	43	1.15	33	1.47	12	1.95	3	2.10
Single Family	5,518	75.08	2,991	79.00	1,539	68.56	375	61.35	89	68.07
Total	7,350		3,786		2,245		612		131	

Table 4-26: Huntington County 5.5M Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.86	3.90	0.60	1.37	6.73
	Capital-Related	0.00	0.35	3.54	0.37	0.50	4.77
	Rental	3.21	0.81	3.75	0.61	0.97	9.36
	Relocation	0.38	0.02	0.21	0.09	0.24	0.94
	Subtotal	3.59	2.04	11.41	1.68	3.08	21.80
Capital Stock Losses							
	Structural	12.76	0.89	4.12	2.28	11.63	31.68
	Non_Structural	59.09	5.58	11.42	10.54	22.56	109.21
	Content	26.35	1.98	8.08	6.06	17.37	59.84
	Inventory	0.00	0.00	0.83	2.21	1.34	4.38
	Subtotal	98.20	8.46	24.45	21.09	52.90	205.10
	Total	101.79	10.49	35.85	22.78	55.99	226.90

Figure 4-17: Huntington County 5.5M Scenario-Building Economic Losses in Thousands of Dollars



Huntington County 5.5M Scenario—Essential Facility Losses

Before the earthquake, the region had 1,157 care beds available for use. On the day of the earthquake, the model estimates that only 53 care beds (5%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 54% of the beds will be back in service. By day 30, 81% will be operational.

Results 5.0 Magnitude 500-Year Probabilistic Scenario

The results of the 500-year probabilistic analysis are depicted in Tables 4-27 and 4-28. HAZUS-MH estimates that approximately 159 buildings will be at least moderately damaged. This is more than 1% of the total number of buildings in the region. It is estimated that one building will be damaged beyond repair. The total building-related losses totaled $5.05 million; 21% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies, which made up more than 39% of the total loss.

Table 4-27: 500-Year Probabilistic Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,506	11.14	80	18.04	34	24.09	5	26.93	0	17.83
Commercial	601	4.45	30	6.76	11	7.84	2	8.50	0	6.67
Education	10	0.08	0	0.11	0	0.13	0	0.13	0	0.15
Government	84	0.62	4	0.80	1	0.92	0	0.89	0	1.05
Industrial	97	0.72	5	1.14	2	1.53	0	1.68	0	1.06
Other Residential	861	6.37	49	11.00	18	13.03	1	5.14	0	3.43
Religion	194	1.44	9	2.13	4	2.71	1	3.11	0	3.19
Single Family	10,164	75.19	268	60.02	69	49.76	10	53.63	1	66.63
Total	**13,517**		**446**		**139**		**19**		**1**	

Table 4-28: 500-Year Probabilistic Scenario-Building Economic Losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.02	0.21	0.03	0.08	0.33
	Capital-Related	0.00	0.01	0.20	0.02	0.03	0.25
	Rental	0.11	0.03	0.22	0.03	0.05	0.44
	Relocation	0.01	0.00	0.01	0.00	0.01	0.04
	Subtotal	**0.13**	**0.05**	**0.64**	**0.08**	**0.17**	**1.06**
Capital Stock Losses							
	Structural	0.49	0.05	0.20	0.11	0.74	1.60
	Non_Structural	0.98	0.11	0.21	0.13	0.42	1.86
	Content	0.16	0.01	0.07	0.05	0.19	0.49
	Inventory	0.00	0.00	0.01	0.02	0.02	0.04
	Subtotal	**1.63**	**0.18**	**0.49**	**0.32**	**1.37**	**3.99**
	Total	**1.76**	**0.23**	**1.13**	**0.40**	**1.53**	**5.05**

500-Year Probabilistic Scenario—Essential Facility Losses

Before the earthquake, the region had 1,157 care beds available for use. On the day of the earthquake, the model estimates that only 724 care beds (63%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 98% of the beds will be back in service. By day 30, 100% will be operational.

Results Annualized Risk Scenario

HAZUS-MH estimates that approximately 87 buildings will be at least moderately damaged. This is approximately 1% of the total number of buildings in the region. It is estimated that no building will be damaged beyond repair.

Vulnerability to Future Assets/Infrastructure for Earthquake Hazard

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

Analysis of Community Development Trends

Community development will occur outside of the low lying areas in flood plains with a water table within five feet of grade which are susceptible to liquefaction.

4.4.4 Thunderstorm Hazard

Hazard Definition for Thunderstorm Hazard

Severe thunderstorms are defined as thunderstorms with one or more of the following characteristics: strong winds, large damaging hail, or frequent lightning. Severe thunderstorms most frequently occur in Indiana during the spring and summer months, but can occur any month of the year at any time of day. 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 of diameter 0.75 inches or higher
- Frequent and dangerous lightning
- Wind speeds equal to or greater than 58 mph

Hail

Hail is a product of a strong thunderstorm. Hail usually falls near the center of a storm, however 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, but hailstones larger than softballs have been reported on rare occasion.

Lightning

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

Severe Winds (Straight-Line Winds)

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

Previous Occurrences for Thunderstorm Hazard

The NCDC database reported 67 hailstorms in Huntington County since 1950. Hailstorms occur nearly every year in the late spring and early summer months. The most recent significant occurrence was in June 2008. A cluster of thunderstorms developed during the morning hours across portions of central Illinois in advance of a weak trough and upper level system. These storms expanded and intensified as they moved into northern Indiana, producing areas of wind damage and hail.

The Huntington County hailstorms are identified in Table 4-29. Additional details for NCDC events are included in Appendix D.

Table 4-29: Huntington County Hailstorms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	7/6/1957	Hail	1.75 in.	0	0	0	0
Huntington	4/29/1970	Hail	1.75 in.	0	0	0	0
Huntington	8/11/1973	Hail	1.75 in.	0	0	0	0
Huntington	6/14/1975	Hail	1.00 in.	0	0	0	0
Huntington	6/2/1980	Hail	1.75 in.	0	0	0	0
Huntington	7/1/1983	Hail	1.00 in.	0	0	0	0
Huntington	7/1/1983	Hail	0.75 in.	0	0	0	0
Huntington	9/6/1983	Hail	1.75 in.	0	0	0	0
Huntington	9/6/1983	Hail	1.75 in.	0	0	0	0
Huntington	7/5/1985	Hail	0.75 in.	0	0	0	0
Huntington	5/6/1986	Hail	0.75 in.	0	0	0	0
Huntington	6/19/1986	Hail	0.75 in.	0	0	0	0
Huntington	4/3/1988	Hail	1.00 in.	0	0	0	0
Huntington	5/9/1988	Hail	1.00 in.	0	0	0	0
Huntington	8/15/1988	Hail	0.75 in.	0	0	0	0
Huntington	4/3/1989	Hail	2.75 in.	0	0	0	0
Huntington	4/25/1989	Hail	1.00 in.	0	0	0	0
Huntington	9/9/1992	Hail	1.00 in.	0	0	0	0
Huntington	3/23/1994	Hail	1.00 in.	0	0	0	0
Huntington	6/28/1994	Hail	2.00 in.	0	0	50K	0
Huntington	6/28/1994	Hail	1.50 in.	0	0	0	0
Huntington	6/21/1995	Hail	0.75 in.	0	0	0	0
Huntington	6/23/1995	Hail	1.00 in.	0	0	6K	0
Huntington	6/24/1995	Hail	1.00 in.	0	0	0	9K
Huntington	7/2/1997	Hail	0.75 in.	0	0	20K	0
Bippus	5/19/1998	Hail	0.88 in.	0	0	0	0
Bippus	5/29/1998	Hail	0.75 in.	0	0	0	0
Huntington	5/18/2000	Hail	0.75 in.	0	0	0	0
Huntington	5/25/2002	Hail	0.75 in.	0	0	0	0
Warren	5/25/2002	Hail	0.88 in.	0	0	0	0
Huntington	6/4/2002	Hail	0.75 in.	0	0	0	0
Huntington	6/4/2002	Hail	1.75 in.	0	0	0	0
Huntington	6/4/2002	Hail	0.75 in.	0	0	0	0
Huntington	6/4/2002	Hail	1.00 in.	0	0	0	0
Roanoke	6/4/2002	Hail	1.00 in.	0	0	0	0
Andrews	6/4/2002	Hail	1.00 in.	0	0	0	0
Huntington	6/4/2002	Hail	0.75 in.	0	0	0	0
Bippus	6/4/2002	Hail	1.00 in.	0	0	0	0
Huntington	3/20/2003	Hail	0.75 in.	0	0	0	0
Huntington	3/20/2003	Hail	0.75 in.	0	0	0	0
Andrews	4/4/2003	Hail	1.00 in.	0	0	0	0
Huntington	5/7/2003	Hail	0.75 in.	0	0	0	0
Huntington	5/7/2003	Hail	0.75 in.	0	0	0	0
Huntington	5/7/2003	Hail	0.88 in.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	7/4/2003	Hail	0.75 in.	0	0	0	0
Roanoke	8/2/2003	Hail	0.75 in.	0	0	0	0
Huntington	6/13/2004	Hail	0.88 in.	0	0	0	0
Markle	4/20/2005	Hail	0.75 in.	0	0	0	0
Warren	5/11/2005	Hail	1.00 in.	0	0	0	0
Warren	5/11/2005	Hail	1.00 in.	0	0	0	0
Warren	5/11/2005	Hail	1.00 in.	0	0	0	0
Huntington	6/30/2005	Hail	1.00 in.	0	0	0	0
Huntington	8/13/2005	Hail	1.75 in.	0	0	0	0
Mt Etna	3/31/2006	Hail	0.88 in.	0	0	0	0
Warren	3/31/2006	Hail	0.88 in.	0	0	0	0
Warren	4/7/2006	Hail	0.88 in.	0	0	0	0
Andrews	4/14/2006	Hail	1.00 in.	0	0	0	0
Mt Etna	4/16/2006	Hail	0.88 in.	0	0	0	0
Huntington	6/21/2006	Hail	0.75 in.	0	0	0	0
Huntington	6/21/2006	Hail	1.00 in.	0	0	0	0
Huntington	6/22/2006	Hail	1.00 in.	0	0	0	0
Warren	6/22/2006	Hail	1.00 in.	0	0	0	0
Huntington	6/28/2006	Hail	0.75 in.	0	0	0	0
Huntington	6/28/2006	Hail	0.75 in.	0	0	0	0
Warren	9/27/2006	Hail	0.75 in.	0	0	0	0
Huntington	8/24/2007	Hail	0.88 in.	0	0	0K	0K
Huntington	6/21/2008	Hail	1.00 in.	0	0	0K	0K

** 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 three occurrences of significant lightning strikes in Huntington County since 1950. For example, in May 2006, lightning struck a residence on Maple Grove Road, northwest of Andrews, causing a fire in the rafters of the basement.

The Huntington County lightning strikes are identified in Table 4-30. Additional details for NCDC events are included in Appendix D. Lightning occurs in Huntington County every year. The following list only represents those events which were recorded by the NCDC.

Table 4-30: Huntington County Lightning Strikes*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Markle	7/29/2002	Lightning	N/A	0	0	80K	0
Andrews	8/4/2005	Lightning	N/A	0	0	8K	0
Andrews	5/30/2006	Lightning	N/A	0	0	15K	0

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

The NCDC database identified 95 wind storms reported since 1950. For example, in June 2008, emergency management officials reported two semi-trucks were blown off Interstate 69, one at mile marker 72 and the other mile marker 75. Damage was estimated at $25,000. A stationary boundary across the area combined with remnants of overnight convection. This interacted with moderate instability to allow for numerous thunderstorms, a few of which reached severe levels.

As shown in Table 4-31, wind storms have historically occurred year-round with the greatest frequency and damage between May and July. The following table includes available top wind speeds for Huntington County.

Table 4-31 Huntington County Wind Storms*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	5/10/1957	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/4/1957	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/4/1957	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/3/1960	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/18/1966	Tstm Winds	0 kts.	0	0	0	0
Huntington	4/29/1970	Tstm Winds	0 kts.	0	0	0	0
Huntington	4/29/1970	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/2/1970	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/20/1974	Tstm Winds	0 kts.	0	0	0	0
Huntington	9/22/1980	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/8/1981	Tstm Winds	0 kts.	0	0	0	0
Huntington	9/6/1983	Tstm Winds	0 kts.	0	0	0	0
Huntington	9/6/1983	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/13/1984	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/15/1985	Tstm Winds	0 kts.	0	0	0	0
Huntington	5/6/1986	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/7/1986	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/11/1986	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/25/1986	Tstm Winds	0 kts.	0	0	0	0
Huntington	8/26/1986	Tstm Winds	52 kts.	0	0	0	0
Huntington	5/21/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	5/30/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	5/30/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/29/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/29/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/26/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/29/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/29/1987	Tstm Winds	0 kts.	0	0	0	0
Huntington	9/19/1988	Tstm Winds	0 kts.	0	0	0	0
Huntington	11/16/1988	Tstm Winds	0 kts.	0	0	0	0
Huntington	8/28/1990	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/2/1991	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/7/1991	Tstm Winds	0 kts.	0	0	0	0
Huntington	7/7/1991	Tstm Winds	0 kts.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	6/17/1992	Tstm Winds	0 kts.	0	0	0	0
Huntington	6/17/1992	Tstm Winds	0 kts.	0	0	0	0
Huntington	4/27/1994	Tstm Winds	0 kts.	0	0	500K	0
Huntington	7/5/1994	Tstm Winds	0 kts.	0	0	50K	0
Huntington	11/21/1994	High Wind	0 kts.	0	0	50K	0
Huntington	11/27/1994	High Wind	0 kts.	0	0	120K	0
Huntington	6/7/1995	Tstm Winds	0 kts.	0	0	2K	0
Huntington	6/7/1995	Tstm Winds	0 kts.	0	0	0	0
North Huntington Co	7/7/1996	Tstm Winds	65 kts.	0	0	45K	10K
Roanoke	7/30/1996	Tstm Winds	60 kts.	0	0	0	0
Huntington	10/29/1996	Tstm Winds	58 kts.	0	0	0	0
Huntington	7/18/1997	Tstm Winds	0 kts.	0	0	5K	0
Huntington	5/19/1998	Tstm Winds	52 kts.	0	0	0	0
Huntington	6/19/1998	Tstm Winds	55 kts.	0	0	0	0
Huntington	7/21/1998	Tstm Winds	52 kts.	0	0	0	0
Rock Creek	11/10/1998	Tstm Winds	0 kts.	0	0	0K	0
Huntington	12/6/1998	Tstm Winds	0 kts.	0	0	10K	0
Markle	5/9/2000	Tstm Winds	0 kts.	0	0	0	0
Roanoke	6/13/2000	Tstm Winds	0 kts.	0	0	0	0
Goblesville	6/14/2000	Tstm Winds	0 kts.	0	0	0	0
Huntington	9/11/2000	Tstm Winds	0 kts.	0	0	0K	0
Roanoke	5/26/2001	Tstm Winds	0 kts.	0	0	18K	0
Roanoke	6/12/2001	Tstm Winds	0 kts.	0	0	0	0
Warren	7/10/2001	Tstm Winds	0 kts.	0	0	0	0
Huntington	8/18/2001	Tstm Winds	60 kts.	0	0	0	0
Markle	8/18/2001	Tstm Winds	0 kts.	0	0	0	0
Roanoke	10/24/2001	Tstm Winds	0 kts.	0	0	0	0
Huntington	3/9/2002	High Wind	55 kts.	0	0	0	0
Huntington	9/19/2002	Tstm Winds	0 kts.	0	0	0	0
Warren	5/9/2003	Tstm Winds	50 kts.	0	0	0	0
Plum Tree	7/4/2003	Tstm Winds	50 kts.	0	0	10K	0
Huntington	7/4/2003	Tstm Winds	51 kts.	0	0	0	0
Markle	7/6/2003	Tstm Winds	50 kts.	0	0	0	0
Huntington	7/8/2003	Tstm Winds	50 kts.	0	0	0	0
Huntington	11/12/2003	High Wind	56 kts.	0	0	50K	0
Huntington	3/5/2004	High Wind	52 kts.	0	0	0	0
Banquo	5/23/2004	Tstm Winds	50 kts.	0	0	0	0
Andrews	5/23/2004	Tstm Winds	50 kts.	0	0	0	0
Huntington	5/23/2004	Tstm Winds	50 kts.	0	0	0	0
Huntington	5/23/2004	Tstm Winds	50 kts.	0	0	0	0
Huntington Muni Arpt	7/6/2004	Tstm Winds	50 kts.	0	0	5K	0
Huntington	3/31/2005	Strong Wind	45 kts.	0	0	60K	0
Huntington	6/5/2005	Tstm Winds	61 kts.	0	0	0	0
Huntington	7/20/2005	Tstm Winds	50 kts.	0	0	0	0
Mt Etna	7/26/2005	Tstm Winds	60 kts.	0	0	0	0
Andrews	8/4/2005	Tstm Winds	50 kts.	0	0	0	0

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Andrews	8/13/2005	Tstm Winds	50 kts.	0	0	0	0
Huntington	8/13/2005	Tstm Winds	55 kts.	0	0	20K	0
Huntington	8/13/2005	Tstm Winds	50 kts.	0	0	0	0
Huntington	11/6/2005	Tstm Winds	50 kts.	0	0	13K	0
Huntington	5/30/2006	Tstm Winds	50 kts.	0	0	0	0
Warren	6/22/2006	Tstm Winds	61 kts.	0	0	0	0
Huntington	6/22/2006	Tstm Winds	61 kts.	0	0	0	0
Roanoke	7/2/2006	Tstm Winds	55 kts.	0	0	5K	0
Plum Tree	6/8/2007	Tstm Wind	50 kts.	0	0	10K	0K
Markle	6/27/2007	Tstm Wind	55 kts.	0	0	0K	0K
Huntington	8/24/2007	Tstm Wind	60 kts.	0	0	200K	0K
Monument City	5/30/2008	Tstm Wind	70 kts.	0	0	15K	0K
Mt Etna	6/6/2008	Tstm Wind	52 kts.	0	0	1K	0K
Goblesville	6/15/2008	Tstm Wind	52 kts.	0	0	0K	0K
Huntington	6/26/2008	Tstm Wind	55 kts.	0	0	25K	0K

** 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 Thunderstorm Hazard

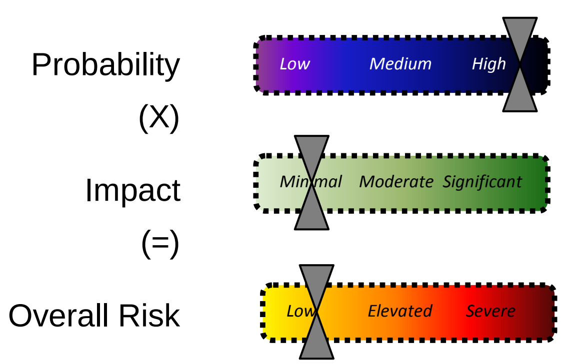
The entire county has the same risk for occurrence of thunderstorms. They can occur at any location within the county.

Hazard Extent for Thunderstorm Hazard

The extent of the historical thunderstorms varies in terms of 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 probability of a thunderstorm is high. In Meeting #2, the planning team determined that the potential impact of a thunderstorm is minimal; therefore, the overall risk of a thunderstorm hazard for Huntington County is low.



Vulnerability Analysis for Thunderstorm Hazard

Severe thunderstorms are an equally distributed threat across the entire jurisdiction; therefore, the entire county's population and all buildings are vulnerable to a severe thunderstorm and can expect the same impacts within the affected area. This plan will therefore consider all buildings located within the county as vulnerable. The existing buildings and infrastructure in Huntington County are discussed in Table 4-6.

Critical Facilities

All critical facilities are vulnerable to severe thunderstorms. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, fires caused by lightning and loss of function of the facility (e.g. a damaged police station will no longer be able to serve the community). Table 4-5 lists the types and numbers of all of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-6. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure, debris (trees or limbs) causing damage, roofs blown off or windows broken by hail or high winds, fires caused by lightning, and loss of building functionality (e.g. a damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a severe thunderstorm the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable it is important to emphasize that any number of these items could become damaged during a severe thunderstorm. 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 fail or become impassable causing risk to traffic.

Potential Dollar Losses for Thunderstorm Hazard

A HAZUS-MH analysis was not completed for thunderstorms because the widespread extent of such a hazard makes it difficult to accurately model outcomes.

To determine dollar losses for a thunderstorm hazard, the available NCDC hazard information was condensed to include only thunderstorm hazards that occurred within the past ten years. Huntington County's MHMP team then reviewed the property damages reported to NCDC and made any applicable updates.

It was determined that since 1998, Huntington County has incurred $545,000 in damages relating to thunderstorms, including hail, lightning, and high winds. The resulting information is listed in Table 4-32.

Table 4-32: Huntington County Property Damage (1998–Present)

Location or County	Date	Type	Property Damage
Bippus	5/19/1998	Hail	$ -
Huntington	5/19/1998	Tstm Wind	$ -
Bippus	5/29/1998	Hail	$ -
Huntington	6/19/1998	Tstm Wind	$ -
Huntington	7/21/1998	Tstm Wind	$ -
Rock Creek	11/10/1998	Tstm Wind	$ -
Huntington	12/6/1998	Tstm Wind	$ 10,000.00
		1998 Subtotal	$ 10,000.00
Markle	5/9/2000	Tstm Wind	$ -
Huntington	5/18/2000	Hail	$ -
Roanoke	6/13/2000	Tstm Wind	$ -
Goblesville	6/14/2000	Tstm Wind	$ -
Huntington	9/11/2000	Tstm Wind	$ -
		2000 Subtotal	$ -
Roanoke	5/26/2001	Tstm Wind	$ 18,000.00
Roanoke	6/12/2001	Tstm Wind	$ -
Warren	7/10/2001	Tstm Wind	$ -
Huntington	8/18/2001	Tstm Wind	$ -
Markle	8/18/2001	Tstm Wind	$ -
Roanoke	10/24/2001	Tstm Wind	$ -
		2001 Subtotal	$ 18,000.00
Huntington	3/9/2002	High Wind	$ -
Huntington	5/25/2002	Hail	$ -
Warren	5/25/2002	Hail	$ -
Andrews	6/4/2002	Hail	$ -
Bippus	6/4/2002	Hail	$ -
Huntington	6/4/2002	Hail	$ -
Huntington	6/4/2002	Hail	$ -
Huntington	6/4/2002	Hail	$ -
Huntington	6/4/2002	Hail	$ -
Huntington	6/4/2002	Hail	$ -
Roanoke	6/4/2002	Hail	$ -
Markle	7/29/2002	Lightning	$ 80,000.00
Huntington	9/19/2002	Tstm Wind	$ -
		2002 Subtotal	$ 80,000.00
Huntington	3/20/2003	Hail	$ -
Huntington	3/20/2003	Hail	$ -
Andrews	4/4/2003	Hail	$ -
Huntington	5/7/2003	Hail	$ -
Huntington	5/7/2003	Hail	$ -
Huntington	5/7/2003	Hail	$ -

Location or County	Date	Type	Property Damage
Warren	5/9/2003	Tstm Wind	$ -
Huntington	7/4/2003	Hail	$ -
Huntington	7/4/2003	Tstm Wind	$ -
Plum Tree	7/4/2003	Tstm Wind	$ 10,000.00
Markle	7/6/2003	Tstm Wind	$ -
Huntington	7/8/2003	Tstm Wind	$ -
Roanoke	8/2/2003	Hail	$ -
Huntington	11/12/2003	High Wind	$ 50,000.00
		2003 Subtotal	$ 60,000.00
Huntington	3/5/2004	High Wind	$ -
Andrews	5/23/2004	Tstm Wind	$ -
Banquo	5/23/2004	Tstm Wind	$ -
Huntington	5/23/2004	Tstm Wind	$ -
Huntington	5/23/2004	Tstm Wind	$ -
Huntington	6/13/2004	Hail	$ -
Huntington Muni Arpt	7/6/2004	Tstm Wind	$ 5,000.00
		2004 Subtotal	$ 5,000.00
Huntington	3/31/2005	Strong Wind	$ 60,000.00
Markle	4/20/2005	Hail	$ -
Warren	5/11/2005	Hail	$ -
Warren	5/11/2005	Hail	$ -
Warren	5/11/2005	Hail	$ -
Huntington	6/5/2005	Tstm Wind	$ -
Huntington	6/30/2005	Hail	$ -
Huntington	7/20/2005	Tstm Wind	$ -
Mt Etna	7/26/2005	Tstm Wind	$ -
Andrews	8/4/2005	Lightning	$ 8,000.00
Andrews	8/4/2005	Tstm Wind	$ -
Huntington	8/13/2005	Hail	$ -
Andrews	8/13/2005	Tstm Wind	$ -
Huntington	8/13/2005	Tstm Wind	$ 20,000.00
Huntington	8/13/2005	Tstm Wind	$ -
Huntington	11/6/2005	Tstm Wind	$ 13,000.00
		2005 Subtotal	$ 101,000.00
Mt Etna	3/31/2006	Hail	$ -
Warren	3/31/2006	Hail	$ -
Warren	4/7/2006	Hail	$ -
Andrews	4/14/2006	Hail	$ -
Mt Etna	4/16/2006	Hail	$ -
Andrews	5/30/2006	Lightning	$ 15,000.00
Huntington	5/30/2006	Tstm Wind	$ -
Huntington	6/21/2006	Hail	$ -
Huntington	6/21/2006	Hail	$ -
Huntington	6/22/2006	Hail	$ -
Warren	6/22/2006	Hail	$ -
Huntington	6/22/2006	Tstm Wind	$ -
Warren	6/22/2006	Tstm Wind	$ -

Location or County	Date	Type	Property Damage
Huntington	6/28/2006	Hail	$ -
Huntington	6/28/2006	Hail	$ -
Roanoke	7/2/2006	Tstm Wind	$ 5,000.00
Warren	9/27/2006	Hail	$ -
		2006 Subtotal	$ 20,000.00
Plum Tree	6/8/2007	Tstm Wind	$ 10,000.00
Markle	6/27/2007	Tstm Wind	$ -
Huntington	8/24/2007	Hail	$ -
Huntington	8/24/2007	Tstm Wind	$ 200,000.00
		2007 Subtotal	$ 210,000.00
Monument City	5/30/2008	Tstm Wind	$ 15,000.00
Mt Etna	6/6/2008	Tstm Wind	$ 1,000.00
Goblesville	6/15/2008	Tstm Wind	$ -
Huntington	6/21/2008	Hail	$ -
Huntington	6/26/2008	Tstm Wind	$ 25,000.00
		2008 Subtotal	$ 41,000.00
		Total Property Damage	**$ 545,000.00**

The historical data is erratic and not wholly documented or confirmed. As a result, potential dollar losses for a future event cannot be precisely calculated; however, based on statistical averages in the last decade, it can be determined that Huntington County incurs an annualized estimate of $54,500 per year.

Vulnerability to Future Assets/Infrastructure for Thunderstorm Hazard

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

Analysis of Community Development Trends

Preparing for severe storms will be enhanced if officials sponsor a wide range of programs and initiatives to address the overall safety of county residents. New structures need to be built with more sturdy construction, and those structures already in place need to be hardened to lessen the potential impacts of severe weather. Community warning sirens to provide warning of approaching storms are also vital to preventing the loss of property and ensuring the safety of Huntington County residents.

4.4.5 Drought and Extreme Heat Hazard

Hazard Definition for Drought Hazard

Drought is a climatic phenomenon that occurs in Huntington County. The meteorological condition that creates a drought is below normal rainfall. However, excessive heat can lead to increased evaporation, which will enhance 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 more).

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

Hazard Definition for Extreme Heat Hazard

Drought conditions are often accompanied by extreme heat, which is defined as temperatures that hover 10 degrees or more above the average high for the area and last for several weeks. Extreme heat can occur in humid conditions when high atmospheric pressure traps the damp air near the ground or in dry conditions, which often provoke dust storms.

Common Terms Associated with Extreme Heat

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

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

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

Source: FEMA

Previous Occurrences for Drought and Extreme Heat Hazard

The NCDC database reported two drought/heat wave events that affected Huntington County since 1950. In 1995, heat wave conditions developed across all of Indiana. High temperatures reached between 95 and 105 degrees with heat indices between 100 and 120 degrees. Nearly all heat-related deaths occurred in the sick or elderly populations and most occurred in northwest Indiana; however, the actual damages/deaths in Huntington County are a minute amount of the totals listed in Table 4-27.

NCDC records of droughts/heat waves are identified in Table 4-27. Additional details for NCDC events are included in Appendix D.

Table 4-27: Huntington County Drought/Heat Wave Events*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Statewide	7/13/1995	Heat Wave	N/A	14	0	1.0M	0
Statewide	8/21/1995	Heat Wave	N/A	1	0	0	0

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

Geographic Location for Drought and Extreme Heat Hazard

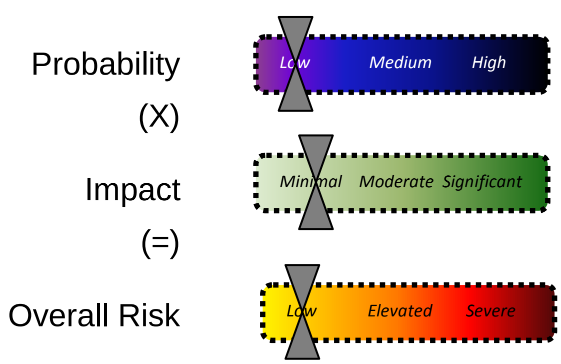
Droughts are regional in nature. All areas of the United States are vulnerable to the risk of drought and extreme heat.

Hazard Extent for Drought and Extreme Heat Hazard

Droughts and extreme heat can be widespread or localized events. The extent of the droughts varies both in terms of the extent of the heat and the range of precipitation.

Risk Identification for Drought/Extreme Heat Hazard

Based on historical information, the probability of a drought is low. In Meeting #2, the planning team determined that the potential impact of a drought or an extended period of extreme heat is minimal; therefore, the overall risk of a drought/extreme heat hazard for Huntington County is low.



Vulnerability Analysis for Drought and Extreme Heat Hazard

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

The entire population and all buildings have been identified as at risk. The building exposure for Huntington County, as determined from the building inventory is included in Table 4-6.

Critical Facilities

All critical facilities are vulnerable to drought. A critical facility will encounter many of the same impacts as any other building within the jurisdiction, which should involve only minor damage. 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. Table 4-5 lists the types and numbers of all of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-6. The buildings within the county can all expect the same impacts similar to those discussed for critical facilities. These impacts include water shortages, fires as a result of drought conditions, and residents in need of medical care from the heat and dry weather.

Infrastructure

During a drought the types of infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. The risk to these structures is primarily associated with a fire that could result from the hot, dry conditions. Since the county’s entire infrastructure is equally vulnerable, it is important to emphasize that any number of these items could become damaged during a heat wave. 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 fail or become impassable causing risk to traffic.

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

Future development will remain vulnerable to these events. 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 the populated area place 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.

Analysis of Community Development Trends

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

Source: FEMA

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

4.4.6 Winter Storm Hazard

Hazard Definition for Winter Storm Hazard

Severe winter weather consists of various forms of precipitation and strong 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, and death.

Ice (glazing) and Sleet Storms

Ice or sleet, even in the smallest quantities, can result in hazardous driving conditions and can be a significant cause of property damage. Sleet can be easily identified as frozen raindrops. Sleet does not stick to trees and wires. The most damaging winter storms in Indiana have been ice storms. Ice storms are the result of cold rain that freezes on contact with objects having a temperature below freezing. Ice storms occur when moisture-laden gulf air converges with the northern jet stream causing strong winds and heavy precipitation. This precipitation takes the form of freezing rain coating power lines, communication lines, and trees with heavy ice. The winds will then cause the overburdened limbs and cables to snap; leaving large sectors of the population without power, heat, or communication. Falling trees and limbs can also cause building damage during an ice storm. In the past few decades numerous ice storm events have occurred in Indiana.

Snowstorms

Significant snowstorms are characterized by the rapid accumulation of snow, often accompanied by high winds, cold temperatures, and low visibility. A blizzard is categorized as a snowstorm with winds of 35 miles per hour or greater and/or visibility of less than ¼ mile for three or more hours. The strong winds during a blizzard blow falling and already existing snow, create poor visibility and impassable roadways. Blizzards have the potential to result in property damage.

Indiana has repeatedly been struck by blizzards. Blizzard conditions can not only cause power outages and loss of communication, but also make transportation difficult. The blowing of snow can make visibility less than ¼ mile, but the resulting disorientation makes even travel by foot dangerous if not deadly.

Severe Cold

Severe cold is characterized by the ambient air temperature dropping to around 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 affects. 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 for Winter Storm Hazard

The NCDC database identified 24 winter storm and extreme cold events for Huntington County since 1950. For example, in March 2008, spotters reported one to three inches of snow, up to one quarter inch of sleet, and a tenth of an inch of ice. Strong low pressure tracked from Arkansas into central Ohio, bringing a swath of precipitation to all of northern Indiana. A band of heavy snow, with amounts ranging from six to ten inches, extended from Cass County, Indiana northeast through Whitley and Allen Counties.

The NCDC winter storms are listed in Table 4-34. Additional details for NCDC events are included in Appendix D.

Table 4-34: Winter Storm Events*

Location or County	Date	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Huntington	1/14/1994	Extreme Cold	N/A	3	0	5.0M	0
Huntington	2/25/1994	Heavy Snow/ blowing Snow	N/A	0	0	0	0
Huntington	12/8/1995	Winter Storm	N/A	0	0	0	0
Huntington	12/18/1995	Winter Storm	N/A	0	0	0	0
Huntington	1/2/1999	Heavy Snow	N/A	0	0	0	0
Huntington	3/11/2000	Heavy Snow	N/A	0	0	0K	0
Huntington	12/13/2000	Heavy Snow	N/A	0	0	0K	0
Huntington	12/24/2002	Heavy Snow	N/A	0	0	0	0
Huntington	2/22/2003	Heavy Snow	N/A	0	0	0	0
Huntington	1/26/2004	Winter Storm	N/A	0	0	0	0
Huntington	12/22/2004	Winter Storm	N/A	0	0	0	0
Huntington	1/5/2005	Ice Storm	N/A	0	1	0	0
Huntington	12/8/2005	Heavy Snow	N/A	0	0	0	0
Huntington	2/13/2007	Blizzard	N/A	0	0	0K	0K
Huntington	2/24/2007	Ice Storm	N/A	0	0	25K	0K
Huntington	12/4/2007	Heavy Snow	N/A	0	0	0K	0K
Huntington	12/4/2007	Heavy Snow	N/A	0	0	0K	0K
Huntington	12/9/2007	Ice Storm	N/A	0	0	0K	0K
Huntington	12/15/2007	Winter Storm	N/A	0	0	0K	0K
Huntington	2/1/2008	Winter Storm	N/A	0	0	0K	0K
Huntington	2/25/2008	Winter Storm	N/A	0	0	0K	0K
Huntington	2/25/2008	Winter Storm	N/A	0	0	0K	0K
Huntington	3/4/2008	Winter Storm	N/A	0	0	0K	0K
Huntington	12/18/2008	Ice Storm	N/A	0	0	0K	0K

** 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 Winter Storm Hazard

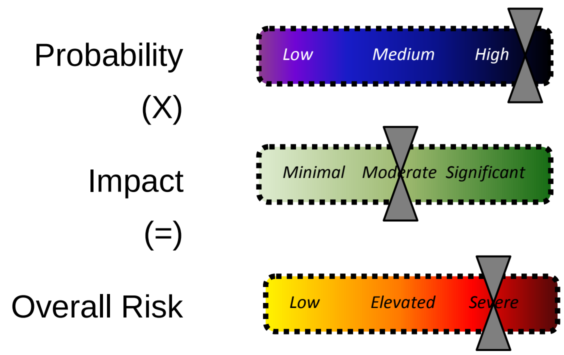
Severe winter storms are regional in nature. Most of the NCDC data is calculated regionally or in some cases statewide.

Hazard Extent for 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 jurisdiction.

Risk Identification for Winter Storm Hazard

Based on historical information, the probability of a winter storm is high. In Meeting #2, the planning team determined that the potential impact of a winter storm is moderate; therefore, the overall risk of a winter storm hazard for Huntington County is severe.



Vulnerability Analysis for Winter Storm Hazard

Winter storm impacts are equally distributed across the entire jurisdiction; therefore, the entire county is vulnerable to a winter storm and can expect the same impacts within the affected area. The building exposure for Huntington County, as determined from the building inventory, is included in Table 4-6.

Critical Facilities

All critical facilities are vulnerable to a winter storm. A critical facility will encounter many of the same impacts as other buildings within the jurisdiction. 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 4-5 lists the types and numbers of the essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-6. The impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These include loss of gas of 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 infrastructure that could be impacted include roadways, utility lines/pipes, railroads, and bridges. Since the county's entire infrastructure is equally vulnerable it is important to emphasize that any number of these items could become damaged during a winter storm. Potential impacts include broken gas and/or electricity lines or damaged utility lines, damaged or impassable roads and railways, and broken water pipes.

Potential Dollar Losses for Winter Storm Hazard

A HAZUS-MH analysis was not completed for winter storms because the widespread extent of such a hazard makes it difficult to accurately model outcomes.

To determine dollar losses for a winter storm hazard, the available NCDC hazard information was condensed to include only winter storm hazards that occurred within the past ten years. Huntington County's MHMP team then reviewed the property damages reported to NCDC and made any applicable updates.

It was determined that since 1998, Huntington County has incurred $25,000 in damages relating to winter storms, including sleet/ice and heavy snow. The resulting information is listed in Table 4-35.

Table 4-35: Huntington County Property Damage (1998–Present)

Location or County	Date	Type	Property Damage
Huntington	1/2/1999	Heavy Snow	$ -
		1999 Subtotal	$ -
Huntington	3/11/2000	Heavy Snow	$ -
Huntington	12/13/2000	Heavy Snow	$ -
		2000 Subtotal	$ -
Huntington	12/24/2002	Heavy Snow	$ -
		2002 Subtotal	$ -
Huntington	2/22/2003	Heavy Snow	$ -
		2003 Subtotal	$ -
Huntington	1/26/2004	Winter Storm	$ -
Huntington	12/22/2004	Winter Storm	$ -
		2004 Subtotal	$ -
Huntington	1/5/2005	Ice Storm	$ -
Huntington	12/8/2005	Heavy Snow	$ -
		2005 Subtotal	$ -
Huntington	2/13/2007	Blizzard	$ -
Huntington	2/24/2007	Ice Storm	$ 25,000.00
Huntington	12/4/2007	Heavy Snow	$ -
Huntington	12/4/2007	Heavy Snow	$ -
Huntington	12/9/2007	Ice Storm	$ -
Huntington	12/15/2007	Winter Storm	$ -
		2007 Subtotal	$ 25,000.00

Location or County	Date	Type	Property Damage
Huntington	2/1/2008	Winter Storm	$ -
Huntington	2/25/2008	Winter Storm	$ -
Huntington	2/25/2008	Winter Storm	$ -
Huntington	3/4/2008	Winter Storm	$ -
Huntington	12/18/2008	Ice Storm	$ -
		2008 Subtotal	$ -
		Total Property Damage	**$ 25,000.00**

The historical data is erratic and not wholly documented or confirmed. As a result, potential dollar losses for a future event cannot be precisely calculated; however, based on statistical averages in the last decade, it can be determined that Huntington County incurs an annualized estimate of $2,500 per year.

Vulnerability to Future Assets/Infrastructure for Winter Storm Hazard

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

Analysis of Community Development Trends

Because the winter storm events are regional in nature future development will be equally impacted across the county.

4.4.7 Hazardous Materials Storage and Transport Hazard

Hazard Definition for Hazardous Materials Storage and Transport Hazard

The State of Indiana has numerous active transportation lines that run through many of the counties in the state. Active railways transport harmful and volatile substances between our borders every day. The transportation of chemicals and substances along interstate routes is commonplace in Indiana. The rural areas of Indiana have considerable agricultural commerce creating a demand for fertilizers, herbicides, and pesticides to be transported along rural roads. Finally, Indiana is bordered by two major rivers and Lake Michigan. Barges transport chemicals and substances along these waterways daily. These factors increase the chance of hazardous material releases and spills throughout the State of Indiana.

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 for Hazardous Materials Storage and Transport Hazard

Huntington 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, although there have been many minor releases that 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 Huntington County residents.

Geographic Location for Hazardous Materials Storage and Transport Hazard

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

Hazard Extent for Hazardous Materials Storage and Transport 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 for Hazardous Materials Release

Based on historical information, the probability of a hazmat hazard is high. In Meeting #2, the planning team determined that the potential impact of a hazmat release is significant; therefore, the overall risk of a hazmat hazard for Huntington County is severe.

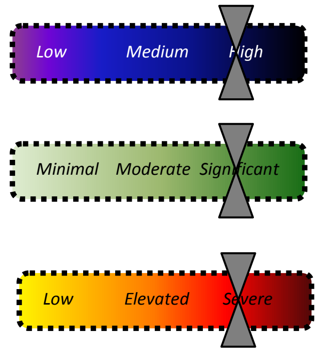
Probability

(X)

Impact

(=)

Overall Risk



Vulnerability Analysis for Hazardous Materials Storage and Transport Hazard

Hazardous material impacts are an equally distributed threat across the entire jurisdiction; therefore, the entire county is vulnerable to a hazardous material release and can expect the same impacts within the affected area. The main concern during a release or spill is the populations affected. The building exposure for Huntington County, as determined from building inventory, is included in Table 4-6. This plan will therefore consider all buildings located within the county as vulnerable.

Critical Facilities

All critical facilities and communities within the county are at risk. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural failure due to fire or explosion and loss of function of the facility (e.g. a damaged police station will no longer be able to serve the community). Table 4-4 lists the types and numbers of all essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is listed in Table 4-6. The buildings within the county can all expect the same impacts, similar to those discussed for critical facilities. These impacts include structural failure due to fire or explosion or debris and loss of function of the building (e.g. a damaged home will no longer be habitable causing residents to seek shelter).

Infrastructure

During a hazardous material release the types of infrastructure that could be impacted 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 any number of these items could become damaged in the event of a hazardous material release. 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 fail or become impassable causing risk to traffic.

In terms of numbers and types of buildings and infrastructure, typical scenarios are described to gauge the anticipated impacts of hazardous material release events in the county.

The U.S. EPA's ALOHA (Areal Locations of Hazardous Atmospheres) model was utilized to assess the area of impact for an anhydrous ammonia release on the Norfolk and Western railroad near downtown Huntington.

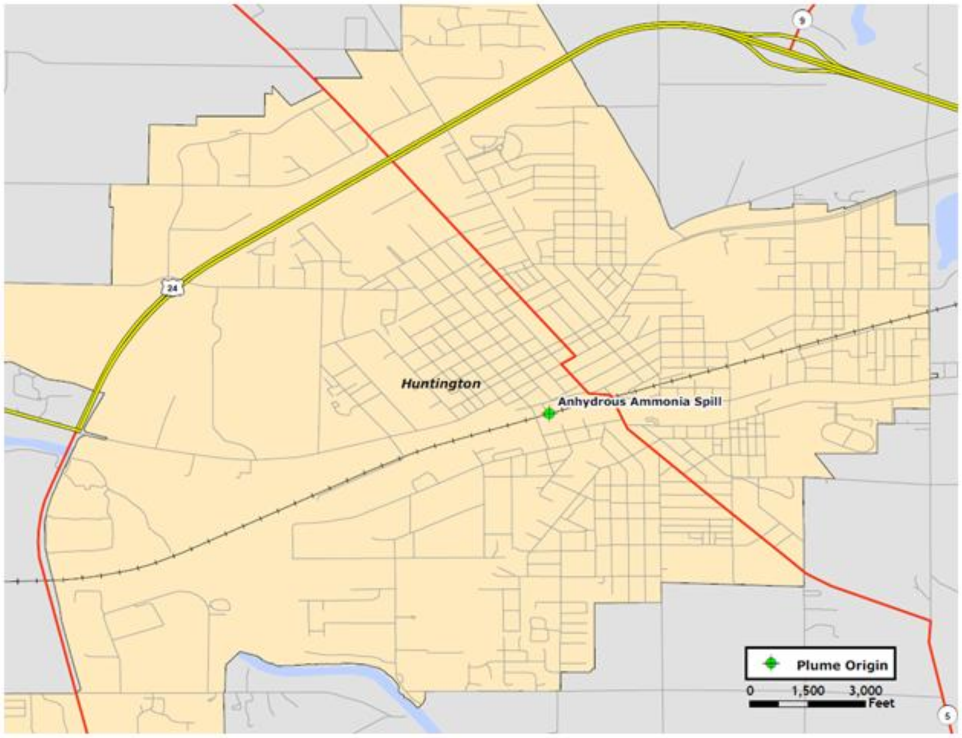
Anhydrous ammonia is a clear colorless gas with a strong odor. Contact with the unconfined liquid can cause frostbite. Though the gas is generally regarded as nonflammable, it can burn within certain vapor concentration limits with strong ignition. The fire hazard increases in the presence of oil or other combustible materials. Vapors from an anhydrous ammonia leak initially hug the ground, and prolonged exposure of containers to fire or heat may cause violent rupturing and rocketing. Long-term inhalation of low concentrations of the vapors or short-term inhalation of high concentrations has adverse health effects. Anhydrous ammonia is generally used as a fertilizer, a refrigerant, and in the manufacture of other chemicals.

Source: CAMEO

ALOHA is a computer program designed especially for use by people responding to chemical accidents, as well as for emergency planning and training. Anhydrous ammonia is a common chemical used in industrial operations and can be found in either liquid or gas form. Rail and truck tankers commonly haul anhydrous ammonia to and from facilities.

For this scenario, moderate atmospheric and climatic conditions with a slight breeze from the west were assumed. The target area, illustrated in Figure 4-18, was chosen due to its proximity to residential, commercial, and critical facility locations.

Figure 4-18: Location of Chemical Release



Analysis

The ALOHA atmospheric modeling parameters, depicted in Figure 4-19, were based upon a westerly wind speed of five miles per hour. The temperature was 68°F with 75% humidity and partly cloudy skies.

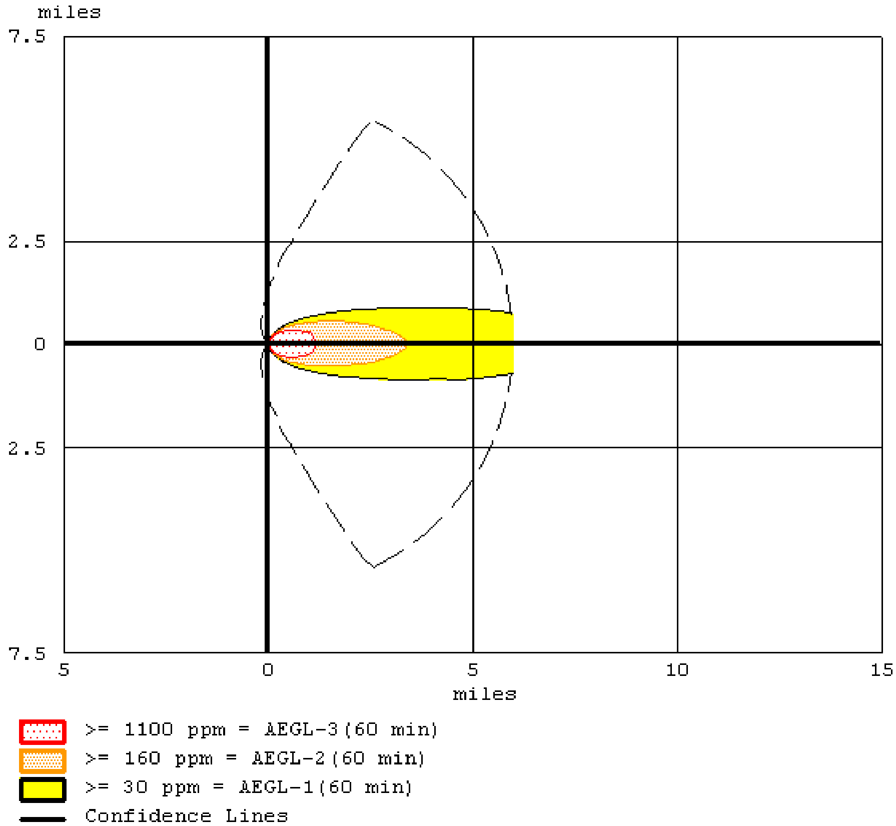
The source of the chemical spill is a horizontal, cylindrical-shaped rail tanker. The diameter of the tank was set to 9.81 feet and the length set to 53 feet (30,000 gallons). At the time of its release, it was estimated that the tank was 85% full. The anhydrous ammonia in this tank is in its liquid state.

This release was based on a leak from a 2.5-inch-diameter hole, 12 inches above the bottom of the tank. According to the ALOHA parameters, approximately 7,750 pounds of material would be released per minute. The image in Figure 4-20 depicts the plume footprint generated by ALOHA.

Figure 4-19: ALOHA Plume Modeling Parameters

```
SITE DATA:
  Location: HUNTINGTON, INDIANA
  Building Air Exchanges Per Hour: 0.40 (unsheltered single storied)
  Time: July 6, 2009  1130 hours EST (using computer's clock)

CHEMICAL DATA:
  Chemical Name: AMMONIA                 Molecular Weight: 17.03 g/mol
  AEGL-1(60 min): 30 ppm   AEGL-2(60 min): 160 ppm   AEGL-3(60 min): 1100 ppm
  IDLH: 300 ppm      LEL: 160000 ppm     UEL: 250000 ppm
  Ambient Boiling Point: -29.1° 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
  Flammable chemical escaping from tank (not burning)
  Tank Diameter: 9.81 feet               Tank Length: 53 feet
  Tank Volume: 30,000 gallons
  Tank contains liquid                   Internal Temperature: 68° F
  Chemical Mass in Tank: 65.0 tons       Tank is 85% full
  Circular Opening Diameter: 2.5 inches
  Opening is 12 inches from tank bottom
  Release Duration: 28 minutes
  Max Average Sustained Release Rate: 7,750 pounds/min
     (averaged over a minute or more)
  Total Amount Released: 123,933 pounds
  Note: The chemical escaped as a mixture of gas and aerosol (two phase flow).

THREAT ZONE:
  Model Run: Heavy Gas
  Red   : 1.2 miles --- (1100 ppm = AEGL-3(60 min))
  Orange: 3.4 miles --- (160 ppm = AEGL-2(60 min))
  Yellow: greater than 6 miles --- (30 ppm = AEGL-1(60 min))
```

Figure 4-20: Plume Footprint Generated by ALOHA



Acute Exposure Guideline Levels (AEGLs) are intended to describe the health effects on humans due to once-in-a-lifetime or rare exposure to airborne chemicals. The National Advisory Committee for AEGLs is developing these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills or other catastrophic exposures. As the substance moves away from the source, the level of substance concentration decreases. Each color-coded area depicts a level of concentration measured in parts per million (ppm). The image in Figure 4-21 depicts the plume footprint generated by ALOHA in ArcGIS.

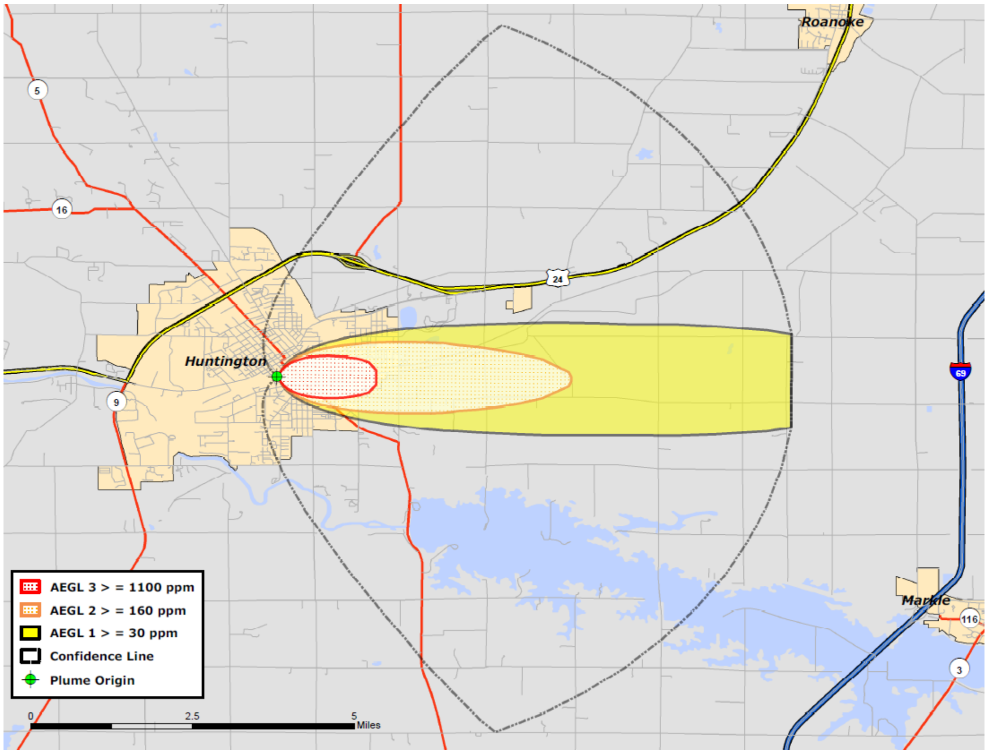
- **AEGL 3:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death. The red buffer (>=1,100 ppm) extends no more than one mile from the point of release after one hour.

- **AEGL 2:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape. The orange buffer (>=60 ppm) extends no more than three miles from the point of release after one hour.

- **AEGL 1:** Above this airborne concentration of a substance, it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure. The yellow buffer (>=30 ppm) extends more than six miles from the point of release after one hour.

- **Confidence Lines:** The dashed lines depict the level of confidence in which the exposure levels will be contained. The ALOHA model is 95% confident that the release will stay within this boundary.

Figure 4-21: ALOHA Plume Footprint Overlaid in ArcGIS

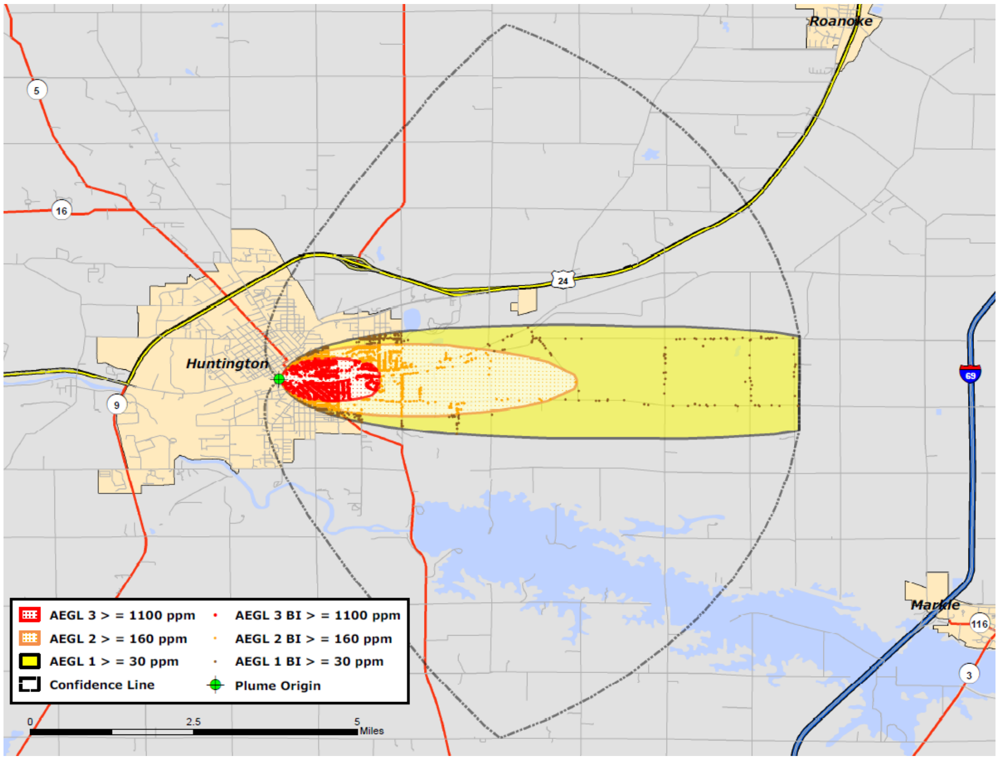


Results

By summing the building inventory within all AEGL levels (Level-3: > = 1,100 ppm, Level-2: > = 160 ppm, Level 1: > = 30 ppm), the GIS overlay analysis predicts that as many as 4,700 buildings could be exposed at a replacement cost of $655 million. The overlay was performed against parcels provided by Huntington County that were joined with Assessor records showing property improvement. If this event were to occur, approximately 4,500 people would be affected.

The Assessor records often do not distinguish parcels by occupancy class when the parcels are not taxable; therefore, the total number of buildings and the building replacement costs for government, religious/non-profit, and education may be underestimated.

Figure 4-22: Huntington County Building Inventory Classified By Plume Footprint



Building Inventory Damage

The results of the analysis against the Building Inventory points are depicted in Tables 4-36 through 4-39. Table 4-36 summarizes the results of the chemical spill by combining all AEGL levels. Tables 4-37 through 4-39 summarize the results of the chemical spill for each level separately.

Table 4-36: Estimated Exposure for all AEGL Levels (all ppm)

Occupancy	Population	Building Counts	Building Exposure (thousands)
Residential	4,500	4,080	$382,854
Commercial	0	406	$111,240
Industrial	0	59	$92,636
Agriculture	0	69	$9,658
Religious	0	41	$32,479
Government	0	45	$25,909
Education	0	0	$0
Total	**4,500**	**4,700**	**$654,777**

Table 4-37: Estimated Exposure for AEGL Level 3 (> =1100 ppm)

Occupancy	Population	Building Counts	Building Exposure (thousands)
Residential	2,045	818	$80,294
Commercial	0	103	$30,114
Industrial	0	9	$10,361
Agriculture	0	0	$0
Religious	0	9	$9,287
Government	0	11	$6,592
Education	0	0	$0
Total	**2,045**	**950**	**$136,647**

Table 4-38: Estimated Exposure for AEGL Level 2 (> = 160 ppm)

Occupancy	Population	Building Counts	Building Exposure (thousands)
Residential	1,610	1,462	$134,789
Commercial	0	143	$7,538
Industrial	0	22	$28,551
Agriculture	0	16	$1,708
Religious	0	15	$1,547
Government	0	16	$2,203
Education	0	0	$0
Total	**1,610**	**1,674**	**$176,336**

Table 4-39: Estimated Exposure for AEGL Level 1 (> = 30 ppm)

Occupancy	Population	Building Counts	Building Exposure (thousands)
Residential	845	1,800	$167,772
Commercial	0	160	$43,474
Industrial	0	28	$43,362
Agriculture	0	53	$7,951
Religious	0	17	$12,359
Government	0	18	$10,523
Education	0	0	$0
Total	**845**	**2,076**	**$285,441**

Critical Facilities Damage

There are eight critical facilities within the limits of the chemical spill plume. The affected facilities are identified in Table 4-40 and their geographic locations are depicted in Figures 4-23 and 4-24.

Table 4-40: Critical Facilities within Plume Footprint

Name
Lincoln Elementary School
Huntington County EOC
Huntington Police Department
Huntington Sheriff Department
Huntington City Fire Department
WBZQ Communications
Onward Manufacturing Co.
Isolatek Intl.

Figure 4-23: Critical Facilities within Plume Footprint

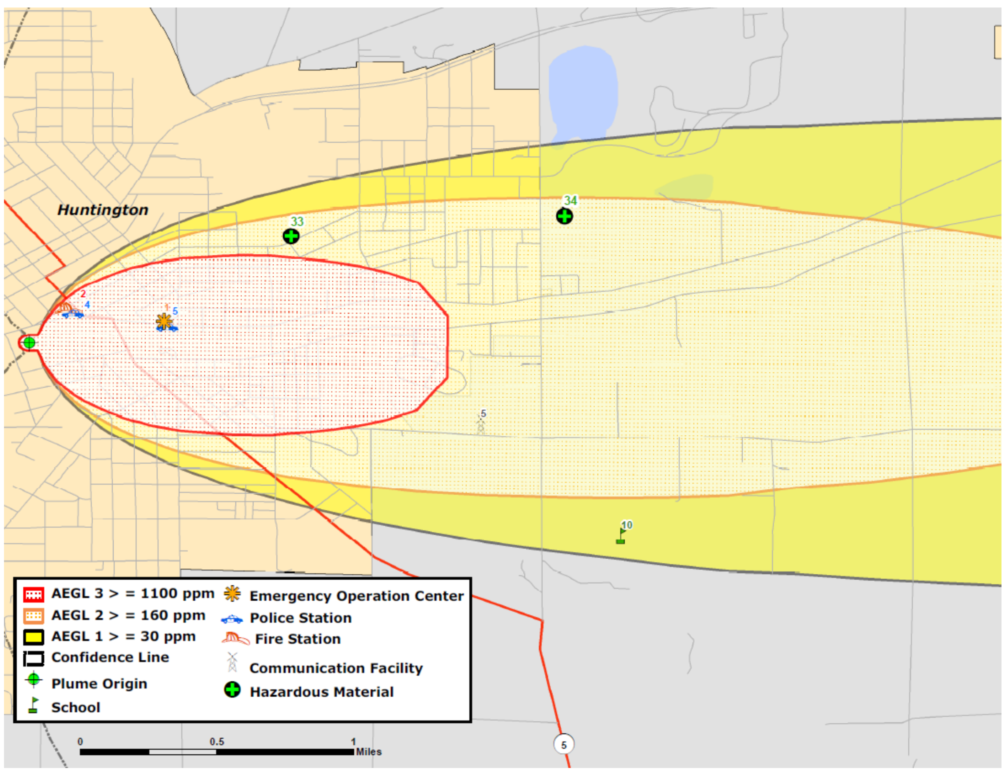
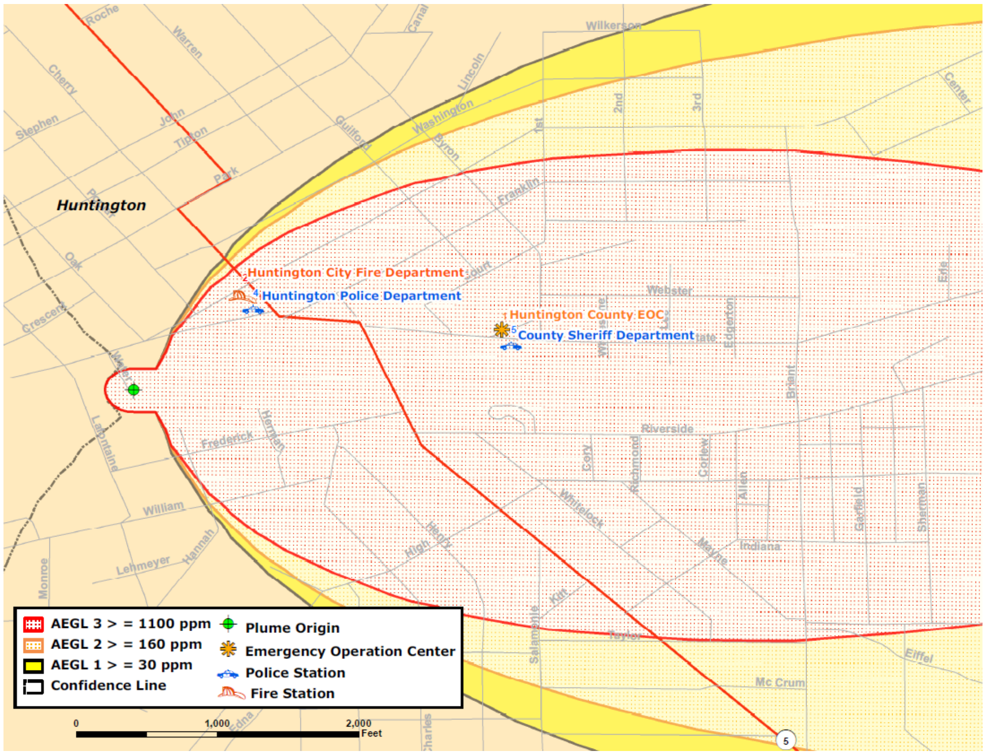


Figure 4-24: Critical Facilities at Greatest Risk



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

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

Analysis of Community Development Trends

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

4.4.9 Fire Hazard

Hazard Definition for Fire Hazard

The Huntington County comprehensive hazard analysis has identified four major categories of fires within the county—tire fires, structural fires, wildfires, and arson.

Tire Fires

The State of Indiana generates thousands of scrap tires annually. Many of those scrap tires end up in approved storage sites that are carefully regulated and controlled by federal and state officials. However, scrap tires are sometimes intentionally dumped in unapproved locations throughout the state. Huntington County has no approved location for tire disposal and storage, but the number of unapproved locations cannot be readily determined. These illegal sites are owned by private residents who have been continually dumping waste and refuse, including scrap tires, at those locations for many years.

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

- Relatively small tire fires can require significant fire resources to control and extinguish.
- Those resources often cost much more than Huntington County government can absorb compared to standard fire responses.
- There may be significant environmental consequences of a major tire fire. Extreme heat can convert a standard vehicle tire into approximately two gallons of oily residue that may leak into the soil or migrate to streams and waterways.

Structural Fires

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

Wildfires

Approximately 35% to 55% of Indiana’s land base is heavily wooded or forested. When hot and dry conditions develop, forests may become vulnerable to devastating wildfires. In the past few decades an increased commercial and residential development near forested areas has dramatically changed the nature and scope of the wildfire hazard in Huntington County. In addition, the increase in structures resulting from new development is a strain to the effectiveness of the fire service personnel in the county.

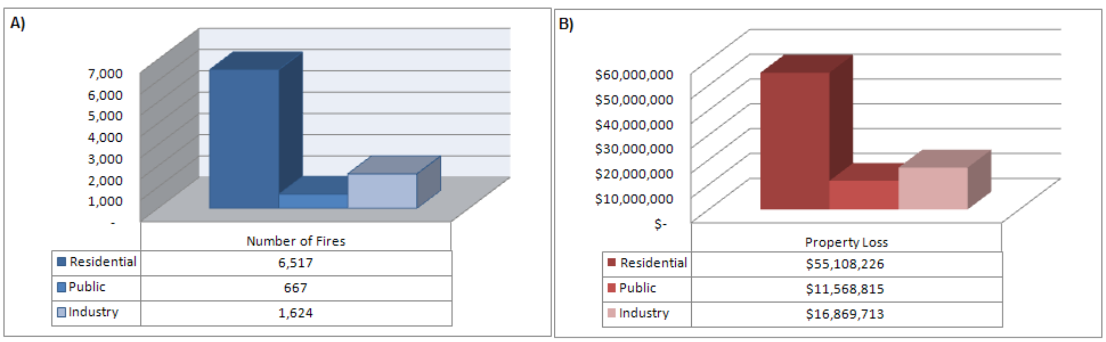
Arson

It is important to note that arson is a contributing factor to fire-related incidents within the county. According to the United State Fire Administration, approximately 22% of the total fires reported from 2001-2002 were of incendiary or suspicious nature.

Previous Occurrences for Fire Hazard

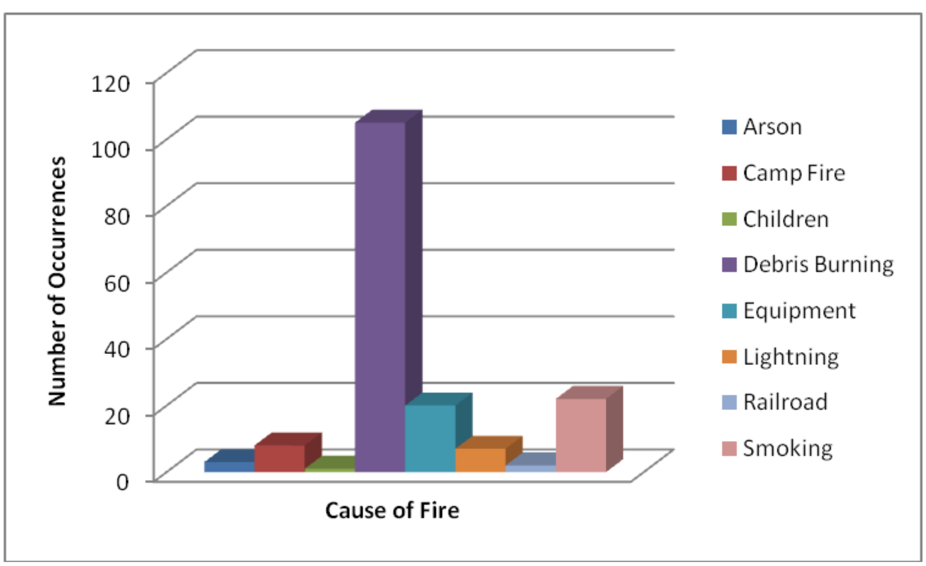
In Huntington County, there have not been many structural fires with significant numbers of deaths or injuries. Records of structural fires in the state of Indiana between January 1, 2007 and December 31, 2007 were obtained from the Fire Service Safety and Risk Management department of the Indiana Department of Homeland Security. Figure 4-25 A and B illustrates the numbers of annual structural fires and the associated property loss respectively, categorized by property type.

Figure 4-25: 2007 Indiana Structural Fires



According to the Indiana Department of Natural Resources, there have been 168 wildfires in Huntington County in the past decade. Figure 4-26 displays the data by cause of the fire.

Figure 4-26: Huntington County Wildfires (1998-2009)



Geographic Location for Fire Hazard

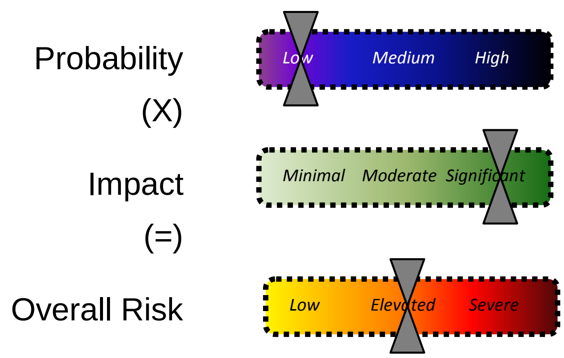
Fire hazards occur countywide and therefore affect the entire county. The heavily forested areas in the county have a higher chance of widespread fire hazard.

Hazard Extent for Fire Hazard

The extent of the fire hazard varies both in terms of the severity of the fire and the type of material being ignited. All communities in Huntington County are affected by fire equally.

Risk Identification for Fire Hazard

Based on historical information, the probability of a fire is low. In Meeting #2, the planning team determined that the potential impact of a fire is significant; therefore, the overall risk of a fire hazard for Huntington County is elevated.



Vulnerability Analysis for Fire Hazard

This hazard impacts the entire jurisdiction equally; therefore, the entire population and all buildings within the county are vulnerable to fires and can expect the same impacts within the affected area.

Table 4-5 lists the types and numbers of all essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

The building exposure for Huntington County, as determined from the building inventory, is included in Table 4-6. Because of the difficulty predicting which communities are at risk, the entire population and all buildings have been identified at risk.

Critical Facilities

All critical facilities are vulnerable to a fire hazards. A critical facility will encounter many of the same impacts as any other building within the jurisdiction. These impacts include structural damage from fire and water damage from efforts extinguishing fire. Table 4-5 lists the types and numbers of essential facilities in the area. Critical facility information, including replacement costs, is included in Appendix F. A map of the critical facilities is included in Appendix G.

Building Inventory

A table of the building exposure in terms of types and numbers of buildings for the entire county is provided in Table 4-6. Impacts to the general buildings within the county are similar to the damages expected to the critical facilities. These impacts include structural damage from fire and water damage from efforts to extinguish the fire.

Infrastructure

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

Vulnerability to Future Assets/Infrastructure for Fire Hazard

Any future development will be vulnerable to these events.

Analysis of Community Development Trends

Fire hazard events may occur anywhere within the county, because of this future development will be impacted.

Section 5 - Mitigation Strategy

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. The goal of mitigation is to build disaster-resistant communities. Mitigation actions and projects should be based on a well-constructed risk assessment, which is provided in Section 4 of this plan. Mitigation should be an ongoing process adapting over time to accommodate a community's needs.

5.1 Community Capability Assessment

The capability assessment identifies current activities used to mitigate hazards. The capability assessment identifies the policies, regulations, procedures, programs, and projects that contribute to the lessening of disaster damages. The assessment also provides an evaluation of these capabilities to determine whether the activities can be improved in order to more effectively reduce the impact of future hazards. The following sections identify existing plans and mitigation capabilities within all of the communities listed in Chapter 2 of this plan.

5.1.1 National Flood Insurance Program (NFIP)

The county and all of its communities, except Mount Etna, are members of the NFIP. Mount Etna does not have an identified flood hazard boundary and chooses not to participate in the program. HAZUS-MH identified approximately 106 households located within the Huntington County Special Flood Hazard Area; 96 households paid flood insurance, insuring $12,699,200 in property value. The total premiums collected amounted to $53,428, which on average was $556.54 annually. As of November 30, 2006, 51 claims were filed totaling $419,344. The average claim was $8,222.

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

Table 5-1 identifies each community and the date each participant joined the NFIP.

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

Community	Participation Date	FIRM Date	CRS Date	CRS Rating	Flood Plain Zoning Ordinance Adopted Last
Town of Andrews	04/02/76	09/30/82	N/A	N/A	12/28/06
City of Huntington	06/07/74	07/18/83	N/A	N/A	05/01/93
Huntington County	03/03/78	07/18/83	N/A	N/A	12/18/06
Town of Markle	11/07/91	NSFHA	N/A	N/A	11/07/91
Town of Roanoke	12/28/73	12/01/82	N/A	N/A	05/16/06
Town of Warren	11/23/73	09/30/82	N/A	N/A	06/12/06

5.1.2 Stormwater Management Stream Maintenance Ordinance

Huntington County has a stormwater management ordinance that covers the municipal units and extra territorial jurisdictions. The ordinance protects lakes and streams that may be affected during construction or new development when deposits of sediment can reduce the capacities of storm sewers and drainage systems.

5.1.3 Zoning Management Ordinance

Huntington County has a zoning ordinance that covers the municipal limits and extra territorial jurisdictions and regulates construction and development based on land use regulations. Table 5-2 lists amendment dates of various ordinances within the county.

Table 5-2: Description of Zoning Plans/Ordinances

Community	Comp Plan	Zoning Ord	Subd Control Ord	Erosion Control	Storm Water Mgmt	Burning Ord.	Seismic Ord.	Bldg. Stndrds.
Huntington County	2003	07/27/09	04/03/06	04/03/06	11/24/04	N/A	N/A	1991
Andrews	N/A	07/20/09	04/03/06	04/03/06	12/29/05	N/A	N/A	1991
Huntington (City)	N/A	04/10/06	04/03/06	04/03/06	01/11/06	N/A	N/A	1991
Markle	N/A	02/15/06	01/13/06	01/13/06	05/18/05	N/A	N/A	1991
Mount Etna	N/A	04/01/09	02/13/06	02/13/06	07/07/05	N/A	N/A	1991
Roanoke	N/A	07/21/09	03/07/06	03/07/06	04/05/05	N/A	N/A	1991
Warren	N/A	03/23/09	02/13/06	02/13/06	02/13/06	N/A	N/A	1991

5.1.4 Erosion Management Program/ Policy

Huntington County does not have a separate ordinance for erosion management, but the issue is comprehensively addressed within the stormwater management ordinance.

5.1.5 Fire Insurance Rating Programs/ Policy

Table 5-3 lists Huntington County's fire departments and respective information.

Table 5-3: Listing of Fire Departments, Ratings, and Number of Firefighters

Fire Department	Fire Insurance Rating	Number of Firefighters
Andrews Fire Department	6	19
Bippus Fire Department	9	37
Huntington City Fire Department	4	41
Markle Fire Department	7	28
Mount Etna Fire Department	9	34
Roanoke Fire Department	6	30
Warren Fire Department	7	25

5.1.6 Land Use Plan

The county and extra territorial jurisdictions are covered by land use plans, which are part of the Comprehensive Plan. The amendment dates are listed in Table 5-4.

Table 5-4: Amendment Dates for Huntington County Land Use Plans

Community	Adoption Date
Huntington County	07/2005
Andrews	07/2005
Huntington (City)	06/1969
Markle	07/2005
Mount Etna	07/2005
Roanoke	07/2005
Warren	07/2005

5.1.7 Building Codes

Table 5-2 identifies the building code amendment dates within the county. There are no building codes specific to seismic control. Many of the building codes for manufactured homes require tie downs to minimize wind effects.

5.2 Mitigation goals

In Section 4 of this plan, the risk assessment identified Huntington County as prone to eight hazards. The MHMP committee members understand that although hazards cannot be eliminated altogether, Huntington County can work toward building disaster-resistant communities. Following are a 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 to attain the listed goals.

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

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

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

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

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

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

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

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

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

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

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

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

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

5.3 Mitigation Actions/Projects

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

- **Prevention:** Government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning and zoning, building codes, capital improvement programs, open space preservation, and stormwater management regulations.

- **Property Protection:** Actions that involve the modification of existing buildings or structures to protect them from a hazard or removal from the hazard area. Examples include acquisition, elevation, structural retrofits, storm shutters, and shatter-resistant glass.

- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them. Such actions include outreach projects, real estate disclosure, hazard information centers, and school-age and adult education programs.

- **Natural Resource Protection:** Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

- **Emergency Services:** Actions that protect people and property during and immediately after a disaster or hazard event. Services include warning systems, emergency response services, and protection of critical facilities.

- **Structural Projects:** Actions that involve the construction of structures to reduce the impact of a hazard. Such structures include dams, levees, floodwalls, seawalls, retaining walls, and safe rooms.

After Meeting #3, held October 20, 2009, MHMP members were presented with the task of individually listing potential mitigation activities using the FEMA evaluation criteria. The MHMP members brought their mitigation ideas to Meeting #4 which was held December 7, 2009. The evaluation criteria (STAPLE+E) involved the following categories and questions.

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

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

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

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

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

Economic:

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

Environmental:

- How will this action affect the environment (land, water, endangered species)?
- Will this action comply with local, state, and federal environmental laws and regulations?
- Is the action consistent with community environmental goals?

5.4 Implementation Strategy and Analysis of Mitigation Projects

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

In Meeting #4, the planning team prioritized mitigation actions based on a number of factors. A rating of high, medium, or low was assessed for each mitigation item and is listed next to each item in Table 5-5. The factors were the STAPLE+E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria listed in Table 5-4.

Table 5-4: STAPLE+E planning factors

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

For each mitigation action related to infrastructure, new and existing infrastructure was considered. Additionally, the mitigation strategies address continued compliance with the NFIP. While an official cost benefit review was not conducted for any of the mitigation actions, the estimated costs were discussed. The overall benefits were considered when prioritizing mitigation items from high to low. An official cost benefit review will be conducted prior to the implementations of any mitigation actions. Table 5-5 presents mitigation projects developed by the planning committee, as well as actions that are ongoing or already completed. Since this is the first mitigation plan developed for Huntington County, there are no deleted or deferred mitigation items.

Table 5-5: Mitigation Strategies

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Establish a Flood Overlay Plan and Joint Board	Goal: Develop long-term strategies to educate Huntington County residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Flood	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Complete	This project has been implemented.
Elevate St. Joe Street	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Flood	Huntington County	Complete	This project was completed in 2003.
Increase the right-of-way on Etna Avenue	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Flood	Huntington	Complete	This project was completed.
Implement Code Red notification system	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm, Hazmat	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Complete	This system has been implemented.
Procure weather radios for all schools	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Flood, Thunderstorm, Winter Storm	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Complete	This project has been implemented.
Establish a hazmat team and procure equipment	Goal: Develop long-term strategies to educate Huntington County residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Hazmat	Huntington County	Ongoing	The team has been established, but procuring and maintaining equipment will be an ongoing strategy.
Institute a buy-out plan for homes along the Wabash River and Little Wabash River	Goal: Create new or revise existing plans/maps for Huntington County Objective: Support compliance with the NFIP for each jurisdiction in Huntington County.	Flood	Huntington County, Huntington, Roanoke, Andrews, Warren	High	The County EMA oversees the implementation of the project. Funding has not been secured as of 2010 but will be sought from funding sources such as IDHS. Implementation, if funding is available, is forecasted to begin within one year.
Construct additional retention facilities for Roanoke	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Flood	Roanoke	Medium	The County EMA will oversee the implementation of this project. Funding has not been secured as of 2010, but INDOT and IDHS are possible funding sources. Implementation, if funding is available, will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Conduct stream maintenance	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Flood	Huntington County	Medium	The County EMA will oversee this project. IDHS and IDNR are potential funding sources. If funding is available, implementation will begin within three years.
Purchase a sandbagging machine for the county and communities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Flood	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Low	The EMA director will oversee implementation of this project. Funding has not been secured as of 2010, but the county will seek funds from IDHS and community grants. Implementation will begin within five years.
Develop a public education program to inform residents of potential hazards and emergency plans	Goal: Develop long-term strategies to educate Huntington County residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	Flood, Tornado, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat, Fire	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	High	The County EMA will oversee this project. Local resources will be used to develop educational literature and present to each jurisdiction at public events or in schools. Funds for brochures and trailers will be sought from FEMA. If resources are available, the project will be implemented within one year.
Harden, relocate, or reconstruct critical facilities—especially fire stations and schools—and shelters and trailer parks throughout the county	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Tornado, Flood, Earthquake, Thunderstorm, Winter Storm	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	High	The County EMA will oversee the implementation of this project. Local resources will be used to identify the required structures to be hardened. Funding has not been secured as of 2010, but the pre-disaster mitigation program and community development grants are possible funding sources. Implementation, if funding is available, will begin within one year.
Upgrade existing and install new warning sirens	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Evaluate and strengthen the communication and transportation abilities of emergency services throughout the county.	Tornado, Thunderstorm, Winter Storm	Huntington County	Medium	The County EMA oversees the implementation of the project. Local resources will be used to evaluate, install, and maintain the warning systems. Additional funding will be sought from other funding sources, e.g. PDM program, to expand the warning system coverage area. Implementation, if funding is available, is forecasted to begin within three years.
Trim trees to minimize the amount/duration of power outages	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Thunderstorm, Winter Storm	Huntington County	Low	The County EMA will oversee implementation of this project. Funding has not been secured as of 2010, but the PDM program, INDOT, or IDHS are possibilities. If funding is available, implementation will begin within five years.
Procure back-up generators for critical facilities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Flood, Tornado, Earthquake, Thunderstorm, Winter Storm	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Low	The County EMA will oversee the implementation of this project. Funding has not been secured as of 2010, but the pre-disaster mitigation program and community development grants are possible funding sources. If funding is available, this project is forecasted to begin within five years.
Install a backup power line	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Thunderstorm, Winter Storm	Markle	Low	The County EMA will oversee the implementation of this project. Funding has not been secured as of 2010, but community development grants are possible funding sources. If funding is available, this project is forecasted to begin within five years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Develop an ordinance to require that new subdivisions bury power lines	Goal: Create new or revise existing plans/maps for Huntington County Objective: Review and update existing community plans and ordinances to support hazard mitigation.	Tornado, Thunderstorm, Winter Storm	Huntington County	Low	The County EMA will oversee implementation of this project. Local resources, with assistance from state and federal agencies, will complete this project. Implementation, if funding and resources are available, will begin within five years.
Install inertial valves at critical facilities	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Retrofit critical facilities with structural design practices and equipment that will withstand natural disasters and offer weather-proofing.	Earthquake	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Medium	The County EMA will oversee implementation of this project. Funding has not been secured as of 2010, but the PDM program and community grants are an option. If funding is available, implementation will begin within three years.
Distribute literature advising that residents, schools, healthcare facilities, and other critical facilities bolt bookshelves to walls and secure water heaters	Goal: Develop long-term strategies to educate Huntington County residents on the hazards affecting their county Objective: Raise public awareness on hazard mitigation.	Earthquake	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Low	The County EMA will work with schools, healthcare facilities, and public officials to create and distribute the literature. Local resources and FEMA will be used for funding. If funding is available, implementation will begin within five years.
Establish new shelters and warming/cooling centers	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Improve emergency sheltering in Huntington County.	Tornado, Flood, Earthquake, Thunderstorm, Drought, Winter Storm, Hazmat	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Low	The County EMA will oversee the implementation of this project. Local resources and IDHS grants will be sought to procure the materials. Implementation, if funding is available, is forecasted to begin within five years.
Develop a database of special needs populations	Goal: Create new or revise existing plans/maps for Huntington County Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Winter Storm	Huntington County, Andrews, Huntington, Markle, Mt. Etna, Roanoke, Warren	Low	The County EMA will work with utility companies and healthcare staff to identify the population. Local resources will be used to create the database. Implementation will begin within five years.
Purchase new snow removal equipment and pre-treatment equipment and supplies	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Equip public facilities and communities to guard against damage caused by secondary effects of hazards.	Winter Storm	Huntington County	Medium	The County EMA will oversee this project. Funding has not been secured as of 2010, but the PDM program and community development grants are a possibility. If funding is available, implementation will begin within three years.
Establish a countywide plan to improve security at several bulk tank storage facilities	Goal: Develop long-term strategies to educate Huntington County residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Hazmat, Fire	Huntington County	Medium	The County EMA will oversee implementation of this project. Local resources, with assistance from state and federal agencies, will complete this project. Implementation, if funding and resources are available, will begin within five years.
Increase school training regarding hazmat response and evacuation	Goal: Develop long-term strategies to educate Huntington County residents on the hazards affecting their county Objective: Improve education and training of emergency personnel and public officials	Hazmat	Andrews, Huntington, Roanoke, Warren	Medium	The County EMA will work with schools to oversee implementation of this project. Local resources will complete this project. Implementation, if funding and resources are available, will begin within three years.

Mitigation Item	Goals and Objects Satisfied	Hazards Addressed	Jurisdictions Covered	Priority	Comments
Conduct a commodity flow study for safety concerns	Goal: Create new or revise existing plans/maps for Huntington County Objective: Conduct new studies/research to profile hazards and follow up with mitigation strategies.	Hazmat	Huntington County	Medium	Community planners and local government leaders will coordinate this study. Funding will be requested from community grants or IDHS. Implementation will begin within three years.
Install modern fire suppression systems in older downtown buildings and ensure new buildings are fire-safe	Goal: Lessen the impacts of hazards to new and existing infrastructure Objective: Minimize the amount of infrastructure exposed to hazards.	Fire	Huntington, Andrews, Markle, Roanoke, Warren	Low	The County EMA will oversee implementation of this project. Funding has not been secured as of 2010, but the PDM program and community grants are an option. If funding is available, implementation will begin within five years.

The Huntington County Emergency Management will be the local champions for the actions. The County Commissioners and the city and town councils will be an integral part of the implementation process. Federal and state assistance will be necessary for a number of the identified actions. Region III-A Regional Planning Commission is qualified to provide technical grant writing services to assist the county in seeking resources to achieve the recommended mitigation action.

5.5 Multi-Jurisdictional Mitigation Strategy

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

Each of the seven incorporated communities within Huntington 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. When a community was not able to provide representation at these sessions, it was contacted individually and afforded the opportunity to provide input about its specific jurisdiction and the county strategies in general. In Huntington County, this occurred from the incorporated communities of Mount Etna and Warren. All potential strategies and goals that arose through this process are included in this plan. The county planning team used FEMA's evaluation criteria to gauge the priority of all items. A final draft of the disaster mitigation plan was presented to all members to allow for final edits and approval of the priorities.

Section 6 - Plan Maintenance

6.1 Monitoring, Evaluating, and Updating the Plan

Throughout the five-year planning cycle, the Huntington County Emergency Management Agency will reconvene the MHMP planning committee to monitor, evaluate, and update the plan on an annual basis. Additionally, a meeting will be held on March 10, 2015 to address the five-year update of this plan. Members of the planning committee are readily available to engage in email correspondence between annual meetings. If the need for a special meeting, due to new developments or a declared disaster occurs in the county, the team will meet to update mitigation strategies. Depending on grant opportunities and fiscal resources, mitigation projects may be implemented independently by individual communities or through local partnerships.

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

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

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

6.2 Implementation through Existing Programs

The results of this plan will be incorporated into ongoing planning efforts. Many of the mitigation projects identified as part of this planning process are ongoing. Huntington County and its incorporated jurisdictions will update the zoning plans and ordinances listed in Table 5-2 as necessary and as part of regularly scheduled updates. The mitigation plan will be used to help guide building code changes and land use planning. Each community will be responsible for updating its own plans and ordinances.

6.3 Continued Public Involvement

Continued public involvement is critical to the successful implementation of the MHMP. Comments from the public on the MHMP will be received by the EMA director and forwarded to the MHMP planning committee for discussion. Education efforts for hazard mitigation will be ongoing through periodic updates in the local newspaper, which will announce public meetings scheduled during the five-year update cycle. Once adopted, a copy of this plan will be held at the EMA office. Each incorporated jurisdiction will also receive a plan.

Glossary of Terms

A

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

B

BFE – Base Flood Elevation

C

CAMEO – Computer-Aided Management of Emergency Operations
CEMA – County Emergency Management Agency
CEMP – Comprehensive Emergency Management Plan
CPRI – Calculated Priority Risk Index
CRS – Community Rating System

D

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

E

EAP – Emergency Action Plan
ERPG – Emergency Response Planning Guidelines
EMA – Emergency Management Agency
EPA – Environmental Protection Agency

F

FEMA – Federal Emergency Management Agency
FIRM – Flood Insurance Rate Maps
FIS – Flood Information Study

G

GIS – Geographic Information System

H

HAZUS-MH – **Ha**zards **US**A **M**ulti-**H**azard
HUC – Hydrologic Unit Code

I

IDHS – Indiana Department of Homeland Security
IDNR – Indiana Department of Natural Resources
IGS – Indiana Geological Survey

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

PPM – Parts Per Million

S

SPC – Storm Prediction Center

U

USGS – United States Geological Survey

APPENDIX A: MHMP MEETING MINUTES

Huntington County Pre-Disaster Mitigation Meeting

MEETING #1

21, April, 2009 at 7:00pm

Meeting Minutes

Meeting #1 of the Huntington County Pre-Disaster Mitigation (PDM) Committee was held 21, April, 2009 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St. St., Huntington, Indiana 46750. Those present are listed in the following table.

Name	Organization
Dave Coats	The Polis Center, IUPUI
Melissa Gona	The Polis Center, IUPUI
Brandon Taylor	Huntington County EMA Director
Duane Brumbaugh	Fire Chief, Markle Fire Dept.
Tim Ford	Fire Capt., Warren Fire Dept.
Jeff Caley	Fire Marshal, Huntington Fire & EMA Dept.
Dave Gee	Region III-A, Tech. Serv. Director
Dave Schaefer	Region III-A, Tech. Serv. Planner

Dave Coats of The Polis Center welcomed attendees to the first Whitley County Mitigation Plan meeting. He relayed plan details through a slide presentation, including the following information. All incorporated areas in the U.S. are mandated to have a disaster plan by the Disaster Mitigation Act of 2000. FEMA provides local match funding to support Pre-Hazard Mitigation Planning that results in an approved FEMA plan. The local match is achieved by County donated labor and GIS data sharing to provide the County with no out of pocket dollars spent. However, every incorporated city/town within the County must be represented on the planning team or the plan and funding will not be approved by FEMA. It was noted that the planning team can be enlarged to include such people as police, firefighters, hospital personnel, county highway, and newspapers.

There will be a total of 6 meetings spanning 6 months to a year, at the end of which the team will compile, discuss and review data to be used in the Huntington County Mitigation Plan. In addition, all participants need to keep track of time spent at each meeting and as well as time spent gathering meeting information. The recorded time will be used as credit for the matching-funds requirement.

Polis Center, GIS Coor., Melissa Gona, provided a Polis Center map of Huntington County critical infrastructures for the planning team to review and compare to the County's map and data. Some data and information changes will be submitted to the Polis Center so that updated maps will be available for Meeting #2. Team members are to complete and provide the following items: facility names, correct locations, building replacement costs, number of attending students in schools and the number of beds in the care facilities. Other assignments were made to check information on items, such as, towers and communication centers, power generation facilities, fire depts., police and law enforcement facilities, hospitals, dams and levees. Also, user defined items, such as, Buildings and Armories, storage facilities, potable water, waste water, and water treatment, Hazmat issues. Top employer information is also desirable.

As Huntington County does not have a GIS coordinator at this time, Dave Coats mentioned that if the Advisory Council approves and signs off to give the Polis Center
access to GIS data supplied to the county by GIS consultant Schnieder Eng. , then the Polis Center would use this information to update the Huntington County critical infrastructure maps. The updated Polis Center maps are then given to Huntington County.

At Meeting #2 two strategies for each disaster scenario will be discussed. Dave Coats asked members to bring documentation of memorable historical hazards. He also asked that the county team members prioritize hazards at the next meeting.

Dave Coats also discussed the agenda for Meetings #3 and #4. Meeting #3 will be held about 6 weeks after Meeting #2 and will be for public input into the planning process. This meeting will need to be advertised on the radio and in the local newspapers. Meeting #4 will be held about one month after meeting #3 and will be a brainstorming session for all planning team members.

Pre-disaster mitigation plan information can be accessed and viewed or downloaded with the username INDIANA_PDM and the password hoosiers at www.pdmplanning.com.

The meeting adjourned at 8:30pm. The next meeting will be held on 26, May, 2009 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St., Huntington Indiana 46750.

Dave Schaefer, Region III-A, Tech. Serv. Planner

Huntington County Pre-Disaster Mitigation Meeting

MEETING #2

26, May, 2009 at 7:00pm

Meeting Minutes

Meeting #2 of the Huntington County Pre-Disaster Mitigation (PDM) Committee was held 26, May, 2009 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St. St., Huntington, Indiana 46750. Those present are listed in the following table.

Name	Organization
Dave Coats	The Polis Center, IUPUI
Adam Campbell	The Polis Center, IUPUI
Brandon Taylor	Huntington County EMA Director
Duane Brumbaugh	Fire Chief, Markle Fire Dept.
Tim Ford	Fire Capt., Warren Fire Dept.
Dave Gee	Region III-A, Tech. Serv. Director
Dave Schaefer	Region III-A, Tech. Serv. Planner

At the start of Meeting # 2, information requested at Meeting#1 was provide by the team, discussed and will be used by the Polis Center to update their data and maps.

Adam Campbell and Dave Coats of the IUPUI Polis Center provided a list of NCDC Historical hazards that have occurred in Huntington County since 1955. This list contains information on tornadoes, flooding, thunderstorms/hail/lighting/high winds, severe winter storms, drought/high heat, and other concerns. From this list and from concerns by team members the various disaster scenarios were prioritized and ranked in order of severity.

The Polis Center software was used to provide the following list:

Disaster	Occurrences	Probability	Impact	Rank
Tornado	16	High	Significant	Severe
Flood	16	High	Significant	Severe
Winter Storms	25	High	Moderate	Severe
Structual Fires	3	Low	Significant	Elevated
Dam/Levee failure	3	Low	Significant	Elevated
T'storms/Lighting	165	High	Minimal	Low
Drought/Heat	2	Low	Minimal	Low
Earthquake	0	Low	Minimal	Low

As the list was for the County, individual incorporated towns and cities were also looked at for ranking concerns. Andrews, Markle, and Roanoke indicated that flooding is the major concern. Huntington, Mount Etna, and Warren proposed little change from the county list. Brandon Taylor, Huntington County EMA Director, represents Huntington and Roanoke, and is in conversation with Andrews and Mount Etna concerning these issues.

Polis Center, GIS Coor., Adam Campbell, provided Polis Center maps of Huntington County showing tornado paths, flooding levels, and prevailing winds to be used for HAZ-US modeling for worst case scenarios. The team members picked the critical paths and areas of concern for the modeling. Also, a 5.5 magnitude earthquake will be modeled by the Polis Center. Some data and information changes will be submitted to the Polis Center so that updated maps and modeling will be available for Meeting #3.

Dave Coats also discussed the agenda for Meetings #3 and #4. Meeting #3 will be held about 6 weeks after Meeting #2 and will be for public input into the planning process. This meeting will need to be advertised on the radio and in the local newspapers. Meeting #4 will be held about one month after meeting #3 and will be a brainstorming session for all planning team members.

Pre-disaster mitigation plan information can be accessed and viewed or downloaded with the username INDIANA_PDM and the password hoosiers at www.pdmplanning.com.

The meeting adjourned at 8:30pm. The next meeting will be held in about six to eight weeks at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St., Huntington Indiana 46750.

Dave Schaefer, Region III-A, Tech. Serv. Planner

Huntington County Pre-Disaster Mitigation Meeting

MEETING #3

20, October, 2009 at 7:00pm

Meeting Minutes

Meeting #3 of the Huntington County Pre-Disaster Mitigation (PDM) Committee was held 20, October, 2009 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St. St., Huntington, Indiana 46750. Those present are listed in the following table.

Name	Organization
John Buechler	The Polis Center, IUPUI
Adam Campbell	The Polis Center, IUPUI
Brandon Taylor	Huntington County EMA Director
Rick Asher	Fire Chief, Markle Fire Dept.
Tim Ford	Fire Capt., Warren Fire Dept.
Jerry Helvie	County Commissioner
Jeff Caley	Huntington County Fire Dept.
Dave Gee	Region III-A, Tech. Serv. Director
Dave Schaefer	Region III-A, Tech Serv. Planner

As meeting #3 was a public meeting, a Public Meeting Announcement was published in The Huntington Hearld-Press and the Huntington County Tab newspapers.

John Buechler of The Polis Center welcomed attendees and the Public to the 3nd Huntington County Mitigation Planning meeting. John Buechler and Adam Campbell, Polis Center, GIS Coor., presented the Polis Center Report on HAZUS-US modeling for the following scenarios relevant to Huntington County :

1. F4 Tornado modeling for Huntington County from Southwest to Northeast going through the communities of Andrews, Huntington, and Roanoke.
2. 100 Year/Flash Flood modeling for Huntington Couty.
3. Hazardous Material Spill(ammonia tanker) modeling for the city of Huntington on a railroad line in the center of the city.
4. Earthquake (5.5 scale) modeling with epicenter located in the center of the Huntington County and other locations.
5. Other natural disasters such as, Thunderstorms, Winter Storms, Wind, Fire, and Lightening.

Based on historical and statistical data the modeling indicated the level of Probability(Low, Medium, High), Impact(Minimal, Moderate, Significant), and total Hazard Risk(Low, Elevated, Severe) for each scenario.

The information from Meeting #2 and the HAZUS modeling indicated the following risk levels for Huntington County: Severe(Tornado,Flood,Winter Storms,Hazardous Materials Release), Elevated(Dam/Levee failure, Fires), Low(Earthquake, Thunderstorms/Hail/Lightning/Wind, Drought/Heat).

Costs associated with the disaster scenarios were discussed and include:
Deaths, injuries,and displacement; structure rebuilding, replacement or relocation; loss of critical infrastructure or services.

As the list was for the County, individual incorporated towns and cities were also looked at for ranking concerns. Andrews, Huntington, and Markle indicated that Dam/Levee failure is a severe concern. New concerns can still be added to the plan and modifications to existing concerns can still be made.

John Buechler also discussed the agenda for Meetings #4 and #5. Meeting #4 will be held about one month after meeting #3 and will be a brainstorming session for all planning team members. Meeting #4 will concentrate on the team choosing mitigation strategies for each disaster scenario and for each community within Huntington County. Meeting #5 will be for review of the plan and strategies.

Pre-disaster mitigation plan information can be accessed and viewed or downloaded with the username INDIANA_PDM and the password hoosiers at www.pdmplanning.com.

The meeting adjourned at 8:00pm. The next meeting will be held on, December 7,2009 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St., Huntington Indiana 46750.

Dave Schaefer, Region III-A, Tech. Serv. Planner

Huntington County Pre-Disaster Mitigation Meeting

MEETING #4
7, December, 2009 at 7:00pm
Meeting Minutes

Meeting #4 of the Huntington County Pre-Disaster Mitigation (PDM) Committee was held 7, December, 2009 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St. St., Huntington, Indiana 46750. Those present are listed in the following table.

Name	Organization
Dave Coats	The Polis Center, IUPUI
Melissa Gona	The Polis Center, IUPUI
Brandon Taylor	Huntington County EMA Director
Duane Brumbaugh	Fire Chief, Markle Fire Dept.
Troy Karshner	Roanoke Town Council
Bryn Keplinger	Asst. Director DCD, Huntington County
Tom Wuench	Fire Chief, Andrews
Jerry Helvie	Huntington County Commissioner
Jeff Caley	Huntington County Fire Dept.
Dave Gee	Region III-A, Tech. Serv. Director
Dave Schaefer	Region III-A, Tech Serv. Planner

Dave Coats of The Polis Center welcomed attendees to the 4th Huntington County Mitigation Planning meeting. Dave Coats and Melissa Gona of the Polis Center presented and led the planning team through the mitigation brain storming process. The team provided a list of possible mitigation strategies for each hazard scenario relevant to Huntington County and its communities. Each representative voiced the strategies for their community and the county. Each strategy was discussed and the most important concerns (by mutual agreement) for each scenario in Huntington County and its communities was listed for possible mitigation and FEMA assistance. Those items were:

Flooding

1. House /structure buyouts for the towns of Roanoke, Andrews, Warren.
2. Retention ponds are needed at several locations within the county.
3. Creek clearing is needed at several locations within the county.
4. Sandbagging machines are needed for the county and communities.
5. Need more Public Outreach information and education about disaster scenarios within Huntington County and communities. Use FEMA brochures.

Note: At present there is a Flood Overlay Plan and Joint Board in effect in Huntington County and communities. Also, several INDOT projects are in process, such as, a grant to raise Joe St. and increase right of way on Etna Ave. in Roanoke.

And, the county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation.

Tornado

1. Harden community and county fire stations and other critical services structures.
2. Hardened shelters are needed at Fair Grounds and trailer courts in Andrews and Roanoke and at several other locations in the county.
3. Need more sirens to be located within the county and communities.
4. Need more Public Outreach information and education about disaster scenarios within Huntington County and communities. Use FEMA brochures.

Note: The county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation.

Thunderstorms(Straight Winds/Hail/Power Outage)

1. Need extensive tree trimming around power lines throughout the county.
2. Need generators and electrical transfer systems for backup power installed at many locations within the county and communities.
3. Backup power line is needed for the town of Markle.
4. Planning code changes needed for new developments to bury power lines.
5. Need more Public Outreach information and education about disaster scenarios within Huntington County and communities. Use FEMA brochures.

Note: The county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation.

Earthquakes

1. Harden community and county fire stations and other critical services structures.
2. Install inertial valves on gas lines in critical services structures throughout the county.
3. Need more Public Outreach information and education about disaster scenarios within Huntington County and communities. Use FEMA brochures. Inform the public about simple things they can do, such as, securing shelves and items to a wall.

Note: The county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation.

Winter Storms/Summer Heat

1. Additional shelters with heat sources or Summer cooling are needed throughout the county and communities.
2. Establish a list of people from throughout the county and communities with special needs to be used for their assistance.
3. More snow handling equipment is needed throughout the county and communities.
4. Need more Public Outreach information and education about disaster scenarios within Huntington County and communities. Use FEMA brochures.

   Note: The county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation.

Hazmat

1. There needs to be better security in place at the several bulk tank storage facilities within the county. Need a county wide plan to accomplish this.
2. County transportation systems need to be reviewed for safety concerns.
3. More training is needed at the schools within the county for Hazmat concerns.
4. Need more Public Outreach information and education about disaster scenarios Huntington County and communities. Use FEMA brochures.
   Note: The county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation. The county has a HAZMAT team and equipment in operation.

Structural Fires

1. Greater enforcement of present fire codes is needed throughout the county.
2. Modern fire suppression systems need to be installed in older downtown buildings in towns and cities throughout Huntington County.
3. Need more Public Outreach information and education about disaster scenarios within Huntington County and communities. Use FEMA brochures.

Note: The county has a Code Red notification system in operation for disaster or emergency situations. All schools within the county have the Weather Alert radio system in operation.

Dave Coats also discussed the agenda for Meetings #5 and #6. Meeting #5 will be held about one month after meeting #4 and will be a plan review session for all planning team members. New concerns can still be added to the plan, and modifications to existing concerns can also be made.

Meeting #6 will be held after the approved plan has been returned from FEMA and will be for the County and Town councils to provide an approved resolution .

Pre-disaster mitigation plan information can be accessed and viewed or downloaded with the username INDIANA_PDM and the password hoosiers at www.pdmplanning.com.

The meeting adjourned at 8:15pm. The next meeting will be held in January, 2010 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St., Huntington Indiana 46750.

Dave Schaefer, Region III-A, Tech. Serv. Planner

Huntington County Pre-Disaster Mitigation Meeting

MEETING #5

23, February, 2010 at 7:00pm

Meeting Minutes

Meeting #5 of the Huntington County Pre-Disaster Mitigation (PDM) Committee was held 23, February, 2010 at 7:00pm, at the Emergency Center/ Huntington County Jail Bldg., 332 E. State St. St., Huntington, Indiana 46750. Those present are listed in the following table.

Name	Organization
Brandon Taylor	Huntington County EMA Director
Tim Ford	Warren Fire Dept.
Jim Paul	Mt. Etna Fire Dept.
Duane Brumbaugh	Fire Chief, Markle Fire Dept.
Troy Karshner	Roanoke Town Council
Bryn Keplinger	Asst. Director DCD, Huntington County
Tom Wuench	Fire Chief, Andrews
Jerry Helvie	Huntington County Commissioner
Jeff Caley	Huntington County Fire Dept.
Dave Gee	Region III-A, Tech. Serv. Director
Dave Schaefer	Region III-A, Tech Serv. Planner

The agenda for Meeting #5 was for review and correction to the Huntington County Hazard Mitigation Plan. The following list of corrections or additions were requested:

3.5, Table 3-3, Company Name, Bendix Commercial Systems, Type of Business, Industrial Machinery, (change type of business to “Vehicle Air Brake Systems”).
4.4.2, Previous Occurrences for Dam and Levee Failure, delete “According to the Huntington County planning team there have been three dam failures in the county.”(no failures have been recorded in the county).

4.4.5, Previous Occurrences for drought and Extreme Heat Hazard, Table 4-27, 14 deaths, (the team indicates this number is too large).

4.4.7,Hazardous Materials Storage and Transport Hazard,Critical Facilities Damage, Table 4-40 Critical Facilities within Plume Footprint, Name, Majestic Products Co., (change to: Onward Manufacturing Co).

4.4.9, Tire Fires, Huntington County has no approved location for tire disposal and storage, (this has been confirmed).

5.1.3, Zoning Management Ordinance, Table 5-2, (indicate that dates are for last amended)
5.1.4, Erosion Management Program/Policy,(add sentence, “The City of Huntington has an erosion control ordinance that was last amened on 5-12-09.
5.1.6, Land Use Plan, Table 5-4, (indicate that Land Use Plan and Comprehensive Plan Table 5-2 are the same by Code).

5.5, Multi-Jurisdictional Mitigation Strategy," In Huntington County, this occurred from the incorporated communities of Mount Etna and Warren".
5.5, Table 5-5, Mitigation Strategies, Mitigation Item, "Increase the right-of-way on Etna Avenue", (change Jurisdictions Covered from Roanoke to Huntington).
5.5, Table 5-5, Mitigation Strategies, Mitigation Item, "Construct a retention pond near Main Street", (change to: Construct additional retention facilities for Roanoke).
5.5, Table 5-5, Mitigation Strategies, Mitigation Item, "Harden critical facilities-", (change to: Harden, relocate, or reconstruct critical facilities-especially fire stations and schools- and shelters for trailer parks throughtout the county).
5.5, Table 5-5, Mitigation Strategies, Mitigation Item, Install modern fire suppression systems in older downtown buildings, (change Jurisdictions Covered to include Markle).
6.1, Monitoring, Evaluating, and Updating the Plan, "a meeting will be held on March 10, 2015".

Meeting #6 for resolution signing, will be held after the approved plan has been returned from FEMA and will be for the County and Town councils to provide an approved resolution .

Pre-disaster mitigation plan information can be accessed and viewed or downloaded with the username INDIANA_PDM and the password hoosiers at www.pdmplanning.com.

The meeting adjourned at 8:15pm. The sixth and final meeting will be held at Huntington County and Town Council meetings for the signing of resolutions adopting the Huntington County Hazard Mitigation Plan.

Dave Schaefer, Region III-A, Tech. Serv. Planner

Mitigation Strategies

Winter Storm:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: purchase back-up generators for public facilities* Provide a Shelter With a backup generator so there would be a place for people to go if the power goes out in town.

Hazardous Materials Spills:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: identify current and establish alternate approved routes for transporting hazardous materials*

Fire:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: Create and distribute fire safety brochures at the county fair*
  Provide fire safety education for the school.

Drought:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: establish cooling shelters near nursing homes*

Which of the hazards listed above is the biggest threat to your community? Explain why in detail.

Weather related hazards. This is the biggest concern because we do not have a shelter with a backup generator.

Submitted by <Name>, <Title>: [signature] Lud? Mt Etna Fire Dept.

Mitigation Strategies

Community Name: Mt. Etna

The purpose of this planning grant is to identify the hazards that most affect your community and then identify projects and strategies that could reduce the damage and loss of life for future disasters (Mitigation Strategies). This worksheet will help us prepare materials for the plan document and meetings. WE WANT TO MAKE SURE YOUR COMMUNITY IS REPRESENTED IN THE PLAN.

Flood:

- Is flooding a major problem in your community (yes or no)
- What is the major reason or source of flooding?
- What could be done to reduce future flooding (Mitigation strategy)? LIST AT LEAST ONE STRATEGY (use the back side of the sheet for additional space if needed). *Example: voluntary buyouts ~~for two houses on Oak Street~~*

Dam/Levee Failure:

- Will your community be impacted by any dam failure? (yes or no)
- If so what could be done to reduce the risk of failure? LIST AT LEAST ONE STRATEGY. *Example: enforce dam inspectionss*

Tornado:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *~~Example:~~ install weather sirens in mobile home communities*

Need a new siren to replace the ~~[illegible]~~ present one that is roughly 50-60 years old.

Provide an additional siren to cover all of the town.

Earthquake:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: bolt bookshelves to walls in all schools*

Thunderstorm:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: develop family emergency plans during Severe Weather Week in schools*

This would pertain to tornados also but it would help to have a shelter in town for the residences to go to. The shelter would also need to have a generator for when the power goes out.

Mitigation Strategies

Community Name: Warren Vol Fire Dept

The purpose of this planning grant is to identify the hazards that most affect your community and then identify projects and strategies that could reduce the damage and loss of life for future disasters (Mitigation Strategies). This worksheet will help us prepare materials for the plan document and meetings. WE WANT TO MAKE SURE YOUR COMMUNITY IS REPRESENTED IN THE PLAN.

Flood:

- Is flooding a major problem in your community (yes or no)
- What is the major reason or source of flooding? Big rain falls. make the River over flow
- What could be done to reduce future flooding (Mitigation strategy)? LIST AT LEAST ONE STRATEGY (use the back side of the sheet for additional space if needed). *Example: voluntary buyouts ~~for two houses on Oak Street~~* of one Home on South Nancy st

Dam/Levee Failure:

- Will your community be impacted by any dam failure? (yes or no)
- If so what could be done to reduce the risk of failure? LIST AT LEAST ONE STRATEGY. *Example: enforce dam inspectionss*

Tornado:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *~~Example: install~~ weather sirens in ~~mobile~~ home ~~communities~~*
  ~~Rep~~ Get a grant to Replase or Repaire 2 of the 6 Sirens that we Have.

Earthquake:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: bolt bookshelves to walls in all schools*
  None

Thunderstorm:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: develop family emergency plans during Severe Weather Week in schools*

Winter Storm:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: purchase back-up generators for public facilities*, Ask the Nursing Home, if they would let people use there facilities in an emergency.

Hazardous Materials Spills:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *~~Example~~: identify current and establish alternate approved routes for transporting hazardous materials*

Fire:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: Create and distribute fire safety brochures at the county fair*, and teach kids in the schools.

Drought:

- What could be done to reduce damage and loss of life (Mitigation strategy)? LIST AT LEAST ONE STRATEGY. *Example: establish cooling ~~shelters~~ near nursing homes*
N.A

APPENDIX B: NEWSPAPER ARTICLES

COMMUNITY CALENDAR

SATURDAY

■ Pleasant Chapel United Methodist Church is having a Soup Supper and Bazaar from 4 to 7 p.m. The menu includes chili and vegetable soup, sandwiches, pie and cake, coffee and cold drink. Pleasant Chapel is located at the corner of 1100 North and 100 East.

MONDAY

■ Board of Public Works and Safety will meet at 9 a.m. in the Mayor's Conference Room.

■ Huntington County Commissioners will meet at 8:30 a.m. in the County Commissioner's Room, 1st floor in the Huntington County Courthouse.

■ Cancer/Catron Support Group will meet at 7 p.m. at Trinity United Methodist Church on the corner of Guilford and Market St.

sion of the group's activities will be held followed by assigned writers reading some of their work with critiquing by the group.

The group is open to area writers and poets. Anyone interested in the meeting is welcome to attend.

TUESDAY

■ The Huntington County Hazard Mitigation Steering Committee will host a public information and strategy planning session at 7 p.m. at the Jail Building, 332 E. State St. second floor training room.

■ Youth Services Bureau will have a coupon fundraiser at Applebee's. To obtain a coupon contact the YSB office at 356-9681 or www.ysbofhuntingtonco.org.

■ Child Conservation Club will meet at the home of Miriam Lockwood at 1 p.m.

Appeals will meet at 6:30 p.m. in the Warren Town Hall Annex, 131 Wayne St. in Warren.

■ Dallas-Warren Township Home Extension Club will meet at 1:30 p.m. at the Tipton House

THURSDAY

■ Huntington County Council will meet at 7 p.m. in the GAR Room.

OCT. 23

■ Heith Garner Scholarship Dinner – Dan's Fish Fry from 5 to 8 p.m. at Hier's Park.

■ Huntington Catholic School is hosting The Shoppers' Showcase! Sell-from-home favorites like Pampered Chef, Premiere Jewelry, Tastefully Simple, Longaberger, Gold Canyon Candles, Mary Kay and others will be featured. The

Monday, October 5, 2009 The TAB Page 5

County seeks strategies to deal with disasters

The Huntington County Hazard Mitigation Steering Committee, in association with the Huntington County Department of Emergency Management, will host a public information and strategy planning session on Tuesday, Oct. 20, at 7 p.m. in the second floor training room at the Huntington County Jail.

The Steering Committee has been working toward developing a Multi-Hazard Mitigation Plan (MHMP) for Huntington County that is designed to reduce the negative impact of future natural disasters on county residents.

Every unit of local government is now required by the Federal Emergency Management Agency (FEMA) to have an MHMP.

Examples of projects taken on by other communities in accordance with an MHMP have included storm shelters, warning sirens, flood walls and fire protection enhancements.

Huntington County's Steering Committee had identified hazards likely to affect the region, including floods, tornadoes, drought and extreme heat, severe winter storms, earthquakes, hazardous materials releases and severe thunderstorms.

The committee has been working with the Polis Center, an urban planning research center at Indiana University-Purdue University Indianapolis (IUPUI), to create Huntington County's MHMP.

At the public meeting on Oct. 20, Huntington County citizens will have the opportunity to view the plan in its current stage and offer questions and comments to the Steering Committee.

Once the plan is complete, it will be sent to FEMA for consideration. If approval is secured, the local steering committee will develop ways to fund any disaster-preparedness projects that were included in the plan.

For more information about the MHMP, or to provide input, contact Huntington County Emergency Management Director Brandon Taylor at 358-4870.

APPENDIX C: ADOPTIONS

APPENDIX D: NCDC HISTORICAL DATA

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
Huntington	07/08/55	Tornado	F1	0	0	3K	0	None Reported
Huntington	05/10/57	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/04/57	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/04/57	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/06/57	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	07/03/60	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	08/19/61	Tornado	F	0	0	3K	0	None Reported
Huntington	04/17/63	Tornado	F2	0	0	250K	0	None Reported
Huntington	07/18/66	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/01/67	Tornado	F2	0	2	25K	0	None Reported
Huntington	05/16/68	Tornado	F3	0	3	3K	0	None Reported
Huntington	04/29/70	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	04/29/70	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	04/29/70	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	05/15/70	Tornado	F0	0	0	0K	0	None Reported
Huntington	07/02/70	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	08/11/73	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	04/03/74	Tornado	F2	0	0	0K	0	None Reported
Huntington	06/20/74	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/14/75	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	11/10/75	Tornado	F1	0	15	250K	0	None Reported
Huntington	06/02/80	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	09/22/80	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/08/81	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/01/83	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	07/01/83	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	09/06/83	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	09/06/83	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	09/06/83	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	09/06/83	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/13/84	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/15/85	Tornado	F2	0	0	25K	0	None Reported
Huntington	06/15/85	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/05/85	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	05/06/86	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	05/06/86	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/19/86	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	07/07/86	Tstm Wind	0 kts.	0	0	0	0	None Reported

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
Huntington	07/11/86	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/25/86	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	08/26/86	Tstm Wind	52 kts.	0	0	0	0	None Reported
Huntington	05/21/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	05/30/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	05/30/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/29/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/29/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/26/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/29/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/29/87	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	04/03/88	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	05/09/88	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	08/15/88	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	09/19/88	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	11/16/88	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	04/03/89	Hail	2.75 in.	0	0	0	0	None Reported
Huntington	04/25/89	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	08/28/90	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/02/91	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/07/91	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	07/07/91	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/17/92	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	06/17/92	Tstm Wind	0 kts.	0	0	0	0	None Reported
Huntington	09/09/92	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	10/08/92	Tornado	F1	0	0	250K	0	None Reported
Huntington	10/08/92	Tornado	F1	0	0	250K	0	None Reported

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
Huntington	01/14/94	Extreme Cold	N/A	3	0	5.0M	0	Bitter cold weather settled over Indiana during the third week of January. Many locations recorded daily minimum temperatures below zero each day from January 14 to January 21. The coldest temperatures were recorded on the morning of January 19, when a new record minimum for the state of Indiana was established with a reading of -36 at the National Weather Service cooperative weather station at New Whiteland in Johnson County. Other record low temperatures recorded on the 19th included an all time record low of -27 at Indianapolis, and record lows for the day of -17 at Evansville, -18 at Fort Wayne, and -21 at South Bend. Some locations with official temperatures of -30 or colder on the 19th included Cambridge City with -35, Martinsville with -35, Spencer with -33, the Bloomington Airport with -33, Salem with -32, Rushville with -31, and Brookville with -31. Three people in Vanderburgh County died as a result of the extreme cold. A 79 year woman died from hypothermia in her home, a 77 year old male man died from exposure while working on his farm, and a 46 year old male froze to death after he passed out in his car. (F79P)(M77O)(M46V) INZ030-032>092,16,1600EST-* Central and,17,1200EST,,,0,?,5,0,Heavy Snow/Ice Storm Southern Indiana A major winter storm brought heavy snow to central and southern Indiana. In parts of southern Indiana one-quarter to one-half inch of freezing rain accumulated before the precipitation changed to snow. Most of central and southern Indiana received between six and nine inches of snow. However, heavier amounts fell in extreme southern Indiana, with 16 inches being reported over Harrison, Floyd, and Clark Counties, and close to a foot of snow being reported over the southern parts of Spencer and Perry Counties. Many businesses and schools were closed for several days following the storm, with some schools remaining closed for an entire week. Many roads in southern Indiana were impassable for several days following the storm. IOWA
Huntington	02/25/94	Heavy Snow/blowing Snow	N/A	0	0	0	0	Snow moved into northwest Indiana late on the morning of the 25th, and spread east across the northern part of the state during the afternoon. At times snow fell at the rate of one to two inches per hour. Most of northern Indiana received between three and five inches of snow, although there were some spots that reported six inches or more. Eight to ten inches of snow fell over Pulaski and Elkhart Counties, and six to seven inches fell in Starke County. After the snow tapered off strong winds developed and caused severe blowing and drifting snow. At times whiteout conditions were reported in northern Indiana, with wind gusts of 40 to 60 mph. Numerous roads had to be closed, and many motorists were stranded. Three foot drifts were reported in Elkhart County. Interstate 65 had to be closed north of Lafayette. Snow emergencies were declared in Benton, Jasper, White, Marshall, Clinton, Cass, Howard, and Tippecanoe Counties. State Emergency Management reported that approximately 1,400 stranded motorists were housed at shelters.
Huntington	03/23/94	Hail	1.00 in.	0	0	0	0	One inch diameter hail was reported throughout the county.
Huntington	04/27/94	Tstm Winds	0 kts.	0	0	500K	0	A thunderstorm produced downburst winds just southeast of Warren.
Huntington	06/28/94	Hail	2.00 in.	0	0	50K	0	Numerous reports of one to two inch diameter hail in the city caused damage to several cars and house rooftops.
Huntington	06/28/94	Hail	1.50 in.	0	0	0	0	Large hail occurred just southeast of Huntington.
Huntington	07/05/94	Tstm Winds	0 kts.	0	0	50K	0	Thunderstorm winds damaged the roofs of three homes, blew off a porch, and damaged an attached garage in northern Huntington County, near the Whitley County line. Damage was estimated at $9,000.
Huntington	11/21/94	High Wind	0 kts.	0	0	50K	0	An intense low pressure system over the Great Lakes and its associated cold front produced high winds across all of Indiana. Winds in excess of 50 mph were common across the state beginning near midnight in western Indiana. High winds spread to eastern Indiana by noon EST. Scattered power outages and downed trees were reported across many parts of Indiana including the South Bend, Lafayette, Indianapolis areas as well as rural areas northeast of Evansville.
Huntington	11/27/94	High Wind	0 kts.	0	0	120K	0	An intense low pressure area and its associated cold front swept across the region with high winds both before and after the cold front. The cold front itself triggered a squall line that produced damage. The high winds resulted in a roof collapse at the ATF automotive business in Indianapolis around 2 PM EST. Also, a

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
								church steeple was damaged late Sunday evening on Indianapolis' eastside.
Huntington	03/07/95	Flood	N/A	0	0	0	0	One to three inch rains fell across west-central, north-central, and northeast Indiana on the 6th and 7th. This caused minor street flooding in some counties and minor river flooding of agricultural areas. Since this was before the growing season, farmers were not impacted.
Huntington	06/07/95	Tstm Winds	0 kts.	0	0	2K	0	One to three inch rains fell across west-central, north-central, and northeast Indiana on the 6th and 7th. This caused minor street flooding in some counties and minor river flooding of agricultural areas. Since this was before the growing season, farmers were not impacted.
Huntington	06/07/95	Tstm Winds	0 kts.	0	0	0	0	Numerous homes and automobiles were damaged in Huntington by blown over trees. Due to the damage and numbers of trees blocking the streets a state of emergency was declared in the town.
Huntington	06/21/95	Hail	0.75 in.	0	0	0	0	Three-quarters inch hail fell at Bippus.
Huntington	06/23/95	Hail	1.00 in.	0	0	6K	0	Several automobiles were damaged by one inch hail in Huntington.
Huntington	06/24/95	Hail	1.00 in.	0	0	0	9K	One-inch diameter hail fell at Bippus and Goblesville areas producing damage to crops in those areas.
Huntington	07/13/95	Heat Wave	N/A	14	0	1.0M	0	Heat wave conditions developed across all of Indiana. High temperatures reached between 95 and 105 degrees with heat indices between 100 and 120 degrees. The Evansville area temperatures reached or exceeded 95 degrees from July 11-17. Nearly all heat related deaths occurred in the sick or elderly populations and most occurred in northwest Indiana. Also, nearly 800,000 baby chickens died at the Rose Acre Farms in Seymour resulting in losses totaling near one million dollars. F81PH,M47PH,F71PH,F81PH,M87PH,M75PH,F65PH,M52OU,F71PH,M52PH,M72PH,M40OU,M68OU,F02PH
Huntington	08/21/95	Heat Wave	N/A	1	0	0	0	Heat wave conditions initially developed over southwest Indiana on the 12th then overspread all but northwest Indiana for the remainder of the week. Heat wave conditions ended across the north and central sections on the 19th and over the south by the 21st. High temperatures were in the 90s throughout the period and near 100 across the south. High humidity also yielded Heat Index values between 100 and 115 degrees most of the week. These extreme conditions resulted in a heat stroke and death of an elderly male. The Indiana State Fair lost over $400 thousand due to low turnouts and most of Indiana crops suffered some due to the heat. M72PH
Huntington	12/08/95	Winter Storm	N/A	0	0	0	0	A low pressure system and cold front swept across Indiana bringing the first significant snowfall and cold temperatures of the winter season. Though snowfall amounts only averaged from two to four inches across the state, numerous vehicle accidents occurred, several resulting in fatalities. The cold front brought the first subzero temperatures to the state and prompted wind chill advisories for all of Indiana.
Huntington	12/18/95	Winter Storm	N/A	0	0	0	0	A low pressure system moving east through the Ohio and Tennessee River Valleys brought significant ice and snow to the northern two thirds of Indiana. Freezing rain began during the evening on the 18th across central and northeast Indiana while snow fell in northwest and north central sections. The freezing rain changed to snow between 0600 and 1100 on the 19th across central and northeast sections. Total snowfall amounts of four to eight inches were common across central and northeast Indiana. Ice accumulations of a quarter to a half inch were common in east-central Indiana. The ice accumulation caused widespread power outages in central and east central Indiana leaving up to 65,000 homes without power at one point. Locations near Muncie did not have power restored until the 21st.
Roanoke	05/16/96	Flash Flood	N/A	0	0	100K	10K	Three and one half inches of rain fell in an hour at Roanoke, Indiana causing McPherren Ditch to overflow it's banks flooding 18 homes in Roanoke. One home was seriously damaged and will have to be replaced with three other homes suffering minor damage to the living quarters. The other homes had basement damage due to the flooding. Several businesses, also, sustained minor damage.

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North Huntington Co	07/07/96	Tstm Wind	65 kts.	0	0	45K	10K	STRONG THUNDERSTORM WINDS BLEW DOWN TREES AND POWER LINES ACROSS NORTHERN HUNTINGTON COUNTY. ONE HOME WAS DAMAGED WHEN A TREE FELL ON THE HOME IN JACKSON TOWNSHIP.
Huntington County	07/18/96	Flash Flood	N/A	0	0	7.0M	100 K	SEVEN INCHES OF RAIN FELL IN A 12 HOUR PERIOD IN HUNTINGTON, INDIANA PRODUCING DEVASTATING FLASH FLOODING IN THE COMMUNITY. OVERFLOWING SEWERS AND CREEKS PRODUCED SEVERE FLOODING WITH 370 HOMES DAMGED WITH 60 RECEIVING SEVERE FLOOD DAMAGE. THE FLOODING, ALSO, CAUSED SEVERE DAMAGE TO THE MAJESTIC PRODUCTS COMPANY. DAMAGE IN THE CITY OF HUNTINGTON ALONE WAS ESTIMATED AT 6 MILLION DOLLARS. ELSEWHERE IN HUNTINGTON COUNTY A TOTAL OF 2200 ACRES OF CROP LAND WAS INUNDATED BY FLOOD WATERS. IN THE TOWNS OF ANDREWS AND ROANOKE APPROXIMATELY 35 HOMES WERE DAMAGED. THE FLOODING ACROSS HUNTINGTON COUNTY WAS DESCRIBED AS THE WORST SINCE 1913.
Roanoke	07/30/96	Tstm Wind	60 kts.	0	0	0	0	TREES AND POWER LINES WERE BLOWN DOWN IN ROANOKE, INDIANA BY STRONG THUNDERSTORM WINDS.
Huntington	10/29/96	Tstm Wind	58 kts.	0	0	0	0	Wind gusts estimated as high as 67 mph blew down trees and power lines in and around Huntington.
Huntington	07/02/97	Hail	0.75 in.	0	0	20K	0	Thunderstorm winds knocked down trees and power lines across the northern one half of the county.
Huntington	07/18/97	Tstm Wind	0 kts.	0	0	5K	0	heavy wind damage-roof peeled of modular home. two trees in yard partially uprooted.
Huntington	07/23/97	Flash Flood	N/A	0	0	0	0	northern huntington county roads under water from 3 to 4 inches rain.
Huntington	05/03/98	Tornado	F0	0	0	0	0	BRIEF TOUCHDOWN
Bippus	05/19/98	Hail	0.88 in.	0	0	0	0	None Reported
Huntington	05/19/98	Tstm Wind	52 kts.	0	0	0	0	None Reported
Bippus	05/29/98	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	06/19/98	Tstm Wind	55 kts.	0	0	0	0	SEVERAL TREES DOWN WITH MINOR ROOF DAMAGE TO SEVERAL HOMES.
Huntington	07/21/98	Tstm Wind	52 kts.	0	0	0	0	NUMEROUS TREES AND POWER LINES DOWN IN COUNTY.
Huntington	07/22/98	Flood	N/A	0	0	1.5M	500 K	TWO INCHES OF RAIN FELL IN LESS THEN 40 MINUTES IN HUNTINGTON WHICH FLOODED MANY BASEMENTS IN TOWN. A TREE FELL ONTO A VAN CRUSHING IT SEVERLY. MANY COUNTY ROADS WERE COMPLETELY WASHED OUT AS WELL INCLUDING US 24.
Rock Creek	11/10/98	Tstm Wind	0 kts.	0	0	0K	0	THE ROOF WAS BLOWN OFF THE OLD ROCK CREEK TOWNSHIP HIGH SCHOOL.
Huntington	12/06/98	Tstm Wind	0 kts.	0	0	10K	0	SEVERAL TREES WERE UPROOTED OR SNAPPED IN TOWN.
Huntington	01/02/99	Heavy Snow	N/A	0	0	0	0	Synoptic and mesoscale conditions on the 1st of January 1999... The northern hemishperic longwave pattern began the year in transition as a high zonal index hinted at major changes to the longwave pattern over the New Year's Day weekend. Two potent shortwaves...one associated with the northern branch of the jet stream and the other associated with the southern branch...were progged to phase over the central plains on the 2nd of January. Lee troughing developed during the day on the 1st with the eventual surface low developing across the Texas panhandle that afternoon. Tremendous moisture was advected off the gulf of mexico during the afternoon as the low deepened. Moderate to heavy snow began to break out across the county warning area by late evening. On the 2nd of January...intense low pressure was located across northeast Arkansas and slowly moved northeastward into northwest Indiana by late evening. Snowfall rates of 1 to 2 inches per hour were common throughout the day with even heavier snow noted as the system wrapped up and closed off over northern Illinois that evening. Nearly all the snowfall across the county warning area was due to the tremendous warm advection that occurred on the nose of a 60 knot low level jet overtop the shallow cold dome that was in place. Precipitation in areas along and east of a

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								Lafayette Indiana to Defiance Ohio line eventually changed to freezing rain and sleet as 850 millibar temperatures warmed to above freezing. Snowfall amounts were the highest observed since the Blizzard of 1978 in many areas. Several cooperative observer stations reported all-time record 24 hour snowfalls as well. Storm totals ranged from two feet across northwest Indiana and southwest lower Michigan...12 to 18 inches across north central Indiana into south central Michigan and northwest Ohio... 6 to 8 inches across east central Indiana into western Ohio, where significant sleet and freezing rain later fell on top of the heavy snow. Impacts on the people across the area were significant. Many rural roads remained impassable for several days. Some schools were closed for up to two weeks after the snowstorm. Many buildings... especially manufacturing warehouses and large retail stores in areas that received the heavier snow... reported collapsed roofs due to the weight of the snow. Damage estimates were not known at the time of this report.
Huntington	01/22/99	Flood	N/A	2	0	3K	0	Synoptic and mesoscale conditions on the 1st of January 1999... The northern hemishperic longwave pattern began the year in transition as a high zonal index hinted at major changes to the longwave pattern over the New Year's Day weekend. Two potent shortwaves...one associated with the northern branch of the jet stream and the other associated with the southern branch...were progged to phase over the central plains on the 2nd of January. Lee troughing developed during the day on the 1st with the eventual surface low developing across the Texas panhandle that afternoon. Tremendous moisture was advected off the gulf of mexico during the afternoon as the low deepened. Moderate to heavy snow began to break out across the county warning area by late evening. On the 2nd of January...intense low pressure was located across northeast Arkansas and slowly moved northeastward into northwest Indiana by late evening. Snowfall rates of 1 to 2 inches per hour were common throughout the day with even heavier snow noted as the system wrapped up and closed off over northern Illinois that evening. Nearly all the snowfall across the county warning area was due to the tremendous warm advection that occurred on the nose of a 60 knot low level jet overtop the shallow cold dome that was in place. Precipitation in areas along and east of a Lafayette Indiana to Defiance Ohio line eventually changed to freezing rain and sleet as 850 millibar temperatures warmed to above freezing. Snowfall amounts were the highest observed since the Blizzard of 1978 in many areas. Several cooperative observer stations reported all-time record 24 hour snowfalls as well. Storm totals ranged from two feet across northwest Indiana and southwest lower Michigan...12 to 18 inches across north central Indiana into south central Michigan and northwest Ohio... 6 to 8 inches across east central Indiana into western Ohio, where significant sleet and freezing rain later fell on top of the heavy snow. Impacts on the people across the area were significant. Many rural roads remained impassable for several days. Some schools were closed for up to two weeks after the snowstorm. Many buildings... especially manufacturing warehouses and large retail stores in areas that received the heavier snow... reported collapsed roofs due to the weight of the snow. Damage estimates were not known at the time of this report.
Roanoke	04/22/99	Urban/sml Stream Fld	N/A	0	0	0	0	Flooding reported by Huntington County Sheriff along US Route 24 and Roanoke Road/800N near Roanoke. A warm front across the southern Great Lakes region served as the focus for strong to severe thunderstorms. Overrunning precipitation was heavy enough to cause localized flooding over a narrow portion of northeastern Indiana. Thunderstorms training along the warm front dumped up to 2 inches of rain per hour across the region. Dew points were in the lower 60s south of the warm front and provided ample moisture for the convection to sustain itself. A low-level jet over southern Illinois and Indiana aided in the thunderstorm development.
Huntington	03/11/00	Heavy Snow	N/A	0	0	0K	0	...Synoptic and mesoscale conditions on March 11th... A strong shortwave trough was located over the central plains the evening of the 10th with surface low pressure developing over the lower Mississippi valley. As this system moved northeast on the 11th... it rapidly intensified spreading a developing swath of heavy snow across the midwest with some locations reporting thundersnow in the developing deformation zone north of the amplifing upper trough. As a result... the biggest snowstorm of the season thus ensued

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								across the southeastern third of the county warning area during the late afternoon and evening hours of the 11th. Most locations reported from 6 to 8 inches of snow with many locations reporting snowfall rates of 1-2 inches per hour during the height of the storm with the Fort Wayne airport reporting 4 inches of snow in just 2 hours and a total of 8.8 inches for the event. The heavy, wet nature of the snow caused numerous accidents including some multiple vehicle accidents in Wells and Allen counties.
Markle	05/09/00	Tstm Wind	0 kts.	0	0	0	0	Minor wind damage.
Huntington	05/18/00	Hail	0.75 in.	0	0	0	0	None Reported
Roanoke	06/13/00	Tstm Wind	0 kts.	0	0	0	0	Tree down and limbs down.
Goblesville	06/14/00	Tstm Wind	0 kts.	0	0	0	0	Several trees down. Synoptic and mesoscale conditions for June 14th... A significant mid-level shortwave trough was located over Iowa on the morning of June 14th with an outflow dominated squall line across western Illinois. Rapid destabilization ensued later in the morning across eastern Illinois and northern Indiana with CAPES to 3500 j/kg by early afternoon. VAD wind profiles showed 850 millibar winds in excess of 50 knots in advance of the upper trough by afternoon and as storms developed along the left over outflow boundary across Illinois... they quickly became severe and organized into a large bow echo and moved quickly eastward into northern Indiana causing extensive wind damage. By late afternoon... a short segmented squall line developed just ahead of this bow echo squall line and extended from a St. Joseph to Fulton county line. Along the southern end of this line... an embedded tornadic supercell developed and interacted with a left over storm-scale outflow boundary to produce the Wabash/Kosciusko and DeKalb county tornadoes. The lack of significant low level shear likely prevented a much larger and more widespread tornado event especially across Whitley and Allen counties where several funnel clouds were captured on film but failed to touch down.
Huntington	06/24/00	Flood	N/A	0	0	0	100 K	Hundreds of acres of soybeans and corn were lost due to excessive flooding throughout the entire county.
Huntington	09/11/00	Tstm Wind	0 kts.	0	0	0K	0	Trees down in town. One home suffered considerable damage to the roof and front porch when a large tree fell on it.
Huntington	12/13/00	Heavy Snow	N/A	0	0	0K	0	...Synoptic and mesoscale conditions for December 13th... Another in a series of strong upper level disturbances coming out of the southern plains combined with an intensifing upper jet over southern Canada led to another bout of heavy snow across part of Indiana and Northwest Ohio on the 13th. Although the surface low remained quite weak and the upper level system moved rather quickly... moisture was able to quickly advect northward out of the lower Mississippi valley as the low level jet intensified in response to increasing upper level divergence associated with the strong upper level jet over southern Canada. Snow developed around noon and quickly became heavy by mid afternoon and continued into late evening before tapering off. Some notable storm total snowfall reports included 8 inches at Grissom AFB... 7.4 in Young America... 7 in Defiance, Huntington, Monroeville, Portland, Bluffton, and Montpelier, and 6 in Marion, Columbus Grove, Fort Wayne, Hartford City, Monticello, Van Wert, Wabash, Wauseon, and Columbia City.
Huntington	05/26/01	Tornado	F0	0	0	0	0	Brief touchdown in field. No damage Synoptic and mesoscale conditions and event summary for Saturday May 26th, 2001 A low topped supercell thunderstorm developed in Cass county Indiana, and moved northeast through the Fort Wayne metropolitan area and into northwest Ohio. This thunderstorm produced several tornadoes and numerous funnel clouds. The wind field was favorable for rotating storms on with strong veering in the KIWX Wind Profile. This was on the south side of a unseasonably cold closed upper low in the mid and upper levels. Surface temperatures in the lower 50s, and scattered showers were against strong thunderstorm development. However sunshine over central Indiana allowed enough heating for a thunderstorm to develop and quickly began rotating.
Roanoke	05/26/01	Tstm Wind	0 kts.	0	0	18K	0	3 telephone poles down, large tree down, roof damage. Synoptic and mesoscale conditions and event

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
								summary for Saturday May 26th, 2001 A low topped supercell thunderstorm developed in Cass county Indiana, and moved northeast through the Fort Wayne metropolitan area and into northwest Ohio. This thunderstorm produced several tornadoes and numerous funnel clouds. The wind field was favorable for rotating storms on with strong veering in the KIWX Wind Profile. This was on the south side of a unseasonably cold closed upper low in the mid and upper levels. Surface temperatures in the lower 50s, and scattered showers were against strong thunderstorm development. However sunshine over central Indiana allowed enough heating for a thunderstorm to develop and quickly began rotating.
Roanoke	06/12/01	Tstm Wind	0 kts.	0	0	0	0	Power lines down
Warren	07/10/01	Tstm Wind	0 kts.	0	0	0	0	Large tree limb down.
Huntington	08/18/01	Tstm Wind	60 kts.	0	0	0	0	Reported by amateur radio operator.
Markle	08/18/01	Tstm Wind	0 kts.	0	0	0	0	Numerous trees and power lines down.
Roanoke	10/24/01	Tstm Wind	0 kts.	0	0	0	0	Law enforcement reported trees down in Roanoke.
Huntington	03/09/02	High Wind	55 kts.	0	0	0	0	An unusually strong cold front moved through the region during the daylight hours of the 9th. A strong pressure gradient existed with the front as 3 hour pressure falls of 4 millibars ahead of the front combined with 3 hour pressure rises of 11 millibars. Winds just above the surface ranged from 70 to 80 mph. The combination of these 2 factors was tapped by a narrow line of showers immediately ahead of the cold front. Widespread reports of trees, tree limbs and power lines being blown down were received as surface winds of 50 to 70 mph were experienced by many areas. Damage was mainly confined to the northeast part of the county.
Huntington	05/25/02	Hail	0.75 in.	0	0	0	0	None Reported
Warren	05/25/02	Hail	0.88 in.	0	0	0	0	None Reported
Huntington	06/04/02	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	06/04/02	Hail	1.75 in.	0	0	0	0	None Reported
Huntington	06/04/02	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	06/04/02	Hail	1.00 in.	0	0	0	0	None Reported
Roanoke	06/04/02	Hail	1.00 in.	0	0	0	0	None Reported
Andrews	06/04/02	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	06/04/02	Hail	0.75 in.	0	0	0	0	None Reported
Bippus	06/04/02	Hail	1.00 in.	0	0	0	0	None Reported
Markle	07/29/02	Lightning	N/A	0	0	80K	0	Lightning struck a home causing a fire that destroyed half of the roof. Major smoke and water damage occurred to the remainder of the dwelling.
Huntington	09/19/02	Tstm Wind	0 kts.	0	0	0	0	Newspaper reported a tree knocked down onto power line near the Homier Distributing corporate office.
Huntington	12/24/02	Heavy Snow	N/A	0	0	0	0	Low pressure tracked from Kentucky into Ohio during the overnight hours of Christmas Eve into Christmas Day morning, spreading a large area of snow across the region. Most locations received 6 to 8 inches of snow. A narrow band of 8 to 10 inches occurred from Monticello, to Rochester, to Albion. Isolated reports of 9 inches of snow were received in Adams and Grant counties. Gusty northwest winds created widespread blowing and drifting snow.
Huntington	02/22/03	Heavy Snow	N/A	0	0	0	0	Low pressure tracked from Kentucky into Ohio during the overnight hours of Christmas Eve into Christmas Day morning, spreading a large area of snow across the region. Most locations received 6 to 8 inches of snow. A narrow band of 8 to 10 inches occurred from Monticello, to Rochester, to Albion. Isolated reports of 9 inches of snow were received in Adams and Grant counties. Gusty northwest winds created widespread blowing and drifting snow.

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Huntington	03/20/03	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	03/20/03	Hail	0.75 in.	0	0	0	0	None Reported
Andrews	04/04/03	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	05/07/03	Hail	0.75 in.	0	0	0	0	Dime size hail was reported to be covering the ground.
Huntington	05/07/03	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	05/07/03	Hail	0.88 in.	0	0	0	0	None Reported
Warren	05/09/03	Tstm Wind	50 kts.	0	0	0	0	Trees were reported blown down in Warren.
Huntington	07/04/03	Hail	0.75 in.	0	0	0	0	None Reported
Plum Tree	07/04/03	Tornado	F1	0	0	5K	0	An NWS storm survey team found F1 damage from a tornado that touched down 2 miles southeast of Plum tree and exited Huntington county into Wells county 4 miles southeast of Plum Tree. Damage was to a farm house as well as trees and a power pole snapped.
Plum Tree	07/04/03	Tstm Wind	50 kts.	0	0	10K	0	Law enforcement reported extensive damage to a home and a pull barn destroyed east of Plum Tree.
Huntington	07/04/03	Tstm Wind	51 kts.	0	0	0	0	A trained spotter reported an estimated wind gust to 60 MPH.
Warren	07/05/03	Flash Flood	N/A	0	0	150K	0	Law enforcement reported flash flooding with water rising quickly in a trailer park in Warren. Some residents were evacuated. 7 to 8 homes had some damage with roads and culverts washed out.
Huntington	07/06/03	Flash Flood	N/A	0	0	0	0	Law enforcement reported water over 1 foot deep on roads in Huntington.
Markle	07/06/03	Tstm Wind	50 kts.	0	0	0	0	911 dispatch reported trees down near Markle.
Huntington	07/08/03	Tstm Wind	50 kts.	0	0	0	0	Law enforcement reported trees down in Huntington.
Roanoke	08/02/03	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	11/12/03	High Wind	56 kts.	0	0	50K	0	Winds gusted to 65 MPH behind a strong cold front that moved across the region during the late afternoon and evening. Numerous power outages occurred with trees and power lines down. Damage was reported to some roofs with extensive damage to the Knox City Court Building in Starke County.
Huntington	01/26/04	Winter Storm	N/A	0	0	0	0	Snow accumulated 2 to 5 inches across the area with with east to northeast winds of 20 to 30 mph causing extensive blowing and drifting snow. Snow drifts were as high as 4 feet across some county roads.
Huntington	03/05/04	High Wind	52 kts.	0	0	0	0	An intense area of low pressure moving across Michigan produced sustained winds of 40 MPH with measured gusts to 60 MPH across all of Northern Indiana, Northwest Ohio and Southwest Lower Michigan from late morning through early evening. Widespread reports of trees and power lines down were received from law enforcement across the region.
Huntington	04/20/04	Tornado	F0	0	0	25K	0	NWS storm survey team found F0 damage to five homes and in trees southwest of Huntington. The tornado was skipping along a three and one half mile path and was around 50 yards wide. On April 20th, 2004 a warm front located across central Indiana in the afternoon began to move north in the evening as a strong southerly flow rode over the front, creating an favorable environment for rapid thunderstorm development. Favorable wind shear existed along the boundary with east to southeast surface winds north of the boundary and south to southwest surface winds just south of the boundary, leading to the rapid evolution of the storms into rotating supercells. One of these supercells was responsible for tornadoes in Miami, Wabash, and Huntington counties, with other storms producing two tornadoes in Grant county.
Huntington	04/20/04	Tornado	F0	0	0	0	0	NWS storm survey team found F0 damage to trees from east of Huntington to southeast of Roanoke. The tornado was skipping along a 6 mile wide path and was 50 yards wide. On April 20th, 2004 a warm front located across central Indiana in the afternoon began to move north in the evening as a strong southerly flow rode over the front, creating an favorable environment for rapid thunderstorm development. Favorable wind shear existed along the boundary with east to southeast surface winds north of the boundary and south to southwest surface winds just south of the boundary, leading to the rapid evolution of the storms

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
								into rotating supercells. One of these supercells was responsible for tornadoes in Miami, Wabash, and Huntington counties, with other storms producing two tornadoes in Grant county.
Banquo	05/23/04	Tstm Wind	50 kts.	0	0	0	0	Emergency management reported a barn blown down southwest of Banquo.
Andrews	05/23/04	Tstm Wind	50 kts.	0	0	0	0	Emergency management reported trees and power lines down in Andrews.
Huntington	05/23/04	Tstm Wind	50 kts.	0	0	0	0	Amateur radio reported trees and telephone poles down south of Huntington.
Huntington	05/23/04	Tstm Wind	50 kts.	0	0	0	0	Emergency management reported trees down southwest of Huntington.
Huntington	06/13/04	Hail	0.88 in.	0	0	0	0	None Reported
Huntington Muni Arpt	07/06/04	Tstm Wind	50 kts.	0	0	5K	0	Mainly roof damage occurred to a few hangars on the airport. Debris was thrown away from the hangar and into other hangars with minor damage occurring to these buildings. Minor damage occurred to an aircraft in one of the hangars due to being struck by a 2x4. Damage amount estimated.
Huntington	12/22/04	Winter Storm	N/A	0	0	0	0	Low pressure moved out of the western Gulf of Mexico and tracked towards eastern Ohio. Abundant moisture accompanying the system allowed for a large area of snow to blanket much of northern Indiana. Accumulations of 6 to 12 inches fell southeast of a Marion, to Fort Wayne to Angola line. Locations from Hartford City to near Decatur seen the highest accumulations, with Ridgeville in Jay county reporting 13 inches of snow. During the peak of the storm, the snow fell at the rate of 2 to 3 inches per hour in some areas.
Huntington	01/05/05	Ice Storm	N/A	0	1	0	0	A significant ice storm affected portions of northern and central Indiana beginning early on the 5th of January and continuing into the 6th. Locations generally along and south of a Francesville to Fort Wayne line experienced ice accumulations ranging from a quarter inch to nearly 2 inches. Numerous reports of trees, tree limbs and power lines knocked down were received. The damage, combined with many areas of power outages and dangerous driving conditions forced schools in the area to close, with some remaining closed for several days as cleanup continued. Some locations were without power for nearly a week after the storm. The hardest hit counties were Grant, Jay and Blackford where 1.5 to 2 inches of ice accumulated, resulting in power loss to nearly 80 percent of all property in each county. One death, indirectly related to the storm, was reported in Adams county. A 44 year old man was found dead as a result of carbon monoxide poisoning. The gentleman was running a generator in his garage as a result of the power outage. Another resident of the home was not affected by the carbon monoxide. An injury was reported in Portland in Jay county. A firefighter was injured when a tree branch fell onto his head. The branch cracked the helmet and face mask and cut his face.
Huntington	01/12/05	Dense Fog	N/A	0	0	420K	0	Widespread dense fog developed across much of Northern Indiana during the morning hours. Visibility was reported to be at or near zero in many locations. Numerous accidents were reported as a result of the fog. The fog was indirectly responsible for a total of 2 deaths and at least 11 injuries. A 32 vehicle pile-up occurred on the Indiana Toll Road, 4 miles east of State Route 9 near the Indiana/Michigan state line at approximately 11 am EST. A 27 year old male was killed when the car he was traveling in as a passenger was crushed between 2 semi's involved in the pile up. 8 other injuries were reported in this pile up. 2 ambulances were also involved in the pile up when they were struck by semi-trucks. None of the emergency workers were injured, but one ambulance was severely damaged. In a seperate accident in Noble county, a 54 year old woman was killed when her car was broadsided by another vehicle in near zero visibility. Three other accidents resulted in one injury each in various parts of De Kalb county. The unusually dense fog was the result of very warm and moist air moving over a rapidly diminshing snowpack.
Huntington	03/31/05	Strong Wind	45 kts.	0	0	60K	0	A 30 year old drive-in movie theater screen near the city of Huntington was severely damaged as a result of winds estimated around 50 mph from a strong thunderstorm that moved through during the early morning hours of the 31st. No other damage to trees, power lines or other structures was reported. Estimates of around $60,000 were reported for repair to the screen and associated structures.
Markle	04/20/05	Hail	0.75 in.	0	0	0	0	Penny size hail fell for 5 minutes.

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
Warren	05/11/05	Hail	1.00 in.	0	0	0	0	None Reported
Warren	05/11/05	Hail	1.00 in.	0	0	0	0	None Reported
Warren	05/11/05	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	06/05/05	Tstm Wind	61 kts.	0	0	0	0	Several trees were reported down southwest of Huntington. Sustained winds of 50 mph with gusts to 70 mph were estimated by spotters in Mount Etna.
Huntington	06/30/05	Hail	1.00 in.	0	0	0	0	Hail ranging from penny to quarter size was reported just south of Huntington.
Huntington	07/20/05	Tstm Wind	50 kts.	0	0	0	0	Tree blown down.
Mt Etna	07/26/05	Tstm Wind	60 kts.	0	0	0	0	A driver lost control of his vehicle on State Route 9, near county road 400 south as a result of strong winds. No damage occurred to the car and the driver was not injured.
Andrews	08/04/05	Lightning	N/A	0	0	8K	0	A small fire was started in a house as lightning struck a antenna and traveled into a house, starting a small pile of clothes on fire. Smoke and water damage was reported in the room where the fire occurred.
Andrews	08/04/05	Tstm Wind	50 kts.	0	0	0	0	A large tree was blown down near the intersection of State Road 105 and County Road 300 North. A large tree also fell onto a transmission line in Andrews, causing a brief power outage.
Huntington	08/13/05	Hail	1.75 in.	0	0	0	0	Hail ranging from the size of quarters to golf balls was reported in and around Huntington.
Andrews	08/13/05	Tstm Wind	50 kts.	0	0	0	0	A few large trees were blown down.
Huntington	08/13/05	Tstm Wind	55 kts.	0	0	20K	0	A 18 inch diameter tree was blown down onto a van.
Huntington	08/13/05	Tstm Wind	50 kts.	0	0	0	0	Trees were blown down in the city of Huntington.
Huntington	11/06/05	Tstm Wind	50 kts.	0	0	13K	0	Trees were blown down in the city of Huntington.
Huntington	12/08/05	Heavy Snow	N/A	0	0	0	0	A low pressure system combined with a strong upper level disturbance moved slowly through the Ohio Valley and brought a widespread heavy snow to the entire region. Accumulating snow began in the mid to late afternoon on the 8th and reached 6 inches during the late evening. The accumulating snow tapered off during the pre-dawn hours of the 9th. Storm total accumulations reached 6 to 9 inches throughout the region with local amounts of up to 10 inches. Snowfall was moderate to occasionally heavy during the late afternoon and evening of the 8th with rates of 1 to 2 inches per hour. A fatal accident occurred in Elkhart county around 330 pm on Thursday the 8th, near the Goshen Municipal airport. A 37 year old female, who was a passenger in one of the vehicles, was pronounced dead at the scene.
Mt Etna	03/31/06	Hail	0.88 in.	0	0	0	0	None Reported
Warren	03/31/06	Hail	0.88 in.	0	0	0	0	None Reported
Warren	04/07/06	Hail	0.88 in.	0	0	0	0	Nickel size hail was covering the ground.
Andrews	04/14/06	Hail	1.00 in.	0	0	0	0	Hail ranging from penny to quarter size was reported along US 24 from Andrews to Huntington.
Mt Etna	04/16/06	Hail	0.88 in.	0	0	0	0	None Reported
Andrews	05/30/06	Lightning	N/A	0	0	15K	0	Lightning struck a residence on Maple Grove Road, northwest of Andrews, causing a fire in the rafters of the basement. Those in the house quickly discovered the fire and attempted to put the fire out, but then left the house. The fire was contained to the basement area. Damage figures are estimated.
Huntington	05/30/06	Tstm Wind	50 kts.	0	0	0	0	None Reported
Huntington	06/21/06	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	06/21/06	Hail	1.00 in.	0	0	0	0	None Reported
Huntington	06/22/06	Hail	1.00 in.	0	0	0	0	None Reported
Warren	06/22/06	Hail	1.00 in.	0	0	0	0	None Reported
Warren	06/22/06	Tstm Wind	61 kts.	0	0	0	0	Six tractor trailers blown over on Interstate 69.

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
Huntington	06/22/06	Tstm Wind	61 kts.	0	0	0	0	None Reported
Huntington	06/28/06	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	06/28/06	Hail	0.75 in.	0	0	0	0	None Reported
Roanoke	07/02/06	Tstm Wind	55 kts.	0	0	5K	0	Several trees and powerlines down.
Warren	09/27/06	Hail	0.75 in.	0	0	0	0	None Reported
Huntington	02/13/07	Blizzard	N/A	0	0	0K	0K	Average snowfall across the county based on surrouding reports and observations ranged from 10 to 13 inches.A powerful winter storm blanketed all of northern Indiana with heavy snow and strong winds. This caused widespread whiteout conditions across the area with many roads becoming impassable due to drifting snowfall. Numerous schools and businesses were closed on Valentines day as a result of the dangerous weather. The blowing and drifting was so widespread, that many counties pulled the snow plows from the roads and declared travel restrictions to all but emergency vehicles. Two weather related deaths were reported, one in Ashley in Steuben county and the other in Springville in Laporte county. Both deaths were traffic accident related. Accumulations ranged from 6 inches across the far north, to 17 inches from White county towards Grant county.
Huntington	02/24/07	Ice Storm	N/A	0	0	25K	0K	Two to four tenths of an inch of ice covered roads and power lines, creating hazardous driving conditions and widespread power outages along with tree limbs downed. No injuries or deaths were reported in the county.A late February storm system brought widespread precipitation in the form of mainly freezing rain. Several locations did see periods of sleet during the event, however the ice accumulations posed the greatest threat. Reports of around one quarter inch of ice along with a few tenths of an inch of sleet was reported across parts of northern Indiana. 10 to 20 mph winds caused additional problems with fallen tree limbs and power lines, causing road closures and power outages. Temperatures rose above freezing during the overnight hours keeping overall damage to a minimum.
Plum Tree	06/08/07	Tstm Wind	50 kts.	0	0	10K	0K	A semi trailer was blown over on Interstate 69 at mile marker 79.Thunderstorms developed in a weakly capped and moderately unstable environment ahead of a cold front. Strong winds aloft allowed for several of the storms to occasionally bow out producing reports of wind damage across portions of northern and eastern Indiana.
Markle	06/27/07	Tstm Wind	55 kts.	0	0	0K	0K	Trees were reported down across a road west of Markle.A prefrontal trough moved across Michigan producing storms that layed out several outflow boundaries that progressed south into Indiana. These boundaries interacted with a high CAPE/low shear environment to set the stage for pulse thunderstorms. Several wet microbursts developed and produced areas of wind damage.
Huntington	08/24/07	Hail	0.88 in.	0	0	0K	0K	A stationary boundary, unstable atmosphere and strong winds aloft all allowed for another round of severe storms to develop across a good portion of northern Indiana.
Huntington	08/24/07	Tstm Wind	60 kts.	0	0	200K	0K	Several trees and power lines were blown down from just west of Huntington to 7 miles east of Huntington. A couple dozen houses as well as several vehicles were damaged by falling trees. A 4-H pavilion was heavily damaged. Damage is estimated at $200,000.A stationary boundary, unstable atmosphere and strong winds aloft all allowed for another round of severe storms to develop across a good portion of northern Indiana.
Huntington	12/04/07	Heavy Snow	N/A	0	0	0K	0K	A stationary boundary, unstable atmosphere and strong winds aloft all allowed for another round of severe storms to develop across a good portion of northern Indiana.
Huntington	12/04/07	Heavy Snow	N/A	0	0	0K	0K	Spotters in Middle bury reported 6.3 inches of snow and 5.5 inches in Simonton Lake.An Alberta clipper moved quickly southeast across the Great Lakes, leaving a swath of 3 to 5 of snow in most areas. Isolated locations received from 5 to 7 inches in some of the heavier bands across parts of northern Indiana.
Huntington	12/09/07	Ice Storm	N/A	0	0	0K	0K	A warm front moved north across the area during the day of December 9th. Abundant moisture traveled north of this front into a below freezing air mass across much of Northern Indiana, setting the stage for ice

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
								accumulations. Widespread icing on the order of 0.25 to 0.30 inches was observed, causing numerous accidents and slide offs as well closure of many school and business for the day. Temperatures warmed above freezing during the afternoon and evening hours, allowing the ice to melt.
Huntington	12/15/07	Winter Storm	N/A	0	0	0K	0K	Nine to twelve inches of snow fell along with blowing and drifting snow, creating difficult travel conditions for the entire county.A powerful winter storm tracked in from the gulf states with abundant moisture. Cold air was in place across all of northern Indiana, allowing the precipation to fall in the form of snow, which was heavy in many locations. Accumulations range from six to more than fourteen inches across the area. The highest amounts, ranging from 14 to 17 inches were found along a swath from Kosciusko county northeast into parts of Elkhart, Noble and Lagrange counties. Many schools and business were closed the following day due to the snow as well as strong winds which caused large drifts.
Huntington	02/01/08	Winter Storm	N/A	0	0	0K	0K	Two to four inches of a combination of sleet and snow fell, as well as up to a tenth of an inch of ice, causing difficult travel.A winter storm developed in the Southern Plains and tracked into the area with a swath of mainly snow for northern Indiana. The precipitation did start as a period of sleet and even freezing rain. Most areas north and west of a Marion to south of Fort Wayne line received 6 to 8 inches of snow along with blowing and drifting snow. Many schools were closed for the day, giving students a long weekend.
Roanoke	02/05/08	Flood	N/A	0	0	10K	0K	Local media outlets reported high water affecting portions of US 24 between Roanoke and Huntington, as well as State Road 114, west of US 24, on the Whitley/Huntington county line. A Roanoke firefighter spotted something in floodwaters, requested assistance and upon entering a boat and heading to the area, observed an elderly Warsaw, Indiana man sitting in his truck in waist deep water. The driver was hypothermic and difficult to understand from exposure to the cold floodwaters. He was taken to a local hospital for treatment.A snowpack of one to three inches rapidly melted as warm air arrive in the region. This snowmelt, combined with a partially frozen, very moist ground and rainfall from two to locally over 3 inches, resulted in an increase in low land and river flooding running along and south of a Knox to north of Millersburg line. At the onset, some flash flooding occurred in areas experiencing rainfall rates of one-half to one inch per hour.
Huntington	02/25/08	Winter Storm	N/A	0	0	0K	0K	Five to seven inches of snow fell across the county.Low pressure moved across central Indiana during the evening hours of the 25th into much of the 26th with widespread snow across northern Indiana. Areas south of US 30 received 4 to 6 inches of snow along with some sleet, with locations north of US 30 receiving six to locally 10 inches with some blowing and drifting snow. Grant, Blackford and Jay counties reported 1 to 3 inches of snow, however temperatures rose above freezing, switching the snow to rain for several hours.
Huntington	02/25/08	Winter Storm	N/A	0	0	0K	0K	Five to seven inches of snow fell across the county.Low pressure moved across central Indiana during the evening hours of the 25th into much of the 26th with widespread snow across northern Indiana. Areas south of US 30 received 4 to 6 inches of snow along with some sleet, with locations north of US 30 receiving six to locally 10 inches with some blowing and drifting snow. Grant, Blackford and Jay counties reported 1 to 3 inches of snow, however temperatures rose above freezing, switching the snow to rain for several hours.
Huntington	03/04/08	Winter Storm	N/A	0	0	0K	0K	Spotters reported one to three inches of snow, up to one quarter inch of sleet, and a tenth of an inch of ice, causing slippery roads.Strong low pressure tracked from Arkansas into central Ohio, bringing a swath of precipitation to all of northern Indiana. A band of heavy snow, with amounts ranging from six to ten inches, extended from Cass county Indiana northeast through Whitley and Allen counties. Some sleet was also mixed in with higher amounts noted north and south of the heavy snow. Drier air allowed for lighter snow amounts and a bit more in the way of sleet into northwestern Indiana where amounts were in the one to four inch range. At least one fatality was reported in the area when a 78 year old Kosciusko county resident was killed when her car was struck by another, sending the woman's vehicle into a tree. She was

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
								pronounced dead at a local hospital.
Monument City	05/30/08	Tstm Wind	70 kts.	0	0	15K	0K	The same thunderstorm that produced the brief tornado west of Salmonie Lake continued into Huntington County. Trees and power lines were damaged in the area, as well as a garage storing two vehicles. The debris from the garage was thrown into an adjacent field, with the last debris being found just south of Andrews. Spotters and Andrews Fire Department spotters estimated winds in the 70 to 80 mph range. No injuries were reported. Damage was estimated at $15,000.A moderately unstable, sheared environment was in place across northern Indiana ahead of a cold front. The atmosphere remained capped until the late afternoon and evening hours, when storms began to develop rapidly. Several storms south of a Monon, Indiana to Decatur, Indiana line became strong and even in some instances severe. A few storms exhibited rotation with one tornado confirmed in Wabash County.
Mt Etna	06/06/08	Tstm Wind	52 kts.	0	0	1K	0K	A trained spotter reported some tree damage and destroyed shed. Damage is estimated at $1,000.A line of thunderstorms moved from central into northeastern Indiana. Several reports of straight-line wind damage were reported across the area.
Goblesville	06/15/08	Tstm Wind	52 kts.	0	0	0K	0K	A trained spotter reported some tree damage and destroyed shed. Damage is estimated at $1,000.A line of thunderstorms moved from central into northeastern Indiana. Several reports of straight-line wind damage were reported across the area.
Huntington	06/21/08	Hail	1.00 in.	0	0	0K	0K	A cluster of thunderstorms developed during the morning hours across portions of central Illinois in advance of a weak trough and upper level system. These storms expanded and intensified as they moved into northern Indiana, producing areas of wind damage and hail.
Huntington	06/26/08	Tstm Wind	55 kts.	0	0	25K	0K	Emergency management officials reported two semi-trucks were blown off Interstate 69, one at mile marker 72 and the other mile marker 75. Damage is estimated at $25,000.A stationary boundary across the area combined with remnants of overnight convection. This interacted with moderate instability to allow for numerous thunderstorms, a few of which reached severe levels.
219 INZ013 - 015 - 020 - 022>027 - 032	12/18/08	Ice Storm	N/A	0	0	0K	0K	Mixed wintry precipitation overspread the area late December 18th and continued through about 07:00 am on December 19th. Precipitation started out as a brief period of snow and sleet before changing over to moderate freezing rain. The area picked up a quarter of an inch or more of ice accumulation, with a report of a quarter of an inch 5 miles west of Chalmers. Utility companies and the local newspaper reported over 6,000 power outages across White County due to ice accumulation on trees and power lines. There were numerous reports of slide-offs and accidents across the region.Significant ice accumulations and light snow/sleet amounts affected the region as a quick moving area of low pressure tracked eastward through central portions of Indiana and Ohio on late December 18th into the first half of December 19th. Precipitation started out as a brief period of snow and sleet, with accumulations of a trace to 2 inches. The precipitation then changed over to freezing rain with most locations receiving between a quarter and half an inch of ice accumulation.
220 INZ013 - 015 - 020 - 022>027 - 032	12/18/08	Ice Storm	N/A	0	0	0K	0K	Mixed wintry precipitation overspread the area late December 18th and continued through about 07:00 am on December 19th. Precipitation started out as a brief period of snow and sleet before changing over to moderate freezing rain. The area picked up a quarter of an inch or more of ice accumulation, with a report of a quarter of an inch 5 miles west of Chalmers. Utility companies and the local newspaper reported over 6,000 power outages across White County due to ice accumulation on trees and power lines. There were numerous reports of slide-offs and accidents across the region.Significant ice accumulations and light snow/sleet amounts affected the region as a quick moving area of low pressure tracked eastward through central portions of Indiana and Ohio on late December 18th into the first half of December 19th. Precipitation started out as a brief period of snow and sleet, with accumulations of a trace to 2 inches. The precipitation then changed over to freezing rain with most locations receiving between a quarter and half an inch of ice accumulation.
221	01/27/09	Heavy Snow	N/A	0	0	0K	0K	Snow, moderate to heavy at times, developed during the afternoon hours on January 27th and continued

Location or County	Date	Type	Mag	Dth	Inj	PrD	CrD	Description
INZ018 - 025>027 - 033								through the mid-morning hours of January 28th. Total snow accumulations of 5 to 7 inches were reported across the county, with a report of 5.7 inches in Huntington. There were reports of slide-offs and accidents across the region. Most schools were closed on January 28th due to the heavy snowfall.A deepening area of low pressure tracked from Tennessee northeast into western Pennsylvania late January 27th into January 28th. A swath of heavy snow fell to the northwest of this track, which affected portions of central and northeast Indiana. Total snow accumulations ranged between 5 and 9 inches.
222 INZ004 - 009 - 025 - 026	02/11/09	High Wind	50 kts.	0	0	50K	0K	The broadcast media reported a large tree was blown down onto a house in South Bend, with a second large tree down across a nearby road. County officials also reported scattered to numerous power lines down from both winds and falling branches or trees. Damage is estimated at $50,000.Deep low pressure tracked across the Great Lakes, dragging along a strong cold front. Behind the front sustained winds were frequently in the 35 to 45 mph range with gusts of between 55 and as high as 70 mph in some areas. This caused scattered to numerous tree and power line damage, along with some structure damage.
223 INZ004 - 009 - 025 - 026	02/11/09	High Wind	50 kts.	0	0	50K	0K	The broadcast media reported a large tree was blown down onto a house in South Bend, with a second large tree down across a nearby road. County officials also reported scattered to numerous power lines down from both winds and falling branches or trees. Damage is estimated at $50,000.Deep low pressure tracked across the Great Lakes, dragging along a strong cold front. Behind the front sustained winds were frequently in the 35 to 45 mph range with gusts of between 55 and as high as 70 mph in some areas. This caused scattered to numerous tree and power line damage, along with some structure damage.
224 Bippus	03/08/09	Hail	1.00 in.	0	0	0K	0K	A local newspaper reported that quarter size hail was observed in Bippus.Weak instability and moderate shear associated with a northward moving warm front allowed a favorable environment for several small clusters of storms to become severe, mainly producing pockets of damaging winds. One storm exhibiting supercell characteristics began producing more focus damage in Wabash County, with a brief tornado developing on the north side of Columbia City in Whitley County. A few hail reports were also received.
225 Bippus	03/08/09	Tstm Wind	65 kts.	0	0	5K	0K	Trained spotters reported 2 utility poles being snapped on State Route 105, just north of Bippus.Weak instability and moderate shear associated with a northward moving warm front allowed a favorable environment for several small clusters of storms to become severe, mainly producing pockets of damaging winds. One storm exhibiting supercell characteristics began producing more focus damage in Wabash County, with a brief tornado developing on the north side of Columbia City in Whitley County. A few hail reports were also received

APPENDIX E: HAZARDS MAP

The following map shows historical natural hazard events for Huntington County. Figures A and B on the following pages depict magnified views of the demarcated regions shown below.

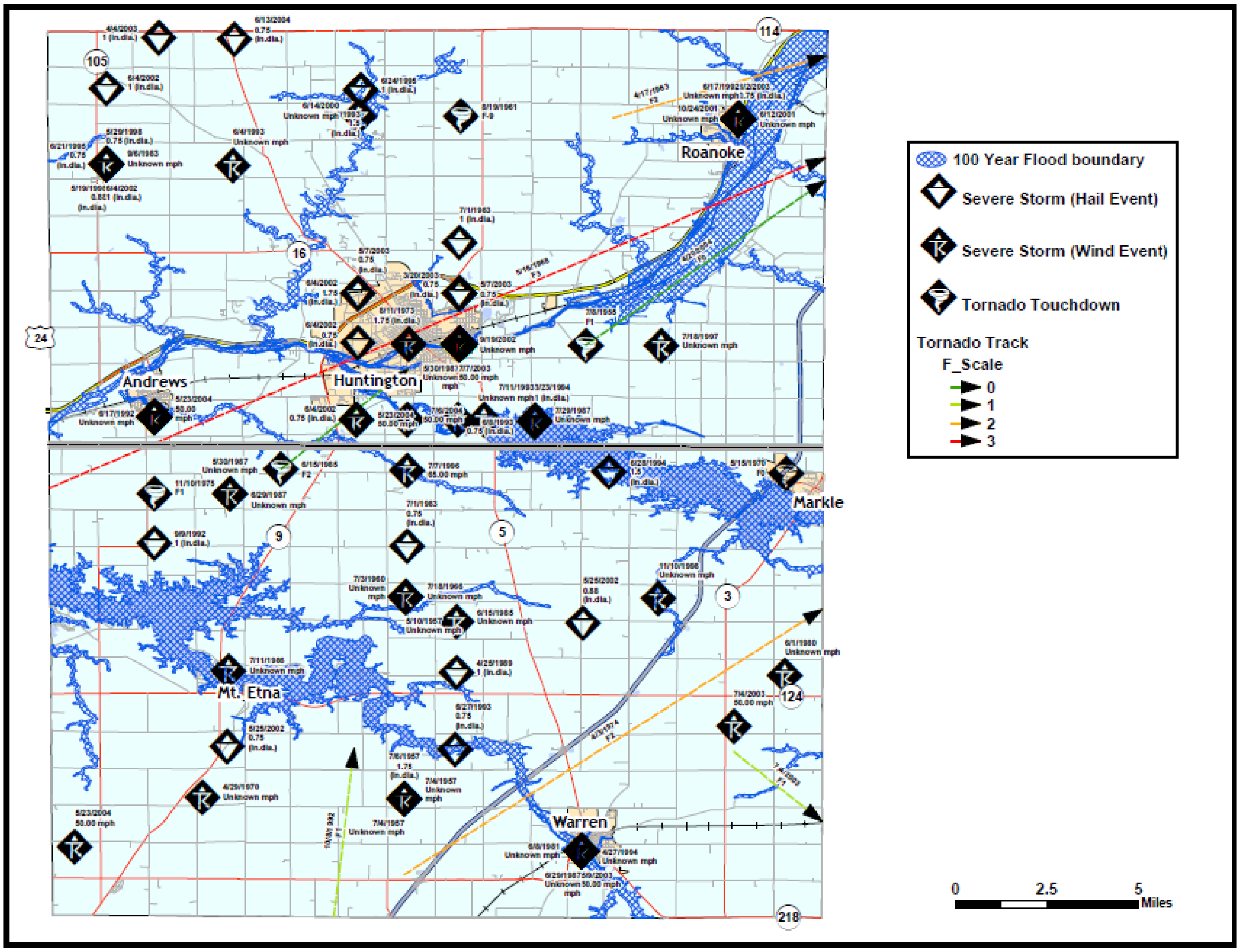


Figure A

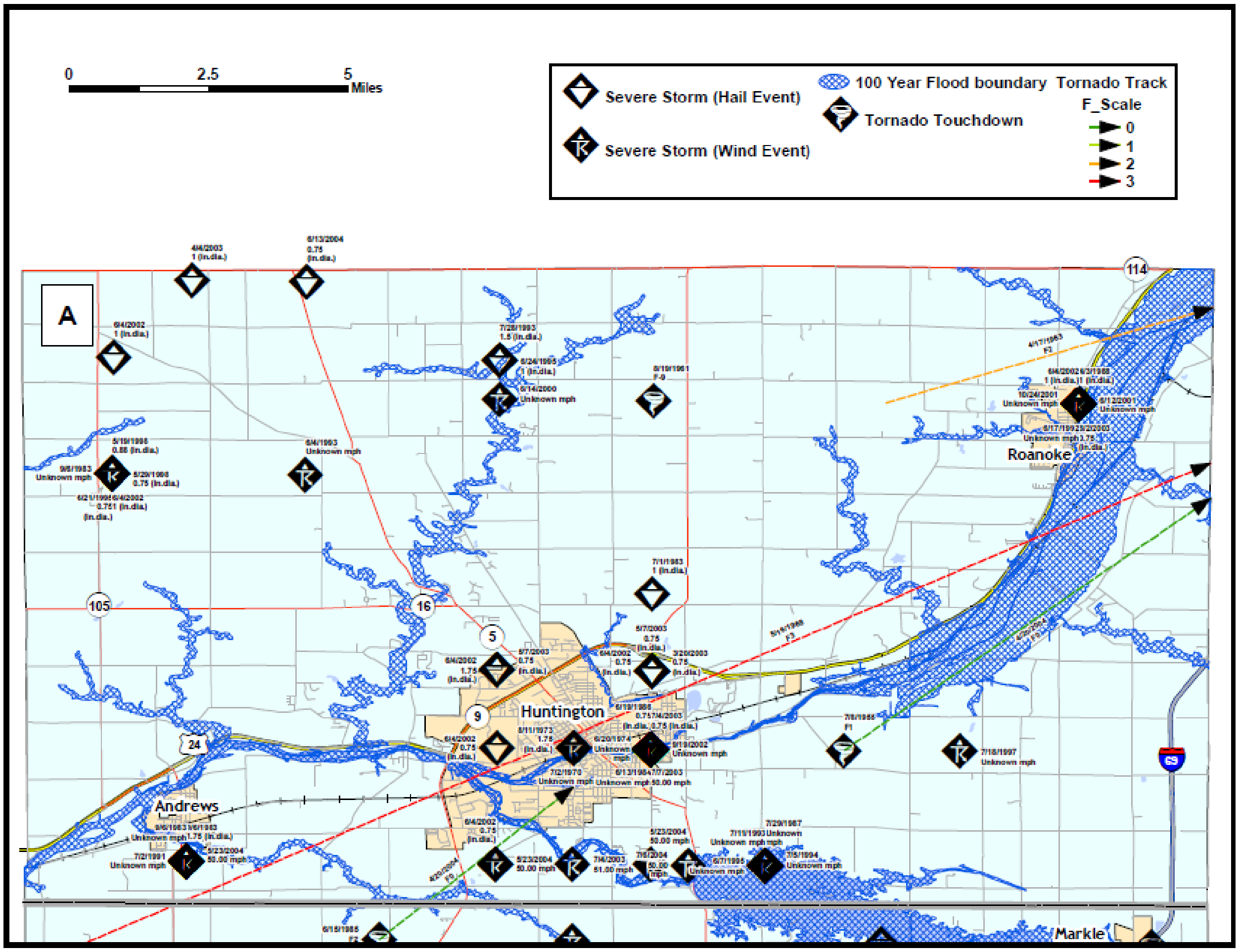
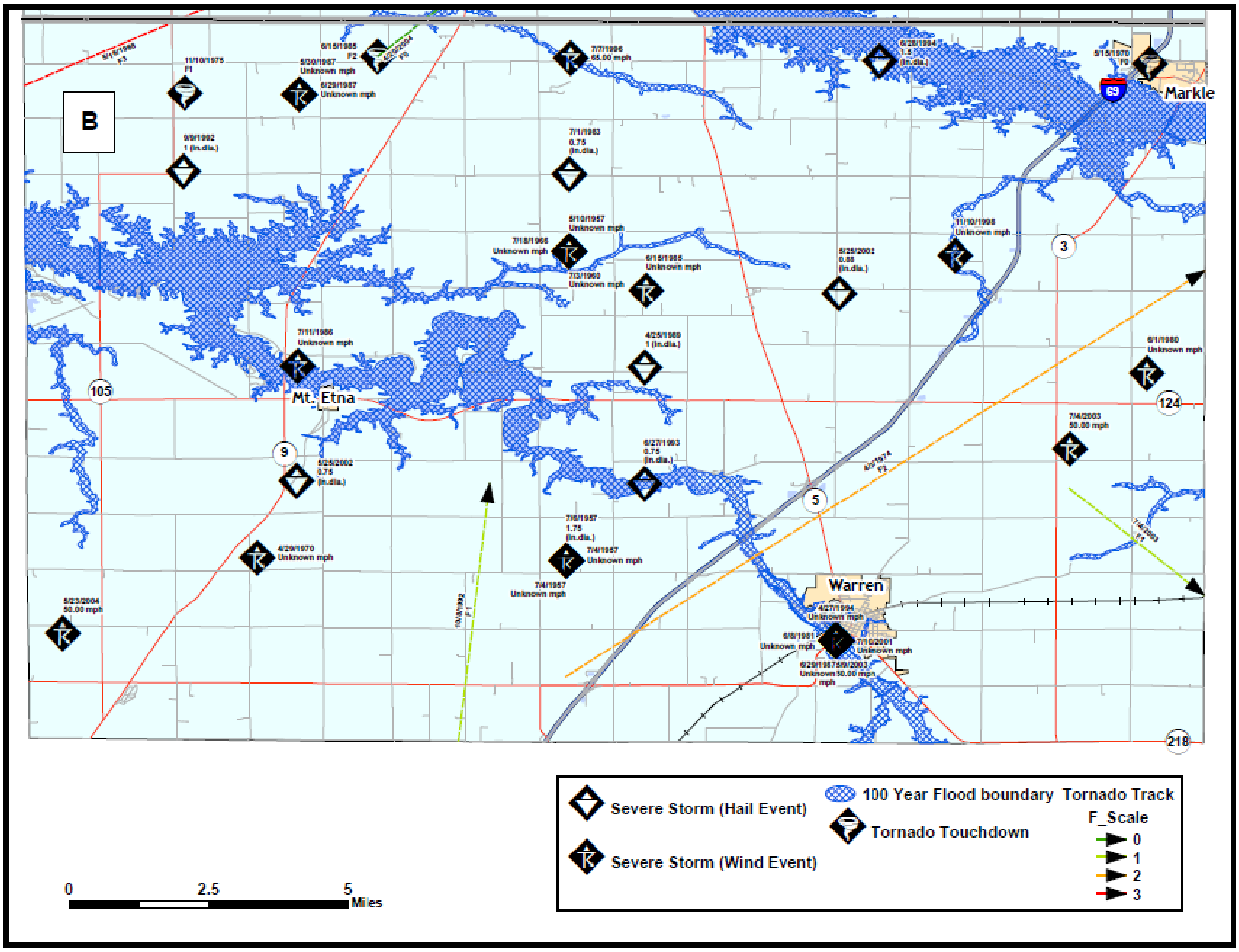

0
2.5
5
Miles
Severe Storm (Hail Event)
Severe Storm (Wind Event)
100 Year Flood boundary
Tornado Touchdown
Tornado Track
F_Scale
0
1
2
3
A
Huntington
Roanoke
Andrews
Markle
114
105
16
5
9
24

Figure B


B
Mt. Etna
Warren
Markle
105
9
5
3
124
218
Severe Storm (Hail Event)
Severe Storm (Wind Event)
100 Year Flood boundary
Tornado Touchdown
Tornado Track
F_Scale
0
1
2
3
0
2.5
5
Miles

APPENDIX F: CRITICAL FACILITIES LIST

Airport Facilities

ID	Class	Name	Address	City	Contact	Use	Year Built	Cost (x$1,000)
1	ADFLT	HUNTINGTON MUNI	AIRPORT	HUNTINGTON	HHG	Public	1900	$5,614
2	ADFLT	BOWLIN	AIRPORT	HUNTINGTON	IN85	Private	1900	$5,614
3	ADFLT	HUNTINGTON MEMORIAL HOSPITAL	HELIPORT	HUNTINGTON	26II	Private	1987	$5,614
4	ADFLT	BECK PVT	AIRPORT	HUNTINGTON	II14	Private	1982	$5,614
5	ADFLT	JOHNSON	AIRPORT	MARKLE	3IN4	Private	1990	$5,614
6	ADFLT	THE WOLF DEN	AIRPORT	ROANOKE	44II	Private	1987	$5,614
7	ADFLT	FISHER FARM	AIRPORT	ROANOKE	60IN	Private	1900	$5,614
8	ADFLT	DAUGHERTY FIELD	AIRPORT	WARREN	II75	Private	1982	$5,614

Care Facilities

ID	Class	Name	Address	City	NumBeds	Use	Year Built	Cost (x$1,000)
1	EFHS	PARKVIEW HUNTINGTON	2001 STULTS RD	HUNTINGTON	36	Hospital		$3,605
3	EFHL	MILLER'S MERRY MANOR	1500 GRANT ST	HUNTINGTON	169	Long_Term		$14,420
4	EFHS	HICKORY CREEK AT HUNTINGTON	1425 GRANT ST	HUNTINGTON	40	Long_Term		$3,605
5	EFHL	NORWOOD NURSING CENTER	3720 N NORWOOD RD	HUNTINGTON	96	Long_Term		$14,420
6	EFHL	MAGNOLIA HEALTH SYSTEMS	850 ASH ST	HUNTINGTON	55	Long_Term		$14,420
7	EFHL	HERITAGE OF HUNTINGTON, THE	1180 W 500 N	HUNTINGTON	168	Long_Term		$14,42
8	EFHL	UNITED METHODIST MEMORIAL	801 HUNTINGTON AVE	WARREN	593	Long_Term		$14,420

Communication Facilities

ID	Class	Name	Address	City	Contact	Use	Year Built	Cost (x$1,000)
1	CBR	WOWO	11483 US 24 N	Roanoke	DAN Daytime LIC	AM		$103
5	CBR	WBZQ	1600 E Taylor St.	HUNTINGTON	DA2 Nighttime LIC	AM		$103
7	CBR	WSOT-LP	9342 W 1200 S	MARION	DA CP	TX		$103
8	CBR	WQHU-LP	8087 N 300 W	HUNTINGTON	288 ND LIC	FL		$103
9	CBR	WXKE	6749 N US 24 E	HUNTINGTON	275 ND LIC	FM		$103
11	CBR	WCJC	9499 W 1100 S	Lafontaine	257 ND LIC	FM		$103
12	CBR	WCKZ	233 W 600 N	Huntington	231 ND USE	FA		$103
13	CBR	WVSH	450 Macgahan St.	HUNTINGTON	220 ND LIC	FM		$103
15	CBR	WBSW	11996 S Marion Rd	MARION	215 ND LIC	FM		$103

Dams

ID	Class	Name	Near City	Distance To City	Owner	Purpose	Year Built	Normal Storage
1	HPDE	WAHL-SHIN-CAH LAKE	HUNTINGTON	5	IDNR--STATE PARKS AND RES	RF	1986	162
2	HPDE	TIMBER LAKE DAM	HUNTINGTON	7	JAMES W. WEBER	RP	1964	44
3	HPDE	HUNTINGTON COLLEGE LAKE D.	HUNTINGTON	1	HUNTINGTON COLLEGE	R	1966	49
4	HPDC	J. EDWARD ROUSH LAKE DAM	HUNTINGTON	2	CELRL	CR	1968	12500
5	HPDZ	Markle Levee (USACE)	Markle		<Add facility owner>	U		

Emergency Centers

ID	Class	Name	Address	City	Contact	Year Built	Cost (x$1,000)
1	EDFLT	Huntington County EOC	332 East State St.	Huntington	Brandon Taylor		$1,288

Fire Stations

ID	Class	Name	Address	City	Contact	Year Built	Cost (x$1,000)
1	EFFS	Roanoke Fire Dept	126 N Main St	Roanoke	Fire Departments		$618
2	EFFS	Huntington City Fire Dept	300 Cherry St	Huntington	Fire Departments		$618
3	EFFS	Dallas Twp Volunteer Fire Dept	796 N Main St	Andrews	Fire Departments		$618
4	EFFS	Bippus Fire Dept	8227 N 900 W	Bippus	Fire Departments		$618

Hazmat

ID	Class	Name	Address	City	Owner	Chemical	Year Built	Amount
10	HDFLT	GLADIEUX TRADING & MARKETING	4757 N. U.S. HWY. 24 E	HUNTINGTON		BENZENE		
41	HDFLT	Koch Nitrogen	502 E HOSLER	HUNTINGTON	<Add facility	Ammonia		
42	HDFLT	CF Industries	574 E HOSLER	HUNTINGTON	<Add facility	Ammonia		
18	HDFLT	ECOLAB INC.	970 E. TIPTON ST.	HUNTINGTON		ETHYLENE		
26	HDFLT	HONEYWELL COMMERCIAL	1850 RIVERFORK DR. W.	HUNTINGTON		NICKEL		
29	HDFLT	MACO CORP.	1345 HENRY ST.	HUNTINGTON		ALUMINUM		
32	HDFLT	IMCO INC.	1819 W. PARK DR.	HUNTINGTON		TETRACHLOROE		
33	HDFLT	ONWARD MANUFACTURING CO.	1000 E. MARKET ST.	HUNTINGTON		XYLENE (MIXED		
34	HDFLT	ISOLATEK INTL.	701 N. BROADWAY	HUNTINGTON		CARBONYL		
35	HDFLT	SQUARE D CO.	6 COMMERCIAL RD.	HUNTINGTON		DIISOCYANATES		
37	HDFLT	WABASH TECHS.	1375 SWAN ST.	HUNTINGTON		COPPER		
38	HDFLT	WABASH TECHS.	1600 RIVERFORK DR. E.	HUNTINGTON		COPPER		

ID	Class	Name	Address	City	Owner	Chemical	Year Built	Amount
39	HDFLT	WAYNE METAL PRODS. CO. INC.	400 E. LOGAN ST.	MARKLE		TOLUENE		

Highway Bridges

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
1	HWB15	ROCK CREEK	State Highway Agency	402	50	3	1939	$2,390
2	HWB15	WABASH RIVER	State Highway Agency	402	158	7	1963	$7,551
3	HWB15	WABASH RIVER OVERFLOW	State Highway Agency	402	98	4	1955	$4,683
4	HWB11	MAJENICA CREEK	State Highway Agency	201	22	3	1990	$884
5	HWB15	WABASH RIVER /HUNT. RES.	State Highway Agency	402	48	3	1965	$2,294
6	HWB3	CLEAR CREEK	State Highway Agency	505	23	1	1931	$625
7	HWB26	PRAIRIE CREEK	State Highway Agency	119	7	2	1965	$157
8	HWB22	SALAMONIE RIVER	State Highway Agency	602	178	7	1965	$6,759
9	HWB22	SALAMONIE RIVER	State Highway Agency	602	178	7	1965	$6,759
10	HWB17	MAJENICA CREEK	State Highway Agency	502	92	5	1965	$2,720
11	HWB17	MAJENICA CREEK	State Highway Agency	502	92	5	1965	$2,720
12	HWB10	LOON CREEK	State Highway Agency	201	35	3	1965	$1,323
13	HWB10	LOON CREEK	State Highway Agency	201	35	3	1965	$1,323
14	HWB15	N & S RR	State Highway Agency	402	42	3	1965	$2,007
15	HWB15	N & S RR	State Highway Agency	402	42	3	1965	$2,007
16	HWB15	WABASH RIVER	State Highway Agency	402	108	5	1965	$5,161
17	HWB15	US 24	State Highway Agency	402	58	4	1965	$2,772
18	HWB26	BRANCH NIEMAN CREEK	State Highway Agency	319	9	3	1992	$202
19	HWB3	CLEAR CREEK	State Highway Agency	111	22	1	1963	$598
20	HWB23	SILVER CREEK	State Highway Agency	602	41	3	2000	$1,656
21	HWB23	SILVER CREEK	State Highway Agency	602	41	3	2000	$1,656
22	HWB23	CLEAR CREEK	State Highway Agency	602	37	3	2000	$1,495
23	HWB23	CLEAR CREEK	State Highway Agency	602	37	3	2000	$1,495
24	HWB26	HUNTINGTON DRAIN	State Highway Agency	319	7	2	1965	$157
25	HWB15	US 24 EBL	State Highway Agency	402	51	3	1964	$2,437
26	HWB11	BULL CREEK	State Highway Agency	201	25	3	1994	$1,004

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
27	HWB11	BULL CREEK	State Highway Agency	201	25	3	1994	$1,004
28	HWB4	COW CREEK	State Highway Agency	101	9	1	1995	$255
29	HWB3	CALF CREEK	State Highway Agency	506	13	1	1940	$353
30	HWB22	SALAMONIE RIVER - RESER.	State Highway Agency	602	185	7	1965	$7,024
31	HWB11	LOON CREEK	State Highway Agency	201	29	3	1995	$1,165
32	HWB15	WABASH RIVER	State Highway Agency	402	65	2	1910	$3,106
33	HWB10	SILVER CREEK	State Highway Agency	201	27	3	1984	$1,021
34	HWB10	CARROLL DITCH	State Highway Agency	201	21	3	1987	$794
35	HWB3	EAST FORK CLEAR CREEK	State Highway Agency	111	8	1	1947	$218
36	HWB22	RICHLAND CREEK	State Highway Agency	602	82	3	1965	$3,114
37	HWB22	SALAMONIE RIVER	State Highway Agency	602	90	5	1965	$3,417
38	HWB10	BROOK CREEK	State Highway Agency	201	31	3	1965	$1,172
39	HWB10	BROOK CREEK	State Highway Agency	201	20	3	1985	$756
40	HWB15	I-69	State Highway Agency	402	72	4	1963	$3,441
41	HWB26	PRICE DITCH	State Highway Agency	319	6	2	1984	$134
42	HWB15	SALAMONIE RIVER	State Highway Agency	402	78	3	1986	$3,728
43	HWB11	MORRISON DITCH	State Highway Agency	201	24	3	1992	$964
44	HWB3	LITTLE RIVER - W.XING	State Highway Agency	302	25	1	1986	$680
45	HWB3	LITTLE RIVER - E.XING	State Highway Agency	302	27	1	1986	$734
46	HWB15	I-69	State Highway Agency	402	73	4	1964	$3,489
47	HWB3	MAJENICA CREEK	Other State Agencies	302	21	1	1926	$571
48	HWB15	I-69	State Highway Agency	402	79	2	1963	$3,775
49	HWB15	SR 5 & SR 218	State Highway Agency	402	42	3	1963	$2,007
50	HWB15	SR 5 & SR 218	State Highway Agency	402	42	3	1963	$2,007
51	HWB15	I-69	State Highway Agency	402	75	2	1963	$3,584
52	HWB15	I-69	State Highway Agency	402	75	2	1963	$3,584
53	HWB10	SALAMONIE RIV. & CR 800S	State Highway Agency	202	126	6	1963	$4,763
54	HWB10	SALAMONIE RIV. & CR 800S	State Highway Agency	202	126	6	1963	$4,763
55	HWB15	SR 5	State Highway Agency	402	43	3	1963	$2,055

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
56	HWB15	SR 5	State Highway Agency	402	43	3	1963	$2,055
57	HWB15	I-69	State Highway Agency	402	69	2	1963	$3,298
58	HWB15	I-69	State Highway Agency	402	63	2	1963	$3,011
59	HWB10	ELKENBERRY DITCH	State Highway Agency	201	21	3	1963	$794
60	HWB10	ELKENBERRY DITCH	State Highway Agency	201	21	3	1963	$794
61	HWB15	I-69	State Highway Agency	402	68	2	1963	$3,250
62	HWB15	WABASH RIVER & DIV RD	State Highway Agency	403	167	6	1964	$7,981
63	HWB15	WABASH RIVER & DIV RD	State Highway Agency	403	167	6	1964	$7,981
64	HWB15	I-69	State Highway Agency	402	63	2	1963	$3,011
65	HWB10	FLAT CREEK	State Highway Agency	201	23	3	1963	$869
66	HWB10	FLAT CREEK	State Highway Agency	201	23	3	1963	$869
67	HWB3	EIGHT MILE CREEK (#)	County Highway Agency	310	36	1	1883	$979
68	HWB26	RICHLAND CREEK	County Highway Agency	701	16	3	1980	$359
69	HWB4	RICHLAND CREEK	County Highway Agency	506	21	1	1991	$595
70	HWB4	RICHLAND CREEK	County Highway Agency	506	15	1	1992	$425
71	HWB10	RICHLAND CREEK	County Highway Agency	201	28	3	1966	$1,058
72	HWB26	RICHLAND CREEK	County Highway Agency	701	14	3	1993	$314
73	HWB3	POND CREEK	County Highway Agency	505	12	1	1960	$326
74	HWB3	POND CREEK	County Highway Agency	505	12	1	1960	$326
75	HWB22	BROOK CREEK	County Highway Agency	602	59	3	1965	$2,240
76	HWB22	SALAMONIE RIVER	County Highway Agency	602	79	3	1965	$3,000
77	HWB10	SALAMONIE RIVER OVERFLOW	County Highway Agency	201	23	3	1979	$869
78	HWB22	SALAMONIE RIVER	County Highway Agency	602	51	3	1979	$1,936
79	HWB3	SALAMONIE RIVER	County Highway Agency	310	61	1	1928	$1,659
80	HWB26	POND CREEK	County Highway Agency	701	15	3	1992	$336
81	HWB17	SALAMONIE RIVER	County Highway Agency	502	90	4	1962	$2,661
82	HWB17	BLACK CREEK	County Highway Agency	505	34	3	1980	$1,005
83	HWB3	MOSSBURG DITCH	County Highway Agency	505	9	1	1985	$245
84	HWB4	ELKENBERRY DITCH	County Highway Agency	701	7	1	1991	$198

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
85	HWB10	ROCK CREEK	County Highway Agency	201	37	3	1979	$1,399
86	HWB4	ELKENBERRY DITCH	County Highway Agency	101	12	1	2003	$340
87	HWB17	ROCK CREEK	County Highway Agency	502	53	3	1965	$1,567
88	HWB3	BRANCH OF ROCK CREEK	County Highway Agency	122	7	1	1960	$190
89	HWB4	LITTLE MAJENICA CREEK	County Highway Agency	701	7	1	1992	$198
90	HWB17	MAJENICA CREEK	County Highway Agency	505	22	3	1967	$651
91	HWB3	MAJENICA CREEK	County Highway Agency	505	15	1	1960	$408
92	HWB3	BROOK CREEK	County Highway Agency	505	16	1	1965	$435
93	HWB17	LOON CREEK	County Highway Agency	505	21	3	1981	$621
94	HWB26	LOON CREEK	County Highway Agency	505	15	3	1995	$336
95	HWB26	MAJENICA CREEK	County Highway Agency	701	15	3	2001	$336
96	HWB26	BRANCH OF MAJENICA CREEK	County Highway Agency	701	12	3	2001	$269
97	HWB17	MAJENICA CREEK	County Highway Agency	505	21	3	1977	$621
98	HWB3	RUSH CREEK	County Highway Agency	505	8	1	1985	$218
99	HWB23	LITTLE WABASH RIVER	County Highway Agency	602	63	3	1995	$2,545
100	HWB17	LITTLE WABASH RIVER	County Highway Agency	505	51	3	1962	$1,508
101	HWB10	FLAT CREEK	County Highway Agency	201	23	3	1970	$869
102	HWB15	HUNTINGTON RESERVOIR	County Highway Agency	402	158	5	1970	$7,551
103	HWB10	FLAT CREEK	County Highway Agency	201	28	3	1976	$1,058
104	HWB10	FLAT CREEK	County Highway Agency	201	28	3	1959	$1,058
105	HWB28	FLAT CREEK	County Highway Agency	701	23	3	2002	$709
106	HWB10	LOON CREEK	County Highway Agency	201	26	3	1978	$983
107	HWB19	BRANCH OF SILVER CREEK	County Highway Agency	505	21	3	1995	$623
108	HWB4	SILVER CREEK	County Highway Agency	504	29	1	2004	$821
109	HWB3	SILVER CREEK	County Highway Agency	505	19	1	1960	$517
110	HWB3	WEST FORK CLEAR CREEK	County Highway Agency	701	7	1	1984	$190
111	HWB17	EAST FORK CLEAR CREEK	County Highway Agency	505	21	3	1977	$621
112	HWB3	EAST FORK CLEAR CREEK	County Highway Agency	505	12	1	1970	$326
113	HWB3	WEST FORK CLEAR CREEK	County Highway Agency	505	18	1	1967	$489

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
114	HWB3	CLEAR CREEK	County Highway Agency	505	15	1	1970	$408
115	HWB26	BROWN DITCH	County Highway Agency	319	7	2	1965	$157
116	HWB3	CLEAR CREEK	County Highway Agency	505	21	1	1970	$571
117	HWB10	CLEAR CREEK	County Highway Agency	201	28	3	1976	$1,058
118	HWB17	CLEAR CREEK	County Highway Agency	505	27	3	1973	$798
119	HWB10	EAST FORK CLEAR CREEK	County Highway Agency	201	23	3	1955	$869
120	HWB26	EAST FORK CLEAR CREEK	County Highway Agency	701	17	3	1998	$381
121	HWB3	BULL CREEK	County Highway Agency	505	12	1	1931	$326
122	HWB26	BULL CREEK	County Highway Agency	701	16	3	1995	$359
123	HWB26	BULL CREEK	County Highway Agency	201	19	3	1982	$426
124	HWB26	BULL CREEK	County Highway Agency	701	18	3	1995	$403
125	HWB17	LITTLE WABASH RIVER	County Highway Agency	502	44	3	1965	$1,301
126	HWB17	EIGHT MILE CREEK	County Highway Agency	505	36	3	1971	$1,065
127	HWB26	COW CREEK	County Highway Agency	701	15	3	1996	$336
128	HWB3	LITTLE WABASH RIVER	County Highway Agency	310	42	1	1915	$1,142
129	HWB22	LITTLE WABASH RIVER	County Highway Agency	602	47	2	1986	$1,785
130	HWB26	CALF CREEK	County Highway Agency	701	15	3	1997	$336
131	HWB10	ABOITE CREEK	County Highway Agency	201	23	3	1955	$869
132	HWB19	LITTLE WABASH RIVER	County Highway Agency	505	25	3	1996	$742
133	HWB4	CALF CREEK	County Highway Agency	505	14	1	1995	$396
134	HWB26	CALF CREEK	County Highway Agency	701	16	3	1988	$359
135	HWB17	CLEAR CREEK	County Highway Agency	506	34	3	1966	$1,005
136	HWB10	CLEAR CREEK	County Highway Agency	201	33	3	1967	$1,247
137	HWB28	WABASH RIVER	County Highway Agency	310	79	2	1920	$2,436
138	HWB23	WABASH RIVER	County Highway Agency	602	101	4	1993	$4,080
139	HWB26	LOON CREEK	County Highway Agency	701	17	3	2001	$381
140	HWB26	LOON CREEK	County Highway Agency	701	14	3	1993	$314
141	HWB10	LOON CREEK	County Highway Agency	201	25	3	1964	$945
142	HWB10	LITTLE WABASH RIVER	County Highway Agency	202	74	3	1960	$2,797

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
143	HWB26	PONY CREEK	County Highway Agency	701	15	3	1998	$336
144	HWB3	BRANCH OF FLAT CREEK	County Highway Agency	701	7	1	1986	$190
145	HWB26	LOON CREEK	County Highway Agency	505	18	3	1973	$403
146	HWB4	LOON CREEK	County Highway Agency	505	15	1	1994	$425
147	HWB3	RABBIT RUN DITCH	County Highway Agency	505	10	1	1961	$272
148	HWB3	POND CREEK	County Highway Agency	505	9	1	1965	$245
149	HWB26	LITTLE MAJENICA CREEK	County Highway Agency	701	15	3	1996	$336
150	HWB22	LITTLE WABASH RIVER	County Highway Agency	602	61	3	1980	$2,316
151	HWB28	LITTLE WABASH RIVER	County Highway Agency	111	74	3	1928	$2,281
152	HWB3	MCPHERRENS DITCH	County Highway Agency	505	8	1	1977	$218
153	HWB3	COW CREEK	County Highway Agency	302	10	1	1930	$272
154	HWB4	MCPHERRENS DITCH	County Highway Agency	101	9	1	1993	$255
155	HWB26	COW CREEK	County Highway Agency	201	9	2	1940	$202
156	HWB3	COW CREEK	County Highway Agency	701	9	1	1987	$245
157	HWB3	LOON CREEK	County Highway Agency	505	13	1	1965	$353
158	HWB22	WABASH RIVER	County Highway Agency	602	83	3	1975	$3,152
159	HWB26	LOON CREEK	County Highway Agency	701	15	3	2001	$336
160	HWB3	LOON CREEK	County Highway Agency	505	7	1	1964	$190
161	HWB4	BRANCH OF WABASH RIVER	County Highway Agency	505	7	1	1995	$198
162	HWB3	BRANCH OF MAJENICA CREEK	County Highway Agency	101	7	1	1950	$190
163	HWB3	BROWN DITCH	County Highway Agency	505	6	1	1983	$163
164	HWB3	MCPHERRENS DITCH	County Highway Agency	701	7	1	1950	$190
165	HWB3	LOGAN CREEK	County Highway Agency	505	6	1	1920	$163
166	HWB3	BRANCH OF CLEAR CREEK	County Highway Agency	505	7	1	1970	$190
167	HWB4	ELKENBERRY DITCH	County Highway Agency	701	7	1	1991	$198
168	HWB4	LOON CREEK	County Highway Agency	505	18	1	1993	$510
169	HWB4	POND CREEK	County Highway Agency	505	8	1	1997	$227
170	HWB4	ELKENBERRY DITCH	County Highway Agency	505	11	1	1997	$312
171	HWB4	BRANCH OF CLEAR CREEK	County Highway Agency	505	8	1	1997	$227

ID	Class	Name	Owner	Bridge Type	Length	Spans	Year Built	Cost (x$1,000)
172	HWB4	BRANCH OF CLEAR CREEK	County Highway Agency	505	8	1	1996	$227
173	HWB4	NORTH BECK DITCH	County Highway Agency	505	11	1	1997	$312
174	HWB4	WEARLEY DITCH	County Highway Agency	505	8	1	1999	$227
175	HWB4	DETAMORE DITCH	County Highway Agency	505	9	1	1999	$255
176	HWB4	BRANCH OF BROOK CREEK	County Highway Agency	505	11	1	1999	$312
177	HWB26	MAJENICA CREEK	County Highway Agency	319	8	2	1999	$179
178	HWB4	BRANCH OF CLEAR CREEK	County Highway Agency	701	8	1	1999	$227
179	HWB4	BRANCH OF BROWN DITCH	County Highway Agency	701	7	1	1999	$198
180	HWB4	FLINT CREEK	County Highway Agency	505	12	1	1999	$340
181	HWB3	KELLY CREEK	County Highway Agency	505	17	1	1977	$462
182	HWB3	SILVER CREEK	County Highway Agency	505	13	1	1989	$353

Military Facilities

ID	Class	Name	Address	City	Owner	Use	Year Built	Cost (x$1,000)
1	HMI12	National Guard Armory	800 Zahn St.	Huntington	Air Force	Unknown		$10,000

Oil Facilities

ID	Class	Name	Address	City	Contact	Use	Year Built	Cost (x$1,000)
1	ODFLT	CITGO Petroleum	4393 N Meridian	Huntington	<Add contact name>	Unknown		$129
2	ODFLT	Lassus Brothers Terminal	4413 N Meridian	Huntington	<Add contact name>	Unknown		$129
3	ODFLT	Buckeye Pipeline	4527 N Meridian	Huntington	<Add contact name>	Unknown		$129
4	ODFLT	Sun Oil Company	4691 N Meridian	Huntington	<Add contact name>	Unknown		$129
5	ODFLT	Marathon Petroleum	4648 N Meridian	Huntington	<Add contact name>	Unknown		$129
6	ODFLT	BP/ Dome Petroleum	226 E Hosler	Huntington	<Add contact name>	Unknown		$129

Police Stations

ID	Class	Name	Address	City	Contact	Year Built	Cost (x$1,000)
1	EFPS	Warren Police Dept	108 E 2nd	Warren	Police Departments		$1,442
2	EFPS	Roanoke Police Dept	126 N Main St	Roanoke	Police Departments		$1,442
3	EFPS	Markle Police Dept	155 W Sparks St	Markle	Police Departments		$1,442
4	EFPS	Huntington Police Dept	300 Cherry St	Huntington	Police Departments		$1,442
5	EFPS	Huntington County Sheriff Dept	332 E State St	Huntington	Sheriff		$1,442
6	EFPS	Andrews Town Marshall	66 N Main St	Andrews	Police Departments		$1,442

Potable Water Facilities

ID	Class	Name	Address	City	Contact	Use	YearBuilt	Cost (x$1,000)
2	PDFLT	Huntington Water Plant	2290 Engle St.	Huntington	<Add contact name>	Unknown		42874
3	PDFLT	Roanoke Water Plant	871 Seminary St.	Roanoke	<Add contact name>	Unknown		42874
4	PDFLT	Bippus Water Plant	8838 West 812 North	Huntington	<Add contact name>	Unknown		42874
6	PDFLT	Warren Water Plant	Grover St.	Warren	<Add contact name>	Unknown		42874
7	PDFLT	Andrews Water Plant	501 Wabash St.	Andrews	<Add contact name>	Unknown		42874

Rail Facilities

ID	Class	Name	Address	City	Contact	Use	Year Built	Cost (x$1,000)
1	RDF	NS Roanoke GM Assembly Plant				Cargo		$2,245

Schools

ID	Class	Name	Address	City	Contact	Students	Year Built	Cost (x$1,000)
1	EFS1	Andrews Elementary School	509 E Jefferson St	Andrews	Huntington Co Com	269		$515
2	EFS1	Riverview School	2465 Waterworks Rd	Huntington	Huntington Co Com	549		$515
3	EFS1	Roanoke Elementary School	423 W Vine St	Roanoke	Huntington Co Com	369		$515
4	EFS1	Salamonie School	1063 E 900 S	Warren	Huntington Co Com	483		$515
5	EFS1	Lancaster Elementary School	2932 W 300 S	Hungtinton	Huntington Co Com	264		$515
6	EFS1	Huntington North High School	450 McGahn St	Huntington	Huntington Co Com	1912		$515
7	EFS1	Flint Springs Elementary	1360 E , Tipton St.	Huntington	Huntington Co Com	434		$515
8	EFS1	Horace Mann Elementary School	2485 Waterworks Rd	Huntington	Huntington Co Com	401		$515
9	EFS1	Northwest Elementary School	4524 W 800 N	Huntington	Huntington Co Com	351		$515
10	EFS1	Lincoln Elementary School	2037 E Taylor St	Huntington	Huntington Co Com	433		$515
11	EFS1	Huntington Catholic School	960 Warren St	Huntington	Diocese of Fort Wayne	166		$515
12	EFS1	Saint Peter Lutheran School	605 Polk St	Huntington	Lutheran Schools of			$515
13	EFS1	Crestview Middle School	1151 W 500 N	Huntington	Huntington Co Com	656		$515

Waste Water Facilities

ID	Class	Name	Address	City	Contact	Use	Year Built	Cost (x$1,000)
1	WDFLT	DAWN LAKES RSD WWTP	NW OF CR 900 N & CR 300 W	HUNTINGTON	MICHAEL T.	Other	2000	$68,598
2	WDFLT	MT. ETNA MUNICIPAL STP	TO BE CONSTRUCTED	MT. ETNA	MR. RAYMOND NEW,	Building	2002	$68,598
3	WDFLT	ROANOKE MUNICIPAL WWTP	US 24 E & 2ND STROANOKE	MR. JOHN HITZEMANN,		Access Poi	2000	$68,598
4	WDFLT	CITY OF HUNTINGTON WATER	290 ENGLE	HUNTINGTON	COLIN E. BULLOCK	Front Gate	1997	$68,598

ID	Class	Name	Address	City	Contact	Use	Year Built	Cost (x$1,000)
5	WDFLT	MARKLE MUNICIPAL WWTP	305 W MORSE ST	MARKLE	MR. SCOTT SPAHR,	Front Gate	1998	$68,598
6	WDFLT	WARREN WASTEWATER TR.		WARREN	MR. LEE POULSON,	Front Gate	1998	$68,598

APPENDIX G: CRITICAL FACILITIES MAPS

The following map shows the locations of Huntington County's critical facilities. Figures A and B on the following pages depict magnified views of the demarcated regions on the county map. Each magnified view includes a table with the facility identification number, name, and type of critical facility. The facility identification number can be matched to the numbers listed above the facilities in the map and in Appendix F. The numbers were automatically assigned through HAZUS-MH and may repeat; the legend clarifies types of facilities.

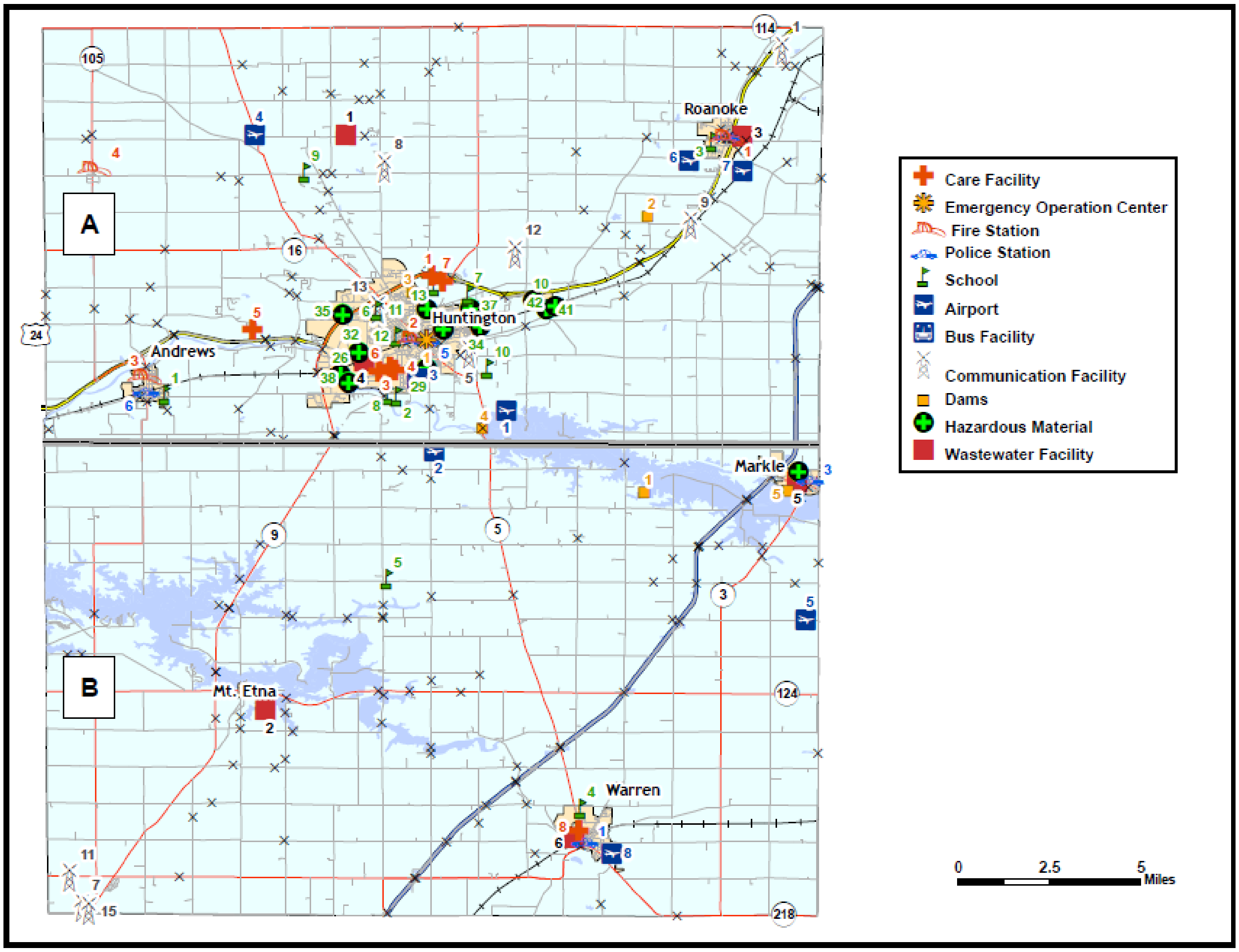
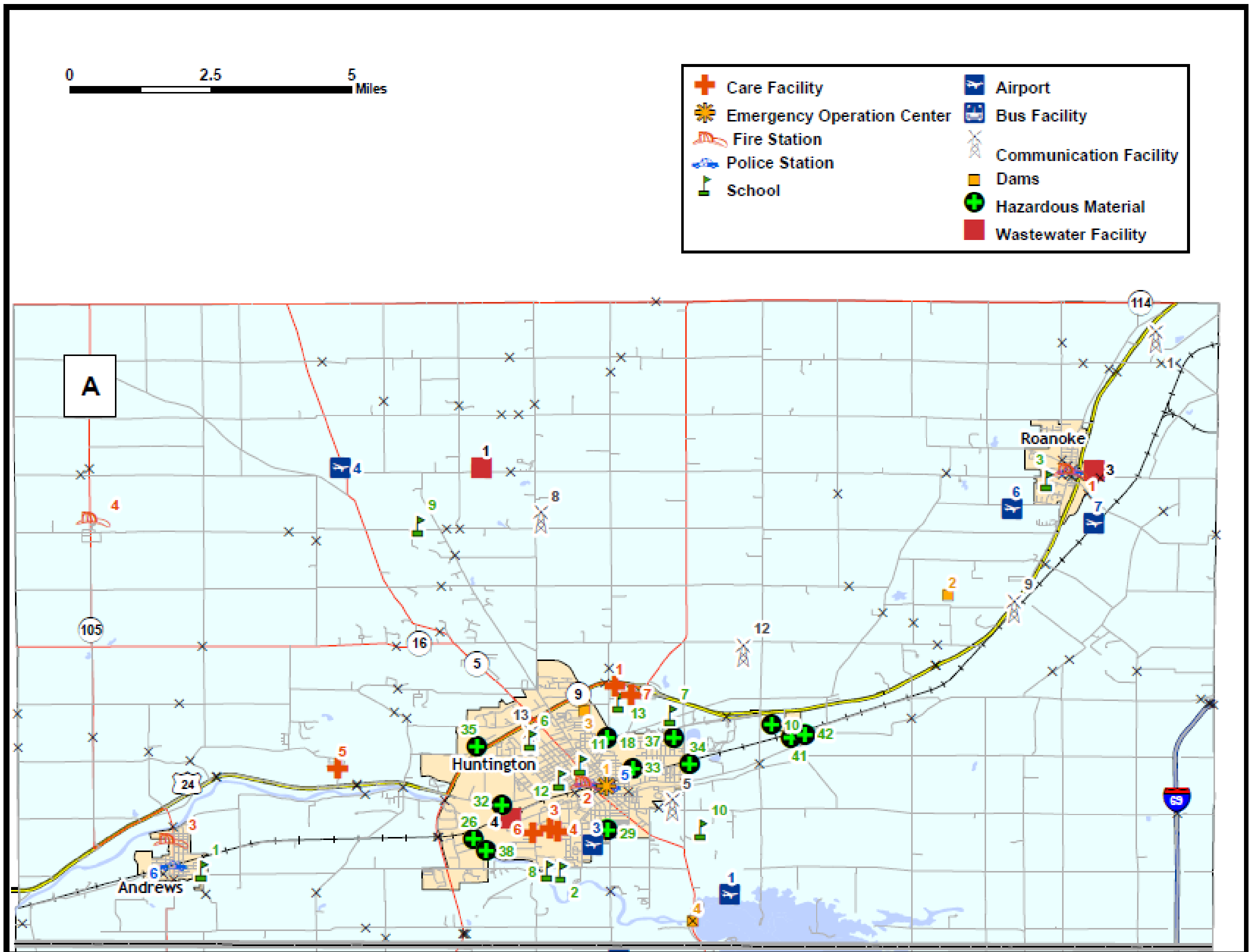


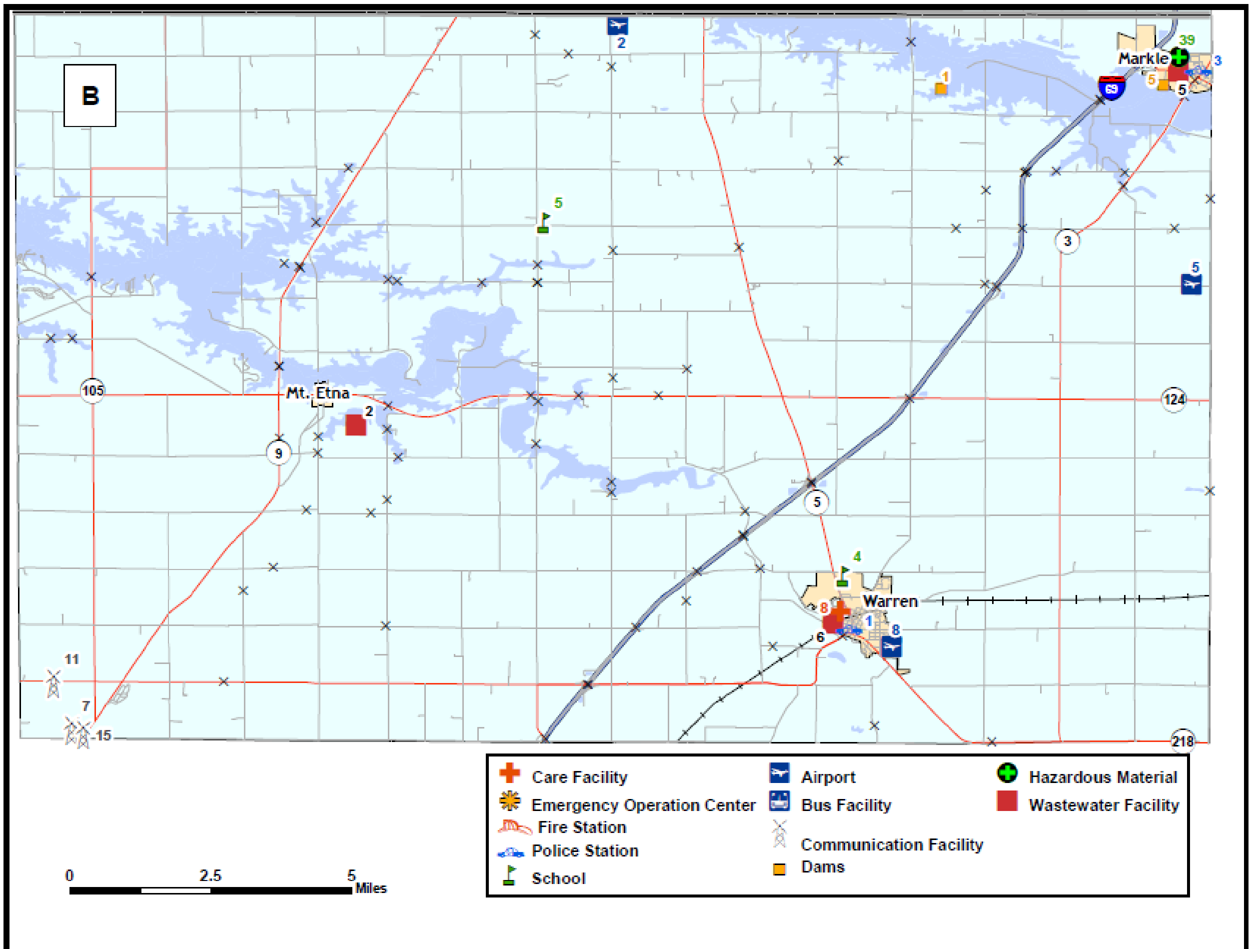
Figure A



ID#	Name	Facility Type	ID#	Name	Facility Type
1	Huntington Municipal	Airport	18	Ecolab Inc.	Hazmat Site
3	Huntington Memorial Hospital	Airport	29	Maco Corp	Hazmat Site
4	BeckPVT	Airport	32	Imco Inc	Hazmat Site
6	The Wolf Den	Airport	33	Onward Manufacturing. CO.	Hazmat Site
7	Fisher Farm	Airport	34	Isolatek Intl	Hazmat Site
1	Parkview Huntington Memorial Hosp	Care	35	Square D Co.	Hazmat Site
3	Miller's Merry Manor	Care	37	Wabash Techs	Hazmat Site
4	Hickory Creek at Huntington	Care	38	Wabash Techs.	Hazmat Site
5	Norwood Nursing Center	Care	2	Roanoke Police Dept	Police
6	Magnolia Health Systems XVIII LLC	Care	4	Huntington Police Dept	Police
7	The Heritage of Huntington	Care	5	Huntington County Sheriff Dept	Police
1	WOWO	Communication	6	Andrews Town Marshall	Police
5	WBZQ	Communication	2	Huntington Water Plant	Potable Water
8	WQHU-LP	Communication	3	Roanoke Water Plant	Potable Water
9	WXKE	Communication	4	Bippus Water Plant	Potable Water
12	WCKZ	Communication	7	Andrews Water Plant	Potable Water
13	WVSH	Communication	1	Andrews Elementary School	School
1	WAHL-SHIN-CAH Lake	Dam	2	Riverview School	School
2	Timber Lake Dam	Dam	3	Roanoke Elementary School	School
3	Huntington College Lake Dam	Dam	6	Huntington North High School	School
4	J. Edward Roush Lake Dam	Dam	7	Flint Springs Elementary	School

ID#	Name	Facility Type	ID#	Name	Facility Type
5	Markle Levee (USACE)	Dam	8	Horace Mann Elementary School	School
1	Huntington County EOC	EOC	9	Northwest Elementary School	School
1	Roanoke Fire Dept	Fire	10	Lincoln Elementary School	School
2	Huntington City Fire Dept	Fire	11	Huntington Catholic School	School
3	Dallas Twp Volunteer Fire Dept	Fire	12	Saint Peter Lutheran School	School
4	Bippus Fire Dept	Fire	13	Crestview Middle School	School
10	Gladieux Trading & Marketing Co. L.P.	Hazmat Site	4	City of Huntington Water Poll.	WWTP
41	Koch Nitrogen	Hazmat Site	1	Dawn Lakes RSD WWTP	WWTP
42	CF Industries	Hazmat Site	3	Roanoke Municipal WWTP	WWTP

Figure B

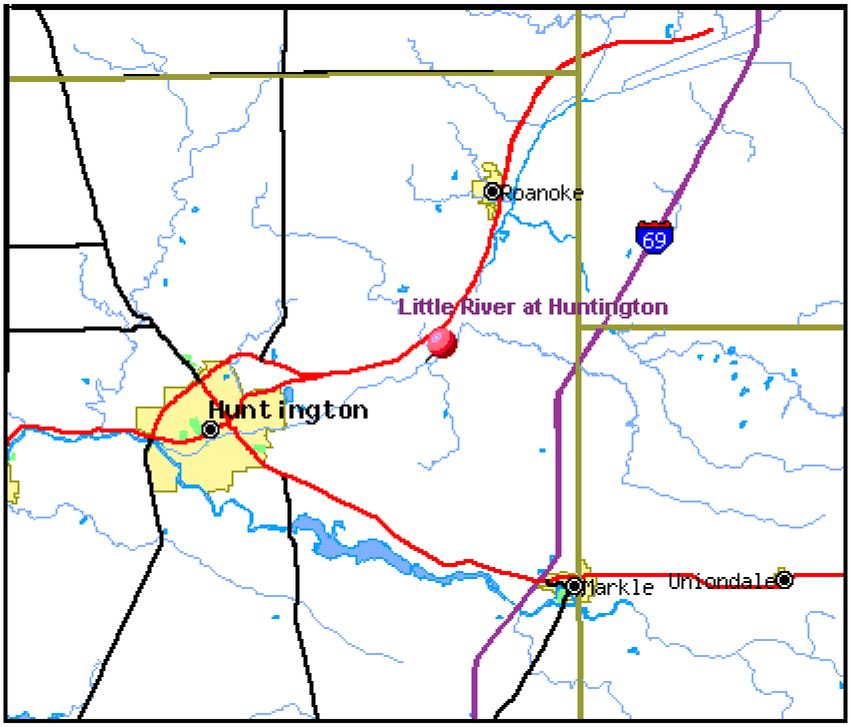


ID#	Name	Facility Type	ID#	Name	Facility Type
2	Bowlin	Airport	1	Warren Police Dept	Police
5	Johnson	Airport	3	Markle Police Dept	Police
8	Daugherty Field	Airport	6	Warren Water Plant	Potable Water
8	United Methodist Memorial Home	Care	4	Salamonie School	School
7	WSOT-LP	Communication	5	Lancaster Elementary School	School
11	WCJC	Communication	5	Markle Municipal WWTP	WWTP
15	WBSW	Communication	2	Mt. Etna Municipal STP	WWTP
39	Wayne Metal Prods. Co. Inc.	Hazmat Site	6	Warren WWTP	WWTP

APPENDIX H: USGS STREAM GAUGE DATA

The following gauge information was obtained from The National Oceanic and Atmospheric Administration (NOAA) Advanced Hydrologic Prediction Service website (www.weather.gov/ahps/). For Huntington County, data is provided for two points: Little River 5 E Huntington and Salamonie River 2 NW Warren.

Little River 5 E Huntington



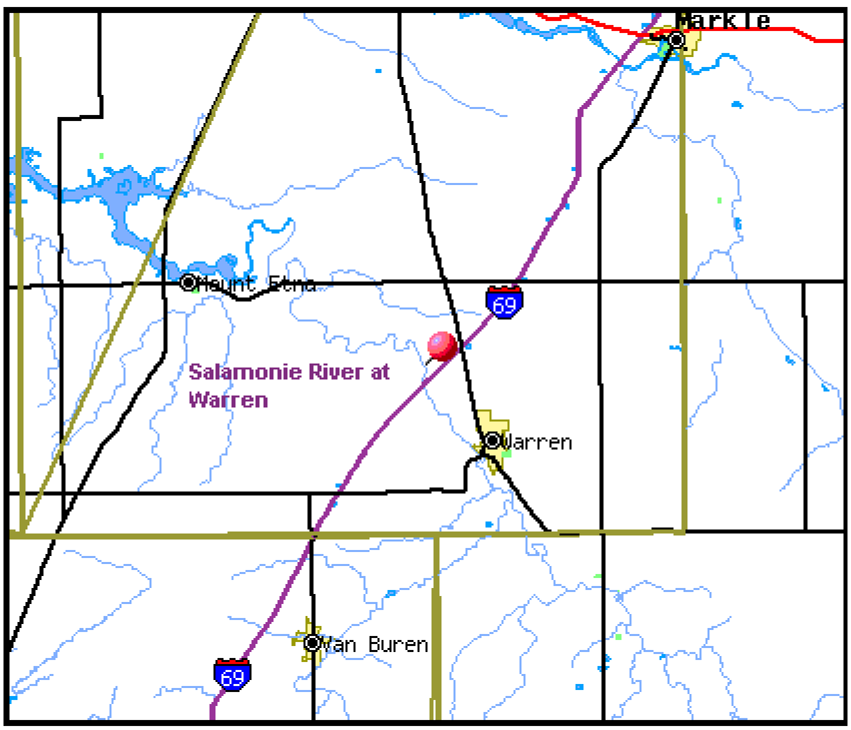
Flood Categories (in feet)

Major Flood Stage:	19
Moderate Flood Stage:	16
Flood Stage:	15
Action Stage:	12

Historical Crests
(1) 20.00 ft on 01/04/1950
(2) 19.50 ft on 02/25/1985
(3) 18.98 ft on 12/31/1990
(4) 18.91 ft on 02/07/2008
(5) 18.77 ft on 07/17/1996
(6) 18.18 ft on 01/24/1999
(7) 17.44 ft on 01/14/2005
(8) 16.92 ft on 06/14/2004
(9) 16.90 ft on 02/28/1997
(10) 16.66 ft on 04/10/1998

Feet	Flood Impacts
21.0	At this level, flooding exceeds the record flood. Massive inundation and damage and the closure of primary roads and bridges can be expected. Many evacuations can also be expected.
20.0	Flooding approaches the height of the record flood. There is extensive inundation and damage with many primary roads and bridges closed. Many evacuations can be expected at this level.
19.0	At this level, many roads and bridges will be closed and there will be extensive inundation and damage with many evacuations.
18.0	Extensive flooding is in progress.
16.0	Moderate flooding is in progress. Secondary roads are blocked by flood waters. People in these areas should move property to higher ground and those nearest the river may have to evacuate their homes.
15.0	BANKFULL CONDITIONS
14.0	Minor flooding is in progress with only minimal damage expected.

Salamonie River 2 NW Warren



Flood Categories (in feet)

Major Flood Stage:	17
Moderate Flood Stage:	15
Flood Stage:	12
Action Stage:	10

There are no historical crests for this point.

Feet	Flood Impacts
17.2	Flood water begins to hit the bottom of the bridge at the gage site.
17.0	Major flooding is in progress with extensive inundation and damage. Many primary roads and bridges are closed. Evacuations from flood prone areas are necessary.
15.0	Moderate flooding can be expected. Secondary roads are blocked and the transfer of property to higher ground is necessary.
12.0	The river reaches flood stage with minor flooding of low agricultural land and roads nearest the river.