2018 Wayne County Hazard Mitigation Plan

Wayne County, Ohio

June 12, 2018

Stantec

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SECTION 1: INTRODUCTION

Authority

This updated plan complies with all requirements set forth by the Ohio Emergency Management Agency and the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Section 104 of the Disaster Mitigation of 2000. In addition, it complies with all of FEMA's Final Rule 44 CFR Part 201, which outlines criteria for approval of hazard mitigation plans.

Purpose

The Federal Emergency Management Agency (FEMA) and the Ohio Emergency Management Agency (OEMA) define Hazard Mitigation as any sustained action taken to reduce or eliminate long-term risk to people and property from natural hazards such as flooding, storms, high winds, earthquakes, etc. Mitigation efforts undertaken by communities will help to minimize damages to buildings and infrastructure, such as water supplies, sewers, and utility transmission lines, as well as natural, cultural and historic resources.

The objective of the Wayne County Hazard Mitigation Plan is to protect citizens, critical facilities, infrastructure, private property and the surrounding environment from natural hazards. This objective can be achieved by identifying potential hazards in the county and establishing procedures that will mitigate the effects of hazards. This plan provides a framework for planning against hazards in the county and participating jurisdictions.

The Wayne County Hazard Mitigation Plan includes all unincorporated areas and incorporated areas within the county. This Plan includes Wayne County unincorporated, the Villages of Apple Creek, Burbank, Congress, Creston, Dalton, Doylestown, Fredericksburg, Marshallville, Mount Eaton, Shreve, Smithville, West Salem and Cities of Orrville, Rittman and Wooster.

Scope

The focus of the 2017 Wayne County Mitigation Plan Update is on those hazards determined to be "high" or "moderate" risks to Wayne County, as determined through a detailed hazard risk assessment. All potential hazards warranted some analysis and assessment. Other hazards that pose a "low" or "negligible" risk will continue to be evaluated during future updates to the Plan, but they may not be fully addressed until they are determined to be of high or moderate risk. This enables Wayne County and the participating jurisdictions to prioritize mitigation actions based on those hazards which are understood to present the greatest risk to lives and property.

The geographic scope (i.e., the planning area) for the Plan includes Wayne County and incorporated jurisdictions. Table 1 indicates the participating jurisdictions.

Table 1: Participating Communities in Wayne County Hazard Mitigation Plan

Communities		
Village of Apple Creek	Village of Marshallville	Wayne County
Village of Burbank	Village of Mount Eaton	City of Wooster
Village of Congress	City of Orrville	
Village of Creston	City of Rittman	
Village of Dalton	Village of Shreve	
Village of Doylestown	Village of Smithville	
Village of Fredericksburg	Village of West Salem	

Summary of Plan Contents

This plan is designed to be as reader-friendly and functional as possible. While significant background information is included on the processes and studies used (i.e., risk assessment, capability assessment), this information is separated from the more meaningful planning outcomes or actions (i.e., mitigation strategy, mitigation action plan). In the beginning of each section is a list of the 44 CFR 201.6 requirements that are met.

Section 2, **Planning Process**, describes the process used to prepare the Plan, including the integration of Community Rating System requirements. It identifies members of the planning team and how the public and other stakeholders were involved. It also includes a summary for each of the key meetings along with any associated outcomes.

The **County Profile**, located in Section 3, provides a general overview of Wayne County, including geographic, demographic, and economic characteristics. In addition, this section discusses building characteristics and land use patterns. This baseline information provides a snapshot of the planning area and helps local officials recognize those social, environmental, and economic factors that ultimately play a role in determining the city's vulnerability to hazards.

The **Risk Assessment** is presented in Section 4. This section serves to identify, analyze, and assess hazards that threaten the Wayne County. The risk assessment also attempts to define hazard risks that may uniquely or exclusively affect specific areas of the county.

The Risk Assessment begins by identifying hazards that threaten Wayne County. Next, it establishes detailed profiles for each hazard, building on available historical data from the previous plan, past hazard occurrences, spatial extent, and probability of future occurrence. This section culminates in a hazard risk ranking based on conclusions regarding the frequency of occurrence, spatial extent, and potential impact highlighted in each of the hazard profiles (known as the Priority Risk Index). The vulnerability assessment uses available hazard data to evaluate vulnerability. FEMA's HAZUS®MH loss estimation methodology evaluates flood and earthquake risk. In essence, the information generated through the risk assessment serves a critical function as the county seeks to determine the most appropriate mitigation actions to pursue and implement. The risk assessment enables the county to prioritize and focus its efforts on those hazards of greatest concern and those structures or planning areas facing the greatest risk.

The **Mitigation Strategy**, found in Section 5, consists of broad goal statements (refined for the 2017 plan update) as well as an analysis of hazard mitigation techniques for Wayne County to consider in reducing hazard vulnerabilities. The strategy provides the foundation for a detailed **Mitigation Action Plan**, which links specific mitigation actions for each jurisdiction, department, or community partner. This process locally-assigns implementation mechanisms and target completion dates. Together, these sections are designed to make the plan both strategic, through the identification of long-term goals, and functional, through the identification of immediate and short-term actions that will guide day-to-day decision-making and project implementation.

With this plan, Wayne County is embarking on an innovative planning process to consider future hazard risks and projection in the risk assessment and mitigation strategies. The plan emphasizes using program and policy alternatives to make Wayne County less vulnerable to natural hazards while improving the economic, social, and environmental health of the community. The concept of multi-objective planning was emphasized throughout the planning

process, particularly in identifying ways to link, where possible, hazard mitigation policies and programs with complimentary community goals related to disaster recovery, housing, economic development, recreational opportunities, transportation improvements, environmental quality, land development, and public health and safety.

The **Capability Assessment**, found in Section 5, provides an inventory and analysis of existing plans, ordinances, and relevant documents. The purpose of this assessment is to identify any existing gaps, opportunities, or conflicts in programs or activities that may hinder hazard mitigation efforts and to identify those activities that should be built upon in establishing a successful and sustainable local hazard mitigation program. Specific capabilities addressed in this section include planning and regulatory capability, staff and organizational (administrative) capability, technical capability, fiscal capability, and political capability. Information was obtained through the use of a use of a Capability Assessment Survey.

The Community Profile, Risk Assessment, and Capability Assessment collectively serve as a basis for determining the goals for the Wayne County Hazard Mitigation Plan, each contributing to the development, adoption, and implementation of a meaningful and manageable Mitigation Strategy that is based on accurate background information.

Plan Maintenance, found in Section 6, includes the measures that the Wayne County will take to ensure the Plan's continuous long-term implementation. The procedures also include the manner in which the Plan will be regularly evaluated and updated to remain a current and meaningful planning document.

Lastly, the **Appendices** provide documentation including: Appendix A: Adoption Resolution; Appendix B: Meeting Notes/Sign-in; Appendix C: Correspondence; Appendix D: Community Hazard Maps; Appendix E: Review Tool (Federal Review Tool).

SECTION 2: PLANNING PROCESS

44 CFR Requirement

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

Requirement: §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

Overview of Hazard Mitigation Planning

Local hazard mitigation planning is the process of organizing community resources, identifying and assessing hazard risks, and determining how to best minimize or manage those risks. This process culminates in a hazard mitigation plan that identifies specific mitigation actions, each designed to achieve both short-term planning objectives and a long-term community vision.

To ensure the functionality of a hazard mitigation plan, responsibility is assigned for each proposed mitigation action to a specific individual, department, or agency along with a schedule or target completion date for its implementation. Plan maintenance procedures are established for the routine monitoring of implementation progress, as well as the evaluation and enhancement of the mitigation plan itself. These plan maintenance procedures ensure that the Plan remains a current, dynamic, and effective planning document over time that becomes integrated into the routine local decision making process.

Communities that participate in hazard mitigation planning have the potential to accomplish many benefits, including:

- Saving lives and property,
- Saving money,
- Speeding recovery following disasters,
- Reducing future vulnerability through wise development and post-disaster recovery and reconstruction,
- Expediting the receipt of pre-disaster and post-disaster grant funding, and

- Demonstrating a firm commitment to improving community health and safety.

Typically, communities that participate in mitigation planning are described as having the potential to produce long-term and recurring benefits by breaking the repetitive cycle of disaster loss. A core assumption of hazard mitigation is that the investments made before a hazard event will significantly reduce the demand for post-disaster assistance by lessening the need for emergency response, repair, recovery, and reconstruction. Furthermore, mitigation practices will enable local residents, businesses, and industries to re-establish themselves in the wake of a disaster, getting the community economy back on track sooner and with less interruption.

The benefits of mitigation planning go beyond solely reducing hazard vulnerability. Mitigation measures such as the acquisition or regulation of land in known hazard areas can help achieve multiple community goals, such as preserving open space, maintaining environmental health, and enhancing recreational opportunities. Thus, it is vitally important that any local mitigation planning process be integrated with other concurrent local planning efforts, and any proposed mitigation strategies must take into account other existing community goals or initiatives that will help complement or hinder their future implementation.

Summary of Previous Planning Efforts

Wayne County has been engaged in planning since the passage of the Disaster Mitigation Act of 2000. The first Wayne County Hazard Mitigation Plan was completed in 2004. A second edition of the Plan was updated in 2010. During the 2010 update, every community in Wayne County participated developing the plan except for the Village of Congress. The hazards of greatest concern as part of the 2010 plan update were winter weather, hail, thunderstorm winds and Tornados.

Preparing the 2017 Hazard Mitigation Plan Update

Hazard mitigation plans are required to be updated every five years to remain eligible for federal mitigation funding. To prepare the 2017 *Wayne County Hazard Mitigation Plan Update*, Stantec and was hired as the consultant to provide professional mitigation planning services. Matthew Lesher from Stantec served as the project manager while Ben Schattschneider served as the lead planner for this project.

Per the contractual scope of work, the consultant team followed the mitigation planning process recommended by FEMA (Publication Series 386 and Local Mitigation Plan Review Guide). The Local Mitigation Plan Review Tool, found in Appendix E, provides a detailed summary of FEMA's current minimum standards of acceptability for compliance with DMA 2000 and notes the location where each requirement is met within this Plan. These standards are based upon FEMA's Final Rule as published in the Federal Register in Part 201 of the Code of Federal Regulations (CFR). The planning team used FEMA's Local Mitigation Plan Review Guide (October 2011) for reference as they completed the Plan.

It was the focus of the Wayne County EMA to expand the Core Committee to include all jurisdictions within Wayne County and additional Wayne County Agencies. Wayne County EMA worked with all the jurisdictions to identify appropriate individuals to serve on the Core Committee for the 2017 update. The selected individuals were invited to all mitigation planning meetings to support the development of the hazard mitigation plan. Table 2 lists representatives from the county and local jurisdictions who participated in the update. The Core Committee includes at least one representative from each local jurisdiction and Wayne County.

Table 2: Core Committee Representatives

Community	Name	Title
Village of Apple Creek	Rob Mackey	Council President
Village of Burbank	Brandon Smith	Fire Chief
Village of Congress	Jay Henry	Mayor
Village of Creston	William Armentrout	Mayor
Village of Creston	Brandon Smith	Fire Chief
Village of Dalton	Judy Cox	Mayor
Village of Doylestown	Casey Tester	Police Chief
Village of Fredericksburg	Ian Weaver	Fire Chief
Village of Marshallville	Tom Rocker	Police Chief
Village of Mount Eaton	Craig Hewitt	Administrator
City of Orrville	Matt Birkbeck	Police Chief
City of Rittman	Jeff Toepke	IT Manager
City of Rittman	Derek Feuerstein	City Manager
Village of Shreve	Jason Lingenfelter	City Council
Village of Smithville	Paul Alexander	Mayor
Village of West Salem	Tina Barnette	Administrative Assistant
Wayne County EMA	Joe Villegas	EMA Director
Wayne County EMA	Barbara Pittard	Planner/Office Manager
Wayne County	Trevor Hunt	Planning Director
Wayne County	Mark Spademan	Deputy Engineer
Wayne County	Russell Robertson	GIS Director
City of Wooster	Barry Saley	Fire Chief

Plan Development Meetings

The preparation of this Plan required a series of meetings and open houses for facilitating discussion, gaining consensus and initiating data collection efforts with local government staff, community officials, and other identified stakeholders. More importantly, the meetings and workshops prompted continuous input and feedback from relevant participants throughout the drafting stages of the Plan. The following is a summary of the key meetings and community workshops held during the development of the plan update.[1] Five in-person meetings were conducted:

1. Core Committee Kick-off/Risk Assessment Meeting,
2. Core Committee Mitigation Strategy Meeting,
3. Public Mitigation Strategy Open House,
4. Core Committee Plan Review Meeting and
5. Public Plan Review Open House.

1 Copies of agendas, sign-in sheets, minutes, handout materials, and public advertisement for all meetings and workshops can be found in Appendix B.

In many cases, routine discussions and additional meetings were held by local staff to accomplish planning tasks specific to their department or agency, such as the approval of specific mitigation actions for their department or agency to undertake and include in the Mitigation Action Plan.

Core Committee Kick-off/Risk Assessment –May 17, 2017

The kick-off meeting was held at the Wayne County EMA on May 17, 2017 at 1:30 pm. The purpose of the meeting was to provide an overview of hazard mitigation including possible techniques; gather local information; and review roles, responsibilities, and project schedule. The meeting was facilitated by Matthew Lesher and Ben Schattschneider with Stantec.

Mr. Lesher started the meeting with a review of the Disaster Mitigation Act of 2000. Mr. Lesher asked the participants to review the goals from the 2010 plan to determine if they are still relevant or if they should be updated to reflect the current needs of Wayne County. The 2010 plan identified the following hazards as priority:

- Winter Weather
- Hail
- T-Storm winds
- Tornado
- HazMat Spill

The 2010 plan identified 15 mitigation actions. The mitigation actions focused on education material, emergency notification systems, flood mitigation, stormwater management and critical infrastructure. Mr. Lesher discussed the 2017 plan update process will include a plan that meets the current needs of Wayne County, leverage local knowledge on historical events and impacts and obtain new hazard information. Participants were asked to think about mitigation in two ways. First, what mitigation actions can be implemented to reduce risk to the existing built environment. Second, what can be done to ensure future development is not at an increased risk to specific hazards.

An icebreaker exercise was conducted so that participants could allocate money to mitigation techniques that were of highest priority. Each community was provided $100 million to allocate for mitigation projects. A summary of the results are provided below:

Mitigation Technique	Dollars Allocated
Structural Projects	$295 million
Emergency Services	$160 million
Prevention	$125 million
Property Protection	$90 million
Natural Resource Protection	$75 million
Public Education/Awareness	$65 million

Mr. Lesher asked the Core Committee to share how they decided to "spend the money. Examples include:

- Wayne County does not have zoning ordinances in the unincorporated areas, so they allocated money for the prevention mitigation technique to establish plans and regulations that limit individual's exposure to hazards.
- City of Rittman experiences flooding from Landis Creek which affects a shopping center on North Main Street. Preferred mitigation techniques were property protection and structural protection.
- Village of West Salem discussed the need for a safe room to house residents during a tornado.

Mr. Lesher outlined the planning process moving forward. There will be requests to communities to provide information on available GIS data, land use plans and regulations. This information will be used to help develop the capability assessment in the hazard mitigation plan. Mr. Lesher wrapped up with a review of the major plan milestones, project schedule and asked if there were any questions.

Core Committee Mitigation Strategy Meeting –August 16, 2017

The mitigation strategy meeting was held at the Wayne County EMA on August 16, 2017 at 1:30 pm. The purpose of the meeting was to provide an overview of hazard mitigation, plan progress to date (including risk assessment), and develop potential mitigation actions. Matt Lesher, Stantec, began facilitation of the meeting with an overview of the meeting agenda and a review of the Disaster Mitigation Act (DMA) of 2000.

Ben Schattschneider from Stantec presented the risk assessment results. It was emphasized that what was being presented was a high level approach compared to what could be found in the plan. Each hazard provided hazard highlights such as previous occurrences, probability, location, potential impacts and previous losses.

The results of the risk assessment process were used to generate a Priority Risk Index (PRI), which categorizes and prioritizes potential hazards as high, moderate, or low risk based on probability, impact, spatial extent, warning time, and duration. The ranking of hazards was presented and attendees were asked to review and comment on the list if anything seemed out of line with perceived risks. The results of the various hazards are as follows:

- High Risk Hazards
  - Severe Thunderstorm / High Winds
  - Severe Winter Storm
  - Flood
  - Tornado
- Moderate Risk Hazards
  - Drought
  - Hazardous Material
  - Hail Storm
- Low Risk Hazards
  - Dam Failure
  - Earthquake

- Wildfire
- Subsidence

Mr. Lesher then gave an overview of the mitigation strategy, explaining that it includes goals, actions, and the action plan. The goals were reviewed and confirmed at the kick-off meeting, meaning the remaining focus was on mitigation actions. He explained the 3 step process needed to complete the mitigation strategy:

1. Review and update existing actions
2. Evaluate potential hazard mitigation actions
3. Develop new hazard mitigation action

Mr. Lesher reviewed with the attendees the mitigation actions from the 2010 plan that were identified for all jurisdictions. These five actions were reviewed and the statuses were updated for the 2017 plan.

Mr. Lesher introduced the community capability assessment. The purpose of the assessment is to identify strengths within a community and areas where a community may need additional resources to pursue mitigation actions. The capability assessment worksheet was used to review planning/regulatory capabilities, administrative/technical capabilities, fiscal capabilities, and political capabilities. Meeting notes and sign in sheets are provided in Appendix B.

Public Mitigation Strategy Open House –August 16, 2017

The mitigation strategy meeting was held at the Wayne County Administration Building on August 16, 2017 at 4:30 pm. The purpose of the open house was to provide the public an opportunity to be engaged in the hazard mitigation plan update by providing input into what hazards impact them and recommend mitigation actions. Wayne County EMA posted the open house on social media as well as posting an advertisement in the local newspaper prior to the open house. Two residents attended the open house to inquire about the planning process.

Plan Review Meeting – November 15, 2017

The purpose of the meeting was to provide an overview of the draft hazard mitigation plan and request any comments from the meeting participants. Matt Lesher, Stantec, began facilitation of the meeting with an overview of the meeting agenda.

Mr. Lesher provided an overview of the hazard mitigation planning process for the Wayne County, Ohio plan update. He then presented the plan and discussed highlights from the sections of the plan. As he discussed the plan, he requested any questions or comments from the meeting participants. The FEMA Hazard Mitigation Plan Review crosswalk was reviewed with attendes and identified where in the plan the 44 CFR 206 regulations are met.

He also provided an overview of the remaining schedule for the Hazard Mitigation Plan update. A public open house was held on November 15, 2017 from 4 to 5 pm at the Wayne County Administration Building to provide the public an opportunity to provide comments and ask questions regarding the draft plan. Community officials and the public will be provided a 2 week comment period for the plan. Comments should be sent to Barbara Pittard at Wayne County EMA by December 1, 2017. The draft plan will be provided on the Wayne County website for review. Following approval from Wayne County EMA the draft plan will be provided to Ohio EMA and FEMA for their review and approval.

Public Plan Review Open House –November 15, 2017

The plan review meeting was held at the Wayne County Administration Building on November 15, 2017 at 4:00 pm. The purpose of the open house was to provide the public an opportunity to ask questions and provide comments regarding the draft hazard mitigation plan. Wayne County EMA posted the open house on social media as well as posting an advertisement in the local newspaper prior to the open house. One resident attended the open house to inquire about the draft plan and was provided an overview of the sections of the plan.

Involving the Public

An important component of the mitigation planning process is public participation. Individual citizen and community-based input provides the entire planning team with a greater understanding of local concerns and increases the likelihood of successfully implementing mitigation actions by developing community "buy-in" from those directly affected by the decisions of public officials. As citizens become more involved in decisions that affect their safety, they are more likely to gain a greater appreciation of the hazards present in their community and take the steps necessary to reduce their impact. Public awareness is a key component of any community's overall mitigation strategy aimed at making a home, neighborhood, school, business or entire city safer from the potential effects of hazards.

Public involvement in the development of the Wayne County Hazard Mitigation Plan was sought using two methods: (1) public open houses and (2) copies of draft Plan deliverables were made available for public review on county websites and at government offices. The Public was provided two opportunities to be involved in the actual plan development at two distinct periods during the planning process: (1) during the drafting stage of the Plan via the public mitigation strategy open house; and (2) upon completion of a final draft Plan, but prior to official plan approval and adoption.

Each of the participating jurisdictions will hold public meetings before the final plan is officially adopted by the local governing bodies. These meetings will occur at different times once FEMA has granted conditional approval of the Plan. Adoption resolutions will be included in Appendix A.

Involving the Stakeholders

Wayne County EMA worked to provide an opportunity for a wide range of stakeholders, including opportunity for agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, private entities, and others to be involved in the planning process.

To involve a wide range of stakeholders, Wayne County went beyond in its local outreach efforts and hosted multiple public open houses. These opportunities were provided for local officials, residents, businesses, academia, and other private interests in Wayne County to be involved and offer input throughout the local mitigation planning process.

In addition, neighboring counties were notified by email of the plan update process and invited to review and comment on the draft plan. The email was sent to county emergency management coordinators. A complete list of those emailed and a copy of the outreach email can be found in Appendix C.

Review and Incorporation of Existing Plans and Studies

Several plans and studies have been leveraged during the development of this plan. Each section references these sources which are primarily found in Section 3 through Section 6. Types of sources leveraged included:

Local planning documents (e.g., floodplain management ordinances, land use plans)

- Floodplain Regulations
  Wayne County and many of the jurisdictions have adopted floodplain regulations that meet all National Flood Insurance Program (NFIP) requirements. Table 3 identifies Wayne County communities participation in the NFIP. These regulations call for the proper elevation of structures and also control the effects on the floodplain itself (cuts, fills). These regulations do not ensure the safety of those who develop in the floodplain but go a long way in reducing the effects of flooding by removing structures from the projected path of water.

Table 3: Communities Participation in the NFIP

Community	NFIP Participation
Village of Apple Creek	Yes
Village of Burbank	Yes
Village of Congress*	No
Village of Creston	Yes
Village of Dalton*	No
Village of Doylestown	No
Village of Fredericksburg	Yes
Village of Marshallville*	No
Village of Mount Eaton*	No
City of Orrville	Yes
City of Rittman	Yes
Village of Shreve	No
Village of Smithville	Yes
Village of West Salem*	Yes
Wayne County	Yes
City of Wooster	Yes

**Community has no Special Flood Hazard Area*

- Subdivision Regulations
  These regulations govern the development of how land will be divided into separate lots or sites. They help manage hazards by requiring proper arrangement of roads, in order to ensure the maneuverability of emergency vehicles. They also require the review and acceptance of planned public facilities that includes drainage and sewerage. These subdivision regulations are designed specifically to complement the Comprehensive Plan of the County.

- Comprehensive Plan
  Wayne County has created a comprehensive plan to guide long-term development. Ingrained into the plan are ideas that are integral to sustainability and disaster resistance. The goals of the Plan include the control development through expansion of community services, land use management, and the preservation of natural resources.

This plan allows Wayne County to incorporate disaster mitigation into all future development decisions.

- Building Code
  These codes create minimum standards for all new or substantially improved structures to protect against natural hazard threats. For example, these standards govern the wind resistance of structures as well as their anchorage for high wind events. These codes help to strengthen our built environment by reducing the vulnerability to certain known hazards.

Documentation of Plan Progress

Progress in hazard mitigation planning for the participating jurisdictions in Wayne County is documented in this plan update. Since hazard mitigation planning efforts officially began in Wayne County and with the development of the initial Hazard Mitigation Plans in the 2004, many mitigation actions have been completed and implemented in the participating jurisdictions. These actions will help reduce the overall risk to natural hazards for the people and property in Wayne County. The actions that have been completed are documented in the Mitigation Action Plan found in Section 5.

In addition, community capability continues to improve with the implementation of new plans, policies and programs that help to promote hazard mitigation at the local level. The current state of local capabilities for the participating jurisdictions are captured in *Capability Assessment*. The participating jurisdictions continue to demonstrate their commitment to hazard mitigation and hazard mitigation planning and have proven this by developing the Core Committee to update the Plan and by continuing to involve the public in the hazard mitigation planning process.

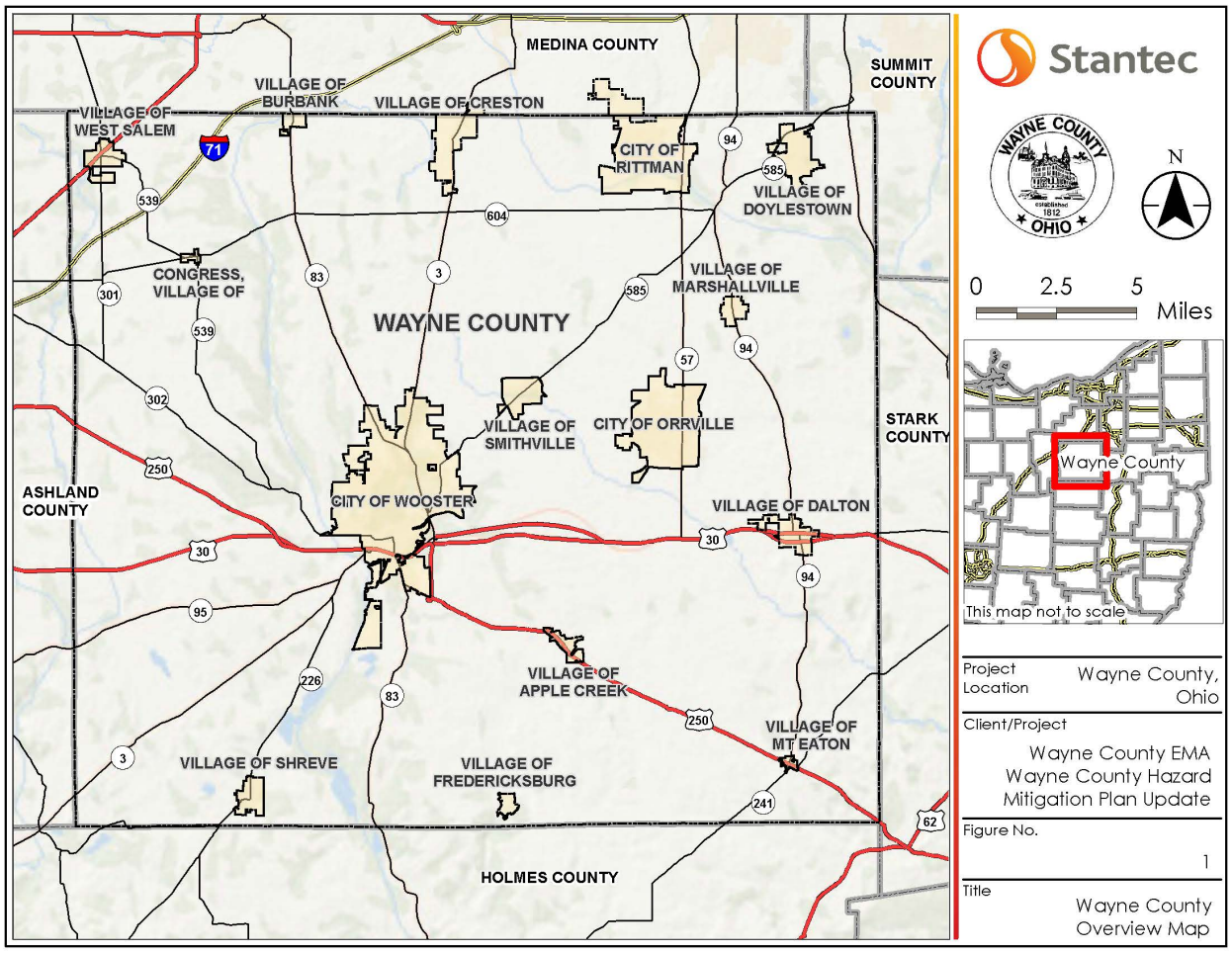
SECTION 3: COUNTY PROFILE

44 CFR Requirement

Requirement §201.6(d)(3): *A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.*

Geography and the Environment

Wayne County is located in northeast Ohio and is approximately 65 miles south of Cleveland. The county has a total area of 557 square miles, with 555 square miles being land and 2 miles is water. An orientation map is provided below. Wayne County was formed on February 13, 1808 and was named after General "Mad" Anthony Wayne. The county seat of Wayne County is the City of Wooster.



Wayne County enjoys a four season climate with an average annual temperature of 49.8 degrees Fahrenheit, average annual rainfall of 40 inches and average annual snowfall of 30 inches. The county enjoys a climate that is characterized by moderate winters with few hot, humid summer

days. Summer temperatures average in the 80s and winter temperatures range from the low 40s to low 50s.

Wayne County offers a variety of recreation activities which include hiking, biking, canoeing or kayaking, tennis, golf, swimming and boating. There are recreational opportunities near Wayne County including the Cuyahoga Valley National Recreation Area, the Rock and Roll Hall of Fame and Museum in Cleveland and the NFL Football Hall of Fame in Canton. (Wayne County Economic Development Council)

Population and Demographics

From 2000 to 2010, population in Wayne County grew by 2,956 people, a 3 percent increase. The population counts from the US Census Bureau for 2000, 2010 and 2016 for each of the participating communities are provided in the table below.

Table 4: Population Counts

Community	2000 Census Population	2010 Census Population	2016 Estimated Population	% Change 2000 to 2016
Village of Apple Creek	999	1,173	1,186	19%
Village of Burbank	279	207	208	-25%
Village of Congress	192	185	186	-3%
Village of Creston	2,161	2,171	2,184	1%
Village of Dalton	1,605	1,830	1,854	16%
Village of Doylestown	2,799	3,051	3,108	11%
Village of Fredericksburg	487	423	420	-14%
Village of Marshallville	826	756	760	-8%
Village of Mount Eaton	246	241	242	-2%
City of Orrville	8,551	8,380	8,505	-1%
City of Rittman	6,314	6,491	6,593	4%
Village of Shreve	1,582	1,514	1,521	-4%
Village of Smithville	1,333	1,252	1,273	-5%
Village of West Salem	1,501	1,464	1,489	-1%
Wayne County (Unincorporated Areas)	57,878	59,263	59,918	3%
City of Wooster	24,811	26,119	27,023	9%
Total Wayne County	111,564	114,520	116,470	4%

Source: U.S. Census Bureau

Based on the 2010 Census, the median age for Wayne County is 39.6 years. The racial characteristics of the county is presented in Table 5.

Table 5: Demographics

Community	White Persons, Percent (2010)	African American, Percent (2010)	Hispanic, Percent (2010)	Other Race, Percent (2010)
Wayne County	95.7	1.5	1.6	1.2

Source: U.S. Census Bureau

Housing, Infrastructure, and Land Use

According to the 2010 Census, there were 45,847 housing units in Wayne County. The median home value was $135,700 (2011-2015). Housing information is provided in Table 6.

Table 6: Housing Characteristics

Community	Housing Units (2000)	Housing Units (2010)	Housing Units (2016)	Owner Occupied Units (2011-2015)	Median Home Value (2011-2015)
Wayne County	42,324	45,847	46,179	73.1%	$135,700

Source: U.S. Census Bureau

There are several major roads that cross Wayne County. These include U.S. Routes 30 and 250; State Routes 3, 83, 95 and 226 and Interstate 71. The Wayne County airport is located approximately 6 miles northeast of the City of Wooster.

A majority of the land use in Wayne County is either cropland or forest. There are several communities located in the county and these areas are where the county's population is generally concentrated. The commercial areas are also where many businesses, commercial uses, and institutional uses are located. Local land use is further discussed in the capability assessment section of this hazard mitigation plan.

Employment and Industry

Wayne County has a labor force of 56,800 as of 2014 with a unemployment rate of 4.6% (Ohio County Profile). The private sector is the largest employer with 38,121 persons (66%). Manufacturing and state and local governments also employ significant numbers in the Wayne County workforce.

SECTION 4: HAZARD RISK ASSESSMENT

44 CFR Requirement

Requirement §201.6(c)(2)(i): *[The risk assessment shall include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Requirement §201.6(c)(2)(i): *[The risk assessment shall include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*

Requirement §201.6(c)(2)(ii): *[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.*

Requirement §201.6(c)(2)(ii): *[The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged floods.*

Requirement §201.6(c)(2)(ii)(A): *The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area*

Requirement §201.6(c)(2)(ii)(B): *[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.*

Requirement §201.6(c)(2)(ii)(C): *[The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Introduction

During the creation of this Hazard Mitigation Plan, the Core Committee analyzed those hazards thought to be of potential risk to Wayne County. By reviewing historical data, known vulnerabilities, and other relevant information, the Committee created an initial hazard assessment based on probability that an event will occur, potential impact, spatial extent, warning time and duration of the event. The assessment of these categories are key factors in the overall hazard risk index prescribed by the Committee. This information has been updated for the 2017 revision of this Plan in order to reflect current available data and changes in the Plan's design.

FEMA Declared Disasters

Several hazard events have resulted in damage severe enough to warrant a disaster declaration within the county over the past 48 years. These events include tornadoes, severe storms, flooding and winter storms. Two presidential disaster declarations have occurred with a three year time frame (2002 to 2005). Table 7 includes all presidential or federal disaster declarations for Wayne County since 1969.

Table 7: FEMA Declared Disasters

Date	Name	Disaster Type	Disaster Number
July 1969	Tornadoes, Severe Storms, Flooding	Presidential	DR-266
February 1977	Snowstorms	Emergency Declaration	EM-3029
January 1978	Blizzards and Snowstorms	Emergency Declaration	EM-3055
November 2002	Severe Storms and Tornadoes	Presidential	DR-1444
December 2004 – February 2005	Severe Winter Storms, Flooding and Mudslides	Presidential	DR-1580
August – October 2005	Hurricane Katrina Evacuation	Emergency Declaration	EM-3250
June – July 2012	Severe Storms	Emergency Declaration	EM-3346

Source: FEMA Disaster Declarations (https://www.fema.gov/disasters)

Hazard Identification

As part of the update process, the hazards from the existing plan were reviewed and new hazards were considered. The existing hazards were also cross-checked with hazards in the state plan during the kick off meeting with the planning committee. Table 8 includes the hazards from the 2014 state plan that were reviewed by the planning committee during the Risk Assessment meeting on May 17, 2017. No new hazards were added to the 2017 plan as there is an absence of information to include additional hazards. Table 9 includes a list of the hazards identified for the 2017 Wayne County Hazard Mitigation Plan update that impact the planning area. During the plan review process, landslide was identified as a potential hazard that might impact Wayne County. At this time, there is insufficient information to include this hazard in the 2017 plan update. Additional research will need to be completed to determine if this hazard should be included in a future mitigation plan update.

Table 8: Hazards from 2014 State Plan

Hazards		
Coastal Erosion	Landslide	Hail
Drought	Land Subsidence	Winter/Ice Storms
Earthquake	Invasive Species	Tornado
Flood	Severe Thunderstorms	Wildfire
Seiche/Coastal Flooding	Windstorms	

Table 9: Wayne County Identified Hazards

Hazards		
Dam Failure	Hail Storm	Subsidence
Drought	Hazardous Materials	Tornado
Earthquake	Severe Thunderstorms/High Winds	Wild/Forest Fire
Flood	Severe Winter Weather	

Priority Risk Index (PRI)

The prioritization and categorization of identified hazards for Wayne County is based on the Priority Risk Index (PRI), a tool used to measure the degree of risk for identified hazards in a particular planning area. This tool is new to the 2017 plan update.

The PRI was used to build consensus on the highest-threat hazards in Wayne County. This process considered the location, extent, impact, probability, and warning time for hazard events, as well as the community asset inventory and the hazard profile information.

The PRI results allow hazards to be ranked against one another (the higher the PRI value, the greater the hazard risk). PRI values are obtained by assigning varying degrees of risk to five categories for each hazard (probability, impact, spatial extent, warning time and duration). Each degree of risk is assigned a value (1 to 4) and a weighting factor.

To calculate the PRI value for a given hazard, the assigned risk value for each category is multiplied by the weighting factor. The sum of all five categories equals the final PRI value, as demonstrated in the example equation below:

PRI VALUE = [(PROBABILITY x .30) + (IMPACT x .30) + (SPATIAL EXTENT x .20) + (WARNING TIME x .10) + (DURATION x .10)]

According to the weighting scheme applied for Wayne County, the highest possible PRI value is 4.0.

Table 10 shows the weighting factors and criteria for each category. By determining a value for each hazard, they can be relatively compared to other hazards threatening the planning area. Further, hazards can be ranked with greater ease. Once PRI rankings are assigned, the hazard rankings are reviewed by the planning team and may be adjusted reflect local knowledge of risks in the planning area.

Many of the PRI categories are described within the hazard profiles. The final PRI results, including the calculated values for each hazard in Wayne County, are found at the end of this section in the “Summary of Hazard Risk”.

Table 10: Priority Risk Index Criteria

PRI Category	Degree of Risk			Assigned Weighting Factor
	Level	Criteria	Index Value	
Probability	Unlikely	Less than 1% annual probability	1	**30%**
	Possible	Between 1 and 10% annual probability	2	
	Likely	Between 10 and 90% annual probability	3	
	Highly Likely	90%+ annual probability	4	
Vulnerability	Minor	Only minor property damage and minimal disruption to government functions and services. No shutdown of critical facilities.	1	**30%**
	Limited	Minor injuries are possible. More than 10% of buildings damaged or destroyed. Temporary shutdown of critical facilities (less than one week).	2	
	Critical	Multiple deaths/injuries possible. More than 25% of buildings damaged or destroyed. Complete shutdown of critical facilities for more than one week.	3	
	Catastrophic	High number of deaths/injuries possible. More than 50% of buildings damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4	
Spatial Extent	Negligible	Limited to a specific area.	1	**20%**
	Small	Small areas affected	2	
	Moderate	Large areas / multiple areas affected	3	
	Large	All areas / all areas affected	4	
Warning Time	More than 24 hours	Self-explanatory	1	**10%**
	12 to 24 hours	Self-explanatory	2	
	6 to 12 hours	Self-explanatory	3	
	Less than 6 hours	Self-explanatory	4	
Duration	Less than 6 hours	Self-explanatory	1	**10%**
	Less than 24 hours	Self-explanatory	2	
	Less than one week	Self-explanatory	3	
	More than one week	Self-explanatory	4	

Data Used

Wayne County provided GIS parcel data and building footprints. The data includes building and land values. In addition, the county provided critical facility data such as hospitals, police stations, fire stations and schools and nursing homes. The following table includes the number and value of total parcels in the planning area, as well as total population.

Table 11: Total Exposure in Wayne County

Location	Parcel Value	Number of Parcels	2010 Population
Village of Apple Creek	$65,446,510	676	1,173
Village of Burbank	$16,736,360	242	207
Village of Congress	$9,328,100	165	185
Village of Creston	$116,477,140	1,113	2,171
Village of Dalton	$140,310,160	1,205	1,830
Village of Doylestown	$207,978,110	1,691	3,051
Village of Fredericksburg	$22,638,440	389	423
Village of Marshallville	$34,421,670	455	756
Village of Mt. Eaton	$18,654,780	240	241
City of Orrville	$656,173,250	4,177	8,380
City of Rittman	$309,228,740	3,334	6,491
Village of Shreve	$59,016,850	1,019	1,514
Village of Smithville	$124,177,120	882	1,252
Wayne County (Unincorporated Areas)	$4,381,819,730	27,704	85,382
Village of West Salem	$58,892,280	1,116	1,464
City of Wooster	$2,101,199,040	11,798	26,119

FEMA's Hazus-MH 4.0 model was used to complete the flood and earthquake vulnerability assessments and estimate the losses from these hazards. In addition, the digital flood insurance rate map (DFIRM), was obtained from FEMA. A variety of additional local, state and national sources were consulted to complete this update. They are cited throughout this section.

Hazard Profiles

Each hazard that affects Wayne County is profiled separately to describe the hazard and potential impacts to the county and jurisdictions. Where data exists, specific information on location, such as jurisdiction or unincorporated area is included. The profile for each hazard includes:

- Description: A scientific explanation of the hazard, including severity and impacts;
- Location: Geographical extent of the hazard;
- Previous occurrences: The number of previous impacts from the hazard in Wayne County
- Extent (or magnitude): The severity of the hazard in the past and potential severity in the future. Measures may include wind speed, wave height, or property damage;
- Probability of future events: The likelihood of future events impacting the county. Given that an exact probability is often difficult to quantify, this characteristic is categorized into ranges to be used in hazard profiles (per the PRI criteria):

- Unlikely: Less than a 1% annual probability
- Possible: Between 1% and 10% annual probability
- Likely: Between 10+% and 90% annual probability
- Highly Likely: Greater than 90% annual probability

- Vulnerability Assessment: The vulnerability assessment will address conditions that may increase or decrease vulnerability such as topography, soil type, land use, and development trends. In addition, estimated potential losses will be calculated using available data and resources. Methods used include GIS analysis and hazard modeling where tools are available. Information such as the number of structures and critical facilities at risk will be analyzed as well.

Each hazard is profiled on the following pages:

DAM FAILURE

Description

A dam is a barrier that impounds water or underground streams. They are classified within four categories (Class I-IV) based on height, volume, and potential impact due to failure.

Table 12: Dam Classes

Class	Height	Volume	Impact
I	> 60 feet	> 5,000 acre-feet	Probable loss of life. Structural damage to high value property anticipated.
II	> 40 feet	> 500 acre-feet	No loss of life anticipated. Damage to homes and businesses is likely.
III	> 25 feet	> 50 acre-feet	Damage restricted to low-value non-residential structures.
IV	< or = 25 feet	< or = 50 acre-feet	Losses restricted mainly to dam.

The impact caused by a dam failure would depend on the Class of the dam, its location relative to populations and development, and the dam's type of failure, which include structural, mechanical or hydraulic failures. A dam failure could become a huge disaster resulting in substantial damage and deaths. However, due to the limited size and extent of the Wayne County dams, dramatic losses are very unlikely.

Most dam failures are a combination of structural problems and overloading due to water retention. Spring is the most likely season for dam failure when melting snow and high ground saturation combine with seasonal precipitation. These conditions can cause flash flooding, when sudden amounts of heavy precipitation result in quick rises in water level. Such events can quickly overwhelm a dam and cause it to fail, especially if an underlying condition is present, such as poor maintenance.

Dam Locations

The locations and classes for the dams in Wayne County are included in the table below:

Table 13: Dam locations in Wayne County

Class	Name	Township	Stream
I	Shreve Lake Dam	Clinton	Tributary to Shreve Creek
I	Lake Wapusun Dam	Clinton	Lake Fork of Mohican River
I	Chippewa Creek Structure VII-C	Green	Little Chippewa Creek
II	Chippewa Creek Structure V-D	Canaan	Steele Ditch
II	Chippewa Creek Structure V-C	Canaan	Tributary to Steel Ditch
II	Mowrer Lake Dam	Chester	Tributary to Killbuck Creek
II	Gross Lake Dam	Wooster	Tributary to Killbuck Creek
II	Wooster Levee Relocation	Wooster	Killbuck Creek - Offstream
III	Orr. Farmer & Sportsmen's League Dam	Baughman	Tributary to Fox Run
III	Stoll Lake Dam	Baughman	Tributary to Orrville Ditch
III	Hoyt Lake Dam	Baughman	Tributary to Fox Run
III	Erdos Lake Dam	Canaan	Tributary to Killbuck Creek
III	Slifko Pond Dam	Chippewa	Offstream to Red Run
III	Franchester lake Dam	Congress	Tributary to Killbuck Creek
III	Boreman Lake Dam	Congress	Tributary to Cedar Run
III	Lake Marie	Congress	Tributary to Muddy Fork
III	Mapledale Lake Dam	Green	Tributary to Little Chippewa Creek
III	Harmony Lake Dam	Sugar Creek	Tributary to Sugar Creek
III	Pres Vannes Lake Dam	Sugar Creek	Tributary to Sugar Creek
III	Waynedale Stock Farm Lake Dam	Wayne	Tributary to Killbuck Creek
III	Dush Lake Dam	Wooster	Tributary to Killbuck Creek

As their failure would have little to no impact, the County's Class IV Dams are not listed here.

The spatial extent would depend on the height of the dam, the volume of the dam, its location within the County, and other factors such as precipitation and the extent of failure. The probable spatial extent of any particular dam failure would have to be evaluated on a case by case basis. Additionally, predicting the areas that could be affected by a dam failure, particularly that of a Class I, can be very difficult. In this vein, one of the mitigation goals of Wayne County is to determine the risk posed by a Class I dam failure (see Section 7: Mitigation Priorities).

Previous Occurrences

There are no records of dam failures within Wayne County.

Extent

Magnitude and Potential Intensity

Wayne County is home to three Class I dams: the Shreve Lake Dam, the Lake Wapusun Dam, and the Chippewa Creek Structure VII-C (refer to map here). These are the only dams in the County that would be expected to result in a loss of life due to their failure. All others are only expected to result in property and ecological damage.

Duration

The immediate danger posed by a dam failure would likely pass very quickly, but the resulting flooding due to a lack of water control could persist for weeks, months, or even longer. The duration of the actual dam failure could be minutes or days, depending on the extent and speed of the failure.

Speed of Onset

The speed of onset will vary by the design of each dam and other factors such as precipitation and maintenance. Dam failures are usually not sudden and will most likely be preceded by signs of structural weakening or other problems. But, if these signs go unchecked, the results will appear to have a very sudden onset.

Availability of Warning Time

Dam failures provide a possibility for warning and evacuation, but only if a leak or other structural problem that would lead to failure is detected. If such things go unnoticed, little or no warning will be available. A map showing the potential dam break inundation area of Shreve Lake Dam is located in Appendix D.

Probability of Future Events

There are no records of dam failures within Wayne County. As such, it is difficult to predict an annual chance of dam failure.

Vulnerability Assessment

At this time, no estimation data exists. There is no historical precedent for dam failure in Wayne County and the full extent of the areas threatened by the failure of a Class I dam is unknown. This makes loss estimation for this hazard particularly difficult.

Priority Risk Index

The table below includes the PRI for the dam failure hazard.

Table 14: PRI for Dam Failure

PRI Category	Level	Index Value
Probability	Unlikely	1
Vulnerability	Limited	2
Spatial Extent	Small	2
Warning Time	More than 24 hours	1
Duration	Less than 24 hours	2

DROUGHT

Description

A drought is period of lower than normal rainfall that results in water shortages for some activity, group, or environmental sector. Wayne County is predominantly a farming community. A drought in Wayne County could have serious ramifications, both within the County, via crop and/or livestock loss, and in the region, as the supply of these items would suffer greatly. While drought may only be a minor annoyance for most citizens, for the farmers whose livelihoods depend upon their crops, these occurrences can destroy their businesses, impacting both the individual citizen and the County.

Climatic factors such as high temperatures, high wind, and low relative humidity are often associated with drought. Summer is the season most susceptible to drought, as it is the warmest and driest part of the year. Drought occurs in virtually all-climatic zones, varying significantly from one region to another, and can be defined according to meteorological, hydrological, agricultural or socioeconomic criteria as detailed in Table 15 below.

Table 15: Drought Types

Drought Type	Description
Meteorological Drought	Meteorological drought is usually based on long-term precipitation departures from normal, but there is no consensus regarding the threshold of the deficit or the minimum duration of the lack of precipitation that makes a dry spell an official drought.
Hydrological Drought	Hydrological drought refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, and as lake, reservoir, and ground water levels.
Agricultural Drought	Agricultural drought occurs when there is insufficient soil moisture to meet the needs of a particular crop at a particular time. A deficit of rainfall over cropped areas during critical periods of the growth cycle can result in destroyed or underdeveloped crops with greatly depleted yields. Agricultural drought is typically evident after meteorological drought but before a hydrological drought.
Socioeconomic Drought	Socioeconomic drought is a period when water shortages begin to affect people when there is not enough water to meet human and environmental needs.

The US Drought Monitor records drought in the US and categorizes drought into five categories as listed in Table 16 below.

Table 16: Drought Categorizes

Category	Name	Description
D0	Abnormally Dry	Going into drought: short-term dryness slowing planting, growth of crops or pastures. Coming out of drought: some lingering water deficits; pastures or crops not fully recovered
D1	Moderate Drought	Some damage to crops, pastures; streams, reservoirs, or wells low, some water shortages developing or imminent; voluntary water-use restrictions requested
D2	Severe Drought	Crop or pasture losses likely; water shortages common; water restrictions imposed
D3	Extreme Drought	Major crop/pasture losses; widespread water shortages or restrictions
D4	Exceptional Drought	Exceptional and widespread crop/pasture losses; shortages of water in reservoirs, streams, and wells creating water emergencies

Location

A drought will affect all of Wayne County, but, based on weather effects and water supply, not all areas will be affected equally. Unincorporated areas will likely suffer more than the cities.

The spatial extent of a drought will be identified by poor rainfall and ground water situations and could spread if dry weather continues. Though not every farm or city will be affected in the same way, they may all face drought-like conditions. Often this is a regional phenomenon which will affect more than just one county at a time.

Previous Occurrences

The US Drought Monitor data was used to assess past drought conditions from January 2000 to May, 2017. The number of weeks recorded were noted based on the highest level of drought recorded that week. Categories are reported as percentages so the highest weekly drought condition may not impact the entire county or the majority of the county. The information is compiled and presented in Table 17 below. The weeks of severe drought occurred in August to September 2002 and August 2016.

Table 17: Drought Monitor Data in Wayne County

Category	Name	Weeks at Drought Level
None	None	711
D0	Abnormally Dry	143
D1	Moderate Drought	48
D2	Severe Drought	6
D3	Extreme Drought	0
D4	Exceptional Drought	0

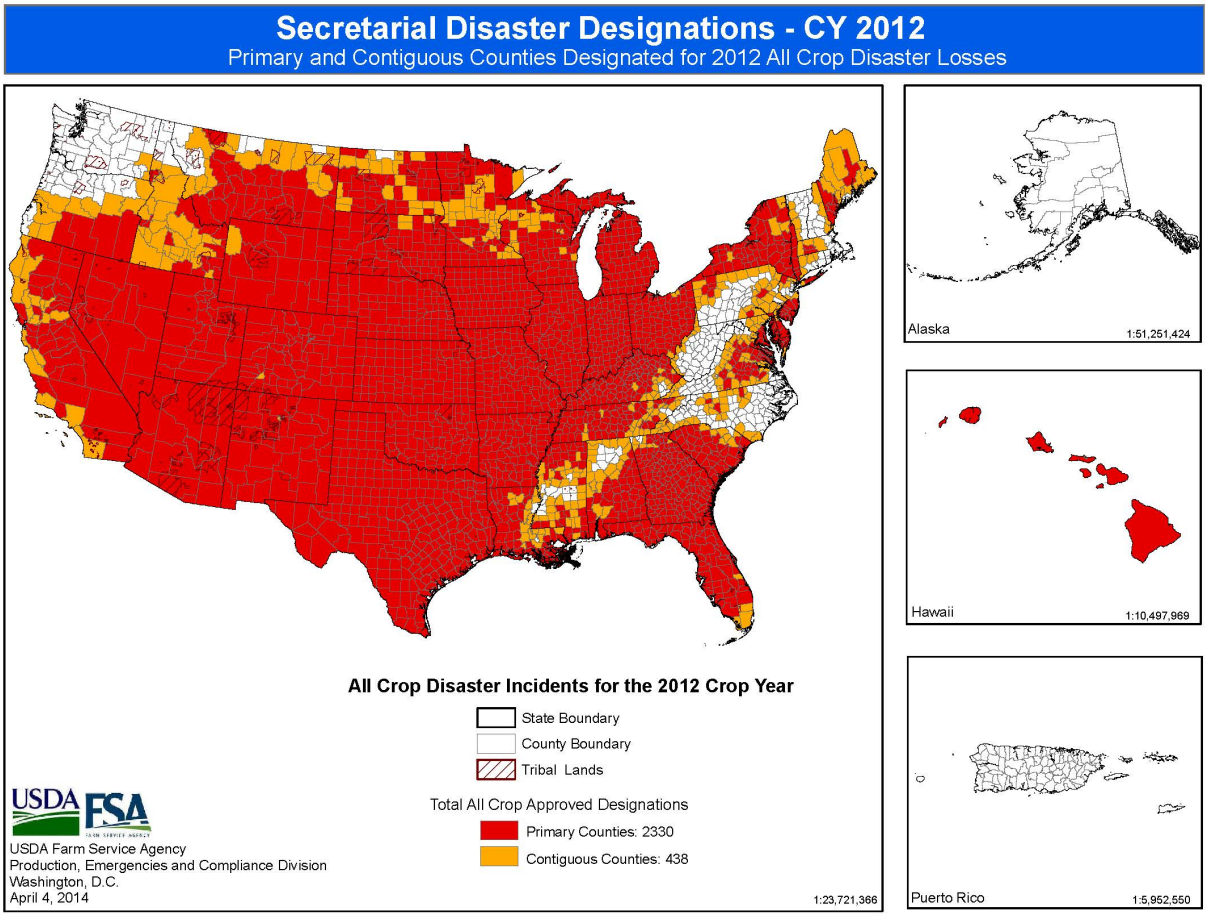
Data from the National Oceanic and Atmospheric Administration's National Centers for Environmental Information is included in Table 18 below. There was one event with losses reported for the drought hazard that occurred in 1999.

Table 18: Drought events

Date	Location	Death/Injuries	Damage ($)
08/01/1996	Wayne County	0/0	0
06/01/1999	Wayne County	0/0	0
07/01/1999	Wayne County	0/0	0
08/01/1999	Wayne County	0/0	0
09/01/1999	Wayne County	0/0	$10,000,000

Source: National Centers for Environmental Information – *Storm Events Database*

The Ohio Hazard Mitigation Plan (2014) lists a disaster declaration that was issued for all 88 counties in Ohio in 2012 for a drought event that year. Crop losses were significant for the state. The map below lists the counties included in this disaster declaration in 2012.



Extent

Magnitude and Potential Intensity

Even during extended periods of drought, such events rarely result in direct property damage. Most damages associated with drought occur in the agricultural sector as the result of crop and livestock losses. According to the USDA's 2007 Census of Agriculture, an extreme drought incurring agricultural losses of 50% or more would cost Wayne County farmers over $123,629,000. As indicated in the Drought Monitor data, there were 6 weeks of Severe Drought reported for Wayne County. However, longer periods of drought may be possible.

Speed of Onset

Droughts are predictable events that can be foreseen by monitoring precipitation and ground water levels, as well as analyzing weather forecasts. It is not the speed of onset, but the length of a drought that does the damage, so it is possible to take measures to prepare for drought like conditions.

Duration

For a drought to cause severe damage, it must last long enough to show an abnormal shift from previous precipitation patterns. The length of a drought will depend upon the length of the moisture deficiency in the area.

Availability of Warning Time

Modern meteorology can provide some advanced warning as to when droughts may occur and how long they may continue. Meteorologists working in conjunction with local officials can notify the public if a drought is about to occur. This information will also allow officials to make informed decisions about the issuance of water conservation warnings and other water preservation measures.

Probability of Future Events

According to the Drought Monitor data for Wayne County, seven of the last fifteen years (2001 to 2016) have experienced at least a week each year of drought condition (D1 – Moderate Drought) or higher. There have been no drought events reported since September 2016 to date. Based on this data, the annual probability is 47%. More severe droughts will be less likely (D2 to D4) based on the historical data. Only 6 weeks of D2 (Severe Drought) were reported in the Drought Monitor data.

Vulnerability Assessment

Loss Estimation

Because of the nature and variability of drought, it is difficult to predict what losses would be incurred by its onset. It does help to understand the extent of what could be affected, though. Approximately 68% of the acreage in Wayne County is used as farmland per the Ohio Department of Development Wayne County Profile (2017). According to the USDA's 2012 Census of Agriculture, the total market value of the agricultural products produced and sold by said farmland equaled $381,000,000 in just one year alone. The loss of even a fraction of that revenue

due to drought would be damaging to the County's economy and potentially devastating to individual farmers.

Priority Risk Index

The table below includes the PRI for the drought hazard.

Table 19: PRI for Drought

PRI Category	Level	Index Value
Probability	Likely	3
Vulnerability	Limited	2
Spatial Extent	Moderate	3
Warning Time	More than 24 hours	1
Duration	More than one week	4

EARTHQUAKE

Description

An earthquake is the resulting ground shaking and radiated seismic energy caused by sudden stress changes in the earth. Earthquakes are not commonly associated with Ohio hazards. However, the New Madrid fault line cuts through the Mississippi River Valley and could produce a large earthquake in the central United States. The highest density of earthquakes for the New Madrid fault line, based on historical data, have been recorded in Missouri, Arkansas, Tennessee, and Illinois.

Despite the distance from Ohio, due to soil conditions and other factors, an intense New Madrid earthquake could indeed cause damage in the Ohio region. Even though this is a very real possibility, the odds of a significant earthquake affecting Wayne County are very low. Earthquakes are not controlled by weather conditions and could occur in any season.

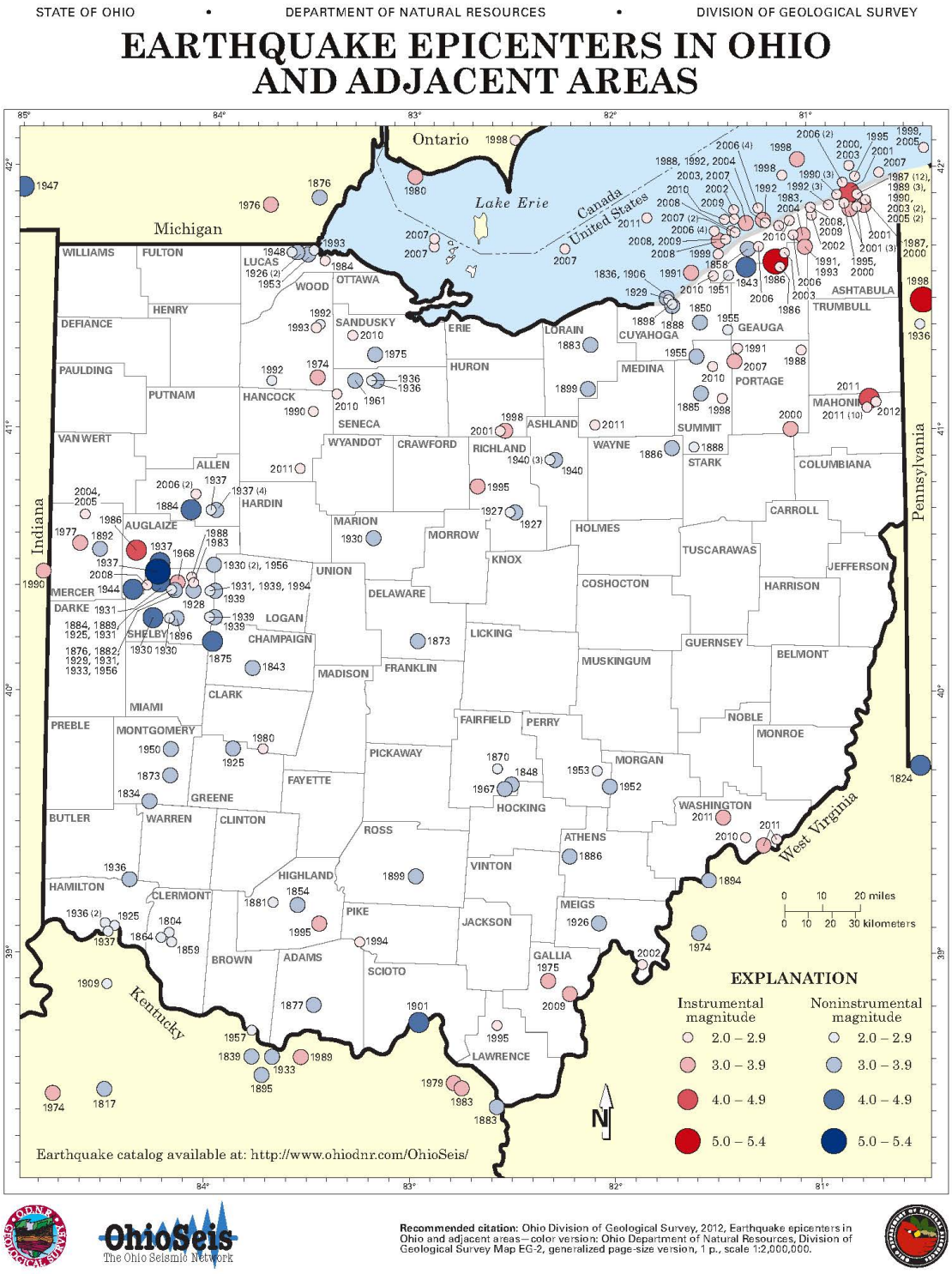
Location

While the source location of an earthquake could come from almost any geographical location, the most probable source for a damaging earthquake would be the New Madrid Fault, which runs through the Missouri, Arkansas, Mississippi, Kentucky, Tennessee, and Illinois border regions. Ultimately, an earthquake has the potential to affect all of Wayne County.

The spatial extent of an earthquake depends upon its intensity and the location of its epicenter; the greater the intensity of an earthquake, the larger the area that will feel its effects. The area that feels said effects is determined by the placement of the epicenter.

Previous Occurrences

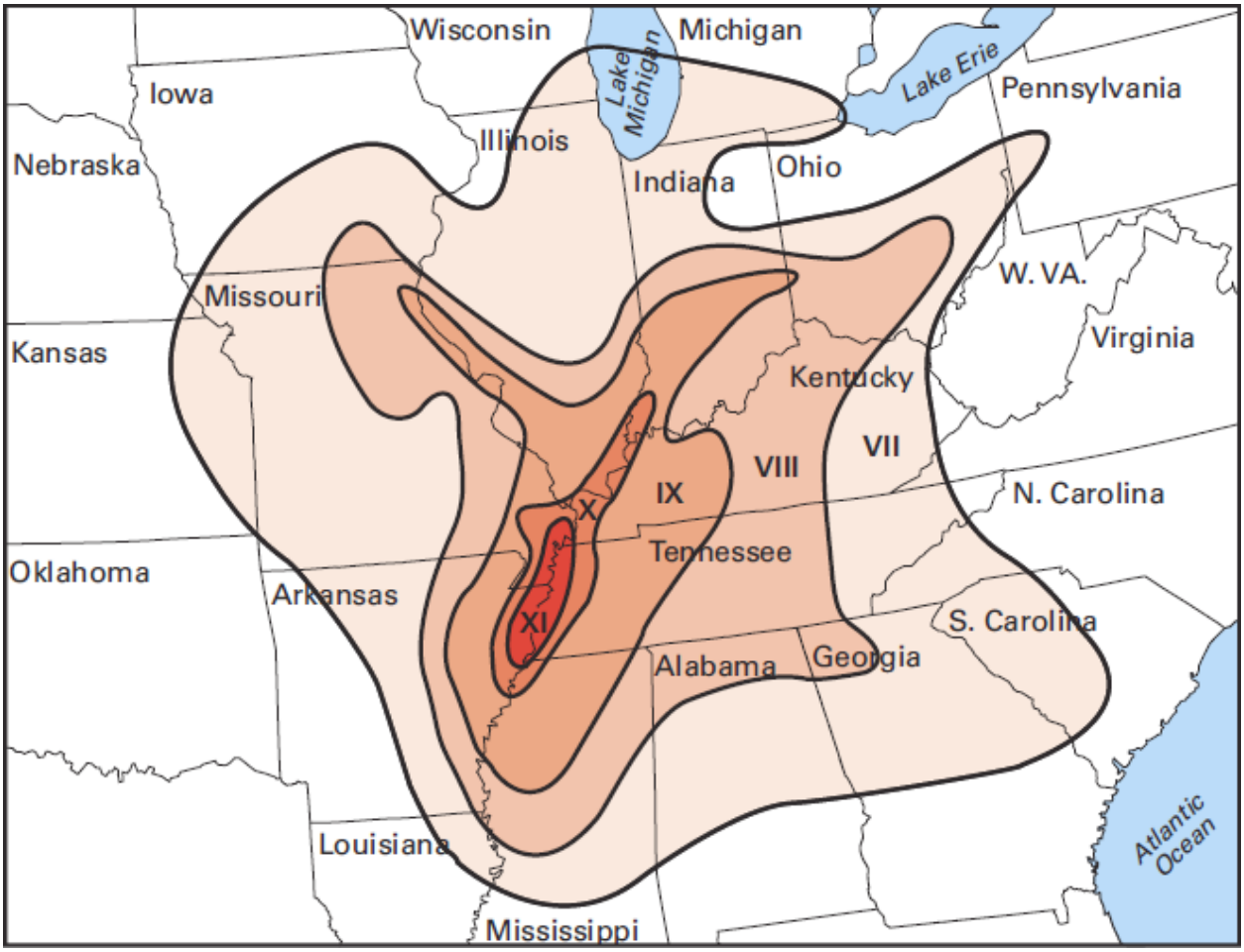
Earthquakes occur with some regularity in and around the Ohio region, but most are either too weak to be noticed or are not powerful enough to cause any real damage. The map, shown on the next page, displays the recorded epicenters of earthquakes greater than 2.0 Magnitude that have happened in Ohio and the surrounding area since the early 1800's. As can be seen, only one earthquake epicenter has ever been recorded in Wayne County. Of the earthquakes that have occurred around the County, most likely did little more than rattle windows and dishes. As part of the plan update process, the State Hazard Mitigation plan (2014) was reviewed for any occurrences of earthquakes in Wayne County. There were no earthquake events recorded in the state plan.



Source: Ohio Department of Natural Resources

Extent

Magnitude and Potential Intensity



Source: Ohio Department of Natural Resources

There are several ways to measure the force and power of an earthquake. Two of the most common are the Modified Mercalli Scale and the Magnitude Scale. The Magnitude Scale, also known as the Richter Scale, is a logarithmic (base 10) scale used to measure the magnitude of the largest seismic wave of an earthquake. The Modified Mercalli Scale, on the other hand, is used to evaluate the physical effects of an earthquake on an area. The Magnitude Scale is an objective measurement of an earthquake's overall power, whereas the Modified Mercalli Scale provides a subjective analysis of the damage it causes. The chart shown at right, obtained from the Ohio Department of Natural Resources website, shows how the two scales compare with each other.

Modified Mercalli Scale		Magnitude Scale
I	Detected only by sensitive instruments	1.5
II	Felt by few persons at rest, especially on upper floors; delicately suspended objects may swing	2
III	Felt noticeably indoors, but not always recognized as earthquake; standing autos rock slightly, vibrations like passing truck	2.5
IV	Felt indoors by many, outdoors by few, at night some awaken; dishes, windows, doors disturbed; standing autos rock noticeably	3
V	Felt by most people; some breakage of dishes, windows, and plaster; disturbance of tall objects	3.5 4
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4.5
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	5
VIII	Panel walls thrown out of frames; walls, monuments, chimneys fall; sand and mud ejected; drivers of autos disturbed	5.5 6
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	6.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	7
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	7.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up into air	8

The map shown on the previous page depicts the potential Modified Mercalli intensities for an 8.0 Magnitude earthquake emanating from the New Madrid fault line, if one were to occur. By this prediction, even if the New Madrid fault line produced an extremely rare 8.0 earthquake, Wayne County would likely experience no more than a Modified Mercalli intensity of IV.

While a Magnitude 8.0 earthquake is a very rare occurrence, it is not impossible. According to the Central United States Earthquake Consortium (CUSEC), the New Madrid fault line has a 25%-40% chance of generating a 6.0 or higher magnitude earthquake within the next 50 years.

Duration

The initial effects of an earthquake would be over quickly, but aftershocks and other earthquakes could be felt up to hours or days afterwards. Additionally, if a particular earthquake were powerful enough, the resulting damage it would cause to infrastructure could last for some time.

Speed of Onset

Earthquakes occur as pressure is released in the earth's crust. This happens quickly and continues until forces in the area are equalized. This causes earthquakes to appear as though they occur instantaneously, with little to no prior buildup of activity.

Availability of Warning Time

Although research is being done on how to best predict earthquakes, accurate prediction of any one single earthquake is almost impossible. Because earthquakes happen very quickly and with very few pre-event effects, the available warning for an earthquake is almost nonexistent.

Probability of Future Events

Probability of future earthquake events impacting Wayne County is determined by using historical occurrence information. There was 1 event reported between 1886 and 2017. Therefore, the probability of a future earthquake can be defined as "unlikely" (less than 1% annual probability).

Vulnerability Assessment

For the earthquake hazard vulnerability assessment, a scenario was created using Hazus 4.0 to estimate the annualized loss for the county. Losses included building damage, inventory loss and business interruption, and were concentrated around the City of Wooster. Total annualized damage in the county totaled approximately $113,000 . Estimated losses are provided in Table 20.

Table 20: Hazus-MH Annualized Loss results by Jurisdiction

Location	Annualized Loss	Location	Annualized Loss
Village of Apple Creek*	$0	Village of Mt. Eaton*	$0
Village of Burbank*	$0	City of Orrville	$6,000
Village of Congress*	$0	City of Rittman	$4,000
Village of Creston*	$0	Village of Shreve*	$0
Village of Dalton*	$0	Village of Smithville*	$0
Village of Doylestown	$1,000	Wayne County	$82,000
Village of Fredericksburg*	$0	Village of West Salem*	$0
Village of Marshallville*	$0	City of Wooster	$20,000
Total			$113,000

**Losses of less than $500 were rounded to $0 in the table.*

The Central United States Earthquake Consortium (CUSEC) estimates earthquake caused damages by intensity using the Modified Mercalli Scale. For Wayne County, some of the strongest earthquakes ever experienced or theorized as a possibility rate around an intensity of V. According to the Modified Mercalli Scale, the most such an earthquake would be likely to do is break windows and dishes, crack plaster and disrupt communication.

Priority Risk Index

The table below includes the PRI for the earthquake hazard.

Table 21: PRI for Earthquake

PRI Category	Level	Index Value
Probability	Unlikely	1
Vulnerability	Minor	1
Spatial Extent	Small	2
Warning Time	Less than 6 hours	4
Duration	Less than 6 hours	1

FLOOD

Description

In its most basic form, a flood is inundation of what is normally dry land. This can occur due to heavy rain, snow melt, a river exceeding its banks, or other reasons. People and places affected by flood are located in what is called the floodplain; the low lying area adjacent to rivers and streams. When an excessive amount of water overloads a waterway, it can spill out onto the floodplain, causing a flood.

Flooding is the most common environmental hazard, due to the widespread geographical distribution of valleys and coastal areas, and the population density in these areas. The severity of a flooding event is determined by a combination of several major factors, including: stream and river basin topography precipitation and weather patterns; recent soil moisture conditions; and the degree of vegetative clearing and impervious surface. Both of these flooding events can be brought on by severe (heavy) rain. Several types of flooding which are described below:

- **Flash Flooding:**

  Flash floods occur within a few minutes or hours of heavy amounts of rainfall and is capable of destroying buildings, uprooting trees, and scouring out new drainage channels. Heavy rains that produce flash floods can also trigger mudslides and landslides. Most flash flooding is caused by slow-moving thunderstorms or repeated thunderstorms in a local area, or by heavy rains from hurricanes and tropical storms. Although flash flooding often occurs in mountainous areas, it is also common in urban centers where much of the ground is covered by impervious surfaces.

- **Sheet Flooding:**

  Sheet flooding is a condition where storm water runoff forms a sheet of water to a depth of six inches or more. Sheet flooding and ponding are often found in areas where there are no clearly defined channels and the path of flooding is unpredictable. This type of flooding more commonly occurs in flat areas. Most flood-prone areas are adjacent to streams or oceans, although almost any area can flood under the right conditions where water may accumulate.

- **Urban Flooding:**

  Urban flooding is usually caused by heavy rain over a short period of time. As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Since sidewalks and roads are non-absorbent, water flows down the surface of the streets, and is then dumped directly into sewers. Fixed drainage channels in urban areas may be unable to contain the runoff that is generated by relatively small but intense rainfall events. Urbanization increases runoff two to six times over what would occur on natural terrain. As a consequence, high volume of water can turn parking lots into lakes, flooding basements and businesses, and cause lakes to form in roads where drainage is poor or overwhelmed.

  Urban flooding occurs where there has been development within stream floodplains. This is partly a result of the use of waterways for transportation purposes in earlier times. Sites adjacent to rivers and coastal inlets provided convenient places to ship and receive commodities. The price of this accessibility has increased flooding in the ensuing urban areas. Urbanization intensifies the magnitude and frequency of floods by increasing impermeable surfaces, amplifying the speed of drainage collection, reducing the carrying capacity of the land, and occasionally, overwhelming sewer systems.

- **Riverine Flooding:**

  Periodic flooding of lands adjacent to non-tidal rivers and streams (known as the floodplain) is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal watercourse, some of the above-normal stream flows onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within the watershed of a stream or river. The recurrence interval of a flood is defined as the average time interval measured in years, expected to take place between the occurrence of a flood of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

In addition to flooding types, there are several types of floodplains. All the flood types described above may occur within a floodplain. However, the flooding may not occur in a designated floodplain.

Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood. Flood frequencies, such as the 100-year flood, are determined by plotting a graph of the size of all known floods for an area and determining how often floods of a particular size occur. Another way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1-percent chance of occurring in any given year and the 500-year flood has a 0.2-percent chance of occurring in any given year.

Most dam and flood-related structures have been designed to meet 100-year flood conditions. FEMA develops digital Flood Insurance Rate Maps (DFIRMs) to indicate areas in the U.S. where mandatory flood insurance requirements apply (the 100-year flood). They are also used for planning purposes to identify hazard areas. In 2009, updated DFIRMs were published by FEMA for Wayne County in support of the National Flood Insurance Program (NFIP) designating zones according to potential risk and impact due to flooding. The most likely time of year for flood is the spring, when increased rainfall meets melting snow and high soil saturation. Flash flooding is likely to occur in any season where heavy rains happen quickly.

Location

The areas most likely to experience flooding are the communities located within a floodplain. These areas include the Cities of Orrville, Rittman, and Wooster, and the Villages of Apple Creek, Burbank, Creston, Doylestown, Fredericksburg, Shreve, Smithville, and West Salem. Other areas may experience flooding as well, but are not at as high of a risk. Maps showing community flood hazard are in Appendix D.

Previous Occurrences

The table below lists the flood and flash flood events reported in the NCEI since 1996. Significant events that have occurred prior to 1996 are included below the table. There are two major events included in the NCEI data. The flood events from May 21, 2004 and January 3, 2005 resulted in damage loss values of $4.5 million.

Table 22: Reported Flood Events

Date	Location	Death/Injuries	Damage ($)
12/11/1996	Wayne County	0/0	$5,000
06/01/1997	Wayne County	0/0	$50,000
06/01/1997	Wayne County	0/0	$60,000
07/22/2003	Wayne County	0/0	$250,000
07/27/2003	Northern Wayne County	0/0	$350,000
05/21/2004	Northern Wayne County including City of Rittman	0/0	$1,100,000
06/14/2004	Southern Wayne County	0/0	$100,000
09/17/2004	Wayne County	0/0	$50,000
01/03/2005	Wayne County	0/0	$3,400,000
05/01/2007	City of Wooster	0/0	$200,000
08/20/2007	City of Rittman	0/0	$250,000
02/28/2011	North eastern Wayne County including City of West Salem	0/0	$500,000
07/10/2013	Cities of Apple Creek and Wooster	0/0	$850,000

Source: National Centers for Environmental Information – *Storm Events Database*

Other notable floods that were not mentioned in the NCEI data include:

1935: Killbuck Creek- Exceeded 100-year flood level. (No loss records.)

1969: Countywide- Exceeded 500-year flood level. $17,000,000 in damages and 21 dead.

1977: Sugar Creek- Exceeded 100 year level. (No loss records.)

1979: Sugar Creek- Exceeded 100-year flood level. (No loss records.)

Extent

Extent can be measured in several ways including flow or discharge rate (cubic feet per second), height of flood waters and damages. The USGS drainage areas, discharge rates, and available flood stage available for Wayne County are included in the table below. Maximum discharge and maximum gage height are an indicator for the flood hazard extent.

Table 23: Summary of Discharge Rates for Wayne County

Water Feature	Gage Location	Median Discharge (ft^3/s)	Max Discharge (ft^3/s - yr)	Drainage Area (sq miles)	Max Gage Height (ft/yr)
Chippewa Creek	Miller Road at Sterling	19 cfs	125 cfs - 2003	50.4	10 ft - 2011

Source: USGS water watch - https://waterwatch.usgs.gov

Magnitude and Potential Intensity

The magnitude and intensity of a flood is determined by a variety of factors. The NFIP standard for floodplain management is based on what is called the 100-Year Flood, which is the flood elevation that has a 1 percent chance of being equaled or exceeded each year. A 100-Year Flood would incur great monetary losses and the potential for loss of life. Even greater than the 100-Year Flood, is the 500-Year Flood, which has a 0.2 percent annual chance of occurrence. Such a flood was recorded in 1969. The flood, which affected the entire County, caused $17,000,000 in damages and claimed the lives twenty-one people.

Duration

The duration of a flood is dependent on many different factors, such as rainfall, soil conditions, and ground saturation levels. Depending on the conditions, flood waters could recede rapidly, or they could remain for days or more.

Speed of Onset

The speed at which a flood occurs depends on the conditions at the time. They can happen very quickly, as in a flash flood, or they can happen gradually over time, such as a swelling river. All of this is determined by factors such as soil conditions and precipitation.

Availability of Warning

Modern meteorology can predict when conditions conducive to flooding will occur and the National Weather Service routinely provides warnings when there is a potential for flood. These warnings are issued via weather radio, television broadcast, and other electronic media. While the NWS does provide warning for flood, not all floods can be predicted. Because of this, not all floods can be warned against, such as some cases of flash flooding.

Probability of Future Events

The NCEI data lists 13 events (flood and flash flood) with property losses reported from 1996 to 2013. This results in a 76% annual probability. Therefore, flood was assigned a probability of "likely". It can be expected that flooding will impact the county on an annual basis. However, there are certain areas that are more susceptible to flooding as indicated on the maps with the FEMA DFIRM data included in Appendix D.

Vulnerability Assessment

Losses will most likely occur to properties located within floodplains. However, all current and future buildings and populations should be considered at risk to flooding. The impacts of flooding can be severe. Impacts of flood include business disruption, mold issues, and damaged contents and equipment. Just a few inches of water in a building could cause thousands of dollars in damage to the flooring and foundation of the structure. In cases where water rises above a few inches, electrical systems and appliances may need to be replaced. Additionally, the County generally tries to acquire those properties that are routinely subjected to flood damages, which further reduces future loss.

Hazus-MH 4.0 was used to estimate potential riverine flood losses in Wayne County. A Digital Elevation model (DEM) was obtained from the USGS for the study area. Hazus-MH was used to estimate floodplain boundaries, potential exposure for each event frequency based on probabilistic scenarios for the 10-, 25-, 50-, 100- and 500-year flood events using a level 1 analysis. A drainage area of 10 square miles was used to generate the stream network. Of note, this boundary is not equivalent to the regulatory flood insurance rate map or FEMA data. However, it does provide comparable flood hazard boundaries that are useful for estimating flood losses. Table 24 lists the total exposure in the county (total replacement value of buildings in the Hazus-MH inventory). Total losses are presented due to flood in Table 25. Total loss includes building loss, content loss, inventory loss, relocation costs, income loss, rental income loss and wage loss. Tables 26 and 27 include total loss for residential and non residential buildings.

Table 24: Total Exposure by Building Type in Wayne County based on Hazus-MH Default Inventory

Location	Residential	Commercial	Other	Total Building
Village of Apple Creek	$94,000,000	$12,000,000	$65,000,000	$171,000,000
Village of Burbank	$21,000,000	$2,000,000	$5,000,000	$28,000,000
Village of Congress	$13,000,000	$12,000	$2,000,000	$15,000,000
Village of Creston	$154,000,000	$20,000,000	$17,000,000	$191,000,000
Village of Dalton	$161,000,000	$24,000,000	$36,000,000	$221,000,000
Village of Doylestown	$263,000,000	$38,000,000	$33,000,000	$334,000,000
Village of Fredericksburg	$37,000,000	$2,000,000	$8,000,000	$47,000,000
Village of Marshallville	$59,000,000	$9,000,000	$8,000,000	$76,000,000
Village of Mt. Eaton	$26,000,000	$13,000,000	$10,000,000	$49,000,000
City of Orrville	$624,000,000	$196,000,000	$296,000,000	$1,116,000,000
City of Rittman	$507,000,000	$76,000,000	$197,000,000	$780,000,000
Village of Shreve	$123,000,000	$21,000,000	$45,000,000	$189,000,000
Village of Smithville	$113,000,000	$16,000,000	$104,000,000	$233,000,000
Wayne County	$4,492,000,000	$639,000,000	$659,000,000	$5,790,000,000
Village of West Salem	$93,000,000	$48,000,000	$12,000,000	$153,000,000
City of Wooster	$2,267,000,000	$665,000,000	$431,000,000	$3,363,000,000
TOTAL	$9,047,000,000	$1,781,012,000	$1,928,000,000	$12,756,000,000

Table 25: Potential Total Losses from Flood by Return Period

Location	10-year	25-year	50-year	100-year	500-year
Village of Apple Creek	$456,000	$498,000	$606,000	$666,000	$875,000
Village of Burbank	$52,000	$64,000	$70,000	$608,000	$725,000
Village of Congress	$0	$0	$0	$0	$0
Village of Creston	$3,000	$6,000	$16,000	$22,000	$29,000
Village of Dalton	$0	$0	$0	$0	$0
Village of Doylestown	$0	$0	$0	$0	$0
Village of Fredericksburg	$425,000	$708,000	$847,000	$959,000	$1,404,000
Village of Marshallville	$0	$0	$0	$0	$0
Village of Mt. Eaton	$0	$0	$0	$0	$0
City of Orrville	$0	$0	$0	$0	$0
City of Rittman	$1,139,000	$1,615,000	$1,873,000	$2,185,000	$3,905,000
Village of Shreve	$0	$0	$0	$0	$0
Village of Smithville	$1,663,000	$1,939,000	$2,072,000	$2,232,000	$2,545,000
Wayne County	$9,709,000	$12,445,000	$14,099,000	$16,915,000	$22,312,000
Village of West Salem	$1,000	$1,000	$1,000	$1,000	$2,000
City of Wooster	$6,815,000	$9,746,000	$11,373,000	$12,815,000	$19,031,000
TOTAL	$20,263,000	$27,022,000	$30,957,000	$36,403,000	$50,828,000

Table 26: Potential Total Residential Losses from Flood by Return Period

Location	10-year	25-year	50-year	100-year	500-year
Village of Apple Creek	$241,000	$263,000	$330,00	$365,000	$487,000
Village of Burbank	$43,000	$51,000	$56,000	$467,000	$549,000
Village of Congress	$0	$0	$0	$0	$0
Village of Creston	$3,000	$6,000	$16,000	$22,000	$29,000
Village of Dalton	$0	$0	$0	$0	$0
Village of Doylestown	$0	$0	$0	$0	$0
Village of Fredericksburg	$395,000	$629,000	$739,000	$831,000	$1,154,000
Village of Marshallville	$0	$0	$0	$0	$0
Village of Mt. Eaton	$0	$0	$0	$0	$0
City of Orrville	$0	$0	$0	$0	$0
City of Rittman	$700,000	$962,000	$1,126,000	$1,346,000	$1,829,000
Village of Shreve	$0	$0	$0	$0	$0
Village of Smithville	$702,000	$792,000	$845,000	$905,000	$1,034,000
Wayne County	$4,383,000	$5,507,000	$6,307,000	$7,767,000	$9,886,000
Village of West Salem	$1,000	$1,000	$1,000	$1,000	$2,000
City of Wooster	$1,016,000	$1,339,00	$1,542,000	$1,759,000	$4,229,000
TOTAL	$7,484,000	$9,550,000	$10,962,000	$13,463,000	$19,199,000

Table 27: Potential Total Non-Residential Losses from Flood by Return Period

Location	10-year	25-year	50-year	100-year	500-year
Village of Apple Creek	$215,000	$235,000	$276,000	$301,000	$388,000
Village of Burbank	$9,000	$13,000	$14,000	$141,000	$176,000
Village of Congress	$0	$0	$0	$0	$0
Village of Creston	$0	$0	$0	$0	$0
Village of Dalton	$0	$0	$0	$0	$0
Village of Doylestown	$0	$0	$0	$0	$0
Village of Fredericksburg	$30,000	$79,000	$108,000	$128,000	$250,000
Village of Marshallville	$0	$0	$0	$0	$0
Village of Mt. Eaton	$0	$0	$0	$0	$0
City of Orrville	$0	$0	$0	$0	$0
City of Rittman	$439,000	$653,000	$747,000	$839,000	$2,076,000
Village of Shreve	$0	$0	$0	$0	$0
Village of Smithville	$961,000	$1,147,000	$1,227,000	$1,327,000	$1,511,000
Wayne County	$5,326,000	$6,938,000	$7,792,000	$9,148,000	$12,426,000
Village of West Salem	$0	$0	$0	$0	$0
City of Wooster	$5,799,000	$8,407,000	$9,831,000	$11,056,000	$14,802,000
TOTAL	$12,779,000	$17,472,000	$19,995,000	$22,940,000	$31,629,000

Repetitive Loss Properties

FEMA defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Currently, there are over 140,000 repetitive loss properties nationwide.

As of June 2017, there are 4 non-mitigated repetitive loss properties located in Wayne County, which account for 10 losses and over $133,000 in claims payments under the NFIP. The average claim amount for these properties is $13,300. Three of the four repetitive loss properties are single family residential buildings and there is one other residential building. It is expected that without mitigation that these structures will likely continue to experience flood losses. Table 28 below presents detailed information on the repetitive loss properties and NFIP claims for Wayne County. There are no severe repetitive loss properties in Wayne County.

Table 28: Summary of Repetitive Loss Properties

Location	Number of Properties	Types of Properties	Number of Losses	Building Payments	Content Payments	Total Payments	Average Payment
Village of Apple Creek	2	2 single family	4	$99,249	$6,736	$105,985	$52,992
Wayne County	2	1 single family, 1 other residential	6	$11,217	$16,498	$27,715	$9,378

Priority Risk Index

The table below includes the PRI for the flood hazard.

Table 29: PRI for Flood

PRI Category	Level	Index Value
Probability	Likely	3
Vulnerability	Limited	2
Spatial Extent	Moderate	3
Warning Time	6-12 hours	3
Duration	Less than one week	3

HAIL STORM

Description

Hail is precipitation in the form of irregular pellets of ice large enough that they could cause damage to things on the ground. Most often, hail storm events are associated with high winds and thunderstorm conditions. The majority of damage caused by hail storms is incurred by automobiles and structure roofs, but such storms can potentially deal significant damage to crops as well.

Hailstorms are a potentially damaging outgrowth of severe thunderstorms. Early in the developmental stages of a hailstorm, ice crystals form within a low-pressure front due to the rapid rising of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until they develop to a sufficient weight and fall as precipitation.

Hail typically takes the form of spheres or irregularly-shaped masses greater than 0.75 inches in diameter. The size of hailstones is a direct function of the size and severity of the storm. High velocity updraft winds are required to keep hail in suspension in thunderclouds. The strength of the updraft is a function of the intensity of heating at the Earth's surface. Higher temperature gradients relative to elevation above the surface result in increased suspension time and hailstone size. The most likely time to experience hail is during the summer thunderstorm season.

Hailstone size can range a great deal in size from 5 millimeters (mm) – approximately pea-sized – to greater than 100 mm – approximately melon-sized. Hailstones are categorized using the TORRO Hailstorm Intensity Scale (Table 30). Hailstone size descriptions are in Table 31.

Table 30: TORRO Hailstorm Intensity Scale (in millimeters)

	INTENSITY CATEGORY	TYPICAL HAIL DIAMETER	PROBABLE KINETIC ENERGY, J-M²	TYPICAL DAMAGE IMPACTS	SIZE CODE
H0	**Hard Hail**	5	0-20	No damage	1
H1	**Potentially Damaging**	5-15	>20	Slight general damage to plants, crops	1-3
H2	**Significant**	10-20	>100	Significant damage to fruit, crops, vegetation	1-4
H3	**Severe**	20-30	>300	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored	2-5
H4	**Severe**	25-40	>500	Widespread glass damage, vehicle bodywork damage	3-6
H5	**Destructive**	30-50	>800	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries	4-7
H6	**Destructive**	40-60		Bodywork of grounded aircraft dented, brick walls pitted	5-8
H7	**Destructive**	50-75		Severe roof damage, risk of serious injuries	6-9
H8	**Destructive**	60-90		Severe damage to multiple roof types (including sheet and metal); damage aircraft bodywork	7-10
H9	**Super Hailstorms**	75-100		Extensive structural damage (including concrete and wooden walls). Risk of severe or even fatal injuries to persons caught in the open	8-10
H10	**Super Hailstorms**	>100		Extensive structural damage (including destruction of wooden houses and damage to brick-built homes). Risk of severe or even fatal injuries to persons caught in the open	9-10

Table 31: TORRO Hailstorm Size Code Descriptions

SIZE CODES	DIAMETER	RELATIONAL SIZE
0	5-9	Pea
1	9-15	Mothball
2	16-20	Marble, grape
3	21-30	Walnut
4	31-40	Pigeon's egg > squash ball
5	41-50	Golf ball > Pullet's egg
6	51-60	Hen's egg
7	61-75	Tennis ball > cricket ball
8	76-90	Large orange > Soft ball
9	91-100	Grapefruit
10	>100	Melon

Location

All locations within Wayne County are equally susceptible to hail storms. The spatial extent of a hailstorm is very limited. The average size of a hailstorm is 100 feet to 2 miles wide and 2-5 miles long. Rarely do they affect more than one populated area within the County at a time.

Previous Occurrences

According to the NCEI, a total of 131 hail events were reported in Wayne County between 1950 and 2017. A total of $901,000 in damages was reported, of which a majority occurred in the City of Wooster. Magnitude as reported as hailstone size, ranged from 0.75 inches to 2.5 inches.

Table 32: Recorded Events with Significant Monetary Damage

Date	Location	Death/Injuries	Damage ($)	Magnitude
6/29/1998	Wayne County	0/0	$100,000	1.75 in.
04/09/2001	City of Wooster	0/0	$15,000	1 in.
04/09/2001	City of Wooster	0/0	$50,000	1.5 in.
04/09/2001	City of Wooster	0/0	$75,000	1.75 in.
04/09/2001	City of Wooster	0/0	$10,000	1 in.
04/09/2001	Village of Apple Creek	0/0	$50,000	2.5 in.
04/09/2001	Village of Mt. Eaton	0/0	$15,000	1 in.

Date	Location	Death/Injuries	Damage ($)	Magnitude
04/09/2001	City of Wooster	0/0	$25,000	1 in.
04/09/2001	Village of Apple Creek	0/0	$50,000	1.75 in.
04/19/2002	City of Rittman	0/0	$40,000	1.5 in.
04/28/2002	City of Wooster	0/0	$5,000	0.75 in.
04/28/2002	Village of Smithville	0/0	$50,000	1.75 in.
06/04/2002	City of Wooster	0/0	$10,000	1 in.
06/04/2002	Wayne County	0/0	$10,000	1 in.
06/04/2002	City of Wooster	0/0	$10,000	1 in.
05/21/2004	Wayne County	0/0	$75,000	1.5 in.
05/25/2006	City of Wooster	0/0	$5,000	1 in.
05/25/2006	Village of Smithville	0/0	$8,000	1.25 in.
05/25/2006	Village of Smithville	0/0	$10,000	1.5 in.
05/01/2007	City of Wooster	0/0	$10,000	1 in.
05/01/2007	Village of West Salem	0/0	$10,000	1 in.
6/10/2011	Village of Smithville	0/0	$100,000	2 in.
6/12/2013	Village of Apple Creek	0/0	$150,000	1.75 in.
8/7/2013	Village of Marshallville	0/0	$5,000	1.25 in.

Source: National Climatic Data Center

Extent

There were two events in 2001 and 2011 with hail stone size in the destructive category (2 and 2.5 inches). Hailstones of this size can result in severe roof damage and the possibility of injuries. Extent may also be described in terms of damage and human impacts (including loss of life and property). The greatest amount of damage reported from a single hail event was $150,000 in 2013. However, costlier events are possible.

Magnitude and Potential Intensity

The size of hail and its location will determine the damage caused by a particular hail storm. Of the ninety-two hail events recorded in Wayne County since 1968, only twenty-two of them have ever caused serious damage. None have resulted in deaths or injuries. The effects of hail storms are generally limited to property damage, most of which is insured, making the impact of a hail event rather low.

Duration

Hailstorms generally occur as short episodes rather than steady streams of precipitation.

Speed of Onset

Hail often appears suddenly and passes just as quickly. Whether or not hail occurs is dictated by the conditions within a particular storm.

Availability of Warning Time

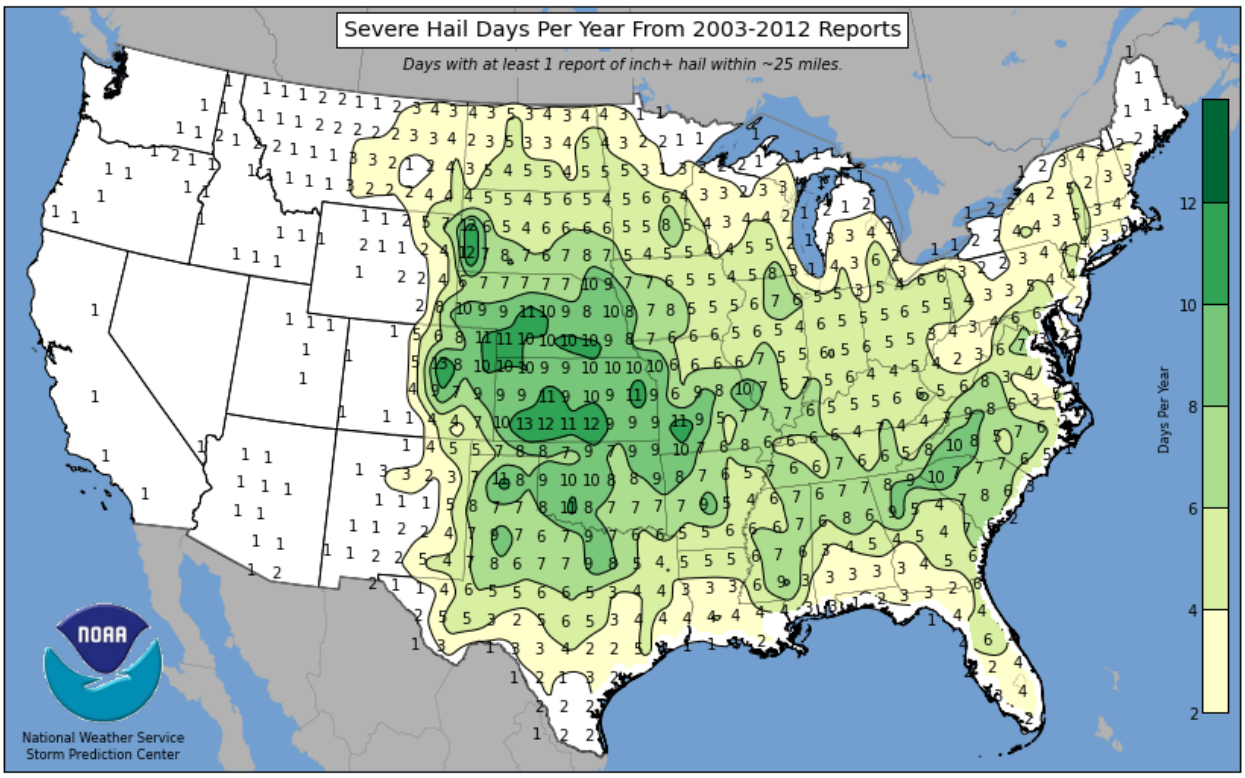
Meteorologists are able to predict if a particular storm system would or would not be capable of producing hail. This makes the issuance of limited warnings possible, but where and when hail

will occur is still difficult to predict. As such, the only real warning for hail that may be available is the sound it makes as it strikes the ground.

Probability of Future Events

A total of 23 events with damages was reported from 1950 to 2013. This results in an approximate annual probability of 37%. Of note, there were no events reported in the NCEI data from August 2013 to date and most events occurred in May or June. Future hail events can be expected to continue to cause damage to property and vehicles in Wayne County. Hail events are most common in the last spring to early fall. Per the National Weather Service, Wayne County is located in an area of the United States that receives an average of five to six days per year with hail events.

Figure 1: United States Average Number of Days per year with Severe Hail Events



Source: NOAA

Vulnerability Assessment

The average loss from a hailstorm is minimal. However, under the right conditions, such as striking a heavily populated area, the losses could be significant. Fortunately, most losses due to hailstorms are insured, which significantly lessens the impact on the people and the community. In addition, although hailstorms are a fairly common, they rarely impact more than one localized area at a time. This causes the affected population to be much smaller than what most other hazards would generate.

Damage estimates of $873,000 have been reported for this hazard. Annualizing these losses over the data period (1950 to 2013) results in an annual damage estimate of approximately $13,900 for the county.

Priority Risk Index

The table below includes the PRI for the hail storm hazard.

Table 33: PRI for Hail Storm

PRI Category	Level	Index Value
Probability	Likely	3
Vulnerability	Minor	1
Spatial Extent	Small	2
Warning Time	Less than 6 hours	4
Duration	Less than 6 hours	1

HAZARDOUS MATERIALS

Description

A hazardous materials incident can be loosely defined as the unintentional or unlawful release of any substance that potentially poses a risk to public safety or the environment, either by itself or through interaction with other factors. Wayne County's hazardous materials risk stems from its mixture of light industry, agriculture, and transportation arteries. In order to prepare for this risk, the County performs hazardous material planning through the Community Right-to-Know Act and the Wayne County Local Emergency Planning Committee (LEPC). The LEPC is responsible for identifying the various hazardous materials within the County and informing the local first responders of their nature and location, so that first response may be better prepared. To achieve this end, the Wayne County LEPC has worked to create a cooperative environment between industry and the emergency response field.

Location

A hazardous materials incident could occur anywhere, as companies and citizens that produce, handle, and use hazardous materials can be found all over Wayne County. All facilities that carry reportable quantities of hazardous materials within Wayne County are required to report to the LEPC as mandated by the Sara Title III Community-Right-To-Know Act legislation.

The probable spatial extent of any particular incident can be estimated with software called ALOHA. ALOHA (Areal Locations of Hazardous Atmospheres) is a computer modeling program created by NOAA and the EPA. By entering current climatic conditions, the type of hazardous material, and the amount, ALOHA can simulate a plume model that can be used by responders at a scene or by planners before an event. For an example of this modeling capability, please see the maps on the two previous pages.

Previous Occurrences

Wayne County averages about 18-25 reported hazardous materials incidents per year.

Extent

Magnitude and Potential Intensity

This will depend on the type of material, the amount of material, the source of release, and the climatic conditions at the time of the incident. An example of a "worst-case" HazMat release scenario for Wayne County would be catastrophic tank failure at the Town & Country Co-op in Smithville. Such an event could release 80,000 pounds of anhydrous ammonia into the

environment. Another example would be a catastrophic failure of the 4,000 pound chlorine tank located in the Orrville Water Treatment Plant.

The extent of each of these theoretical events can be seen on the following maps. The plume maps depicted there were generated by the ALOHA software produced by the EPA and NOAA. Weather conditions were assumed to be fair, with an air temperature of 72°F and a wind speed of 10 miles per hour from the southwest. As weather conditions vary widely, these conditions were chosen for illustrative purposes only.

The "threat zones" (i.e. the red, orange, and yellow cones) shown on the maps correspond to the Acute Exposure Guideline Levels (AEGLs) established by the AEGL Committee. AEGLs are described as three different levels and are measured in parts-per-million or milligrams-per-cubic meter.

- **AEGL-1 (in yellow)** is the airborne concentration of a substance above which it is predicted that the general population could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. These effects are not disabling and disappear upon cessation of exposure.
- **AEGL-2 (in orange)** is the airborne concentration of a substance above which it is predicted that the general population could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.
- **AEGL-3 (in red)** is the airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

Potential Chlorine Release – Orrville Water Treatment Plant

Generated with AccuGlobe ALOHA Plug-in for AccuGlobe 2004

Chemical Name: CHLORINE

Wind: 10 miles/hour from SW at 3 meters

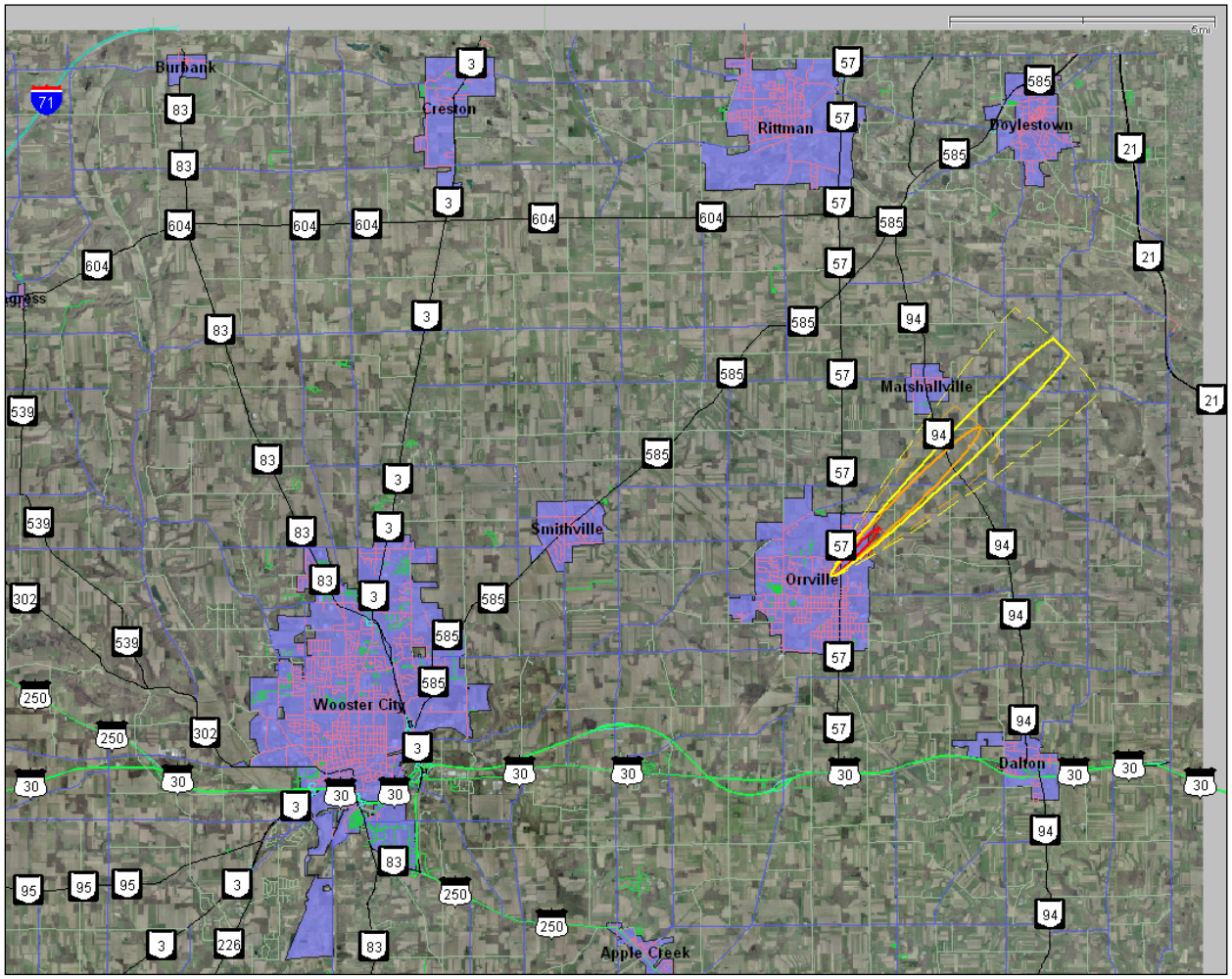
Threat Zone:

Model Run: Heavy Gas

Red: 1.2 miles --- 20 ppm = AEGL-3 (60 min)

Orange: 3.9 miles --- 2 ppm = AEGL-2 (60 min)

Yellow: greater than 6 miles --- 0.5 ppm = AEGL-1 (60 min)



Potential Anhydrous Ammonia Release – Smithville Town & Country Co-Op

Generated with AccuGlobe ALOHA Plug-in for AccuGlobe 2004

Chemical Name: AMMONIA

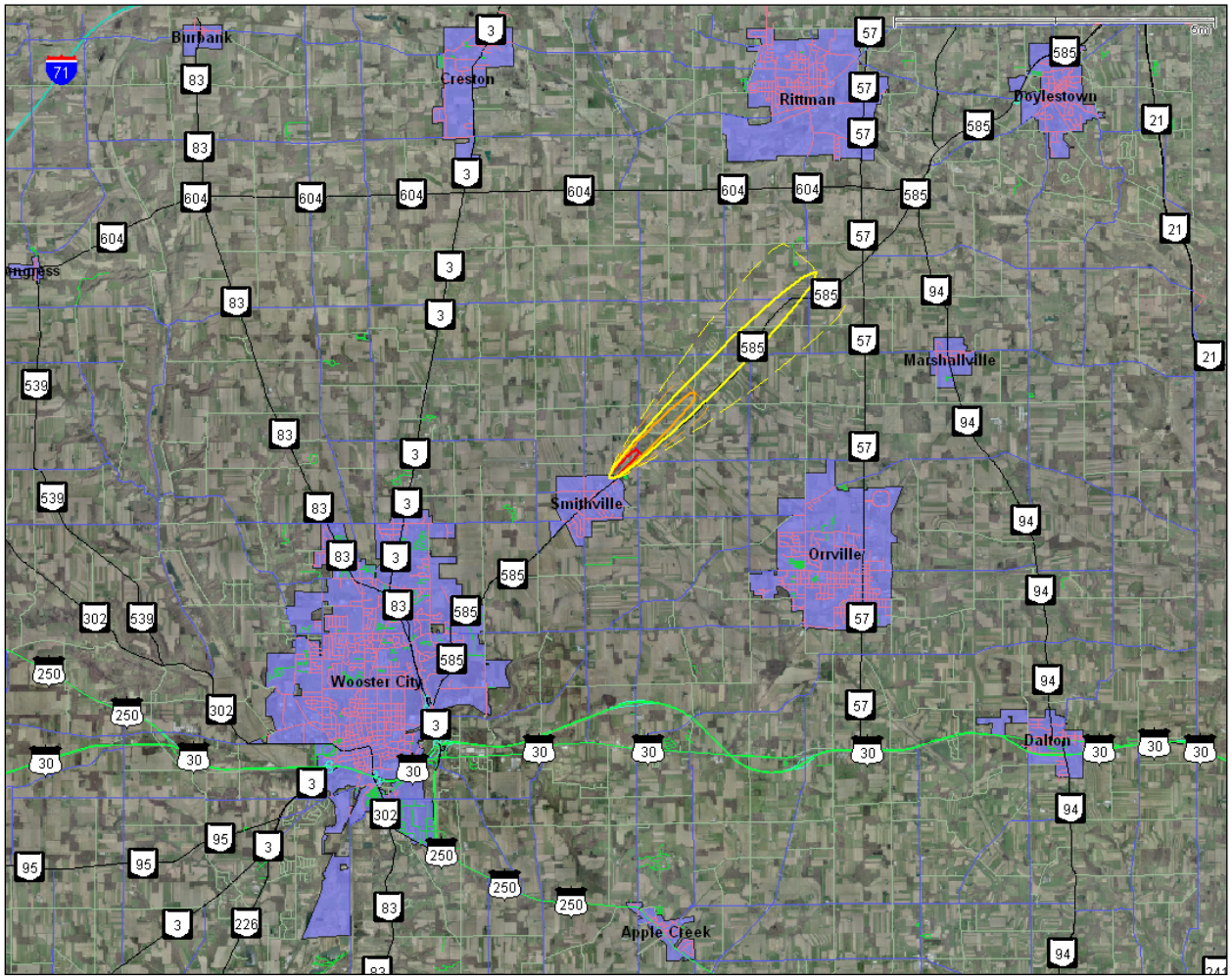
Wind: 10 miles/hour from SW at 3 meters

Threat Zone:

Red: 1273 yards --- 1100 ppm = AEGL-3 (60 min)

Orange: 2.2 miles --- 160 ppm = AEGL-2 (60 min)

Yellow: 5.4 miles --- 30 ppm = AEGL-1 (60 min)



Duration

This will depend on the type of material, the amount of material, the source of release, and the climatic conditions at the time of the incident. The duration of a hazardous materials event is further complicated by comparative difficulty of cleanup and subsequent environmental remediation.

Speed of Onset

The speed of onset for a hazardous materials incident would be determined on a case-by-case basis.

Availability of Warning

Hazardous material spills usually provide little to no warning, as they are generally the result of an accident, negligence, or some other unforeseen event. Typically, no warning may be available until the hazardous materials incident is discovered by the first person to arrive on scene.

Probability of Future Events

Based on prior occurrences, the probability of future occurrences is considered to be highly likely.

Vulnerability Assessment

Loss Estimation

During any hazardous materials incident, the LEPC can perform a cost-recovery function that allows fire departments and other responding agencies to recoup the costs associated with controlling hazardous material spills. The statutory authority for this can be found in Section 3743 of the Ohio Revised Code. The subsequent bill is charged to the company or business that caused the spill and is itemized based on a chart of costs per hour for types of equipment or services provided.

Priority Risk Index

The table below includes the PRI for the hazardous materials hazard.

Table 34: PRI for Hazardous Materials

PRI Category	Level	Index Value
Probability	Highly Likely	4
Vulnerability	Minor	1
Spatial Extent	Negligible	1
Warning Time	Less than 6 hours	4
Duration	Less than 24 hours	2

SEVERE THUNDERSTORM/HIGH WINDS

Description

Severe Thunderstorms and High Winds, though technically different weather phenomena, often occur in conjunction with one another. By definition, a severe thunderstorm is simply a thunderstorm that is capable of producing “penny sized” hail and/or gusts of 58 miles per hour

or greater. High winds are considered to be sustained winds of 40 miles per hour or more for at least two hours continuously, or gusts of 58 miles per hour or greater, just like a severe thunderstorm. For this reason, these two events have been grouped here together. The strong winds they can generate have the potential to pick up and throw debris, topple utility lines, and cause serious property damage.

Typically, thunderstorms are a common and mundane weather phenomenon in Northeast Ohio. Although thunderstorms are often accompanied by hail, flash flooding, and tornadoes, these hazards are covered under their own headings. The threat of lightning strike was not considered to be enough of a hazard to warrant its own section. Upon review, the only component threat of a thunderstorm not covered by this plan was the hazard of damaging winds. Therefore, the decision was made to address that issue here.

Three conditions must occur for a thunderstorm to form. First, it needs moisture to form clouds and rain. Second, it needs unstable air, such as warm air that can rise rapidly (this often referred to as the "engine" of the storm). Third, thunderstorms need lift, which comes in the form of cold or warm fronts, sea breezes, mountains, or the sun's heat. When these conditions occur simultaneously, air masses of varying temperatures meet, and a thunderstorm is formed. These storm events can occur singularly, in lines, or in clusters. Furthermore, they can move through an area very quickly or linger for several hours.

According to the National Weather Service, more than 100,000 thunderstorms occur each year, though only about 10 percent of these storms are classified as "severe." A severe thunderstorm occurs when the storm produces at least one of these three elements: 1) hail of three-quarters of an inch, 2) a tornado, or 3) winds of at least 58 miles per hour. Figure 2 includes thunderstorm hazard severity based on the average number of days with a thunderstorm event.

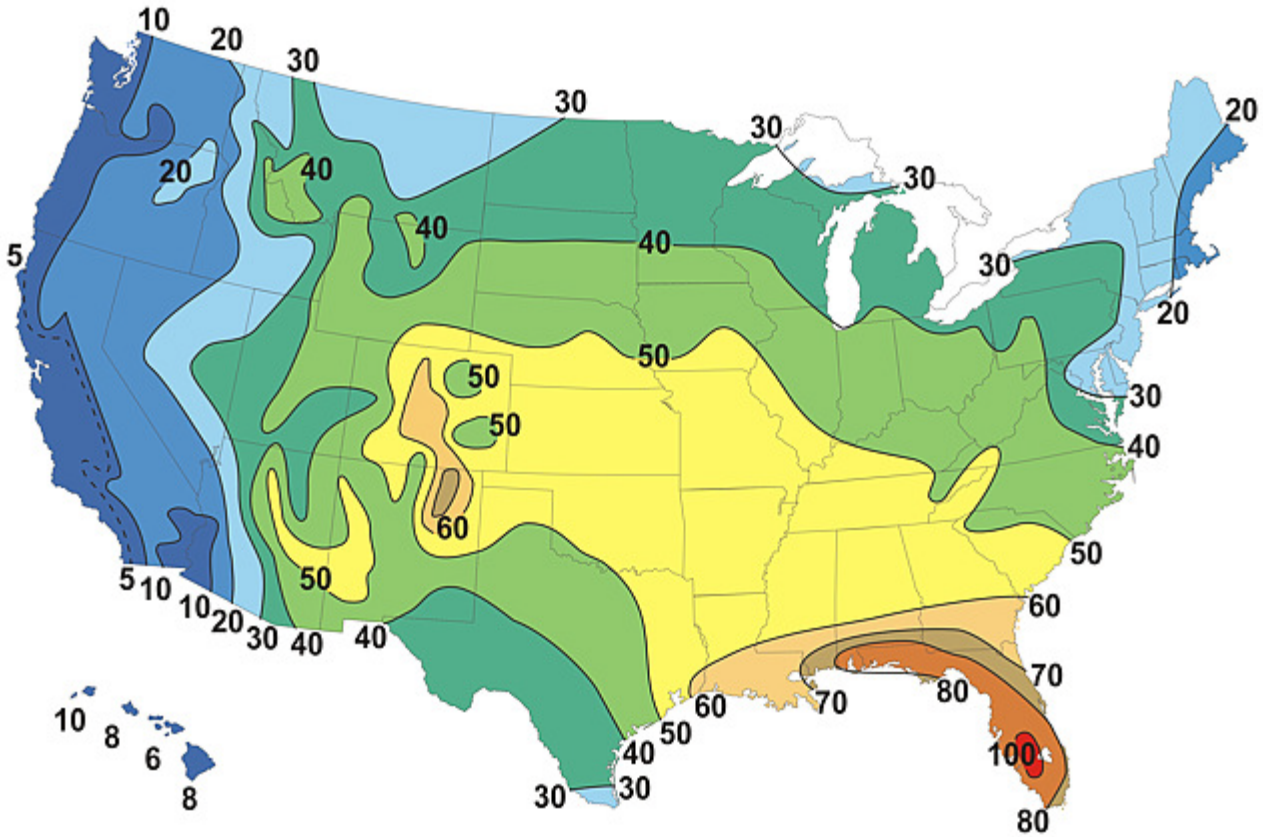


Figure 2: Average Number of Days with Thunderstorms

Source: National Oceanic and Atmospheric Administration
http://www.srh.noaa.gov/jetstream/tstorms/tstorms_intro.html

Severe Thunderstorms and High Winds are most likely to be experienced in the spring and summer months. While the warmer seasons favor high wind conditions, they could potentially occur any time of year. For example, Wayne County has experienced thunderstorm events as late as December and as early as February.

Location

All locations within the County are equally susceptible to severe thunderstorm and high wind conditions.

Previous Occurrences

According to the NCEI database, a total of 249 thunderstorm wind events were reported in Wayne County between 1950 and 2017. A total of $10 million in damages was reported. About half of the reported damages was from a thunderstorm event in September 2008. There were multiple injuries reported from the thunderstorm and high wind events. The event magnitude, as reported by the wind speed in miles per hour, ranged from 58 to 85 miles per hour. The thunderstorm and high wind events as reported in the NCEI data are listed below with associated damages and magnitude.

Table 35: Thunderstorm/High Wind Events

Date	Location	Death/Injuries	Damage ($)	Magnitude
6/16/1994	Village of Doylestown	0/0	$500,000	Not reported
7/2/1994	Village of Dalton and City of Rittman	0/0	$50,000	Not reported
7/13/1995	Wayne County	0/0	$60,000	Not reported
10/30/1996	Wayne County	0/0	$300,000	Not reported
7/9/1999	Wayne County and City of Wooster	0/0	$125,000	Not reported
7/14/2000	Wayne County	0/0	$50,000	Not reported
8/6/2000	City of Wooster	0/1	$50,000	Not reported
12/11/2000	Wayne County	0/0	$200,000	Not reported
10/25/2001	Wayne County	0/2	$100,000	Not reported
11/30/2001	Wayne County and Township of East Union	0/0	$200,000	Not reported
3/9/2002	Wayne County	0/0	$125,000	Not reported
6/26/2002	Village of Shreve	0/0	$75,000	Not reported
7/29/2002	City of Wooster	0/0	$100,000	Not reported
7/7/2003	Wayne County	0/0	$50,000	58 MPH
7/8/2003	Wayne County	0/0	$50,000	58 MPH
11/12/2003	Wayne County	0/0	$50,000	58 MPH
3/5/2004	Wayne County	0/0	$50,000	58 MPH
5/21/2004	Wayne County	0/0	$200,000	58 MPH
5/13/2005	City of Wooster	0/0	$80,000	70 MPH
8/13/2005	Village of Congress, City of Wooster and Orrville	0/0	$75,000	58 MPH
5/25/2006	City of Wooster	0/0	$80,000	58 MPH
6/22/2006	Wayne County	0/0	$950,000	63 MPH
8/9/2007	City of Rittman	0/0	$100,000	58 MPH
9/14/2008	Wayne County	0/2	$4,750,000	60 MPH
2/11/2009	Wayne County	0/0	$600,000	63 MPH
12/9/2009	Wayne County	0/0	$250,000	60 MPH
4/28/2011	Wayne County	0/0	$75,000	62 MPH
10/30/2012	Wayne County	0/0	$75,000	58 MPH
7/14/2015	Village of Doylestown	0/0	$75,000	58 MPH
6/4/2016	Wayne County	0/0	$60,000	85 MPH

Source: National Centers for Environmental Information – *Storm Events Database*

Wind speeds originally given in knots. Converted to MPH for clarity.

Extent

Thunderstorm wind extent can be measured in terms of wind speed. The greatest sustained wind reported was 85 miles per hour in June 2016. Extent can also be measured in terms of damages and human impacts (including injuries and loss of life). The greatest amount of damage associated with one thunderstorm wind event was $4.75 million in September 2008. In addition, injuries

have occurred from the thunderstorm hazard event and are possible in the future. Further description of the thunderstorm hazard extent are provided below in terms of magnitude and potential intensity, probable spatial extent and duration.

Magnitude and Potential Intensity

One common way of measuring wind speed is with the Beaufort Wind Force Scale. Originally developed to describe wind conditions on the open ocean, the Beaufort Scale has been modified over time to describe land based conditions as well, as is shown below. One should note that most Severe Thunderstorm and High Wind conditions would rank on the scale as at least a Force 10 wind.

Force	Wind (MPH)	WMO Classification	Appearance of Wind Effects
			On Land
0	Less than 1	Calm	Calm, smoke rises vertically
1	1-3	Light Air	Smoke drift indicates wind direction, still wind vanes
2	4-7	Light Breeze	Wind felt on face, leaves rustle, vanes begin to move
3	8-12	Gentle Breeze	Leaves and small twigs constantly moving, light flags extended
4	13-17	Moderate Breeze	Dust, leaves, and loose paper lifted, small tree branches move
5	18-24	Fresh Breeze	Small trees in leaf begin to sway
6	25-30	Strong Breeze	Larger tree branches moving, whistling in wires
7	31-38	Near Gale	Whole trees moving, resistance felt walking against wind
8	39-46	Gale	Whole trees in motion, resistance felt walking against wind
9	47-54	Strong Gale	Slight structural damage occurs, slate blows off roofs
10	55-63	Storm	Seldom experienced on land, trees broken or uprooted, "considerable structural damage"
11	64-72	Violent Storm	
12	73+	Hurricane	

Probable Spatial Extent

More often than not, these events will affect the entire County at one time, depending on the size of the storm front generating them.

Duration

Weather events that produce dangerous wind conditions could last minutes, hours, or more. This factor will depend on the size and strength of each individual storm event.

Speed of Onset

The evolution of storms conducive to the generation of high winds can be monitored with weather radar and other observation. This can allow for the provision of as much warning time as possible. The speed with which a storm arises is entirely dependent on environmental factors, so the speed of onset and warning time will vary event to event.

Availability of Warning

Warnings for dangerous wind events are provided by the NWS and are disseminated through various media outlets (television, radio, etc.) and NOAA weather radios. Additionally, the majority of warnings are issued at least a few hours in advance of a given storm.

Probability of Future Events

The NCEI data reported a total of 249 thunderstorm and high wind events in the reporting period from 1950 to 2017 (67 years). This results in an approximate annual probability well over 100 percent. Additionally, it is probable that some thunderstorm hazard events were not reported. The thunderstorm hazard event was assigned a probability of highly likely (greater than 90-percent annual chance). It should be noted that not all events included in the percentage calculation include losses.

Vulnerability Assessment

Damage estimates of $10 million have been reported for this hazard. Annualizing these losses over the data period results in an annual damage estimate of approximately $149,000 for the County. Future losses can be expected and a single event is capable of causing substantial damage, particularly trees and roofs.

Priority Risk Index

The table below includes the PRI for the severe thunderstorm/high wind hazard.

Table 36: PRI for Severe Thunderstorm/High Wind

PRI Category	Level	Index Value
Probability	Highly Likely	4
Vulnerability	Limited	2
Spatial Extent	Large	4
Warning Time	12 to 24 hours	2
Duration	Less than 24 hours	2

SEVERE WINTER WEATHER

Description

Severe winter weather refers to blizzards, ice storms, heavy snow falls, and any other harsh cold weather event. Severe winter storms are a yearly occurrence within Wayne County, and all of Northern Ohio. Severe winter weather can often impact the local economy by shutting down a community, causing businesses and citizens to suffer. There is no way to eliminate winter storms. But weather prediction technology, like Doppler radar, and informed weather preparedness allows the community to brace itself before these harsh winter events occur.

A winter storm is an event in which varieties of precipitation are formed that only occur at low temperatures such as snow, sleet, freezing rain, or ice. Snow storms generally occur with the clash of different types of air masses with differences in temperature, moisture and pressure; specifically when warm moist air interacts with cold dry air. Snow storms that produce a lot of snow require an outside source of moisture, such as the Gulf of Mexico or the Atlantic Ocean in the United States.

An ice storm is defined as a storm with significant amounts of freezing rain and is a result of warm air in between two layers of cold air. With warmer air above, falling precipitation in the form of snow melts, then becomes either super-cooled (liquid below the melting point of water) or re-freezes. The definition of extreme cold varies in different parts of the country. Near freezing temperatures are considered extreme cold in the southern US. In the North, extreme cold is defined as temperatures well below zero. Extreme cold may cause frostbite or hypothermia and may be life threatening. A blizzard is a severe snow storm with winds more than 35 mph and visibility of less than a 1/4 mile for more than 3 hours. A heavy snow storm is any winter storm that produces six inches or more of snow within a 48-hour period or less.

A winter storm can range from a moderate snow over a period of a few hours to blizzard conditions with blinding wind-driven snow that lasts for several days. Events may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Some winter storms might be large enough to affect several states, while others might affect only localized areas. Occasionally, heavy snow might also cause significant property damages, such as roof collapses on older buildings.

The occurrence of severe winter weather is entirely dependent upon seasonal factors. The most likely and perhaps only time they will occur is during the winter months. In Ohio, this period ranges from around November through early March.

Location

Every location within the County is susceptible to severe winter weather. These events often affect entire regions of the state and are not confined to political boundaries. The spatial extent of a severe winter weather event depends on the characteristics of each individual event. Because of their nature, it is more than likely that most of these events will cover all of Wayne County and the surrounding region.

Previous Occurrences

According to the NCEI data, there were 38 severe winter events reported between 1996 and 2017. Not all events have reported losses in the NCEI data. These events included heavy snow, winter weather, winter storm, ice storm and extreme cold/wind chill in the NCEI data. Two injuries were reported from the severe winter weather event on January 2, 1999. The reported losses from severe winter weather was $14.5 million. Two events in late 2004 and early 2005 accounted for

approximately ¾ of the total losses for this hazard. The events reported in the NCEI data with associated damages are listed in the table below.

Table 37: Severe Winter Weather Events

Date	Location	Death/Injuries	Damage ($)	Type
1/2/1996	Wayne County	0/0	$60,000	Heavy Snow
12/13/2000	Wayne County	0/0	$100,000	Winter Storm
3/24/2002	Wayne County	0/0	$50,000	Winter Storm
3/26/2002	Wayne County	0/0	$200,000	Winter Storm
12/24/2002	Wayne County	0/0	$100,000	Heavy Snow
2/5/2004	Wayne County	0/0	$125,000	Winter Storm
3/16/2004	Wayne County	0/0	$250,000	Heavy Snow
12/22/2004	Wayne County	0/0	$5,800,000	Winter Storm
1/5/2005	Wayne County	0/0	$4,800,000	Ice Storm
3/15/2007	Wayne County	0/0	$100,000	Ice Storm
2/11/2008	Wayne County	0/0	$65,000	Winter Storm
2/26/2008	Wayne County	0/0	$100,000	Winter Storm
3/4/2008	Wayne County	0/0	$400,000	Winter Storm
3/7/2008	Wayne County	0/0	$750,000	Winter Storm
1/27/2009	Wayne County	0/0	$150,000	Winter Storm
2/5/2010	Wayne County	0/0	$500,000	Winter Storm
2/15/2010	Wayne County	0/0	$200,000	Winter Storm
2/1/2011	Wayne County	0/0	$300,000	Winter Storm
2/21/2011	Wayne County	0/0	$300,000	Winter Storm
4/29/2012	Wayne County	0/0	$150,000	Extreme Cold/ Wind Chill
12/26/2012	Wayne County	0/0	$75,000	Winter Storm

Source: National Centers for Environmental Information – *Storm Events Database*

Extent

The severity of the winter storm hazard event can be measured in terms of snow or ice accumulation, probable injuries or by economic costs associated with property damage. Wayne County typically receives several inches of snow during winter storm events. In addition, the County has experienced winter weather events that have resulted in injuries, due to car accidents and falls on the ice. Further, single events have resulted in losses totaling in the millions of dollars.

Magnitude and Potential Intensity

"Severe winter weather" is somewhat of a catchall term that encompasses extreme low temperatures, snow fall, ice storms, and high winds. Because of this, not every severe winter weather event will be the same and the magnitude and intensity of any storm would have to be evaluated on a case by case basis.

Duration

A given severe winter weather event could last for only a few hours or for many days, depending on the prevailing weather conditions. Also, it is entirely possible that several different events could happen one after another, in quick succession.

Speed of Onset

Modern weather forecasting can predict severe weather events well enough to allow at least some preparation before the events strike. Still, the speed of onset of an event will vary due to meteorological conditions.

Availability of Warning Time

The National Weather Service can usually provide warning of an impending severe weather event twelve to twenty-four hours before it actually arrives. These warnings are disseminated via NOAA Weather Radio, cable and broadcast television, and other media channels.

Probability of Future Events

Winter storm events are an annual occurrence in the county. Therefore, their probability is highly likely.

Vulnerability Assessment

The losses incurred by this type of hazard will vary each time. This makes it difficult to predict future losses. NCEI data provides a general understanding of what to expect from a severe weather event. Examples of types of damages to expect from a severe winter storm event include frostbite, driving hazards and property damage including roof collapse.

Previous reported losses totaled approximately $14.6 million for heavy snow, ice storm, winter storm, and winter weather per the NCEI data. Annualized, this amounts to $218,000 for the county. Future losses should be expected due to snow and could be significant.

Priority Risk Index

The table below includes the PRI for the severe winter weather hazard.

Table 38: PRI for Severe Winter Weather

PRI Category	Level	Index Value
Probability	Highly likely	4
Vulnerability	Limited	2
Spatial Extent	Large	4
Warning Time	More than 24 hours	1
Duration	Less than 24 hours	2

SUBSIDENCE

Description

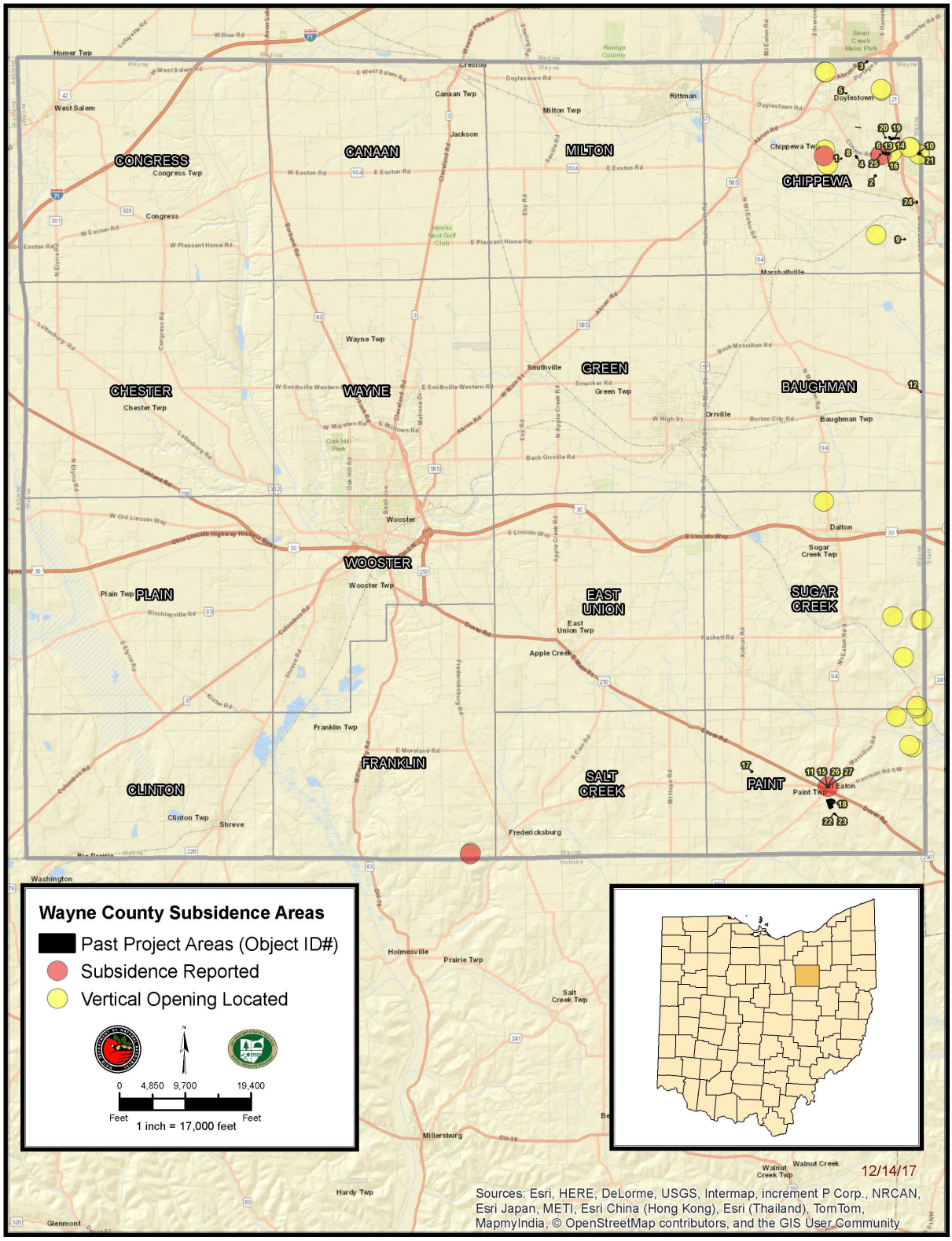
Subsidence is the lowering or sinking of the earth's surface. This can be due to sinkhole formation, the depletion of ground water, mine collapse, or some other geological condition. The most common cause of subsidence in Wayne County is the collapse of abandoned mines.

The areas within the County that are known to contain underground mines, thus possessing higher subsidence risk, are the eastern Townships; Chippewa, Baughman, Sugar Creek, and Paint. Over the years, the Ohio Department of Natural Resources has recorded six abandoned mine related subsidence events within the County, five of which are in Chippewa Township near Doylestown.

There does not appear to be a seasonal pattern to subsidence events in Wayne County. Factors that can contribute to subsidence events, such as ground water levels and snow weight, however, are seasonally dependent. Too few subsidence events have occurred in Wayne County to provide enough data to suggest a seasonal pattern.

Location

The locations in Wayne County that are at the highest risk for subsidence are the eastern Townships of Chippewa, Baughman, Sugar Creek and Paint. These Townships are known to contain underground mines and that is what contributes to their risk. Although the Eastern Townships have the highest risk, the potential exists for a subsidence event to occur anywhere within the County. The spatial extent of a subsidence event will vary. The largest event on record for Wayne County only affected two acres. Although the rest of the recorded events were much smaller, there is a possibility that Wayne County could experience even larger subsidence events. A map and table list the Wayne County subsidence areas.

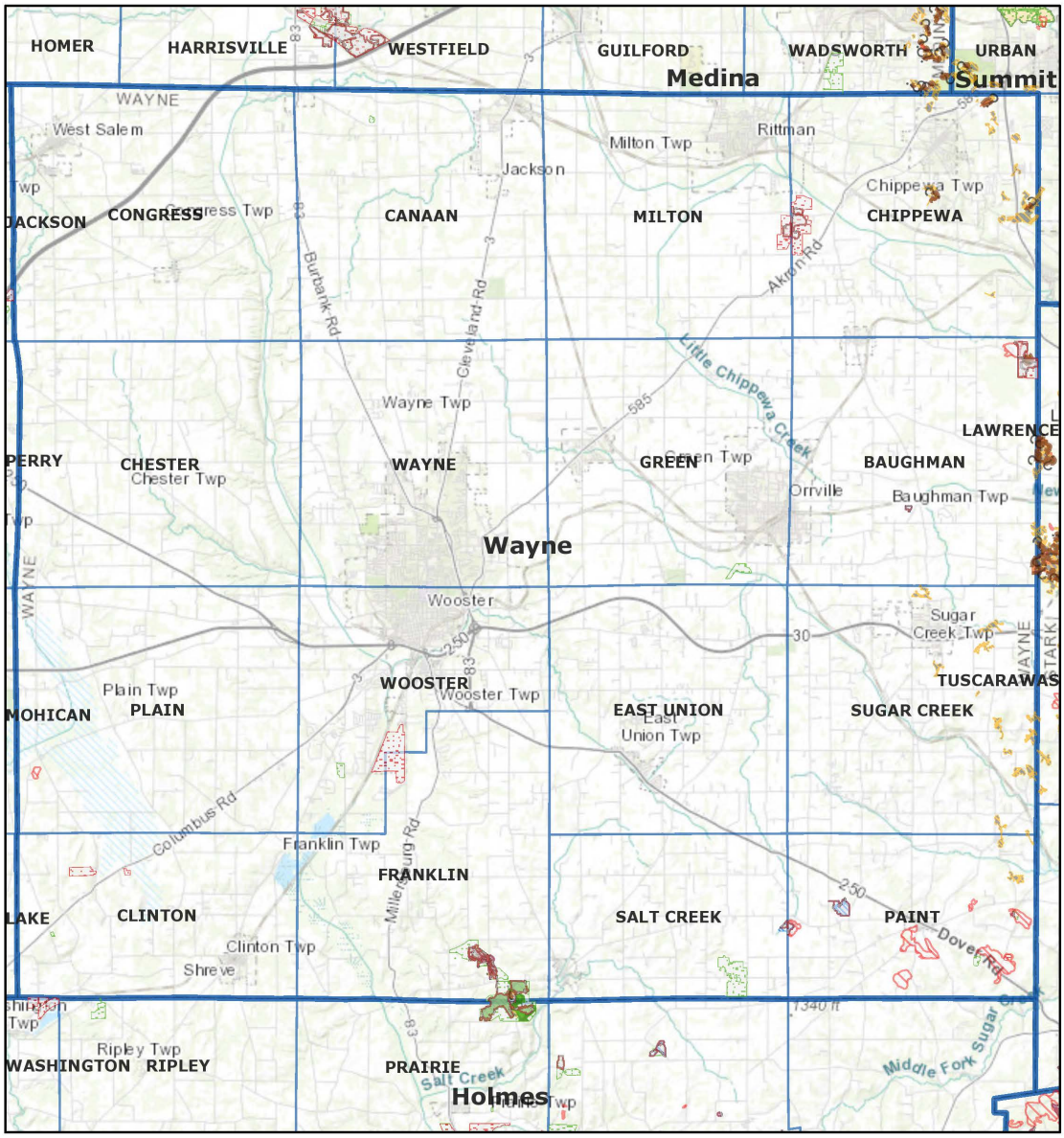


Source: Wayne County EMA

Table 39: Wayne County Subsidence Areas

ID	Project Site Name	Project Site Number
1	Kehres Mine Subsidence	WN-CP-01-E
2	Gleason Subsidence	WN-CP-02-E
3	Nagy Subsidence	WN-CP-13-E
4	Duncan Subsidence	WN-CP-05-E
5	Taylor Mine Opening	WN-CP-04-E
6	Hicks Subsidence	WN-CP-07-E
7	Senff Road Highwall	WN-PT-03-E
8	Allison Subsidence	WN-CP-12-E
9	Jim Kelly Subsidence	WN-CP-14-E
10	Rescue Mission Shafts	WN-CP-15-E
11	Ferrebee Subsidence	WN-PT-07-E
12	Bosley Shaft	WN-BM-01-E
13	Hollow Hicks Subsidence	WN-CP-16-E
14	Hollow Hicks Fix	WN-CP-18-E
15	Ferrebee Subsidence	WN-PT-09
16	Hollow Ridge Road	WN-CP-10
17	Mast l & ll	WN-PT-01 & 02
18	Senff Road	WN-PT-06
19	Finn Shaft	WN-CP-06
20	Stewart Shafts	WN-CP-06
21	Taylor Road Shaft	WN-CP-20
22	R. Weaver Highwall	WN-PT-10
23	R. Weaver Highwall	WN-PT-10
24	Galehouse Road Portal	WN-CP-19
25	Schooling Subsidence-Emergency	WN-CP-22
26	Hawk Subsidence-Emergency	WN-PT-13
27	Mt. Eaton Medical Center Subsidence-Emergency	WN-PT-14

Mines of Ohio



December 14, 2017

Surface Affected Area

Proposed

Original Application

Adjacent Area Application

Current

Past

A Law (1965 - 1972)

B Law (1972 - 1975)

C Law (1976 - 1981)

D Law (1982 - Present)

Historic - From Topo Maps

Historic - From Geology Maps

N

0 2.5 5 10 mi

0 4 8 16 km

1:288,895

Ohio Dept. of Natural Resources

Source: ODNR

Previous Occurrences

Table 40: Previous subsidence events in Wayne County

Location	Problem(s)	Extent	Cost
M. Fork Sugar Creek	Dangerous Highwall / Subsidence	440 feet, 1 acre	$580,000
Doylestown	Subsidence	1 acre	$148,800
Doylestown	Subsidence	0.5 acres	$19,702
Doylestown	Vertical Opening/ Subsidence	3 openings, 2 acres	$230,669
Doylestown	Subsidence	0.1 acres	$34,231
Doylestown	Subsidence	0.1 acres	$2,470

There are no additional subsidence events in the State Hazard Mitigation plan (2014) for Wayne County.

Extent

Magnitude and Potential Intensity

The magnitude and intensity of a subsidence event is entirely dependent on the size of the geological agent that triggers the event. A subsidence event could be just a few feet across, or several hundred meters in diameter or more, in extreme cases.

Duration

The duration depends on the event. The ground could settle slowly over days, or months, or more, or the earth could collapse rapidly within a period of minutes.

Speed of Onset

The speed of onset also depends on the event. The ground could settle slowly over days, or months, or more, or the earth could collapse rapidly within a period of minutes.

Availability of Warning

Warning could be available for a subsidence event, but only if the ground is sinking slowly enough to allow for preparedness activities. If the event happens quickly, there is little that could be done until after the fact.

Probability of Future Events

While the potential for land subsidence exists, it is not a major threat. There have been six events recorded in Wayne County and are predominately located in northeastern Wayne County. Therefore, the probability is categorized as “unlikely”.

Vulnerability Assessment

Losses attributed to this type of hazard would depend on the size of the collapse and the particular location it affects. A reliable dollar loss damage estimate is difficult to determine due to limited data and information. Annualized losses are assumed to be negligible.

Priority Risk Index

The table below includes the PRI for the subsidence hazard.

Table 41: PRI for Subsidence

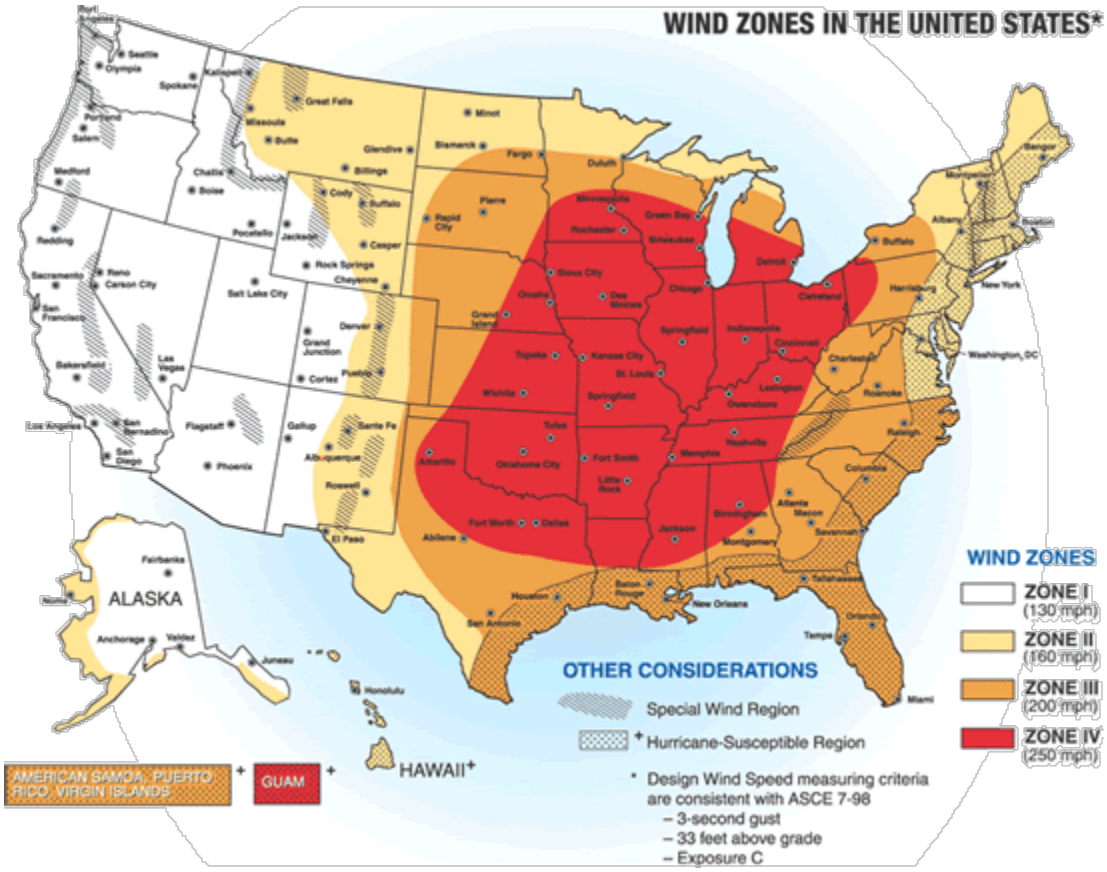
PRI Category	Level	Index Value
Probability	Unlikely	1
Vulnerability	Minor	1
Spatial Extent	Negligible	1
Warning Time	6 to 12 hours	3
Duration	Less than 24 hours	2

TORNADO

Description

A tornado is a violently rotating column of air that has made contact with the ground. It is a powerful natural force and a common phenomenon throughout much of the Midwest. Although tornadoes are difficult to predict, the conditions and environment necessary for them to occur are well known.

Below is a map depicting the various wind zones within the United States. As can be seen, Wayne County and, in fact, all of Ohio, is within wind zone IV. Zone IV is characterized by the ability to generate wind speeds up to 250 miles per hour. This portion of the country is prone to experiencing tornadoes on a regular basis. By knowing that Wayne County is in an area at high risk for tornadoes, the need to mitigate against this threat becomes apparent.



Source: Federal Emergency Management Agency

The destructive force of a tornado can be measured using the "Enhanced Fujita Scale", which was adopted by the National Weather Service in 2007. Similar to the older "Fujita-Pearson Scale", the EF-Scale provides a subjective estimate of a tornado's wind speed based on the amount of damage at a given site. Unlike the older system, however, the deduction of an EF number is based on a judgment of 8 levels of damage to 28 different indicators.

OPERATIONAL EF SCALE	
EF Number	**3 Second Gust (mph)**
0	65-85
1	86-110
2	111-135
3	136-165
4	166-200
5	Over 200

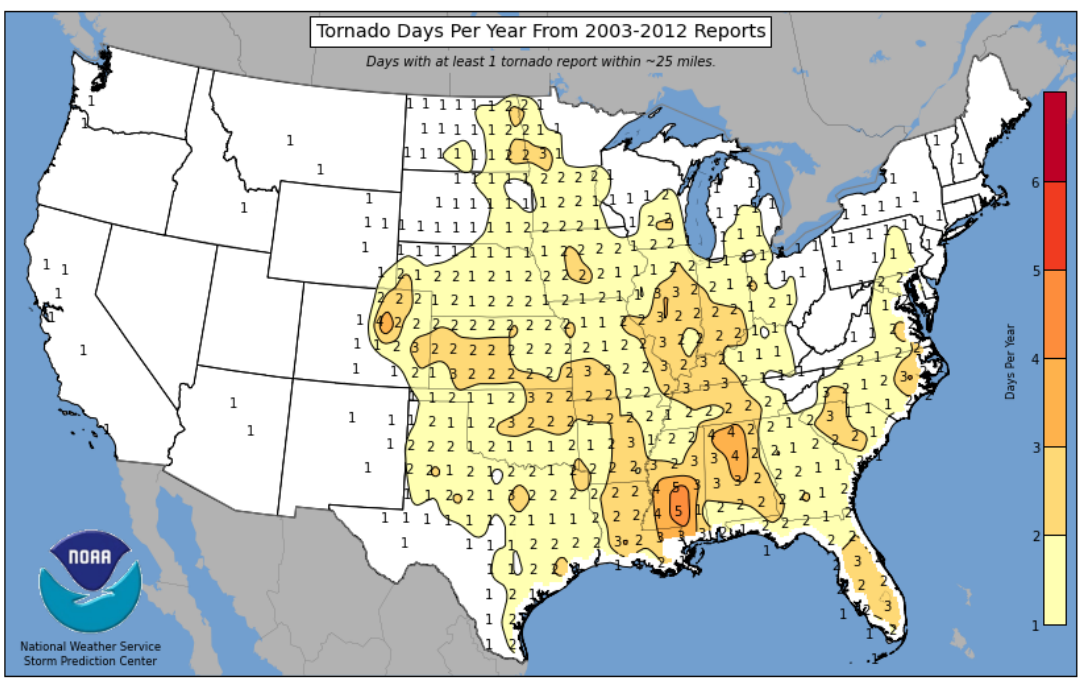
Based on NCEI data, Wayne County experienced many tornadoes over the last fifty years. This data, which still measures tornado magnitude using the older "Fujita-Pearson Scale", shows that the strongest tornadoes experienced by the County are in the F2 category (equivalent to EF2 or EF3). Although Wayne County has had a history of relatively mild tornadoes, the possibility of experiencing a much stronger tornado is very real.

Tornadoes are most likely to occur during late spring through early summer, but can form whenever weather conditions are right. Additionally, tornadoes are more likely to occur between 3pm and 9pm than any other time of day.

Location

Tornadoes typically impact a relatively small area, but damage may be extensive. Event locations are completely random and it is not possible to predict areas that are more susceptible to tornado strikes over time. Therefore, it is assumed that every location in the County is uniformly exposed to tornadoes. The spatial extent of any tornado will depend on its width and path.

The following National Weather Service Map shows there are zero or one day per year where a tornado is reported within 25 miles of Wayne County based on data from 2003 to 2012.



Source: NOAA National Weather Service

Previous Occurrences

NCEI historical occurrences were investigated from 1950 to 2017 for Wayne County. Twenty two events were reported starting in 1957. These events resulted in 10 injuries and over $57 million in damage. A majority of the reported damage was from two events in the City of Wooster that occurred in November 2003 and September 2010. The table below lists tornados reported in the NCEI data and associated damages and magnitude.

Table 42: Tornado Events

Date	Location	Death/Injuries	Damage ($)	Magnitude
5/14/1957	Wayne County	0/3	$250,000	F2
5/15/1968	Wayne County	0/0	$25,000	F1
5/15/1968	Wayne County	0/0	$25,000	F2
6/26/1970	Wayne County	0/0	$2,500	F1
7/9/1972	Wayne County	0/0	$25,000	F1
5/10/1973	Wayne County	0/2	$250,000	F2
7/31/1976	Wayne County	0/0	$25,000	F2
5/13/1980	Wayne County	0/0	$2,500	F1
6/8/1981	Wayne County	0/0	$250,000	F1
3/28/1985	Wayne County	0/0	$25,000	F1
7/30/1992	Wayne County	0/0	$250,000	F0
5/1/1996	Village of Dalton	0/2	$300,000	F1
7/7/1996	Village of Doylestown	0/0	$30,000	F1
1/5/1997	Wayne County	0/0	$50,000	F1
7/1/1999	City of Rittman	0/0	$150,000	F1
4/19/2002	Village of Doylestown	0/0	$0	F0
11/10/2002	Village of West Salem	0/0	$1,000	F2
11/12/2003	City of Wooster	0/3	$21,000,000	F2
6/17/2009	Village of Smithville	0/0	$60,000	EF0
7/31/2009	Wayne County	0/0	$35,000	EF1
9/16/2010	City of Wooster	0/0	$35,000,000	EF2
8/7/2013	East Union Township	0/0	$50,000	EF1

Source: National Centers for Environmental Information – *Storm Events Database*

Extent

Tornado extent can be determined by tornado magnitude according to the Fujita and Enhanced Fujita Scale. The most severe tornadoes on record to impact Wayne County were several events with magnitude F2 or EF2 in 1957, 1968, 1973, 1976, 2002 and 2010. However, events of greater magnitudes are possible.

The extent of the tornadoes may also be measured in terms of property damage and human impact (including loss of life and injuries). The greatest amount of damage reported from a single tornado event was $35 million in 2010. However, costlier events are possible. Further, injuries have occurred with this hazard and are possible in the future.

Duration

The duration of a tornado cannot be accurately predicted.

Speed of Onset

Although conditions favorable to the formation of tornadoes can be predicted and monitored, tornadoes themselves form quickly and with little warning.

Availability of Warning Time

The National Weather Service averages about 10-15 minutes of lead time for a tornado. Larger tornadoes that appear on radar provide more warning, but smaller tornadoes not seen on radar could provide less than 10 minutes warning. Whenever the NWS detects a tornado, or foresees the potential for one to occur, an announcement is made over the NOAA Weather Radio system.

Although the NOAA Weather Radios provide a valuable service, the primary means of tornado warning are the 72 weather sirens installed throughout the County. These sirens are maintained and operated by individual communities and are readily accessible for tornado warning. A map showing the location of the weather sirens is located in Appendix D.

Probability of Future Events

Based on 22 events over 67 years, there is an approximate annual probability of 33 percent, and tornadoes are "likely" (between 10 and 90% annual probability) to occur. Tornadoes are most likely to occur in May through August. Statewide, tornadoes have occurred most in June. In Wayne County, the highest number of tornadoes have occurred in July (6 tornadoes reported). However, the months with the greatest number of tornado days is tied between May and July (6 days with tornadoes).

Vulnerability Assessment

Total damages as reported in the NCEI data for tornado events is approximately $57.8 million. The greatest reported tornado losses on a given day was $35 million in 2010. Annualizing the estimated losses results in an approximate annual loss potential of $863,000 due to tornadoes.

Loss Estimation

The losses incurred from any particular tornado will depend upon the size and strength of the tornado, where it touches down, its path, and its duration. A weak tornado in the center of an urban area could deal much greater damages than a powerful tornado in an open field. As such, it is difficult to estimate potential tornado losses. As a starting point, though, perhaps it is best to consider the tornado that touched down in Wooster in 2003. It did a total of $21M of damage, yet it was only an F2. Had it been a larger tornado, the damages could have been much higher.

Priority Risk Index

The table below includes the PRI for the tornado hazard.

Table 43: PRI for Tornado

PRI Category	Level	Index Value
Probability	Likely	3
Vulnerability	Critical	3
Spatial Extent	Small	2
Warning Time	Less than 6 hours	4
Duration	Less than 6 hours	1

WILD/FOREST FIRE

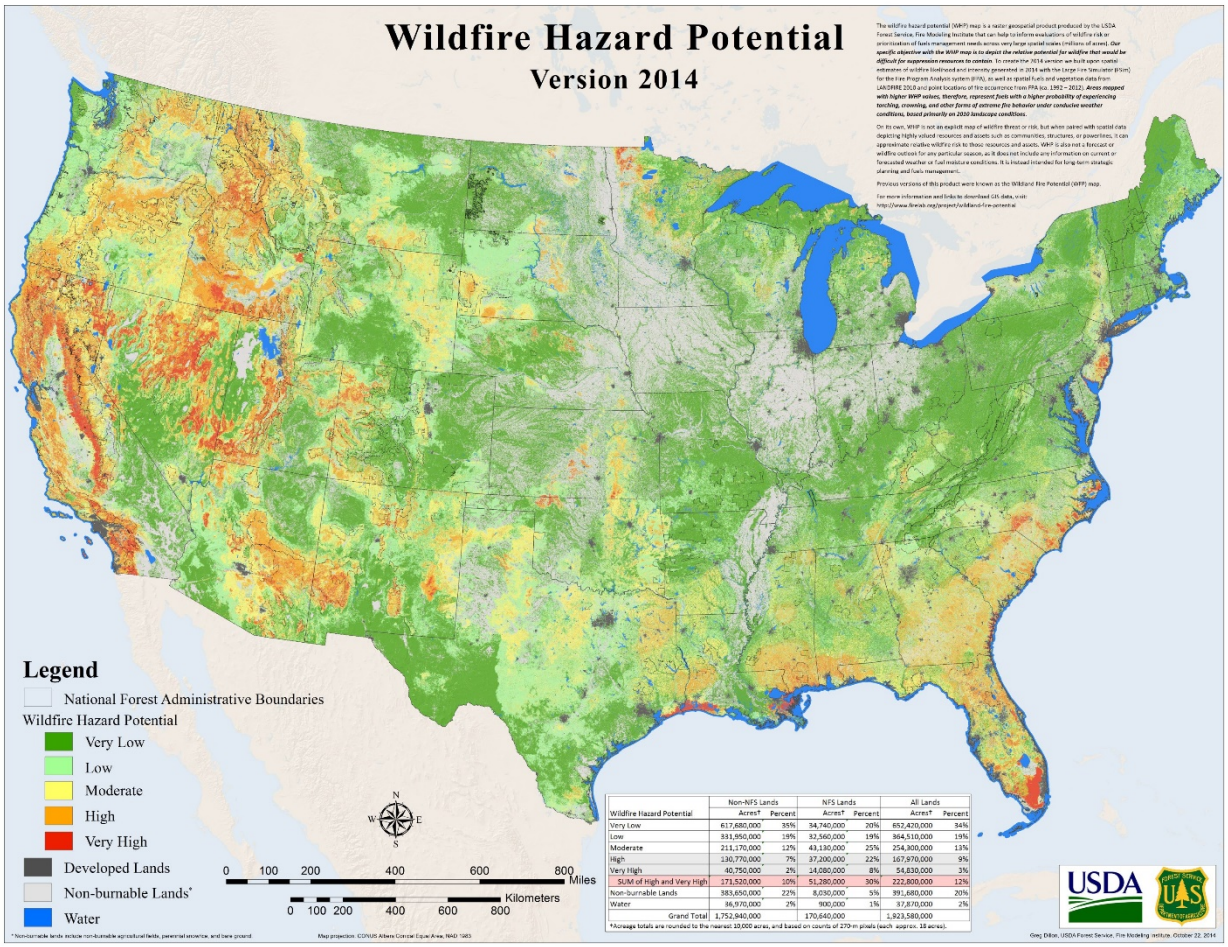
Description

A wildfire is any uncontrolled fire that occurs in the countryside or wilderness area. According to the 2016 Wayne County Profile produced by the Ohio Department of Development, only 13.26% of Wayne County is listed as urban use. The majority of Wayne County is listed as cropland (50.3%) and forest (15.9%). This means that, at the very least, roughly 66% of the land in Wayne County could potentially support wildfires. Even so, the likelihood of Wayne County experiencing a severe wildfire is very low, as the climate in Northeast Ohio is not conducive to the very hot and dry conditions necessary to propagate them.

Similar to drought, the most common time to experience wildfires is during the summer months, when the weather is hotter and drier than the rest of the year. While this is the case, Northeast Ohio rarely becomes hot and dry enough to support large wildfires.

Location

By technical definition, the majority of vegetated land in Wayne County not used for urban purposes is potentially susceptible to wildfires. The probable extent of any wildfires in Wayne County should be very small, limited to small groupings of trees or, at most, several acres of field. The biggest concern wildfires pose to the County is their potential to impact the built environment and initiate structure fires. Per the US Department of Agriculture Forest Service, Fire Modeling Institute, the map below indicates that the wildfire hazard potential for Wayne County is in the Low or Very Low category.



Wildfire Hazard Potential	Non-NFS Lands Acres†	Non-NFS Lands Percent	NFS Lands Acres†	NFS Lands Percent	All Lands Acres†	All Lands Percent
Very Low	617,680,000	35%	34,740,000	20%	652,420,000	34%
Low	331,950,000	19%	32,560,000	19%	364,510,000	19%
Moderate	211,170,000	12%	43,130,000	25%	254,300,000	13%
High	130,770,000	7%	37,200,000	22%	167,970,000	9%
Very High	40,750,000	2%	14,080,000	8%	54,830,000	3%
SUM of High and Very High	171,520,000	10%	51,280,000	30%	222,800,000	12%
Non-burnable Lands	383,650,000	22%	8,030,000	5%	391,680,000	20%
Water	36,970,000	2%	900,000	1%	37,870,000	2%
Grand Total	1,752,940,000		170,640,000		1,923,580,000	

†Acreage totals are rounded to the nearest 10,000 acres, and based on counts of 270-m pixels (each approx. 18 acres).

Source: US Department of Agriculture Forest Service, Fire Modeling Institute
https://www.firelab.org/project/wildfire-hazard-potential

Previous Occurrences

The NCEI data provides no historical accounts of wildfires. Additionally, no considerable losses due to wildfire have ever been reported from local fire departments within Wayne County. With this information, it can be assumed that the frequency of wildfire is quite low. The State Hazard Mitigation plan was reviewed as part of the Wayne County Hazard Mitigation plan update to determine if there were any wild fire hazard events since the last plan update in 2010. There were no wild fire events reported in the State Hazard Mitigation Plan for Wayne County.

Extent

Magnitude and Potential Intensity

The potential for wildfires within Ohio and Wayne County is very limited due to the region's geographical and climatic characteristics. The highest intensity to be experienced within the County would most likely involve a small field or stand of trees. However, providing the right conditions, the potential exists for more substantial losses, particularly near wildland-urban interface areas.

Duration

The duration of a wildfire will depend entirely on things such as weather conditions, ignition sources, available fuel, location, and fire crew response time and could vary from a few minutes to days. Containment of a wildfire could prove to be more important than the duration it burns, as a wildfire has the potential to start structure fires and damage actual property.

Speed of Onset

Fires, whether intentional or accidental, can start and grow very quickly. The speed at which a fire spreads is dependent on factors such as fuel source and weather conditions, among others.

Availability of Warning

The actual start of a wildfire is likely to occur without any warning, but it is possible to warn citizens when environmental conditions, such as extreme drought, are conducive to producing wildfires. If necessary, the National Weather Service can issue what is known as a "Red Flag Warning". This warning indicates that weather conditions are ideal for the generation and propagation of wildfires. Should a large wildfire occur in Wayne County, it could also be possible to warn those individuals who are down wind (i.e. in the path) of the fire, providing them with time to evacuate.

Probability of Future Events

There have been no reported wild/forest fire events in Wayne County. It is likely that the probability of future occurrences will be low for this hazard event.

Vulnerability Assessment

Loss Estimation

Loss estimation for a wildfire event would need to be done on a case-by-case basis. Without historical data of loss information, it is difficult to make an educated estimation in this

Priority Risk Index

The table below includes the PRI for the wild/forest fire hazard.

Table 44: PRI for Wild/Forest Fire

PRI Category	Level	Index Value
Probability	Unlikely	1
Vulnerability	Minor	1
Spatial Extent	Small	2
Warning Time	More than 24 hours	1
Duration	Less than one week	3

PRI RESULTS

The PRI results are presented in the following table.

Table 45: Summary of PRI Results for Wayne County

Hazard	Category/Degree of Risk					PRI Score
	Probability	Vulnerability	Spatial Extent	Warning Time	Duration	
Dam Failure	Unlikely	Limited	Small	More than 24 hours	Less than 24 hours	1.6
Drought	Likely	Limited	Moderate	More than 24 hours	More than one week	2.6
Earthquake	Unlikely	Minor	Small	Less than 6 hours	Less than 6 hours	1.5
Flood	Likely	Limited	Moderate	6-12 hours	Less than one week	2.7
Hail Storm	Likely	Minor	Small	Less than 6 hours	Less than 6 hours	2.1
Hazardous Material Incident	Highly Likely	Minor	Negligible	Less than 6 hours	Less than 24 hours	2.3
Severe Thunderstorm / High Winds	Highly Likely	Limited	Large	12 to 24 hours	Less than 24 hours	3
Subsidence	Unlikely	Minor	Negligible	6 to 12 hours	Less than 24 hours	1.3
Tornado	Likely	Critical	Small	Less than 6 hours	Less than 6 hours	2.7
Wildfire	Unlikely	Minor	Small	More than 24 hours	Less than one week	1.4
Winter Weather	Highly likely	Limited	Large	More than 24 hours	Less than 24 hours	2.9

Hazard Ranking

The hazards were ranked based on PRI results and divided into high, moderate and low. The ranking of the hazards were discussed with the Core Committee at the meeting on August 16, 2017.

Ranking	Hazard
High	Severe Thunderstorm / High Winds Winter Weather Flood Tornado
Moderate	Drought Hazardous Material Incident Hail Storm
Low	Dam Failure Earthquake Wildfire Subsidence

Conclusions on Hazard Risk

The hazards that pose the greatest threat to Wayne County include Severe Thunderstorm/High Winds, Winter Weather, Flood, and Tornado. However, the other natural hazards listed in the table above also pose a risk to the population and property in the county. The county is experiencing population growth. Wayne County has experienced a population growth of approximately 3000 people from 2000 to 2010 and the population is expected to remain close to the current population level into 2030. A rising population does put more people at risk for nearly all future hazard events.

Wayne County has also experienced severe hazard events over the past few years including an EF2 tornado in 2010, a disaster declaration for severe storms in 2012 and multiple flooding events. This could be a trend for future more severe and more frequent hazard events in the county. The county is prepared to address these hazards and continues to take steps to reduce their vulnerability. Specific mitigation measures completed, developed and ongoing are defined in Section 5.

SECTION 5: MITIGATION STRATEGY

44 CFR Requirement

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Requirement §201.6(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Introduction

The mitigation strategy provides a blueprint for Wayne County to follow to become less vulnerable to its identified hazards. It is based on general consensus of the Core Committee, the findings and conclusions of the Risk Assessment, and input from the public and stakeholders. The mitigation strategy includes hazard mitigation plan goals and hazard mitigation actions. The plan goals serve as the guiding principles for future mitigation policy and project administration; hazard mitigation actions serve as implemental items that support goals. The mitigation strategy includes a process for evaluating mitigation actions to ensure actions are feasible based on community capabilities, tied to plan goals, and effective in reducing hazard losses for current and future structures and populations. This section outlines the goals, capabilities, mitigation action evaluation, prioritization process and the Mitigation Action Plan (MAP) for Wayne County.

2017 Wayne County Hazard Mitigation Plan Goals

The plan goals reflect current needs and priorities of the county and are intended to reduce long-term vulnerability to all hazards identified in this plan. The 2017 Wayne County Hazard Mitigation Plan goals were reviewed at the Core Committee kickoff and Risk Assessment meeting in May 2017. The Core Committee reviewed the goals and opted to keep goals unchanged from the previous planning effort, noting no changes in priorities from the previous planning process. The plan goals are as follows:

1. Reduce the loss of life, property, and repetitive damage from the effects of natural hazards.
2. Create safe, sustainable communities through long-range planning that seeks a balance between the natural and man-made environments.
3. Establish a program that will help facilitate orderly recovery and minimize economic disruption following a disaster.
4. Incorporate the use of mitigation throughout the entire County by making and keeping the public aware of hazard risks and mitigation measures.

Community Capability Assessment

In order to select feasible mitigation actions, an assessment of the current capabilities must be considered. These capabilities include plans, policies, authorities, programs and resources in place to accomplish mitigation within the County. Each of these items was assessed via a thorough review. Representatives from each community were contacted to complete the matrix. Capabilities were categorized into planning tool, administrative and technical, fiscal and education and training. The results of the capability assessment are presented in the following matrix. The status of each capability item is indicated with a symbol:

- A checkmark (✓) indicates that the given item is currently in place and being implemented;
- A "C" indicates the item is covered by the county;

Planning Tool Capabilities: What plans are in place that may help implement hazard mitigation projects?

Table 46: Planning and Regulatory Capability (Relevant Plans, Ordinances, and Programs)

Planning / Regulatory Tool	Apple Creek	Burbank	Congress	Creston	Dalton	Doylestown	Fredericksburg	Marshallville	Mt. Eaton	Orrville	Rittman	Shreve	Smithville	Wayne County	West Salem	Wooster
Hazard Mitigation Plan	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Comprehensive Land Use Plan					✓	✓				✓	✓			C		✓
Floodplain Management Plan/Regulations		C		C	C					✓	✓			C	C	✓
Open Space Management Plan (Parks & Rec/Greenway Plan)					✓	✓										✓
Stormwater Management Plan/Ordinance					✓	✓				✓	✓			C		✓
Natural Resource Protection Plan					C	C										
Flood Response Plan		C		C		C					✓					

Planning / Regulatory Tool	Apple Creek	Burbank	Congress	Creston	Dalton	Doylestown	Fredericksburg	Marshallville	Mt. Eaton	Orrville	Rittman	Shreve	Smithville	Wayne County	West Salem	Wooster
Emergency Operations Plan	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Continuity of Operations Plan		C		C	✓	✓				✓				C		✓
Evacuation Plan					✓	C					✓					
Disaster Recovery Plan					✓	C				✓	✓					
Capital Improvements Plan					✓	✓					✓			✓		✓
Economic Development Plan					✓	✓				✓	C			C		✓
Historic Preservation Plan		C		C	✓	✓				✓						✓
Flood Damage Prevention Ordinance										✓	✓			C		✓
Zoning Ordinance						✓				✓	✓		✓		✓	✓
Subdivision Ordinance		C		C	✓	✓				✓	✓		✓	✓	✓	✓
Unified Development Ordinance					✓										✓	
Post-Disaster Redevelopment Ordinance																
Building Code		✓		✓	C	✓				C	C		✓	C	C	✓
Fire Code		✓		✓	C	✓				✓	✓		✓		C	✓
National Flood Insurance Program (NFIP)		✓		✓	C					✓	✓			C	C	✓
NFIP Community Rating System																

Comments:

Doylestown- We have a planning committee, economic development committee, and zoning inspector that meet twice a month to determine best practices concerning the safety, health, and general well-being of the Village.

Dalton- We do a lot through education constantly. People need to be informed to make proper decisions and to take actions.

Administrative and Technical Capabilities: What staff and personal resources are available that may help implement hazard mitigation projects?

Table 47: Administrative and Technical Capability (Relevant Staff / Personnel Resources)

Staff / Personnel Resource	Apple Creek	Burbank	Congress	Creston	Dalton	Doylestown	Fredericksburg	Marshallville	Mt. Eaton	Orrville	Rittman	Shreve	Smithville	Wayne County	West Salem	Wooster
Planners with knowledge of land development / land management practices		C		C	✓	✓				✓				C	✓	✓
Engineers or professionals trained in construction practices related to buildings and/or infrastructure		C		C	✓	✓								✓	✓	✓
Planners or engineers with an understanding of natural and/or human-caused hazards		C		C	✓	✓				✓				✓		✓
Emergency Manager	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Floodplain Manager	✓	✓		✓			✓			✓	✓		✓	✓	✓	✓
Land Surveyors					C									✓		✓
Scientists familiar with the hazards of the community																
Staff with education or expertise to assess the community's vulnerability to hazards		✓		✓	✓						C			C		✓
Personnel skilled in GIS and/or Hazus		C		C	✓					✓				✓ C	✓	✓
Resource development staff or grant writers		✓		✓						✓				C		✓

Comments:

Rittman- City Council is open to reviewing legislation if offered.

<u>Fiscal Capabilities:</u> What fiscal avenues and means are available to help implement hazard mitigation projects?

TABLE 48: FISCAL CAPABILITY (RELEVANT FISCAL RESOURCES)

Fiscal Tool / Resource	Apple Creek	Burbank	Congress	Creston	Dalton	Doylestown	Fredericksburg	Marshallville	Mt. Eaton	Orrville	Rittman	Shreve	Smithville	Wayne County	West Salem	Wooster
Capital Improvement Programming					✓	✓				✓	✓			✓		✓
Community Development Block Grants (CDBG)		C		C		✓				✓	C			✓	✓	✓
Special Purpose Taxes (or taxing districts)		C		C									✓	✓		
Gas / Electric Utility Fees										✓						
Water / Sewer Fees					✓	✓				✓	✓		✓	C	✓	✓
Stormwater Utility Fees											✓					✓
Development Impact Fees						✓										✓
General Obligation, Revenue, and/or Special Tax Bonds		✓		✓	✓	✓				✓	✓			✓		✓
Partnering Arrangements or Intergovernmental Agreements		✓		✓		✓				✓	✓			✓		✓

Comments:

Canaan-Can put plans in place, however we are financially limited

Mitigation Techniques

After evaluating the hazards facing Wayne County and identifying the number of people and the extent of property at risk, the Core Committee began to analyze mitigation actions that might be taken to reduce that risk. During the kick-off meeting the Core Committee began to discuss and analyze the mitigation techniques. In general, all activities considered can be classified under one of the following six (6) broad categories of mitigation techniques.

1. Prevention

Preventative activities are intended to keep hazards from getting worse, and are typically administered through regulatory programs or enforcement actions. Adopting and administering ordinances, regulations, and programs that manage the development of land and buildings to minimize risks of loss due to natural hazards.

- *Building codes*
- *Land use plans*
- *Subdivision regulations*
- *Floodplain regulations*
- *Capital improvement programs*

2. Property Protection
Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard This includes retrofitting existing structures to increase their resistance to damage and exposure of occupants to harm, relocating vulnerable structures and occupants from hazard locations, and conversion of developed land to permanent open space through acquisition and demolition of existing structures.

- *Acquisition of flooded homes*
- *Elevation above flood height*
- *Safe rooms*
- *Tie downs*
- *Critical facilities protection*
- *Insurance*

3. Public Education and Outreach
Public educating and outreach activities are used to advise the public about the risks of hazards hazardous areas, and mitigation techniques available to reduce threats to life and property.

- *Severe weather awareness events*
- *Public service announcements on radio or television*
- *Internet access to hazard information*
- *Social media campaigns*

4. Natural Resources Protection
Preserving and restoring the beneficial functions of the natural environment to promote sustainable community development that balances the constraints of nature with the social and economic demands of the community. Such areas include floodplains, wetlands, etc. Parks, recreation, or conservation agencies and organizations often assist with the implementation of these protective measures.

- *Open space easements*
- *Wetland restoration/preservation*
- *Acquisition of environmentally beneficial lands*
- *Floodplain protection*
- *Watershed management*
- *Riparian buffers*

5. Emergency Services
Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. Responding to and recovering from a natural hazard disaster.

- *Disaster warning and forecasting systems*
- *Weather alert radios*
- *Storm shelters*
- *Emergency power generation*

6. Structural Projects
Engineering structural modifications to natural systems and public infrastructure to reduce the potentially damaging impacts of a hazard on a community. They are usually designed by engineers and managed or maintained by public works departments at local, state and federal agency levels.

- *Reservoirs*
- *Dams / levees*
- *Stream channel modifications*
- *Storm sewers*

Evaluation of Potential Mitigation Actions

FEMA guidance for meeting the planning requirements of the Disaster Mitigation Act of 2000 specifies that plan participants should consider a variety of potential mitigation actions. Considering mitigation is a long-term, ongoing process. Actions are continuously considered based on community needs. Further, there may be a variety of solutions for an existing problem. By evaluating potential actions against a range of factors, the best solution can be selected.

The Core Committee considered the county's overall hazard risk and capability to mitigate the effects of hazards. To assist in evaluating potential actions, the planning team applied the FEMA-recommended "STAPLEE" evaluation criteria to each proposed mitigation action. This includes social, technical, administrative, political, legal, economic and environmental considerations, collectively known as "STAPLEE" evaluation criteria and listed in Table 49. Any proposed actions that were deemed to not adequately meet the "STAPLEE" evaluation criteria were eliminated from further consideration in the development of the Mitigation Action Plan. In addition to STAPLEE the Core Committee considered life safety which factored into final prioritization of actions.

Table 49: Additional Considerations (STAPLEE evaluation)

Hazard	Justification for Inclusion
Socially Acceptable	Is the proposed action socially acceptable? Is the action compatible with present and future values? Are there equity issues involved that would mean that one segment of the community is adversely affected?
Technically Feasible	Will the proposed action serve as a long term solution? Will it create any negative secondary impacts? Are there any foreseeable problems or technical constraints that could limit its effectiveness?
Administratively Possible	Does the community have the capability to implement the proposed action? Is there someone available to coordinate and sustain the effort?
Politically Acceptable	Is there political support to implement the proposed action? Is there enough public support to ensure the success of the action?

Hazard	Justification for Inclusion
Legal	Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for the action? Are they any potential legal consequences of the action?
Economically Sound	What are the costs and benefits of the proposed action? Does the cost seem reasonable for the size of the problem and the estimated benefits? Are there funding sources available to help offset costs of the action? Is the action compatible with other goals of the college?
Environmentally Sound	How will the action impact the environment (natural resources, ecosystems, endangered species, etc.)? Will the action require any environmental regulatory approvals? Is the action consistent with other environmental goals of the college?

Selection of Mitigation Actions

The MAP is a functional plan for action and is considered to be the most essential outcome of the mitigation planning process. The MAP includes a prioritized listing of proposed hazard mitigation actions (policies and projects) for the county and participating jurisdictions to implement. Each action includes accompanying information such as the department responsible for completing the action, timeline, and funding source.

The MAP provides departments or individuals responsible for implementing mitigation actions with a clear path to reduce vulnerability over time. Further, the MAP provides a mechanism to monitor progress over time. Each action also considers benefits and costs of an action, to ensure it is cost effective, which is included in the prioritization of actions.

Prioritization of Mitigation Actions

All actions considered cost-effectiveness including a cost-benefit review for prioritization. In addition, local knowledge or need may necessitate a priority shift from the guidelines presented below.

- **Low Priority Projects**: Projects that are associated with low or infrequent hazard probability and least likely to prevent loss of life.
- **Medium Priority Projects**: Projects associated with a less probable hazard with potential to save lives or damage to property.
- **High Priority Projects**: Projects identified in response to one or more of the highest probability hazards combined with the ability to save lives.

Implementation of Mitigation Actions

The MAP includes several measures to ensure actions are implemented. Wayne County Emergency Management Agency will serve as the coordinating agency. However, each action is

tied to an agency or individual responsible for leading the mitigation action. By assigning responsibility, it increases accountability and the likelihood of action.

In addition to assignment of a local lead department or agency, an implementation time period or a specific implementation date has been assigned in order to assess whether actions are being implemented in a timely fashion. Further, the county will seek outside funding sources to implement mitigation projects in both pre-disaster and post-disaster environments. When known, potential funding sources have been identified for proposed actions listed in the Mitigation Action Plan.

The MAP, provides a functional plan of action for each jurisdiction. It is designed to achieve the established mitigation goals and will be maintained on a regular basis according to the plan maintenance procedures.

Each proposed mitigation action has been identified as an effective measure (policy or project) to reduce hazard risk for Wayne County. Each action is listed in the MAP in conjunction with background information such as the plan goal addressed by the action, a brief description of the action, hazard(s) addressed, relative priority, and estimated cost. Other information provided in the MAP includes potential funding sources to implement the action should funding be required (not all proposed actions are contingent upon funding). Most importantly, implementation mechanisms are provided for each action, including the designation of a lead agency or department responsible for carrying the action out as well as a timeframe for its completion. These implementation mechanisms ensure that the Wayne County Hazard Mitigation Plan remains a functional document that can be monitored for progress over time. The proposed actions are not listed in priority order, though each has been assigned a priority level of "high," "moderate," or "low" as described below. The plan goals are provided below for reference and are listed by number in the Mitigation Action Plan in Table 50.

Plan Goals

1. Reduce the loss of life, property, and repetitive damage from the effects of natural hazards.
2. Create safe, sustainable communities through long-range planning that seeks a balance between the natural and man-made environments.
3. Establish a program that will help facilitate orderly recovery and minimize economic disruption following a disaster.
4. Incorporate the use of mitigation throughout the entire County by making and keeping the public aware of hazard risks and mitigation measures.

Table 50 : 2017 Mitigation Action Plan

Goal	Project Description	Hazard	Jurisdiction	Type	Cost	Benefit (enviro, lives saved, losses avoided)	CBR (assumed to be cost effective?)	Funding Source	Time Frame	Responsible Parties	Priority	2017 Status
4	Educate the public on hazard awareness by providing severe weather training classes and publish education material regarding hazards	All	All	Public Education/ Awareness	Low	Public Information	Yes, minimal cost	General Revenue Fund	Seasonal Programs	Wayne County EMA	Medium	In progress (initiated in previous plan) : County continues to develop and distribute education material
1	Increase tornado siren coverage within the County	Tornado	All	Emergency Services	Medium	Life Safety	Yes	EMPG, Additional Grants	Ongoing	Wayne County EMA	Medium	In progress (initiated in previous plan): County continues to install sirens when need and funding are identified
2	Review and update plans that oversee future development	Flood, Tornado, Severe Winter Weather	All	Prevention	Low	Loss Avoidance	Yes	General Revenue Fund, Grant Funding	Ongoing	County/ Municipal Planning/ Building Departments	Medium	In progress (initiated in previous plan): Planning departments update plans as needed
1	Generators for critical facilities (WWTP, sensitive populations, emergency services)	All	All	Property Protection; Emergency Services	High	Loss Avoidance	Yes	Grant Funding (PDM)	2018-2022	Wayne County EMA, Village and City Municipalities	Medium	New action for 2017 update

Goal	Project Description	Hazard	Jurisdiction	Type	Cost	Benefit (enviro, lives saved, losses avoided)	CBR (assumed to be cost effective?)	Funding Source	Time Frame	Responsible Parties	Priority	2017 Status
1	Encourage community participation in the National Flood Insurance Program	Flood	All	Prevention	Low	Loss Avoidance	Yes	General Revenue Fund	Ongoing	Wayne County Planning Dept. and EMA	Low	In progress (initiated in previous plan): outreach to non-participating communities
1	Enhance emergency notification system and reverse 9-1-1 services	Flood, Severe Winter Weather	All	Emergency Services	Medium / High	Life Safety	Yes	Grant Funding	Ongoing	Wayne County EMA	Medium	In progress (initiated in previous plan): Discussions are ongoing with communities
3	Seek grant funding to mitigate frequently flood structures	Flood	All	Property Protection	High	Loss Avoidance, Life Safety	Yes	Grant Funding (PDM)	2018-2022	Wayne County EMA, Village and City Municipalities Planning/ Building Depts.	Low	New action for 2017 update
1	Emergency back-up generator for critical facilities	All	Burbank, Village of / Canaan Township	Property Protection/ Emergency Services	High	Loss Avoidance	Yes	Grant Funding (PDM)	2018-2022	Village of Burbank and Canaan Township (Mayor/ Fire Dept.)	low	New action for 2017 update
3	Mitigate critical infrastructure that impact by flood	Flood	Burbank, Village of / Canaan Township	Property Protection	High	Loss Avoidance	Yes	Grant Funding (PDM)	2019-2022	Village of Burbank, Canaan Township (Mayor/ Fire Dept.) and Wayne County EMA	low	New action for 2017 update

Goal	Project Description	Hazard	Jurisdiction	Type	Cost	Benefit (enviro, lives saved, losses avoided)	CBR (assumed to be cost effective?)	Funding Source	Time Frame	Responsible Parties	Priority	2017 Status
1	Identify location for severe weather/tornado community shelter or safe room	Tornado	Burbank, Village of / Canaan Township	Structural Projects	High	Life Safety	Yes	Grant Funding (PDM)	2018-2022	Village of Burbank, Canaan Township (Mayor/ Fire Dept.) and Wayne County EMA	Medium	New action for 2017 update
1	Emergency back-up generator for critical facilities	All	Creston, Village of/ Canaan Township	Property Protection/ Emergency Services	High	Loss Avoidance	Yes	Grant Funding (PDM)	2018-2022	Village of Creston and Canaan Township (Mayor/ Fire Dept.)	low	New action for 2017 update
3	Study to assess stormwater flooding impacts	Flood	Creston, Village of	Structural Project/ Prevention	High	Loss Avoidance	Yes	Grant Funding (PDM)	2019-2022	Village of Creston (Mayor)	Medium	New action for 2017 update
3	Mitigate critical infrastructure that impact by flood	Flood	Creston, Village of/ Canaan Township	Property Protection	High	Loss Avoidance	Yes	Grant Funding (PDM)	2019-2022	Village of Creston, Canaan Township (Mayor/ Fire Dept.) and Wayne County EMA	low	New action for 2017 update
1	Identify location for severe weather/tornado community shelter or safe room	Tornado	Creston, Village of/ Canaan Township	Structural Projects	High	Life Safety	Yes	Grant Funding (PDM)	2018-2022	Village of Creston, Canaan Township (Mayor/ Fire Dept.) and Wayne County EMA	Medium	New action for 2017 update
1	Emergency Back-up Generator for town hall and police department.	Tornado, High Winds	Doylestown, Village of	Property Protection; Emergency Services	High	Loss Avoidance	Yes	Grant Funding (PDM)	2018-2022	Village of Doylestown (Mayor/ Fire Dept.), Wayne County EMA	Medium	New action for 2017 update

Goal	Project Description	Hazard	Jurisdiction	Type	Cost	Benefit (enviro, lives saved, losses avoided)	CBR (assumed to be cost effective?)	Funding Source	Time Frame	Responsible Parties	Priority	2017 Status
2	Stormwater detention near Crown Hill to reduce flooding impacts	Flood	Orrville, City of	Property Protection	High	Loss Avoidance	Yes	Grant Funding (PDM)	Finished	City of Orrville (Planning/ Building Dept.) and Wayne County EMA	High	Completed (initiated in previous plan)
2	Stormwater flooding assessment for Landis Ditch & Fairlawn Gully	Flood	Rittman, City of	Property Protection	High	Loss Avoidance	Yes	Grant Funding (PDM)	Finished	City of Rittman (Planning/ Building Dept.) and Wayne County EMA	High	Completed (initiated in previous plan): Assessment completed in 2017
2	Stormwater retention basins	Flood	Rittman, City of	Prevention / Property Protection	High	Loss Avoidance	Yes	Grant Funding and Local Match	2020-2022	City of Rittman (Planning/ Building Dept.), Wayne County	High	New action for 2017 update
4	Risk assessment and inundation mapping for all Class 1 dams in the County	Dam Failure	Wayne County	Structural Projects	High	Loss Avoidance, Life Safety	Yes	General Revenue Fund	ongoing	Wayne County EMA	Medium	In-progress (initiated in previous plan): Inundation mapping has been completed for one Class I dam
4	Explore adding flood monitoring facilities on streams and coupling with a disaster warning system to give early warning of floods.	Flood	Wayne County	Emergency Services	Medium	Loss Avoidance, Life Safety	Yes	Grant Funding, General Revenue Fund	2018-2020	Wayne County EMA	Medium	New action for 2017 update
1	Identify potential location and development of community safe room	Tornado, High Winds	Wayne County	Structural Projects	High	Life Safety	Yes	Grant Funding (PDM)	2018-2022	Wayne County EMA	Medium	New action for 2017 update

Goal	Project Description	Hazard	Jurisdiction	Type	Cost	Benefit (enviro, lives saved, losses avoided)	CBR (assumed to be cost effective?)	Funding Source	Time Frame	Responsible Parties	Priority	2017 Status
1	Identify location and establish secondary EOC	All	Wayne County	Emergency Services	Medium / High	Life Safety	Yes	Grant Funding	2018-2022	Wayne County EMA	Medium	New action for 2017 update
1	Assess landslide risk for possible inclusion in future mitigation plan update	Landslide	Wayne County	Prevention	Low	Loss Avoidance	Yes	General Revenue Fund	2018-2020	Wayne County EMA	Medium	New action for 2017 update
1	Remove overhang of tree to reduce possible flooding due to debris in culverts. Conduct analysis of response calls for debris removal.	Severe Wind/ Flooding	Wayne County Engineer Office	Prevention	Medium	Loss Avoidance	Yes	Grant Funding (PDM)	2018-2022	Wayne County Engineer Office	Medium	New action for 2017 update
1	Reinforce water and sewer infrastructure	Earthquake /Tornado	West Salem, Village of	Structural Projects	High	Loss Avoidance, Environmental Preservation	Yes	Grant Funding (PDM), County and General Funds	2018 - 2028	Village of West Salem (Mayor), Wayne County	Medium	New action for 2017 update
1	Identify potential location and development of community safe room	Tornado, High Winds	Wooster, City of	Structural Projects	High	Life Safety	Yes	Grant Funding (PDM)	2018-2022	City of Wooster (Planning/ Building Dept.)	Medium	New action for 2017 update
2	Development of riparian setback ordinance	Flood	Wooster, City of	Prevention	Low	Loss Avoidance, Environmental Preservation	Yes	General Revenue Fund	2018-2019	City of Wooster (Planning/ Building Dept.)	Medium	New action for 2017 update

SECTION 6: PLAN MAINTENANCE

44 CFR Requirement

44 CFR Part201.6(c)(4)(i): *The plan shall include a plan maintenance process that includes a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.*

44 CFR Part 201.6(c)(4)(ii): *The plan maintenance process shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

44 CFR Part 201.6(c)(4)(iii): *The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.*

Implementation and Integration

This Hazard Mitigation Plan clearly identifies the mitigation measures chosen by Wayne County and the participating jurisdictions. Each jurisdiction will integrate this Plan into relevant government decision-making processes or mechanisms, where feasible. This includes integrating the requirements of the Plan into other local planning documents, processes or mechanisms, such as comprehensive or capital improvement plans, when appropriate. Section 5 identifies the capabilities, plans and regulations for each jurisdiction where there this an opportunity for this Plan to be integrated in the future if feasible. The members of the Core Committee, led by Wayne County EMA, will remain charged with ensuring that the goals and actions of new and updated local planning documents for their agencies or departments are consistent and do not conflict with this Plan. Further, they will ensure that any actions will not contribute to increased hazard vulnerability in Wayne County.

Ideally, once work on the plan is complete, the County will begin adopting these measures. However, funding and support will not be immediately available to implement all of these measures. Efforts must be made to involve the public as well as local officials. Gaining the support and cooperation of these groups of people is a key component of the Plan and its implementation. Even so, initiation of the actions outlined in this Plan is contingent on availability of necessary funding and cooperation of local officials. Obtaining this funding is a process that may take years.

Monitoring, Evaluation and Enhancement

Wayne County Emergency Management Agency is tasked with periodically reviewing the plan to ensure it reflects current vulnerabilities and priorities of the county and participating jurisdictions. Reviewing and monitoring also gives plan developers an opportunity to report progress.

The annual review incorporates the Core Committee's revisions when necessary. The annual review updates any disaster events and/or loss data, as available, as well as evaluates the progress of mitigation actions that have been identified under the plan. The master copy of the Plan with changes is maintained in the Wayne County Emergency Management Agency.

Five Year Plan Review

The Plan will be thoroughly reviewed by the Wayne County Mitigation Committee every five years to determine whether there have been any significant changes in Wayne County that may, require changes to mitigation actions. New development in identified hazard areas, increased exposure to hazards, increase or decrease in capability to address hazards, and changes to federal or state legislation are examples of factors that may affect the content of the Plan.

The plan review provides officials with an opportunity to evaluate those actions that have been successful and to document losses avoided due to implementation of specific mitigation measures. The plan review also provides an opportunity to address mitigation actions that may not have been successful. The Wayne County EMA will be responsible for reconvening the Core Committee and conducting the five-year review.

During the five-year plan review process, the following questions will be considered as criteria for assessing the effectiveness and appropriateness of the Plan:

- Do the goals address current and expected conditions?
- Has the nature or magnitude of risks changed?
- Are the current resources appropriate for implementing the Plan?
- Are there implementation problems, such as technical, political, legal or coordination issues with other agencies?
- Have the outcomes occurred as expected?
- Did County/tribal departments participate in the plan implementation process as assigned?

Following the five-year review, any revisions deemed necessary will be summarized and implemented according to the reporting procedures and plan amendment process outlined herein. Upon completion of the review and update/amendment process, the Wayne County Hazard Mitigation Plan will be submitted to the State Hazard Mitigation Officer at the Ohio Emergency Management Agency (Ohio EMA) for final review and approval in coordination with the Federal Emergency Management Agency (FEMA).

Disaster Declaration

Following a disaster declaration, the Wayne County Hazard Mitigation Plan will be revised as necessary to reflect lessons learned, or to address specific issues and circumstances arising from the event. Wayne County EMA will be responsible for reconvening the Core Committee and ensuring appropriate stakeholders are invited to participate in the plan revision and update process following declared disaster events.

Plan Amendment Process

Upon the initiation of the amendment process, representatives from Wayne County EMA will forward information on the proposed change(s) to all interested parties including, but not limited to, all directly affected community departments, residents, and businesses. Information will also be forwarded to the Ohio EMA. This information will be disseminated in order to seek input on the proposed amendment(s) for no less than a 45-day review and comment period.

At the end of the 45-day review and comment period, the proposed amendment(s) and all comments will be forwarded to the Core Committee for final consideration. The Core Committee will review the proposed amendment along with the comments received from other parties, and if acceptable, the committee will submit a recommendation for the approval and adoption of changes to the Plan.

In determining whether to recommend approval or denial of a Plan amendment request, the following factors will be considered by the Core Committee:

- There are errors, inaccuracies, or omissions made in the identification of issues or needs in the Plan.
- New issues or needs have been identified which are not adequately addressed in the Plan.
- There has been a change in information, data, or assumptions from those on which the Plan is based.

Upon receiving the recommendation from the Core Committee, and prior to adoption of the Plan, the participating jurisdictions will hold a public hearing, if deemed necessary. The governing bodies of each participating jurisdiction will review the recommendation from the Core Committee (including the factors listed above) and any oral or written comments received at the public hearing. Following that review, the governing bodies will take one of the following actions:

- Adopt the proposed amendments as presented;
- Adopt the proposed amendments with modifications;
- Refer the amendments request back to the Regional Hazard Mitigation Planning Committee for further revision; or
- Defer the amendment request back to the Regional Hazard Mitigation Planning Committee for further consideration and/or additional hearings.

Continued Public Involvement

Public participation is an integral component to the mitigation planning process and will continue to be essential as this Plan evolves over time. As described above, significant changes or amendments to the Plan shall require a public hearing prior to any adoption procedures.

Other efforts to involve the public in the maintenance, evaluation, and revision process will be made as necessary. These efforts may include:

- Advertising meetings of the Core Committee in local newspapers, public bulletin boards and/or County office buildings;
- Using websites of participating jurisdictions to advertise any maintenance and/or periodic review activities taking place; and
- Keeping copies of the Plan for public review at the Wayne County EMA.