



HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)



2023

Stark County, Ohio

Hazard Identification and Risk Assessment (HIRA) presented by the Stark
County Emergency Management Agency

Hazard Identification and Risk Assessment (HIRA)

STARK COUNTY, OHIO

PREFACE

Dear Reader,

The Hazard Identification and Risk Assessment (HIRA) for Stark County, Ohio is the following. This analysis incorporates the latest information and requirements available as well as past and historical events concerning hazards. This plan incorporates National Planning Scenarios, National Plan Review, catastrophic planning, and the National Fire Protection Association Standard (NFPA) 1600 Standard.

Our intent in writing this document is to provide an overview of past incidents that have occurred in Stark County. The HIRA for Stark County is not meant to replace an evaluation of potential threats to any particular home, business, institution, or piece of property. It provides a broad examination of what has and might occur in our county over the next few years. This document seeks to capture major events that have occurred in our county. Stark County needs to maintain a history of events that have occurred as those points of weakness and types of events that have already occurred to present similar challenges in the future. Or, as George Santayana has written, "Those who cannot remember the past are condemned to repeat it."

The Hazard Identification and Risk Assessment for Stark County similarly looks to the horizon for new and emerging threats to the Stark County populace. We have used the comprehensive list of potential hazards from NFPA 1600. This list allows us to ponder whether or not a potential hazard is likely to occur in our county.

In summary, this document is not a complete list of the only hazards that will occur in Stark County. This document will help Stark EMA focus its planning efforts on hazards that are more likely to occur than others. Its ability to predict future events is limited at best.

We hope this document is a benefit to other agencies in the county and their emergency planning efforts.

Sincerely,

Stark County Emergency Management Agency

CONTENTS

PREFACE.....	1
INTRODUCTION.....	4
GENERAL OVERVIEW OF HAZARDS IN STARK COUNTY, OHIO	5
Figure 1: Hazard Identification.....	6
Figure 2: Stark County Weather Events (1950-November 2019).....	7
Figure 3: Stark County Count Presidential Major and Emergency Disaster Declarations	8
Figure 4: Gubernatorial Declarations of Emergency	9
Stark County, Ohio Profile.....	10
Geography and Climate.....	10
The Economy of Stark County, Ohio (including transportation)	10
Figure 5: Major Employers in Stark County.....	11
Figure 6: Notable Historical Events and Hazards	11
THE HAZARD ANALYSIS PROCESS	12
Values	12
Figure 7: Factor/Value Overview	15
An Example:.....	16
Figure 8: Stark County Hazzard Summary (Ranking by factor/values).....	17
DETAILED HAZARD SUMMARY	18
Natural Hazards.....	18
Floods.....	18
Tornado/Severe Storms	18
Winter Storms/Ice Storms	19
Subsidence and Landslides.....	19
Infestation.....	20
Figure 9: Ohio Counties in European Gypsy Moth Quarantine.....	21
Drought	21
Epidemic (Disease Outbreak).....	22
Earthquake/Seismic Activity	23
Figure 10: Earthquake Epicenters in Ohio	24
Figure 11: Effects of a Major New Madrid Earthquake in Ohio	25
Wildfire	25
Technological Hazards	26
Hazardous Materials (HazMat)	26
Dam Failure	27
Radiological Incident.....	27
Utility Failure	28
Human-Caused Disasters.....	29
Civil Disturbance	29
Figure 12: Militia Groups in Stark County.....	29
Terrorism (CBRNE).....	30
Active Shooter	30

REFERENCES	32
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INTRODUCTION

This Stark County Hazard Identification and Risk Assessment (HIRA) document is the most current edition for Stark County, Ohio. This document was prepared by the Stark County Emergency Management Agency for use by local agency emergency preparedness officials.

This document intends to be a useful tool for Stark County EMA partners to discuss hazards and vulnerability. The HIRA does not provide policy or action-based recommendations to manage hazards. This document is one element of a comprehensive emergency management program that incorporates prevention, mitigation, preparedness, response, and recovery. Mitigation plans, the Stark County Emergency Operations Plan as well as standard operating procedures round out a comprehensive program to manage hazards.

Emergency Management in Stark County, Ohio is governed by Ohio Revised Code (ORC) 5502.26 which states, “(A) The board of county commissioners of a county and the chief executive of all or a majority of the other political subdivisions within the county may enter into a written agreement establishing a countywide emergency management agency.”ⁱ A countywide agreement, signed by the Stark County Commissioners on February 11, 1982, was promulgated by all political subdivisions for Stark EMA to be the countywide agency for emergency management (disaster services).

For this HIRA, we will use the ORC explanation of hazard. The ORC 5502.21 states hazards mean “...any actual or imminent threat to the survival or overall health, safety, or welfare of the civilian population that is caused by any natural, human-made, or technological event.”ⁱⁱ

As defined by the ORC, hazard identification means “...an identification, historical analysis, inventory, or spatial distribution of risks that could affect a specific geographical area and that would cause a threat to the survival, health, safety, or welfare of the civilian population, the property of that population, or the environment.”ⁱⁱⁱ

The National Fire Protection Association (NFPA) Standard 1600 requires entities to “identify hazards, monitor those hazards, the likelihood of their occurrence, the vulnerability of people, property and the environment, and the entity itself to those hazards”^{iv} as part of the risk assessment process.

This analysis does not offer solutions to hazard-related problems. It is intended, however, to assist readers in attaining a better understanding of hazards and their effects. A brief outline and overview of these hazards will help to illustrate their magnitude.

GENERAL OVERVIEW OF HAZARDS IN STARK COUNTY, OHIO

Upon reviewing the literature, numerous hazards were identified for Stark County. These hazards include those listed in NFPA 1600, the 15 National Planning Scenarios, the National Plan Review, a report produced for Ohio EMA by URS, and Ohio EMA's Enhanced Mitigation Plan. To help simplify the hazards, three major groups have been created to categorize the hazards based on the categories recommended in NFPA 1600. The categories are natural hazards/events, human-caused hazards/events, and technological hazards/events as shown in Figure 1 (on page 7). Each of the hazards identified are not mutually exclusive. Therefore, the hazards are further grouped into seventeen sets of hazards below the three categories. Please see a comprehensive list of hazards on the next page.

As illustrated in Figure 2 (Page 6), the most damaging hazards/events are floods and tornadoes, which (with total costs combined) inflicted over \$254 million in losses over the years in Stark County. Other severe weather events, such as winter storms, have also led to floods or costly recovery actions. Drought has also led to agricultural losses and forced water users to seek assistance during these sustained periods of insufficient precipitation.

Activities associated with mankind also have their effects:

- Woodland and field fires show a need to reduce this costly resource depletion.
- Mine closings have led to issues related to subsidence and landslides. From the 1940s until the present, closings were made without actions to prevent shaft collapses. Urban expansion, or new highway construction, has led to damages related to these collapses.
- Class I and other earthen dams also pose a potential threat to adjacent, or downstream, communities (although not to the extent of floods or tornadoes). Many of these dams serve as up-ground reservoirs or recreational sites. If not properly built or maintained, they may fail, leading to downstream flooding and strained response capabilities.

Over 50 years, the “technical dependency” of the county, state, and nation has become a fact of life. The increased use of synthetics has led to both storage and disposal problems. HAZMAT incidents remain the most common form of technological threat to the State of Ohio, occurring almost daily.

Civil disorder (e.g. riots or acts of terrorism) tends to follow economic or social trends and has not often had origins or causes in Stark County. Civil disorder could affect Stark County, but would probably be limited to larger cities (i.e. Canton, Massillon, and Alliance) and may occur at any time. The past incidents in other areas have emerged from strikes and public demonstrations.

Figure 1: Hazard Identification

NATURAL HAZARDS/EVENTS:	HUMAN-CAUSED HAZARDS/EVENTS:
<u>Earthquake/Seismic Activity</u> Earthquake <u>Subsidence/Landslide</u> Landslides/Land Subsidence <u>Fire</u> Wildfires (Forest, Range, Urban) <u>Floods</u> Floods (Including Flash flooding) <u>Severe Winter Weather</u> Winter Weather (Sever Snow/Ice/Sleet) Extreme Cold <u>Tornado/Severe Storms</u> Hail Thunderstorms Tornado Lightning Strikes Windstorm <u>Drought</u> Drought Extreme Heat Famine <u>Biological</u> Epidemic (Plague, Pan Flu, etc.) Insect Infestations <u>Natural Hazards Not Analyzed for HIRA</u> Animal Infestation/Damage Glacier Coastal Erosion* Expansive Soils* Tsunami Volcano Iceberg Dust/Sand Storm Geomagnetic Storm Storm Surge Hurricane Avalanches *Not explicitly listed in NFPA 1600	<u>Terrorism—Biological Attack</u> Aerosol Anthrax* Plague* Foreign Animal Disease (Foot and Mouth Disease)* <u>Terrorism—Non-Nuclear/Biological/Chemical</u> Civil Disturbances (Riots, Hate Groups) Explosives Attack/Bombing Active shooter <u>Human-Caused Hazards Not Analyzed for HIRA</u> Air/Water Pollution, Contamination Financial Issues, Economic Depression, Inflation Communication Systems Interruptions Building Collapse Transportation Emergency Fuel/Resource Shortage Explosion/Fire Enemy Attack/War Insurrection Disinformation Physical or Information Security Breach Misinformation TECHNOLOGICAL HAZARDS/EVENTS: <u>Hazardous Materials</u> Hazardous Materials Solid Waste Disposal Problems <u>Dam Failure</u> Water Control Structure (Dam/Levee Failures) <u>Power Failure</u> Energy/Power/Utility Failure (Including the Department of Energy) <u>Radiological Incident</u> Radiological Incidents Nuclear Power Generating Facilities* <u>Terrorism</u> Nuclear/Chemical/Biological Attacks <u>Transportation Incidents</u> Chlorine Tank Explosion <u>Terrorism—Dirty Bomb</u> Radiological Dispersal Devices* <u>Technological Hazards Not Analyzed for HIRA</u> Electromagnetic Pulse

Figure 2: Stark County Weather Events (1950-November 2019)

Weather Type	Total	Highest Magnitude	Highest # of Deaths	Highest # of Injuries	Highest Amount of Property Damage	Highest Amount of Crop Damage
Thunderstorm Winds	312	83kts. 06/24/2004 Canal Fulton	1 06/22/2006 Countywide	1 04/13/1994 Canton 07/09/1999 06/22/2006 Countywide	1.2M 06/22/2006 Countywide	25K 07/21/2003 Crystal Springs
High Winds	35	52kts 3/14/1998	0	0	2.0M 9/15/2008 Countywide	250K 9/15/2008
Strong Winds	5	49kts. 03/10/2006	0	0	75K 09/09/2004	0
Hail	213	3.0 in. 08/10/1980 2.75 in. 04/09/2001 North Industry	0	1 04/09/2001 Navarre	30M 07/26/2008 Reedurban	50K 09/25/1994 Stark Co.
Tornado/ Funnel Clouds	18	F2 11/16/1965 04/28/2002 Stark Co.	2 11/16/1965 Stark Co.	9 11/16/1965 Stark Co.	45.5M 04/28/2002 Crystal Springs	0
Extreme Cold/Wind Chill	8	-30 F wind-chill 01/28/2014	0	0	100K 02/02/1996	0
Ice Storm	4	½ in. 02/02/2011 Countywide 60% power outage	0	14 03/09/1994 18 S & E Counties	6 M 01/05/2005	500K 02/08/1994 23 North & Central Counties
Heavy Snow	7	N/A	0	0	1.0 M 02/16/2003	0
Winter Storm	23	N/A	0	2 01/02/1999	3.8 M 12/22/2004 Stark Zone	0
Blizzard	1	N/A	1 12/19/1995 25 N. Counties	0	800K 12/19/1995 25 N. Counties	0
Flash Flood	45	N/A	2 06/25/1995 Countywide	0	52M 07/27/2003 Countywide	250K 06/22/2006 S. Stark Co.
Flood	22	N/A	0	0	7.0M 06/17/2019 Canal Fulton*	20K 06/01/1997 Countywide
Lightning	19	N/A	01 08/02/2017 North Brewster	1 07/26/2005, North Canton 05/29/2001 Massillon	175K 07/14/2000 N. Canton	0
Heat Wave/ Drought	12	N/A	13 08/08/1995 32 Northern Counties	52 08/08/1995 32 Northern Counties	600K 07/12/1995 32 Northern Counties	3.0M 09/01/1999
Heavy Rain	2	N/A	0	0	0	0

Source: NOAA Storm Reports: <https://www.ncdc.noaa.gov/stormevents/>

Figure 3: Stark County Count Presidential Major and Emergency Disaster Declarations

Disaster Declaration Number	Date Declared	Federal Disaster Programs	Incident Type	Other Counties included in the Declaration	Funds Provided
DR-266	15-Jul-69	PA	Heavy rains and flooding	Ashland, Ashtabula, Coshocton, Cuyahoga, Erie, Harrison, Holmes, Huron, Lake, Lorain, Lucas, Medina, Morgan, Muskingum, Ottawa, Richland, Sandusky, Seneca, Stark, Trumbull, Tuscarawas, Wayne, Wood	\$1,000,000 (P)
DR-3055-EM	26-Jan-78	PA	Severe blizzard conditions	All 88 counties	\$3,546,669 (P)
DR-1484*	1-Aug-03	IA/PA/MIT	Severe storms, tornadoes, and flooding	Carroll, Columbiana, Cuyahoga, Franklin, Jefferson, Mahoning, Medina, Portage, Richland, Stark, Summit and Trumbull (IA/MIT); Adams, Columbiana, Carroll, Jefferson, Mahoning, Medina, Monroe, Portage, Stark, Summit, Trumbull and Vinton (PA)	\$135,723,395 (I) \$13,160,834 (P)* \$6,016,488 (M) \$162,790 (S)-
DR-1519*	3-Jun-04	IA/PA/MIT	Severe storms and flooding	Athens, Carroll, Columbiana, Cuyahoga, Delaware, Guernsey, Harrison, Hocking, Holmes, Medina, Noble, Perry, Portage, Summit, and Tuscarawas (IA/PA/MIT); Crawford, Geauga, Licking, Logan, Lorain, Mahoning, Richland and Stark (IA/MIT) and Knox and Jefferson (PA/MIT)	\$30,238,921 (I)* \$14,00,750 (P)* \$2,305,560 (M) \$748,426 (S)-
DR-1556*	19-Sep-04	IA/PA/MIT	Severe storms and flooding	Athens, Belmont, Carroll, Columbiana, Gallia, Guernsey, Harrison, Jefferson, Meigs, Monroe, Morgan, Muskingum, Noble, Perry, Tuscarawas, Vinton and Washington (IA/PA/MIT); Lawrence, Mahoning, Stark and Trumbull (IA/MIT)	\$47,455,690 (I) \$35,597,480 (P)* \$3,948,349 (M)* \$2,300,000 (S)
DR-1580	15-Feb-05	IA/PA/MIT	Severe winter storms, ice, and mudslides	Clark, Sandusky, Warren, and Miami (IA/MIT); Ashland, Auglaize, Athens, Belmont, Coshocton, Crawford, Delaware, Fairfield, Franklin, Guernsey, Henry, Hocking, Holmes, Huron, Jefferson, Licking, Logan, Morgan, Muskingum, Pickaway, Pike, Richland, Ross, Scioto, Stark, Tuscarawas, Washington, and Wyandot (IA/PA/MIT); Adams, Allen, Brown, Carroll, Champaign, Clermont, Columbiana, Darke, Fayette, Hancock, Hardin, Harrison, Highland, Know, Lorain, Marion, Median, Meigs, Mercer, Monroe, Montgomery, Morrow, Noble, Paulding, Perry, Putnam, Seneca, Shelby, Union, Van Wert and Wayne (PA/MIT)	\$13,823,757 (I)* \$123,935,836(P)* \$7,534,746(M)* \$1,500,000 (S)-
EM-3250	13-Sep-05	PA	Hurr. Katrina Emerg. Shelter Operations	All 88 Counties were included in the federal declaration	\$2,499,103 (P)*
DR-1651	2-Jul-06	IA/MIT	Severe storms and flooding	Cuyahoga, Erie, Huron, Lucas, Sandusky, and Stark	\$25,001,761 (I)* \$1,798,019 (M) \$593,090 (S)
HMGP first available with a disaster declared after 1987. (P) - Public Assistance (S) - State Match to Federal Hazard Mitigation funds (M) - Hazard Mitigation Grant (I) - Individual Assistance includes FEMA Disaster Housing, SBA loans for homes, personal property, and businesses, and FEMA/State Other Needs Assistance grants for families and individuals *Indicates the disaster is not officially closed. Information updated as of October 2019. Information retrieved from State of Ohio Disaster History (1964-2018)					

Hazard Identification and Risk Assessment (HIRA)

These incidents have affected both people and property. Gubernatorial Declarations for Stark County, Ohio (Figure 4) have often been issued for several other events, not qualifying for federal assistance via Presidential Declarations, as “Emergencies” or “Disasters”. This process served to initiate coordinated state response efforts for areas requiring assistance beyond local capabilities. The total number of Gubernatorial Declarations for all the counties of Ohio (1987-2001) is 41.

Figure 4: Gubernatorial Declarations of Emergency

INCIDENT	DATE	AFFECTED AREA
Drought w/Burning Ban	31-Oct-91	Statewide
Drought (Burning Ban Rescinded)	2-Nov-91	Statewide

Source: Ohio EMA (Mitigation/PIO/DRB Files)

Although hazards may either decrease or increase, from a strictly numerical standpoint, inflationary labor and material trends have caused overall recovery costs to rise. Each new event is more costly to the county, state, and nation than its predecessors.

Stark County, Ohio Profile

Stark County is vulnerable to many forms of natural, technological, or other hazards. The effects of these (regardless of type or size) upon the county may vary due to differences in urbanization, geography, or land use. A better understanding of both hazards and associated risks may be obtained by a brief examination of the characteristics of the county.

Geography and Climate

Stark County is located in northeastern Ohio, approximately fifty miles south of Cleveland. Stark County covers 579.4 square miles, ranking eleventh in area of the eighty-eight counties in Ohio. Stark County is bounded on the north by Summit and Portage counties; east by Mahoning and Columbiana counties; south by Carroll and Tuscarawas counties; and west by Holmes and Wayne counties.

The 2018 US Census Bureau estimate shows Stark County, Ohio has a population of approximately 371,574. The population exceeds 400,000 during the Professional Football Hall of Fame Festival and several other events each year.

Topographically, the Stark County is in the Appalachian Plateau Physiographic Province. The northern two-thirds of the county is located in the glacial part of the Appalachian Plateau, and the rest of the County is unglaciated. Elevations range from a little less than 900 feet above sea level to about 1,350 feet above sea level. The topography of the unglaciated portion of the County is hilly and steep and variations in relief average about 200 feet within one-half mile. The glaciated part of the County is undulating and rolling, with an average relief varying less than 100 feet within a mile.

Stark County possesses a continental climate ranging through the year from cold, damp winters to warm, humid summers with prevailing westerly wind patterns. Annual temperature ranges vary from an average of 35 degrees F to an average of 82.4 degrees F in July. Average annual precipitation, both rain and snow, is 36.8 inches overall.

The Economy of Stark County, Ohio (including transportation)

Stark County has an economy based mainly upon educational services, health care and social assistance, manufacturing, and trade (See Figure 4). The median household income is \$50,117. Out of the over 177,000 working residents of Stark County, almost twenty-one percent (20.7) of them commute out of the county to work. Nearly seventeen percent (16.9) of Stark County workers commute in from surrounding counties, averaging a commute time of twenty-one minutes.

Figure 5: Major Employers in Stark County

MAJOR EMPLOYERS	TYPE
Alliance Community Hospital (Aultman)	Health Care
Aultman Hospital	Health Care
Diebold Nixdorf, Inc	Computer Services, Finance
Fisher Food, Inc.	Trade
Synchrony	Finance
Mercy Medical Center	Health Care
PCC Airfoils	Manufacturing
Republic Engineered Products	Manufacturing
Stark State College	Technical College
TimkenSteel Company	Manufacturing

Source: Stark Development Board, 2017

Stark County contains a foreign trade zone, Foreign Trade Zone #181, which includes over eight hundred acres of prime commercial/industrial sites. Some of the benefits of being in a foreign trade zone include improved cash flow, reduced, deferred, or eliminated customs duties or tariffs, quota avoidance, and flexibility in the disposition of returned or defective goods.

Passing through and inside Stark County, there are 21 state highways, covering 232 miles; four national highways, covering 72 miles; and one Interstate highway, covering 19 miles.

There are three railroads in Stark County, two Class I railroads and one Regional, listed respectively: CSX Transportation Inc. (CSXT); Norfolk Southern Corporation (NS); and the Wheeling & Lake Erie Railway Co. These railroads transport raw materials as well as finished products. Passenger transportation is provided by AMTRAK.

For almost 200 years, Stark County, Ohio has experienced disasters varying in origins and effects. Some of the more noteworthy of these which resulted in loss of life or economic damages are listed in Figure 5.

Figure 6: Notable Historical Events and Hazards

NAME OF DISASTER	YEAR	HAZARD/EVENT TYPE	LOCATION	CASUALTIES
Cholera Epidemic	1849-50	Biological/Epidemiological	Statewide	5,000+
Influenza Epidemic	1918	Biological/Epidemiological	Statewide	Multiple Thousands
Winter Flood	1937	Flood	Statewide	250
Blizzard	1950	Winter Storm	Statewide	Unknown
Winter/Spring Floods	1959	Flood	Statewide	Unknown
Blizzard	1978	Winter Storm	Statewide	51
Winter Storms	2004-05	Severe Winter Weather	Statewide	Unknown
Radium Response	2016	Radiation Release	Stark County	0

Source: Ohio Almanac/Contributing Agencies/Ohio EMA (Plans)

THE HAZARD ANALYSIS PROCESS

A hazard analysis consists of two elements: the identification of a hazard (with related threats to life and property) and an assessment of the risks associated with that hazard. Research for this analysis involved the collection of both historical and statistical data, including interviews with professionals in various disciplines. Information was then systematically analyzed for potential risk value. The risks associated with each hazard were further assessed using eight factors with numerical risk values. These nine factors are: Past Declarations, Historical Occurrence, Magnitude, Frequency, Warning Time, Demographic Factors, Fiscal Effects, Duration, and Response/Recovery Time. Numerical values were applied to provide a basis on which to compare assigned weights among hazards and assigned risks. Factor value totals were then added, allowing hazards to be compared against each other to obtain final rankings.

Values

Past Declarations: Some disasters have occurred with enough impact that disaster declarations have been requested and declared. This details the severity of the event.

5	Excessive	Many county declarations have occurred
4	High	
3	Medium	Some declarations have occurred
2	Low	
1	None	No declarations have occurred

Historical Occurrences: All research has indicated the frequency with which events have occurred. Some have been fairly frequent in this county while others are only sporadic. This is based on historical reports and queries of subject matter experts for various local authorities.

5	Excessive	Hazard has occurred multiple times in a year.
4	High	Hazard has occurred more than ten times within a ten-year period.
3	Medium	Hazard has occurred from up to ten times in a ten-year period.
2	Low	Hazard has occurred from one to five times within a ten-year period.
1	None	Hazard may have occurred over 10 years ago

Magnitude: Magnitude refers to the number of lives (population) affected. It also includes the type of area in which the hazard has affected.

4	High	Catastrophic; A large area is affected.
3	Medium	Critical; small areas have been affected
2	Low	Limited; Multiple sites have been affected
1	None	Negligible; Single site has been affected

Probability: Probability relates to the chance or possibility of a specific hazard occurring. No probability is any percentage from 0-24 percent of the hazard occurring; some probability of a hazard occurring is 25-50 percent; greater probability of a hazard occurring is 51-75 percent; and a high probability of a hazard occurring is 76-100 percent. Rankings are 2, 4, 6, or 8.

8	High Probability	76-100% chance
6	Greater Probability	51-75% chance
4	Some Probability	25-50% chance
2	No Probability	0-24% chance

Warning Time: Warning Time may affect both the demographic and fiscal factors of a hazard. The lead time required protecting lives and property varies greatly with each event. For instance, a winter storm may develop so slowly that there is time to alert crews and place plows, but flash floods can occur with no warning.

4	Short-none	Under 15 minutes
3	Short	15-30 minutes
2	Medium	31-60 minutes
1	Extended	More than 60 minutes

Demographic Factors: The Demographic Factor refers to the effects upon a populace; casualties via deaths or injuries that can be expected from a given event. The Shadyside Flood of 1990 was a powerful flash flood (with mudslides) that occurred in an area without a warning system, resulting in 33 deaths. Other types of floods (as on the Ohio River) may develop slowly, allowing more warning time and, thus, few, or no, casualties.

8	High	10 +
6	Medium	6-10
4	Low	1-5
2	No Casualties	0

Hazard Identification and Risk Assessment (HIRA)

Duration: Duration may be defined as “time on the ground” or that time period when a hazard, or event, is actively present and causing damage. A HAZMAT spill may last a few minutes or a flood for a week. Duration, therefore, may not always be indicative of the degree of damage but it remains a factor.

4	Long	Over 1 week
3	Medium	13 hours-1 week
2	Short	1-2 hours
1	Minimal	Up to 1 hour

Fiscal Effects: Fiscal Effects relate to the monetary losses suffered in an event. This factor can vary between jurisdictions based on economic, geographic, demographic, and legal considerations. Subdivisions that consistently enforce floodplain regulations are less likely to incur severe fiscal losses than those permitting construction in floodplains.

8	High	Over \$100,000
6	Medium	\$50,001-\$100,000
4	Low	\$10,001-\$50,000
2	Minimal	\$0-\$10,000

Response/Recover Time: Response time refers to the time the local agencies respond to the hazard and how quickly they progress into recovery. The type of event and its severity will determine how long the recovery may take. Some events take years to recover.

8	Extreme
6	High
4	Medium
2	Low

In some areas, figures shown in this analysis may appear to conflict with other data. Information relating to tornado frequencies may, for example, reflect a greater or lesser total number of events than that cited in annual weather safety programs. This apparent discrepancy is based on the fact that the source of the data, the National Weather Service, uses two separate databases, one listing each tornado with multiple touchdowns as one event; while another base counts single tornado touchdowns at several points as multiple tornado events. See Figure 7 for the breakdown of eight of the nine factors.

Figure 7: Factor/Value Overview

HISTORICAL OCCURRENCES		DEMOGRAPHIC FACTOR	
Low Probability	5 events within 5-10 yrs	No Casualties	0 Injuries/Deaths
Medium Probability	10 events within 5-10 yrs	Low	1 to 5
High Probability	10+ events within 5-10 yrs	Medium	6 to 10
Excessive Probability	10+ events within 1 year		
MAGNITUDE		FISCAL EFFECTS	
Negligible/Single Site	Village, Farm, Road Junct	Minimum Losses	\$0-\$10,000
Limited/Multiple Sites	1+ of the above	Low Losses	\$10,000-\$50,000
Critical/Small Area	Whole cities or grouping of cities up to 5 or 10	Medium Losses	\$50,000-\$100,000
Catastrophic/Large Area	The whole county and surrounding counties	High Dollar Losses	\$100,000+
DURATION		Probability	
Minimal	Up to 1 Hour	No Probability	0%
Short	1-12 Hours	Some Probability	25-50%
Medium	13 hours to 1 week	Greater Probability	51-75%
Long	Over 1 Week	High Probability	76-100%
RESPONSE TIME		WARNING TIME	
Low	Less than 24 Hours	Short/None	Less than 15 Min
Medium	1-5 Days	Short Time	15-30 Minutes
High	6-10 Days	Medium Time	31-60 Minutes
Extreme	10+ Days	Extended Time	60+ Minutes
RECOVERY			
The event will govern the amount of time for recovery. Some recovery may take years.			

An Example:

For illustrative purposes, “Sample” County officials, in conducting a hazard analysis, are studying the tornado hazard for the county. By use of this example, we can see how the process may be applied to one county.

There were five tornadoes in the county in the last 10 years. Historical Occurrence receives a 2. Magnitude is given a value of 2 as research indicated that the tornadoes only occurred at single or multiple sites. Probability is possible, but not likely, so it has a value of 4. The siren system can usually give a 5-15 minute warning time so that factor receives an 8. The Demographic Factor rated an 8 as the county’s many trailer parks incurred casualties in the past. Fiscal Effects have ranged from \$10,000-\$50,000 and rate a 4. The time tornadoes spent on the ground has never exceeded 30 minutes, so Duration receives a value of 2. Local response forces work quickly but recovery from a tornado always goes over 10 days so the assigned value for Response/Recovery Time is 8.

An extracted overview of the Tornado Hazard in Sample County indicated the following:

Historical Occurrence	2
Magnitude	2
Frequency	4
Warning Time	8
Demographic Factor	8
Fiscal Effects	4
Duration	2
Response/Recovery	8
Total Hazard Value =	38

The total hazard value for tornadoes in our county is 38 which, as seen in the sample calculation above was determined by adding the values of all eight threat factors.

Once a total numerical threat value is derived for each of the hazards affecting a county, the numbers are then ranked, in order, from highest to lowest values (most to least threatening hazards). Annual emergency management goals and objectives, including plans and training, for the county should be based on this ranking. Thus, if floods pose the greatest threat, readiness actions should address flooding first. Other hazards should not be excluded; and as projects are completed, or event frequencies change, all hazards should be subject to periodic re-evaluation.

Figure 8: Stark County Hazzard Summary (Ranking by factor/values)

HAZARD TYPE	ANALYSIS FACTORS	HISTORICAL OCCURRENCES	MAGNITUDE	PROBABILITY	WARNING TIME	DEMOGRAPHIC FACTOR	FISCAL EFFECTS	DURATION	RESPONSE/RECOVERY	TOTAL
NATURAL Hazards										
	Floods	4	4	6	1	8	6	3	8	40
	Tornado/Severe Storms	5	3	8	2	8	4	1	8	39
	Subsidence/Landslides	1/3	1/1	4/4	2/3	2/2	4/4	3/3	6/8	23/28
	Winter Storms	3	4	2	1	4	4	3	4	25
	Drought	1	4	2	1	2	2	2	6	20
	Earthquake/Seismic Activity	2	2	2	4	2	2	1	4	19
	Wildfires	2	1	4	1	2	2	3	2	17
	Epidemic	1	2	2	1	4	2	4	2	16
	Infestations	3	2	4	1	2	4	4	4	24
TECHNOLOGICAL:										
	Hazardous Material/Solid Waste Disposal	5	1	4	4	4	4	1	4	27/23
	Transportation Incidents	2	1	4	4	6	4	2	2	25
	Dam Failure	2	1	4	1	2	4	3	2	19
	Radiological Incidents	3	1	2	3	2	2	1	4	18
	Department of Energy Facilities	1	1	2	3	2	2	1	6	18
HUMAN-CAUSED HAZARDS:										
	Civil Disturbances	1	2	4	2	6	4	3	4	26
	Terrorism (CBRNE)	2	2	4	4	4	2	1	2	21
	Active Shooter	2	1	2	4	4	4	1	2	20

DETAILED HAZARD SUMMARY

These hazards, grouped according to primary type (Natural, Technological, and Human-Caused), were then subjected to a detailed evaluation and discussion which appears on the following pages.

Natural Hazards

Floods

Floods (**Hazard Rating = 40**), with the highest numerical rating, are the primary natural disaster threat to life and property in Stark County, Ohio. Although often confined to specific drainage systems or geographic regions, floods have affected 12 of Stark County's 36 political subdivisions, which is equivalent to 80,000-85,000 people in the county. Protective actions (evacuation/sheltering) may deplete both material and fiscal resources. Flood waters have also damaged key infrastructure elements (roads, bridges, and sanitary facilities). Infrastructure damages may also lead to an increase in infectious diseases in some affected areas. Other collateral problems include power outages and transportation delays.

Stark County has had 4 Presidential Declared disasters with over 30 million dollars in damages in just the past few decades. The last declaration in which the county was included was July 2, 2006 for severe storms and flooding in the area. See Figure 2 for the most significant amounts of property and crop damage reported between 1950 and 2019. Fortunately, there have not been any reports of injuries or deaths from the flooding in the county.

Stark County can experience **three** types of floods: riverine (the overflow of rivers and streams from rains or melt water); flash (A fast rising of streams or "dry-gulch" waters after heavy rain/snowmelt); urban and small stream (an overflow of storm sewers and streams after a heavy rainfall)

Tornado/Severe Storms

Tornadoes (**Hazard Rating = 39**) are the second greatest natural threat to the county. These violent, rotary windstorms can attain speeds up to 300+ mph and are often accompanied, or followed, by severe thunderstorms. They may occur anywhere at any time of the year but are most likely to occur from February to November with unpredictable, severe effects.

One or more tornadoes (and additional funnel clouds) are typically spotted annually in Stark County. In the spring of 2019, there were three confirmed tornados in a three-week period. Tornadoes have caused complete structural damage in Stark County with at least two deaths. This is of particular concern for outdoor activities and temporary structures that have not been secured (bleachers, bandstands, audio speakers, etc.).

The strongest tornado to hit Stark County was an F2 tornado which occurred November 16, 1965, when it killed two and injured nine. Another F2 tornado struck on April 28, 2002, causing 45.5 million dollars in property damage. This information may also be found in Figure 2. The most common tornados to strike the county are F1/EF-1.

Other severe storms, not officially classed as tornadoes, may be almost as violent and damaging. The potential for loss of life and property is high, coupled with an ability to overwhelm most response capabilities. Effects vary according to wind speed, duration on the ground, and topography. As in the case of floods,

recovery costs and times may extend over years. In Sugarcreek Township on June 22, 2006, a strong storm that produced a tornado in Brewster caused a tree to fall on a tent, killing a seventeen-year-old boy.

The estimated population is 108,000.

Winter Storms/Ice Storms

Winter Storms (**Hazard Rating = 25**) are the third leading weather-related threat to the county. These include heavy snowfall with extreme cold, ice or blizzard conditions, or any combination of the four.

From 1950 to the present, forty-two winter storms and/or major events listed in the previous paragraph have affected Stark County. See Figure 2 for the most damaging winter storms. Stark County's historical data shows the county does experience severe winters including instances where public shelters had to be opened to protect the citizens. Stark County has been the victim of a paralyzing winter storm necessitating the suspension of normal activities and requiring the sheltering of persons without natural gas and or electric service.

In addition to structural and power line damages, these storms have the potential for collateral effects, isolation, and economic disruption (from roadway and business closings) along with ice dams and floods caused by the melting process.

The most significant ice storm the county has experienced occurred in February 2011. The ½ inch of ice build-up caused almost 60% of the county to lose power, some for up to 10 days. This resulted in the largest shelter operation in the county's history, with an initial population of over 250 individuals.

The estimated population at risk during a winter storm is 200,000. See Figure 2 for significant winter storm data.

Subsidence and Landslides

Subsidence and Landslides (**Hazard Rating = 23/28**) are the next major natural threat. There has been an average of 46 mine subsidence events annually over an eight-year period with an estimated 237 annual landslides.

Subsidence is defined as a drop in the earth's surface due to a collapse in bedrock or other underlying material (coal pillars, rock, etc.) into underground mines or other open space. There are two types of subsidence: a pit (sinkhole), which is the abrupt sinking of the ground surface, resulting in a craterlike pattern; and a sag or trough, which is the gradual settling of a surface. A sag may fill with water, but generally, a pit will not because the water is draining into the mine underneath.

Land or mudslides are defined as downward and outward movements of slopes due to rains or melting snow with accompanying damage and debris deposition. They may also include sudden collapses of mines, tunnel walls, or supports with resulting damage to surface structures or features (buildings and highways).

Landslides include three types. A rotational slump occurs when weak rock or sediment moves as a mass in a slow or imperceptible movement. A more common event, Earth flow, involves rock, sediment, or weathered surface materials moving down a slope in a mass. Rockfall is seen as the most common and dangerous form of movement. Rock from a cliff or cut will fall onto roadways or structures. This action is common during periods

of late winter or early spring thawing. Traffic vibration, undercut slopes, increased weight on slopes, or the removal of vegetation and ensuing erosion may also contribute to these events.

There are an incalculable number of abandoned coal mines in Stark County. From time to time, lawns and houses have collapsed because of these mines. So far, these incidents have been experienced primarily in the Market Heights section of the City of Canton and parts of Plain Township. While the Emergency Management Agency has Ohio Department of Natural Resources maps showing the locations of known mining activity, many other mining operations were never charted. The state of Ohio, as a whole, has had subsidence problems dating back to 1923.

During and after WWII, when the demand for mineral resources was high, the state had over 700 active coal mines. As the supply of coal in many mines was exhausted the mines were abandoned with little, or no, preparation. Supporting pillars of coal in shaft mines were mined away before closings. In the mid-1990s over 6,000 closed underground mines were estimated to exist in 37 counties with over 61,000 acres of land affected by closings or site abandonment. Abandoned mines have also occasionally collapsed with damage to surface structures (e.g.: Interstate 70 in Guernsey County) or costly infrastructure damage. Subsidence and landslides, particularly during the 1997 - 98 floods, have also led to the temporary relocation of farmsteads, housing units, or businesses. The estimated population at risk is 150.

Stark County is included in the twenty-six counties of Ohio which are mandated by the Ohio Mine Subsidence Insurance Law for basic homeowners to carry mine subsidence coverage.

Infestation

Infestation (**Hazard Rating=24**) in Stark County is caused primarily by a European strain of the gypsy moth, *Lymantria dispar*, which is one of the most destructive defoliating insect pests to attack the trees and forests of the northeastern United States. Chapter 901:5-52 of the Ohio Revised Code indicates that certain counties in Ohio may be required to be quarantined to prevent or reduce the spread of this pest to other parts of the state as well as to other states (See Figure 9).

Figure 9: Ohio Counties in European Gypsy Moth Quarantine



Another prominent infestation affecting our forests is the emerald ash borer. It was discovered in northwest Ohio in 2002 and has since spread throughout the east coast. As of 2010, the entire state has been quarantined. It is estimated to have an economic impact of \$3 billion over the next ten years.

Drought

Drought (**Hazard Rating = 20**) is a prolonged period of abnormally dry weather. The lack of sufficient precipitation (usually rain) can lead to serious shortage issues. Droughts are commonly of two types: Agricultural drought inflicts harm on crops and livestock. Hydrological drought is characterized by a depletion of groundwater supplies, reductions in stream flow, and lowered lake and reservoir levels.

These events may involve geographical areas ranging from a region of the U.S. to sectors of a state or counties. Drought conditions may affect both rural and urban areas with extensive socio-economic consequences. A growing population, with individual and communal demands upon water supplies, coupled with industrial and agricultural uses, will combine to affect water use during both normal and drought conditions. An estimated five million residents rely upon groundwater sources and an additional two million depend upon private wells for their daily water supply.

Drought is measured by the Palmer Drought Severity Index (PDSI). Ohio Drought Incident Annex Attachment 2 to the Ohio Emergency Operations Plan describes the use of the PDSI, which employs 11 index ranges. These ranges extend from “Extremely Wet” (Index of + 4.00) through near normal conditions to the “Extreme Drought” rating (Index of – 4.00 or less).

Although Ohio’s droughts usually occur in the summer, they could continue through the year, leading to an absence of water for plant or animal survival. Winter droughts also occur if frozen ground prohibits the recharging of groundwater or if water supplies are already reduced.

The more common summer droughts, usually accompanied by extreme heat, can lead to outages of electric power due to increased air conditioning usage accompanied by a high demand for water. Seasonal droughts may also adversely affect farm produce costs. The famous mid-western ("Dust Bowl") drought of the 1930's cost the state some \$58 million (\$250 million in current dollars). Losses can, however, be reduced somewhat by adequate mitigation and preparedness actions.

Droughts can also be the cause of water shortages. This may occur as a result of a drought; contamination of water sources; or an inadequate water delivery system. A shortage of this type is considered low risk and could occur but would not likely be county-wide. The estimated population at risk for a water shortage is 1,500 to 75,000.

Drought/heat waves create a particular concern for the elderly, those with breathing problems, and small children. Health hazards related to extreme heat include sunburns, heat cramps, heat exhaustion, and heat stroke. In August of 1995, thirty-two northern Ohio counties, including Stark County, reported thirteen deaths and fifty-two injuries due to drought conditions. (See Figure 2)

The estimated population at risk is 85,000.

Epidemic (Disease Outbreak)

Epidemics (**Hazard Rating = 26**) are contagious diseases that reoccur in a community and attack a large number of people at the same time. The potential impacts of an epidemic are illness and/or fatalities, disruption or closing of schools, or forced closure of businesses and industrial operations.

West Nile (Asian tiger mosquito), *Aedes albopictus*, was imported to the United States in 1985 via a load of used truck tires from Japan to Texas although there were no reports of West Nile in Ohio until 1985. There were twelve positive test results of West Nile mosquitoes in Stark County in 2005 and in 2008, the positive results came from a mosquito pool located in Richville Park in Perry Township.

The diseases spread by the West Nile mosquito include Yellow Fever, Dengue Fever, and numerous types of encephalitis.

On May 23 and 25, 2001, two West Branch High School students died of *Neisseria meningitidis*, and another student, who attended Marlinton High School, also was diagnosed with the same strain of meningitides. Students and staff in the area schools (approximately 5,800) opted to get vaccinated against meningitis. The Ohio Department of Health paid for the shots.

H1N1 flu epidemic scare in late-2009 through early 2010 had counties and states across the country preparing for the worst. H1N1 is also known as Swine Flu, is a respiratory disease of pigs caused by Type A influenza virus. It usually occurs in pigs and rarely in humans. The infection is caused by contact with an infected pig or environments that may be contaminated with swine flu virus or contact with a person who is infected with the virus.

In 2020 the COVID-19 Pandemic impacted the entire world. Stark County received its first case in March of 2020. All disciplines across the county were taxed throughout the response and mitigation efforts. Public Health led the response to the pandemic by activating all emergency response plans and the assistance of all

partner agencies. Throughout the pandemic, Stark County agencies responded to 99,526 confirmed/probable cases, 4,716 hospitalizations, and 2,041 lives lost. May 11, 2023, marked the end of the COVID-19 Public Health Emergency Declaration.

Estimated population at risk is 175,000.

Earthquake/Seismic Activity

Earthquakes (**Hazard Rating = 19**) are defined as a rapid motion of the ground accompanied by shaking, faulting (surface and subsurface), and ground failure. Earthquakes from two points affect Ohio: events having epicenters within the state, and those occurring along the New Madrid, Missouri Fault.

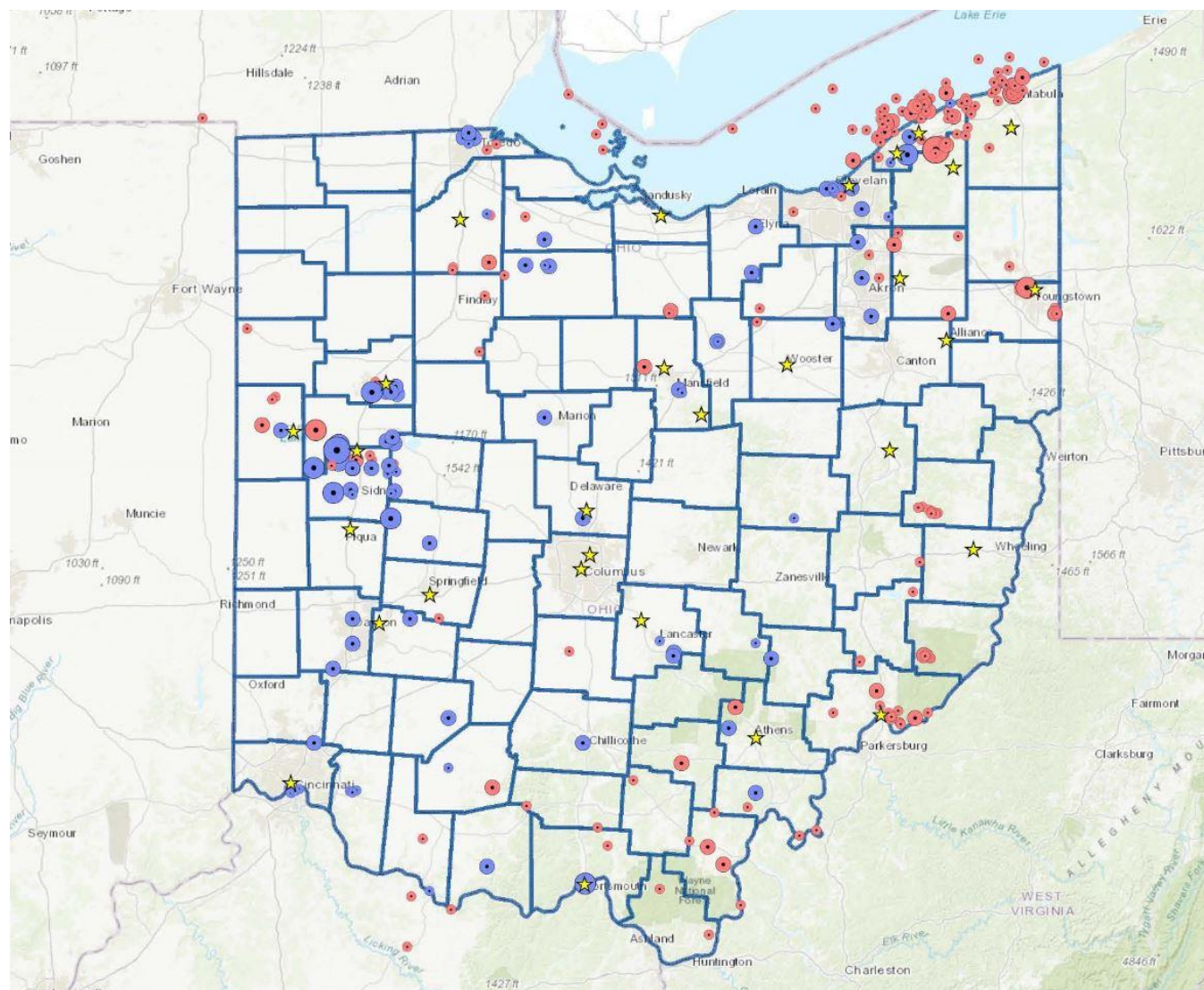
Stark County has two defined faults in which earthquake activity could result. One fault is in the far north central part of the county near Limaville. The other is in the northwest part of the county near the Stark-Summit County line near Akron-Canton Airport. The most recent quake felt in Stark County was June 10, 2019, as a 4.2 earthquake occurred just off the coast in Lake Erie. No damage was reported although many people were alarmed by the earthquake. On April 23, 2011, a 5.8 earthquake struck central Virginia causing people in taller buildings here in Stark County to evacuate as a precaution. Other notable earthquakes felt in Stark County occurred in March of 2007 (3.3 magnitude), January of 1996 (5.0 magnitude), and June of 1987 (5.0 magnitude).

Stark County may also be affected by events generated by the New Madrid Fault, extending from Arkansas to Indiana along the Mississippi and Ohio River Valleys. This fault generated the most powerful earthquakes ever documented in the Continental US in four months between 1811 and 1812. If earthquakes of this intensity occur again, devastating damages in our southwestern counties could be expected.

Collateral effects from an earthquake could be extensive and may include hazardous material spills, landslides, subsidence, dam failures, fires, groundwater contamination, pipeline breaks, infrastructure disruptions, epidemics, floods, along with theft/looting.

The estimated population at risk is 151,000. See Figure 9 and 10 below.

Figure 10: Earthquake Epicenters in Ohio



Source: <https://gis.ohiodnr.gov/MapViewer/?config=earthquakes>

Figure 11: Effects of a Major New Madrid Earthquake in Ohio

MERCALLI INTENSITY	EFFECTS	COUNTIES POTENTIALLY AFFECTED
VI	Felt by all, indoors & outdoors. Many people are frightened and excited. Liquids set in strong motion. With slight damage in poorly built structures. Fallen & cracked plaster with a considerable quantity of broken dishes & glassware.	Allen, Ashland, Auglaize, Crawford, Cuyahoga, Defiance, Erie, Geauga, Hancock, Hardin, Henry, Huron, Lake, Logan, Lorain, Mahoning, Marion, Medina, Mercer, Morrow, Ottawa, Paulding, Portage, Putnam, Richland, Sandusky, Seneca, Shelby, Stark , Summit, Trumbull, Van Wert, Wayne, Wood, & Wyandot. (Approx. 4 million people in 36 counties)
VII	Many people find it difficult to stand. Slight damage in ordinary buildings. Considerable amounts of fallen plaster & numerous broken windows & fallen cornices	Athens, Belmont, Carroll, Champaign, Clark, Columbiana, Coshocton, Darke, Delaware, Franklin, Fulton, Gallia, Guernsey, Harrison, Holmes, Jackson, Jefferson, Knox, Lawrence, Licking, Lucas, Madison, Meigs, Miami, Monroe, Morgan, Noble, Tuscarawas, Union, Washington, and Williams (Approx. 3 million people in 31 counties)
VIII	Alarm approaches panic. Branches of trees broken. Changes in the flow of well & spring water. Considerable damage in ordinary substantial buildings. Fallen walls, factory stacks, towers, & monuments. Heavy furniture overturned.	Adams, Brown, Butler, Clermont, Clinton, Fairfield, Fayette, Greene, Hamilton, Highland, Hocking, Montgomery, Muskingum, Pickaway, Perry, Pike, Preble, Ross, Scioto, Vinton, & Warren (Approx. 3 million people in 21 counties)

Source: U. S. Geological Survey, Maximum Seismic Interactions Map for New Madrid Seismic Zone; Alger mission & Hopper

Wildfire

Wildfires (**Hazard Rating = 17**) are defined as uncontrolled fires spreading through vegetative fuels and possibly consuming structures.

The majority of Stark County is in Region 2 of the Ohio Department of Natural Resources Division of Forestry. Region 2 is outside of the Wildlife Protection Area. The very southern section of Stark County falls within the Wildlife Protection Area. This area is considered to be at a higher risk of wildfires due to the abundant grasslands and forest areas.

Weather is the primary factor in wildfires during the fall and spring. The most fires in the Ohio fire control history occurred on March 27, 1950, when sixty-five fires were reported and burned 5,900 acres. These fires were due to the extreme drought that year. Another significant year for wildfires in Ohio occurred in 1999 when 1,500 fires burned 7,836 acres of forest.

There have not been any wildfires in Stark County, but several factors that may contribute to the starting of wildfires include arson, equipment fires, campfires, and lightning. The estimated population at risk is 58,000.

Technological Hazards

Hazardous Materials (HazMat)

A hazardous material (HAZMAT) incident (**Hazard Rating = 27**) is a release of toxic or noxious material at a fixed (factory/storage) site or in an accident involving the transport of those materials (truck, rail, air, or pipeline). These incidents could occur at any place in Stark County.

Until the 1970s, events involving materials now classified as “hazardous” received little or no attention. After incidents at Bhopal, India, and Ravenswood, West Virginia in the 1980s, Congress enacted the Superfund Amendment and Reauthorization Act (SARA Title III), establishing emergency planning and community right-to-know programs. States and counties are now required to integrate HAZMAT response plans into their preparedness programs. In the late 1980s, according to the EPA, this state ranked second in air pollution, third in total toxin releases, and third in the release of carcinogens in the United States.

HAZMAT incidents may occur in any place in Stark County. Incidents involving the shipment and handling of low-level radioactive isotopes have also required state response actions over years. Small hazmat incidents involving the Stark County Hazardous Material Emergency Response Team occur almost monthly. A prominent hazmat event occurred on September 16, 2014, at Convoy Containers in Canton. A fire in the building caused a chemical reaction with large vats of sulfur releasing sulfur dioxide into the air. The chemical release caused the county hazmat team to order an evacuation of a 21-block area with as many as 7,000 residents affected. A shelter was set up with more than 300 individuals registered and around 130 spending the night.

Primary highways are Interstate 77, U.S. Routes 30 and 62, State Routes 21, 43, 172, 183, and 241. There are three railroads in Stark County, two Class I railroads and one Regional, listed respectively: CSX Transportation Inc. (CSXT); Norfolk Southern Corporation (NS); and the Wheeling & Lake Erie Railway Co. These railroads transport raw materials as well as finished products. Passenger transportation is provided by AMTRAK. These can also pose a risk of a hazardous materials release. On October 27, 2005, a 56-car train leaving the Brewster train yard derailed. Eight cars and a 30,000 tanker carrying about 25,000 gallons of acetone came off the tracks and began leaking. The response and cleanup took over a dozen different agencies and multiple days.

The disposal or storage of solid wastes (including used auto tires) has also led to HAZMAT-related concerns. It is recognized that there is a real fire hazard associated with these sites, which can lead to evacuations from the release of air or waterborne toxins. Further, these sites are potential breeding grounds for disease-bearing vectors (mosquitoes and flies).

Stark County’s solid waste is disposed of in one of three landfills, two located in Stark County and one in Tuscarawas County. One-hundred-twelve facilities in Stark County report hazardous waste activities; nine-hundred-forty-six facilities report handling hazardous waste; and two sites are on the Superfund National Priority List (NPL). The issue of on-site waste treatment and the removal from these sites poses a unique hazard for adjacent communities. In the event of a problem, local subdivisions (and the state) would be engaged in extensive recovery actions.

Dam Failure

Dam Failure (**Hazard Rating = 19**) is defined as a gradual or immediate collapse or failure of water-impounding systems or structures, resulting in downstream damages.

Dams in Ohio have been divided into four classes:

CLASS I	• Larger dams whose failure would result in probable loss of life.
CLASS II	• Dams whose failure would result in flooding of high-value property and damage to public infrastructure such as water supply and roads with no probable loss of life.
CLASS III	• Smaller dams whose failure impacts are limited to rural buildings and local roads with no probable loss of life.
CLASS IV	• Dams less than 25 feet high that impound less than 50 acre-feet and whose failure would be restricted to the dam itself and rural lands. Class IV dams are not actively regulated by the division and owners do not pay an annual fee.

Source: Ohio Department of Natural Resources: Dam Definition, Classification, and Statistics 2013

Stark County has four Class I Dams. Meadow Lake Dam is located in Nimishillen Township; Lake Cable Dam and Suarez Lake Dams are located in Jackson Township; Sippo Creek Reservoir Dam is located in Perry Township (which were constructed for recreational purposes); and Dale Walborn Reservoir Dams in Lexington Township (along with Deer Creek Reservoir Dam, Class II) is for public water supplies for the City of Alliance.

There are thirteen Class II, nineteen Class III, and twenty-seven Class IV Dams in Stark County. The other ninety dams located in Stark County are classified as exempt, abandoned, unclassified, or non-applicable.

There has not been any information obtained indicating that the dams in Stark County have failed. The estimated population at risk in the event of a dam failure is between 55,000 and 65,000.

Radiological Incident

Peacetime Radiological Incidents (**Hazard Rating = 18**) are defined as the uncontrolled release, misuse, or loss of contained radioactive materials. This is considered to be the second largest technological hazard for Stark County involving one or more of the 1,000 Nuclear Regulatory Commission licensees in the state.

In addition to fossil fuels, electric power generation now uses nuclear technology. There are no nuclear power plants located in Stark County, however, Stark County is within the 50-mile Emergency Planning Zone (EPZ) for the Beaver Valley Nuclear Power plant in Beaver Valley, Pennsylvania. Stark County is also at the very edge of the planning zone for the Perry Nuclear Power plant in Lake County, Ohio. In addition, unknown quantities of nuclear material pass through Stark County on common carriers.

On February 23, 2016, the county responded to a radiological (non-intentional) event. Several loads of shredded scrap metal contaminated with Radium 226 were accidentally distributed to two Stark County locations from a site in Pennsylvania. Between the two sites, three workers were confirmed to be contaminated along with the trucks used for transportation and the production and office areas at the

Massillon facility. It was confirmed that one worker contaminated his vehicle, parts of his home, and one of his family members. The response took multiple weeks and involved seven state and local agencies to conclude.

The estimated population at risk is 160,000.

Utility Failure

(Hazard Rating = 18) American Electric Power and First Energy/Ohio Edison provide most of the electric power to the homes and businesses in Stark County. A temporary shutdown of these two companies' facilities would cause a loss of power that could affect the lives and property of county residents. In September 2008, remnants of Hurricane Ike caused nearly sixty percent of the electrical connections to be without power. Natural gas and gasoline shortages could also present a similar problem.

Temporary shutdowns of the energy facilities may be caused by the weather. Stark County's electrical systems are most at risk due to winter storms including ice. A winter storm in Stark County in February 2010 caused a power outage for 747 American Electric Power customers in Stark County and 56,000 customers in the state. An ice storm in February 2011 caused almost 60% of the county to be without power, in many areas for over a week.

Estimated population at risk is 5,000 to 350,000.

Human-Caused Disasters

Civil Disturbance

Civil Disturbance (**Hazard Rating = 26**), including riots, labor disputes, or terrorism, can disrupt civil order and require public safety support in their control or suppression. This hazard could affect the county but would probably be limited to the larger cities (Canton, Massillon, and Alliance) and may occur at any time. Past incidents emerged from strikes and public demonstrations.

Although these events are now (1999-2002) infrequent in Stark County, strikes or demonstrations linked to labor or political movements frequently occurred in the 1920s, 30’s, and 60’s. These included Ku Klux Klan actions, coal and steel strikes, and Vietnam-era disturbances. Many events usually occurred within a few blocks of a campus, industrial site, or neighborhood and did not often expand into the community as a whole. Subsequent legislative or political actions served to “defuse”, or reduce, both events and issues. Historically statewide, 31 major urban civil disturbances have been recorded over a 32-year period for Ohio.

The accompanying chart will illustrate some of the major threats, or real events, that have confronted authorities in the state of Ohio in the period 1995-2001.

There are at least three militia groups known in Stark County. See Figure 12 below.

Figure 12: Militia Groups in Stark County

Group/Element	Location
Constitutional Study Group of Canton	Stark
Mahoning Valley Militia	Stark and Trumbull
Ohio Unorganized Militia	Belmont, Brown, Clark, Clermont, Columbiana, Coshocton, Cuyahoga, Delaware, Hamilton, Knox, Licking, Marion, Medina, Montgomery, Morgan, Stark

Source: Columbus, Ohio Div. of Police, FBI

While many of these groups/elements claim origins dating from the American Revolution, they often espouse extreme racial or political causes. In addition to “demonstrations”, and other activities, they have assumed a paramilitary guise, affecting uniforms, weapons, and equipment to enhance, or legitimize, their self-appointed status as “militias” or “forces”. Other loosely-knit organizations, or groups, consist of “common-law” movements with an estimated 2,400 members in Ohio.

Riots: Stark County has a jail facility located at 4500 Atlantic Boulevard, in Canton, Ohio. The daily average of prisoners housed at the jail between 1998 and 2001 was 393. An increase in prison inmate populations (33 institutions and 44,000 + inmates with a related incident potential) is a concern for both state and local officials. Significant events, including the 1930 Ohio State Penitentiary fire, the 1952 OSP Halloween fire, the 1968 OSP riot, and the 1993 Lucasville riot, were limited to the prisons with minor community impact. Since 1990, eleven critical incidents have occurred at the Department of Rehabilitation and Corrections facilities with similar events occurring at the Department of Youth Services or county facilities. There are no noted riots staged at the jail during its history. Estimated population at risk is 30,000 to 50,000.

Terrorism (CBRNE)

Terrorist incidents may be of a biological/nuclear, incendiary, chemical, or explosive nature and are generally thought to be the work of a terrorist organization. A Terrorism Risk Assessment Committee formed in April 2001 identified activities and sites that a potential terrorist might target in Stark County; this information is on file in the EMA Office.

This combination of events and organizations has made counter-terrorism preparedness a priority concern for state and local officials. In 1997, Ohio EMA was instrumental in the formation of a Senior Interagency Coordinating Group (SICG) designed to address counter-terrorism and WMD issues. Additionally, in 1997, federal and state agencies initiated the Domestic Preparedness Program (under the auspices of the Nunn-Lugar-Dominici Act of 1996) designed to enhance counter-terrorism readiness in major urban centers, including six Ohio cities (Akron-Canton, Cleveland, Cincinnati, Columbus, Dayton, Toledo).

The Federal Bureau of Investigation (FBI) defines terrorism as the "...unlawful use of force or violence against persons or property to intimidate, or coerce a government, civilian population, or any segment thereof in the furtherance of political and social objectives". The victims of terrorism may not always, however, be the intended, or most concerned, elements of society.

From mid-October through late December 2001, over 150 suspicious events of anthrax were reported to the Stark County Health Department. The suspected items ranged from letters, packages, fruit, pizza boxes, and discarded trash along the roadway. None of the suspicious items contained anthrax.

Although events such as the World Trade Center bombing/destruction (1993 & 2001) and Oklahoma City bombing (1995) did not occur in Ohio, the threat, real or implied, to employ terrorism in this state, remains. Threats often involved the employment of weapons of mass destruction (WMD), including bombs and pathogens, and were directed at targets in both rural and urban industrial settings. In 1995, an Ohio resident with ties to unorganized militias was able to order, via mail, samples of Plague bacilli. Although that attempt was thwarted, the events of 2001 show that the bio-terrorist threat remains viable.

At the time of the 1998 general statewide hazard analysis, terrorism was included under a general hazard "blanket" of Civil Disturbances and related activities.

Estimated population at risk is 30,000 to 50,000.

Active Shooter

Stark County is home to five (5) universities; University of Mount Union (Alliance), Walsh University (North Canton), Malone University (Canton), Kent State University, Stark (Jackson Township), Stark State College (Jackson Township) and seventeen (17) Public School districts (Alliance City, Canton City, Canton Local, Fairless, Jackson, Lake, Louisville City, Marlington, Massillon City, Minerva, North Canton City, Northwest, Osnaburg, Perry, Plain, Sandy Valley and Tuslaw).

Even though Stark County has not had a major active shooter situation, we have had several smaller incidents. On February 20, 2018, a student in Jackson Local School District shot himself in a school restroom. The investigation showed that he had intentions of hurting others in school that day in a Columbine-style event (Jackson Township Police Median Release March 1, 2018).

Hazard Identification and Risk Assessment (HIRA)

On July 27, 2019, in the city of Louisville, a man was arrested after an armed standoff that left multiple homes and police cars with bullet holes. The standoff affected the whole neighborhood and was just a few blocks from Louisville High School. There were no major injuries or deaths in this incident.

Even though these events are rare, they do pose a risk to our communities.

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ⁱⁱ See Ohio Revised Code 5502.21 (I) accessed at <http://codes.ohio.gov/orc/5502.21>

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^{iv} See National Fire Protection Association. NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs, 2007 Edition, Pp. 1600-5