

Hazard Mitigation - 2012 5 Year Plan Update Clark County, Ohio



Lisa D'Allessandris, Clark County EMA Director

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Hazard Mitigation Plan – 2012

5-Year Plan Update

Prepared for:

Clark County Emergency Management Agency
3130 E. Main St., Suite 1E
Springfield, OH 45505

Prepared by:

- Clark County Emergency Management Agency
- Clark County Hazard Mitigation Committee
- Mote & Associates, Inc.

 **Mote & Associates**

Engineering, Land Surveying

214 West Fourth Street, Greenville, Ohio 45331

Phone: 937.548.7511 ~ Fax: 937.548.7484

E-mail: info@moteaassociates.com

Website: www.moteaassociates.com

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List of Commonly Used Acronyms

ARC	American Red Cross
BFE	Base Flood Elevation
CCPD	Clark County Park District
CDBG	Community Development Block Grant
CRS	Community Rating System
CCBC	Clark County Board of Commissioners
CCHMC	Clark County Hazard Mitigation Committee
DMA2K	Disaster Mitigation Act of 2000
DSP	Dam Safety Program
EMS	Emergency Medical Services
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
FD	Fire Department
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance Program
GIS	Geographic Information Systems
GPS	Global Positioning
HIRA	Hazard Identification & Risk Assessment
HMGP	Hazard Mitigation Grant Program
HUD	Housing and Urban Development
LHMP	Local Hazard Mitigation Plan
LU/LC	Land Use Land Cover
MCD	Miami Conservancy District
NCDC	National Climatic Data Center
NDMC	National Drought Mitigation Center
NFDRS	National Fire Danger Rating System
NFIP	National Flood Insurance Program
NID	National Inventory of Dams
NOAA	National Oceanic Atmospheric Administration
NRCS	National Conservation Resource Service
NWS	National Weather Service
OAC	Ohio Administrative Code
OBC	Ohio Building Code
ODH	Ohio Department of Health
ODNR	Ohio Department of Natural Resources
ODNR-FPM	Ohio Department of Natural Resources Flood Plain Management
ODOT	Ohio Department of Transportation
OFP	Ohio Flood Plain
Ohio EMA	Ohio Emergency Management Agency
OPWC	Ohio Public Works Commission

ORC	Ohio Revised Code
OSU	Ohio State University
PDM	Pre-Disaster Mitigation Grant Program
PDM-C	Pre-Disaster Mitigation Competitive Grant Program
SFHA	Special Flood Hazard Area
SHARPP	State Hazard Analysis Resource & Planning Portal
SHMD	State Hazard Mitigation Office
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WPCLF	Water Pollution Control Loan Fund
WRP	Wetlands Reserve Program
WTP	Water Treatment Plant
WWTP	Wastewater Treatment Plant

Mitigation Plan Summary



The Clark County Emergency Management Agency (EMA) spearheaded this effort to complete the 5-year update process for the residents of Clark County.

Clark County is subject to natural hazards that threaten life and health as well as having caused extensive property damage. It is the intent of hazard mitigation activities to reduce their impacts on people and property. Through the countywide coordinated program, Clark County has developed this multi-jurisdictional mitigation plan that includes all natural hazards the County is susceptible to as per Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Clark County continues to develop the best practices approach to obtain and utilize mitigation funding through a variety of means to provide the community quality hazard mitigation efforts.

This Mitigation Plan update was developed under the guidance of a Clark County Hazard Mitigation Committee (CCHMC) made up of individuals from communities and agencies throughout Clark County. The CCHMC met four separate times during the planning update process to review the current plan and to address hazards that affect the County, the problems associated with these hazards, discuss potential mitigation activities to minimize the effect of these hazards, and verify the current goals that they would like to see achieved within the County.

The Clark County, Ohio Hazard Mitigation Plan demonstrates how Clark County has successfully completed numerous hazard mitigation projects to reduce future damages, deaths, and injuries should disaster strike. The plan also addresses future mitigation activities needed to be done to further reduce future loss and to provide a framework where local governments, businesses, and county residents and visitors can ensure that positive mitigation planning activities are being carried out. It is the intent that future planned work will be carried out based on accurate information and the appropriate mitigation action items will be prudent investments for the taxpayers of Clark County.

As Clark County expands and changes, challenging vulnerabilities must be addressed. Clark County will face numerous hazards in the future, both natural and manmade, and these hazards can result in disasters that impact citizens, businesses, and all levels of government. By identifying hazards and taking appropriate steps to mitigate future vulnerabilities, growth and change can be done in a positive manner that will lessen the impact of future hazard events. Hazard mitigation can be defined as the sustained action taken to reduce or eliminate long-term risks to people and their property from hazards including natural or man-made disasters. Hazard mitigation planning is a positive process built on assessing the hazards and applying effective strategies to complete preventive measures. It involves multiple stakeholders from throughout the community and the state along with blending public and private sector goals, objectives, and actions.

The goals of this plan are to significantly reduce life loss and injuries and minimize damage to structures and property from disasters. It is also intended to reduce disruptions to society, better integrate hazard mitigation programs and policies, reduce the number of repetitive flood loss structures, and to promote education and outreach activities to create a culture of hazard mitigation for Clark County residents.

The Clark County Hazard Mitigation Plan currently is required to be updated every 5 years in order to remain eligible to receive public assistance for hazard mitigation fund grants. The 2012 plan updates are intended to address new conditions and laws and includes an update and status report of mitigation action items occurring within the 2006 FEMA Approved Plan.

Section 1 “Introduction” summarizes the Plan and describes the planning process and includes the documentation for adoption of the Plan by the Clark County Board of Commissioners and all of the participating municipalities.

Section 2 “Hazard Identification, Risk Assessment & Vulnerability” identifies the most prevalent hazards that have affected and may in the future affect Clark County. This section includes hazard history, determination of risk and vulnerability of buildings and infrastructure, and a discussion on County development trends and how that may affect future analysis.

Section 3 “Clark County Mitigation Strategy” addresses hazard mitigation goals, objectives, and action items to be effective in hazard mitigation.

Section 4 “Plan Maintenance Process” addresses how the Clark County plan will be evaluated and updated.

Appendix: Includes supporting documentation and information that complements the Clark County Hazard Mitigation Plan.

Introduction

A mitigation plan addresses natural disasters that could affect a local community, whether it is flooding, tornadoes, high winds, winter storms, landslides or some other natural disaster. A mitigation plan is an administrative document that is issued to establish activities that should reduce or, when possible, eliminate long-term risk to human life and property. The plan will also provide a community with a “comprehensive guide” for future mitigation efforts as they relate to the hazards that affect their county. By updating and implementing mitigation activities into other planning documents, a community can develop strategies and implement projects for reducing risk.

The Clark County Board of Commissioners supported updating their All Natural Hazards Mitigation Plan (Mitigation Plan) with funds received from Ohio Emergency Management Agency (OEMA) and the Federal Emergency Management Agency (FEMA). There has been an on-going effort in publicizing the County’s activities in relation to mitigation and how the public can continue to get involved and support the County’s mitigation efforts.

The Clark County Hazard Mitigation Committee reaffirmed the following county hazards which includes but are not limited to:

Biological

- Animal or Insect Infestation
- Disease-Human
- Disease-Animal
- Invasive Plants

Geological

- Landslide, Mudslide, Subsidence
- Earthquake

Meteorological

- Tornadoes, High Winds Events
- Flood, Flash Flood, Small Stream/Urban Flooding
- Winter Storms
- Severe Thunderstorm/Lightning/Hail
- Drought
- Extreme Temperatures (Hot/Cold)
- Wild Fire (Field or Woodland fires)

As part of the Disaster Mitigation Act communities that desire to remain eligible for Federal and State mitigation funds must have an approved mitigation plan in place and shall be updated every five years.

Incorporated jurisdictions within a county must participate as well as representatives from

the unincorporated areas. Townships are not required to participate because the County Commissioners can represent them on mitigation projects. However, a township may take an active part by submitting a hazard mitigation project and their participation in the planning effort is crucial. Local participation is “key” to the successful implementation of these mitigation plans.

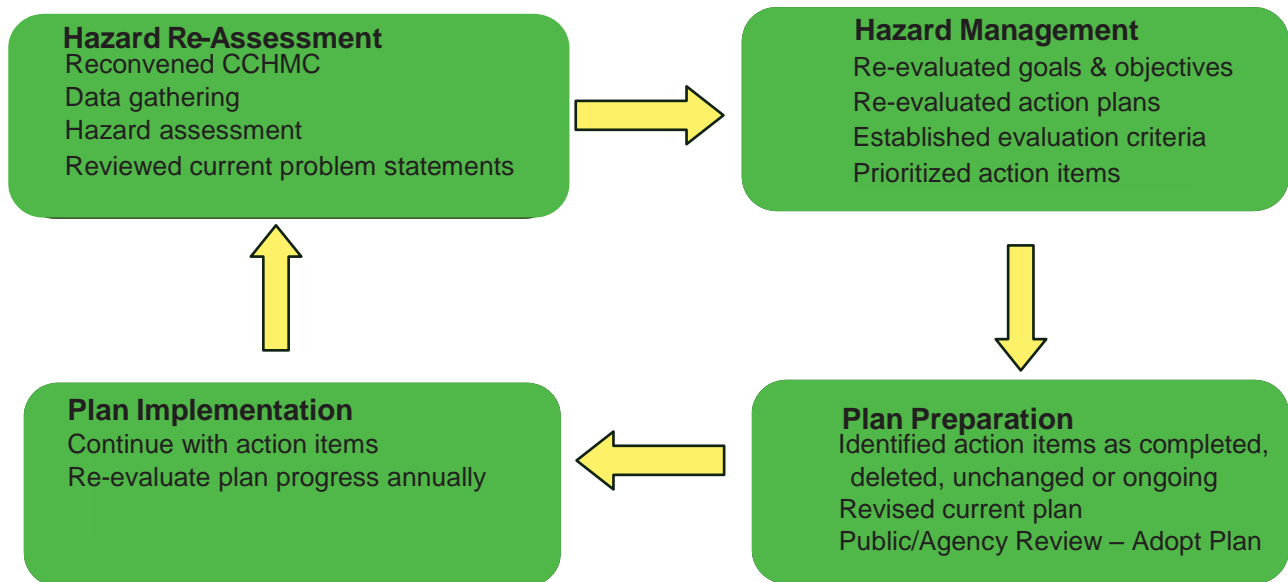
If a community chooses not to participate in the mitigation planning effort, the community becomes ineligible for any future federal or state mitigation money. This mitigation money usually comes in the form of a grant such as the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) or the PDM Grant Program, which is to be used to implement mitigation strategies and activities. Examples of eligible activities that could be supported by mitigation dollars include:

- Acquiring and relocating structures from hazard-prone areas.
- Retrofitting structures to protect them from floods, high winds, earthquakes, or other natural hazards.
- Constructing certain types of minor and localized flood control projects.
- Constructing safe rooms inside schools or other buildings in tornado-prone areas.
- Developing State, Local, or tribal mitigation plans.

When updating the Plan, the planning process also involved evaluating several approved FEMA mitigation planning efforts from around the county that the CCHMC approved for their content and set-up, which met the needs of Clark County as well as satisfied the requirement of the reviewers, OEMA and FEMA.

The following flow diagram shows the Natural Hazard Mitigation Planning update process that was followed:

NATURAL HAZARD MITIGATION PLANNING PROCESS



In addition to the aforementioned process, the CCHMC and the designated leaders of the group made sure that every community that participated in this planning effort was aware of their responsibilities as well as how they could represent their community the best. Some suggestions that were incorporated into the initial invitation to participate in the natural hazard mitigation planning effort included:

- Participate in the Core Group planning meetings representing your community's interests.
- Supply any information (background) on recent natural disasters and action item progress for your community to the CCHMC.
- Review and comment on the updated Mitigation Plan.
- Review and confirm mitigation activities developed by the CCHMC for your community to implement.
- Be an advocate for Final Adoption of the Mitigation Plan by your community.

In an effort to continue to meet the mission of protecting lives, property, economic viability and quality of life for the people of Clark County, the County Commissioners desired to create the Clark County Mitigation Plan for their community and its residents. Clark County authorized the engineering consulting firm of Mote & Associates, Inc. the task of assisting with the mitigation plan update process.

The collaborative efforts of updating the plan included working with the different agencies within Clark County and coordinating with all participating jurisdictions. The County appreciated the planning efforts of all participants.

Clark County currently has ten incorporated areas within its borders that were invited to participate in the planning update process. The process to update the Mitigation Plan started with establishing a "Mitigation CCHMC" of decision makers and implementers. The planning efforts were effective and lead on a countywide basis.

COUNTY OVERVIEW

- 1.1 Profile
- 1.2 Population
- 1.3 Climate, Geography and Environment
- 1.4 History
- 1.5 Incorporated Cities and Villages
- 1.6 Tourism and Points of Interest
- 1.7 Community Parks/Recreation Areas
- 1.8 Public Libraries and Education
- 1.9 Business and Industry
- 1.10 Residential Housing
- 1.11 Tax Value and Land Use
- 1.12 Workforce Labor Statistics
- 1.13 Documentation of the Planning Process

1.14 Local Planning Committee & Contact List

1.15 Plan Adoption by the Board of Commissioners

1.16 Plan Adoption List

1.17 Plan Adoption By Municipalities

1.1 Profile

Clark County is located in southwest Ohio. It is bounded by Champaign County to the north, Miami and Montgomery counties to the west, Greene and Madison counties to the south, and Madison County to the east. The County is comprised of 412 square miles of land. There are 10 townships in Clark County.



The County is semi-rural in setting and agricultural areas dominate the landscape. The urban component of the County is comprised of a series of cities, villages and unincorporated areas of development, activity centers, townships of varying population size, and transportation and greenway corridors. Interstate 70 runs west-east through the County, and U.S. Route 68 is the main north-south thoroughfare in the County. Other major highways include U.S. Route 40, State Routes 4, 41, 54, 56, 72, and 334.

The incorporated areas of Clark County include Catawba Village, Clifton Village, Donnelsville Village, Enon Village, New Carlisle City, North Hampton Village, South Charleston Village, South Vienna Village, Springfield City and Tremont City Village. According to the 2010 Census, the largest areas of population are Springfield (60,608), Springfield Township (12,237) and Bethel Township (12,440). The entire County population is 138,333.

The county seat is located in the City of Springfield. The three-member board of County Commissioners is elected at large in even-numbered years for the four-year overlapping terms and is the legislative and executive body of the County. The County Administrator is the Chief Administrative Officer of the County and leads the administration, enforcement and execution of the policies and resolutions of the board.

According to the Ohio Department of Development (ODOD), the County's major employers include Clark County Government, Community Mercy Health Partners, Assurant, Inc., Dole Fresh Vegetables, Navistar, Rittal Corporation, Robbins & Myers, Inc., Springfield City Schools, Super America LLC/Speedway, Springfield Masonic Community, and Wittenberg University.

1.2 Population

Clark County: 138,333 (Total in 2010) 0.7% loss from 2000 to 2010
 144,742 (Total in 2000)

10 Incorporated Cities & Villages: 72,058 (Total in 2010)

	<u>2000</u>	<u>2010</u>
City of Springfield	65,358	60,608
City of New Carlisle	5,735	5,785
Village of Enon	2,638	2,415
Village of South Charleston	1,850	1,693
Village of North Hampton	370	478
Village of South Vienna	469	384
Village of Tremont City	349	375
Village of Catawba	312	272
Village of Clifton (pt)	49 (part)	48 (part)
Village of Donnelsville	293	304

10 Townships: 65,971 (Total)

	<u>2000</u>	<u>2010</u>
Bethel	12,934	12,440
Gernan	N/A	7,112
Green	2,687	2,750
Harmony	3,079	3,193
Madison	946	850
Mad River	9,190	8,741
Moorefield	11,402	12,436
Pike	3,521	3,246
Pleasant	2,822	2,966
Springfield	12,424	12,237

Decennial Census of Population:

1800	N/A	1910	66,435
1810	N/A	1920	80,728
1820	9,533	1930	90,936
1830	13,114	1940	95,647
1840	16,882	1950	111,661
1850	22,178	1960	131,440
1860	25,300	1970	157,115
1870	32,070	1980	150,236
1880	41,948	1990	147,548
1890	52,277	2000	144,742
1900	58,939	2010	138,333

<u>Population Breakdown 2010</u>	<u>Total</u>	<u>Percent</u>
Total Population	138,333	100.0%
White	119,440	86.3%
African-American	12,128	8.8%
Native American	351	0.3%
Asian	858	0.6%
Pacific Islander	51	0.0%
Other	33	0.0%
Two or More Races	3,509	2.5%
Hispanic (may be of any race)	3,805	2.8%

1.3 Climate, Geography and Environment

Clark County generally receives an average annual rainfall of 39 inches. Snowfalls in Clark County average approximately 25 inches. The number of days with any measurable precipitation is about 125. The average sunny days in Clark County are 177. The July average high temperature is around 86 degrees F and the average low January temperature is 22° F. The comfort index which is based on humidity during the summer “hot” months is 48 out of 100, where higher is more comfortable. The US average on comfort index is 44.

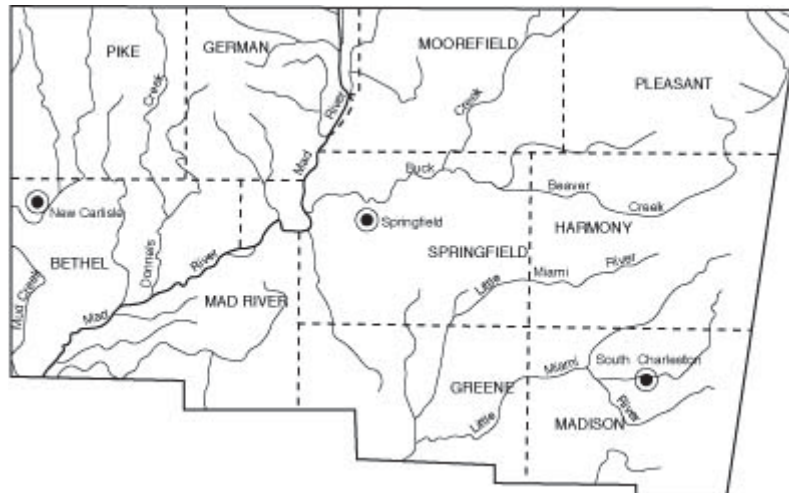
Clark County is composed of rolling till plains with local end moraines. The County contains 30 different soil types, the majority of which are poorly-drained clays and well-drained loams. The County is situated in the ecoregion known as the Eastern Corn Belt Plain. There are three distinct types of Eastern Corn Belt Plain topography located in Clark County. They are the Mad River Interlobate Area, Loamy High Lime Till Plains and Darby Plains. The majority of the County is comprised of Mad River Interlobate Area. This ecoregion is flanked by end moraines that once received concentrated outwash deposits that filled preglacial valleys. Abundant groundwater feeds its distinctive cold water streams that contain an abundance of riffle-inhabiting fish species. Originally, beech forest, mixed oak forest and extensive fresh water fens/wet prairies were common in this region. Today, extensive corn, soybean, dairy and livestock farms as well as urban activity flourish. Woodland still grows on steep sites and along riparian corridors and fresh water fens/wet prairies can also be found locally.

The western and southern portions of Clark County contain the ecoregion known as Loamy High Lime Till Plains. This ecoregion contains soils that developed from loamy, limy, glacial deposits of Wisconsinan age. These soils typically have better natural drainage than those of surrounding ecoregions. Beech forests, oak-sugar maple forests and elm-ash swamp forests once grew on the nearly level terrain. Today, corn, soybean and livestock production is widespread.

Darby Plains is the last ecoregion occupying Clark County and is located in the eastern portion of the County. This ecoregion once had a distinct assemblage of mixed oak forest, with many prairies occurring on its end moraines, gravel-filled pre-glacial valleys and seasonally wet areas. Today, tree density has diminished and very large and productive crop and livestock farms flourish on its level to undulating terrain.

Three different watersheds influence drainage in Clark County: the Mad River, Great Miami River and Little Miami River. Local waterways include the Mad River that enters Clark County from just west of the middle of the County’s northern boundary, and flows southerly leaving the County at the southwestern corner. Principal tributaries are Logonda/Buck Creek, Donnels Creek and Honey Creek. Beaver Creek is a large branch of Buck Creek. The Little Miami River rises in the southeast part of the county and leaves through the middle of the southern border. North Fork and Lisbon Fork are principal branches of the Little Miami River.

The Mad River basin accounts for about 80% of the drainage area in Clark County and has an area of approximately 656 square miles. The County's supply of surface water includes about 2,710 water acres in lakes and approximately 220 linear miles of streams. The following map details the generalized surface water locations in Clark County and was adapted from the Ohio Department of Natural Resources (ODNR) Division of Water river basin maps. (http://ohioline.osu.edu/aex-fact/0480_12.html).



1.4 History

Clark County was formed from Champaign, Madison and Greene counties on March 1, 1817. The County was named in honor of General George Rogers Clark. The first meeting of the Clark County Commission was held on April 25, 1818.

By 1795, a Pennsylvania native by the name of David Lowry was working out of Cincinnati for a General Anthony Wayne. Lowry's duties were to ". . . assist in carrying provisions for the Western Army (L.H. Everts & Co., 1875)." Upon the end of his services of duty to the Western Army, Lowry began working under Israel Ludlow surveying parts of Ohio. On one such excursion, Lowry and his party arrived in the area that was to become known as Broadford, on Mad River, near Enon. He and Jonathon Donnels were impressed by the land and set forth with intentions to settle it. In Cincinnati, they learned that the area they were interested in settling had been purchased by Patten Shorts. Shorts needed the locale surveyed. Jonathan Donnels offered his services and Shorts accepted. Donnels then purchased some of the land he had surveyed from Shorts for both himself and David Lowry. By the fall of 1795, they had made a settlement. Lowry settled at the mouth of a creek he named in honor of his friend, Donnels' Creek. Jonathan Donnels established himself further east near a large spring flowing from a hillside into the bottom land, down to Mad River. David Lowry and Jonathan Donnels were the first white men to settle Clark County.

Other settlers began arriving, including two men by the names of Kreb and Brown in 1796. The two men raised the first crop of corn in the vicinity of what was to become Springfield. David Lowry benefited from Kreb and Brown's initial harvest and in return Lowry hunted for them. By 1799, John Humphreys and Simon Kenton, along with six other families, traveled to Clark County from Kentucky. They built a fort near what would be Mad River Bridge, on the National Road, west of Springfield. *The History of Clark County, Ohio* by L.H. Everts & Co., 1875, W.H. Beers & Co., 1881.

Clark County/Springfield

Clark County and Springfield's early development was hastened by the National Road. During the mid-and-late 19th century, Springfield was dominated by industrialists including Oliver S. Kelly, Asa S. Bushnell, James Leffel, P. P. Mast and Benjamin H. Warder. Asa S. Bushnell built the Springfield, Ohio Bushnell Building^[10] where the patent attorney to the Wright Brothers, Harry Aubrey Toulmin, Sr., wrote the 1904 patent to cover the invention of the airplane. To promote the products of his agricultural equipment company, P. P. Mast started the Farm and Fireside magazine. Mast's publishing company - Mast, Crowell, and Kirkpatrick - grew to become Crowell-Collier Publishing Company best known for Collier's Weekly. In 1894, The Kelly Springfield Tire Company was founded.

At the turn of the 20th century Springfield became known as the "Home City." Several lodges including the Masonic Lodge, Knights of Pythias and Odd Fellows built homes for orphans and aged members of their order. Springfield also became known as "The Champion City"..a reference to the Champion brand of farm equipment manufactured by

the Warder, Bushnell & Glessner Company, which was later absorbed into International Harvester in 1902. International remains in Springfield as Navistar International, a producer of medium to large trucks.

In 1902 A.B. Graham, then the superintendent of schools for Springfield Township in Clark County, established a "Boys' and Girls' Agricultural Club." Approximately 85 children from 10 to 15 years of age attended the first meeting on January 15, 1902 in Springfield, Ohio, in the basement of the Clark County Courthouse. This was the start of what would be called the "4-H Club" within a few years, quickly growing to a nationwide organization. Today, the Courthouse still bears a large 4H symbol under the flag pole at the front of the building to commemorate its part in founding the organization. The Clark County Fair is the second largest fair in the state (only the Ohio State Fair is larger) in large part to 4H still remaining very popular in the area.

Springfield was the first city in the United States to have a black mayor, Robert Henry.

From 1916 to 1926, 10 automobile companies operated in Springfield. Among them: The Bramwell, Brenning, Foos, Frayer-Miller, Kelly Steam, Russell-Springfield and Westcott. The Westcott, known as the car built to last, was a six-cylinder four-door sedan manufactured by Burton J. Westcott of the Westcott Motor Car Company. Burton and Orpha Westcott however, are better known for having contracted the world-renowned architect Frank Lloyd Wright to design their home in 1908 at 1340 East High Street. The Westcott House, a sprawling two-story stucco and concrete house has all the features of Wright's prairie style including horizontal lines, low-pitched roof, and broad eaves. It is the only Frank Lloyd Wright prairie style house in the state of Ohio. The Westcott House Foundation managed the extensive 5 year, \$5.3 million restoration, the house was fully restored to its original glory in October 2005, when it officially opened to the public for guided tours.



Clark County Courthouse in downtown Springfield

Notable Sons & Daughters

Actress from the silent film era:	Lillian Gish
Actors/Actresses:	Justin Chambers and Alaina Reed Hall
Comedian/Actor:	Jonathan Winters
Screenwriter:	Christopher J. Waild
Author:	Dann Stupp
Photographer:	Berenice Abbott
Famous coach:	Randy Ayers
Major League Baseball players:	Dave Burba, Harvey Haddix, Brooks Lawrence, Will McEnaney, Rick White and Luke Lucas
Professional Basketball players:	Jason Collier and Wayne Embry
Musicians/Songwriters:	John Legend, Call Cobbs, Jr., Garvin Bushell, Tommy Tucker, Cecil Scott, Griffen House, Charles Thompson, Earle Warren and Bradley Kincaid

1.5 Incorporated Cities and Villages

Village of Catawba

The Village of Catawba is located in Pleasant Township in northeast Clark County along State Route 54. It is approximately 15 miles northeast of Springfield. The Village has a total land area of 0.3 mi². According to the Census of 2010, there are 272 people and 104 housing units. 69.5% of the population is 18 years of age or older and 30.5% is under the age of 18. 8.7% of the housing units were vacant.

The Village of Catawba was officially platted in 1835 and 1836 by Cass and Marsh. It was incorporated on June 6, 1868. A petition signed by 47 men had been presented to the County Commissioners requesting incorporation of the Village. One of the first grist mills in Catawba was built by William Hunter in 1819 located at the corner of Vernon Asbury Road and Neer Road on Buck Creek.

During the end of the Nineteenth century, a two-story school building called the McConkey Schoolhouse was built on the north side of North Street, just east of where North Street and School Street meet. Part of this building was demolished and a two-room brick school was added to the older room. It is used as an apartment building today.

In 1899, The Catawba Creamery Company was formed. Six men purchased a part of Lot ff26 of the Dawson and Marsh survey of Catawba from Newton S. Conway for \$150.00. It was transferred and recorded on August 1, 1899. The part of land purchased was a long narrow strip 185 feet long by 353-feet wide. The building that was erected was used for milk processing. The building was sold in December of 1900 and operated by a single owner. Over the next 20 years, it was used as a creamery, a residence and a pool room. In December of 1921, it was purchased by T. Milton Hunter. It is now known as the Country Church.

Village of Clifton

Clifton is a village located in Clark and Greene counties in Ohio along State Route 72. In Clark County, the Village occupies the south central portion of the County in Green Township. It is approximately 11 miles south of Springfield. Clifton has a total land area of 0.2 mi². According to the Census 2010, there are 152 people. There are 80 housing units with 80% occupied. 77.6% of the population is 18 years of age or older and 20% is under the age of 18.

The Shawnee Indians were one of the first populations to inhabit Clifton and its surrounding areas. Old Chillicothe, one of the leading Shawnee settlements in Ohio, was located 8.5 miles southwest of Clifton. The Cincinnati-Pittsburgh stagecoach road served the area and several enterprising settlers began establishing water-powered industries in Clifton Gorge. The Village of Clifton was laid out around the milling industry and prospered from the textile mill, grist mills and sawmills located along the Little Miami River.

The Clifton Mill is one of the largest water-powered grist mills still in existence. It was built in 1802, and was originally called Davis Mill after its founder, Owen Davis. The Davis Mill burned in the 1840s. Within a year, John Patterson built another mill at the same location. The Patterson Mill provided cornmeal and flour to soldiers during the Civil War. Unfortunately, this building was destroyed by fire in the late 1860s. The present building was built by the Armstrong Family in 1869. The Armstrong Family owned and operated the mill until 1889. Issac Preston bought the mill and three generations of his family operated it until 1948.



Clifton Mill

From 1948 until 1963, the old mill building was inactive. Robert Heller discovered the vacant mill while hiking through Clifton in 1962. Heller was an engineer and was intrigued by the mill's deteriorated condition and the prospect of restoring it to function on water power. Heller and his wife purchased and restored the mill. Clifton Mill has been a functioning mill ever since. Today it serves as a popular tourist attraction visited by many campers and hikers from nearby John Bryan State Park in Greene County. www.villageofclifton.com

Village of Donnelsville

Donnelsville is located in the western portion of Clark County in Bethel Township along U.S. Route 40. It is approximately 7.5 miles west of Springfield. The Village has a total land area of 0.4 mi². According to the Census of 2010, there are 304 people. There are 133 housing units with 85.7% occupied. 71.1% of the population is 18 years of age or older and 28.9% is under the age of 18.

Donnelsville was platted in 1832 by Captain Abram Smith. It was incorporated in 1850. According to the Census of 1880, there were 232 inhabitants. The town consisted of a dry-goods store, two grocery and provision stores, a wagon and blacksmith shop and two cobbler shops. In 1819, the Methodist Episcopal Church was formed at the house of Jeremiah Leffel, who lived about two miles north of the village. The brick church was built shortly after the town was platted. The Lutheran Church was organized around 1830, and met for a number of years at the house of Jacob Snyder. A building was erected later, known as "Croft Church," and was located on the farm of George Croft.

An early perspective of the Village of Donnelsville in 1875 was given by an excerpt from *The History of Clark County, Ohio* by L.H. Everts & Co.: "Donnelsville has some very tasteful and pleasant private residences. A graded district school is held in a good and substantial two-story brick house."

Village of Enon

Enon is a village located in the southwest portion of Clark County in Mad River Township. It is approximately nine miles southwest of Springfield. The Village has a total land area of 1.3 mi². According to the Census of 2010, there are 2,415 people. There are 1,120 housing units with 95.4% occupied. 80.9% of the population is 18 years of age or older and 19.1% is under the age of 18. Enon is the headquarters of the Speedway SuperAmerica gas station chain.

Three distinct groups of Native Americans made their homes in the Enon area prior to the arrival of the first white settlers. The Adena Native Americans were the first group to reside in the area. The second group was the Hopewells. The last group was the Shawnees who lived at Old Piqua, where George Rogers Clark Park is now located.

Enon is home to the second largest conical Adena burial mound located in the State of Ohio. It can be found east of downtown Enon on the former Knob Prairie Mound Farm. The mound was reportedly used by General George Rogers Clark in 1780 as a vantage point prior to the attack on the Shawnee Village of Picaway, located less than two miles to the north. It is listed on the National Register of Historic Places (NRHP) and is owned by the Village of Enon.



Adena Burial Mound in Enon

The first settlers in Mad River Township settled sometime prior to 1798. The name Enon means "abundance of springs." From 1817 to 1838, the area was a flourishing agricultural center. On May 19, 1838, the site of Enon was platted by Ezra Baker and Elnathan Corey and lots one through 60 were approved on June 18, 1838. The town of Enon was dedicated at the time the Springfield and Dayton Road was laid out. On March 15, 1850, Enon was incorporated. www.enonohio.com

City of New Carlisle

New Carlisle is located in the western portion of Clark County in Bethel Township. It is approximately 18 miles west of Springfield. The City has a total land area of 1.9 mi². According to the Census of 2010, there are 5,785 people. There are 2,389 housing units with 92.7% occupied. 74% of the population is 18 years of age or older and 26% is under the age of 18.

New Carlisle was platted in 1810 by William Reyburn. In 1812, the present plat was developed, and called Monroe. The name was changed to New Carlisle in 1828. The Census of 1880 recorded 872 inhabitants. Some of the early buildings in the City included the town hall, Odd Fellows' and Masonic buildings and five churches. New Carlisle was incorporated in 1832. An excerpt from *The History of Clark County, Ohio* by L.H. Everts & Co. describes the Village in 1875, explaining that, despite its rural location, New Carlisle was still a thriving Village:

“Though remote from railroads, Carlisle has a very fair general trade; there are two fine stocks of dry goods, two drug stores, five grocery and provision stores, one general stock of hardware and queensware, one merchant tailor and clothing establishment, a bakery and confectionery, two harness shops, two tin and stove stores, two furniture and cabinet shops, two hotels, one carriage factory, one wagon shop, five blacksmith shops, one cooper, one shoe store, two shoe manufactories, two livery and feed stables, one agricultural implement warehouse, two millinery establishments, one notion store, two meat markets and two nurseries. New Carlisle is surrounded by one of the most fertile grain-growing districts in the world. Some statistics, recently collected, show an almost incredible amount of wheat, corn, rye, barley, flax-seed, potatoes, hay, beef, pork, sheep, grass seeds produced in an area of four miles around the village. The soil is also well adapted to the growth of fruit trees, as is shown at the nurseries that adjoin the village, hundreds of thousands of which are shipped every year from this place and distributed all over the country; to both wholesale dealers and agents.”

On June 10, 1933, the infamous John Dillinger committed his first bank robbery taking \$10,000 from a bank that occupied a building at the southwest corner of Main and Jefferson Streets.

Village of North Hampton

North Hampton is located in the northwest portion of Clark County in Pike Township. It is approximately 10 miles northwest of Springfield. The Village has a total land area of 0.3 mi². According to the Census of 2010, there are 478 people. There are 178 housing units with 97.2% occupied. 71.1% of residents are 18 years of age or older and 28.9% is under the age of 18.

North Hampton was the first village established in Pike Township, and was platted by Peter Baisinger on January 13, 1829. The original number of lots was sixteen. In 1875, the population of the Village was close to 200. The first merchant of the Village was Joseph Smith, who later moved to Michigan in 1835. The first frame house of North Hampton was built by Smith in 1830. It measured 16-feet by 22-feet, and was used both as a store and dwelling. Other merchants of Pike Township were Bennett and Garlough, John Ramsey, John Davis, William Spence, Spence Brothers, Conklin, French Dickinson, Meranda and Heath, J. E. Fennimore, Jacob Overpack, Michael Hart man, J. P. Hockett, J. M. Austin, J. and W. Morningstar and Levi Wingert. The post office was established in 1835, with Daniel Raffensperger as the first postmaster. The Village was not incorporated until 1925. www.northhamptonohio.net

Village of South Charleston

South Charleston is located in the southeast portion of Clark County along State Route 41 and U.S. Route 42. South Charleston is situated in Madison Township. It is approximately 15 miles southeast of Springfield. The Village has a total land area of 1.3 mi². According to the 2010 Census, there are 1,693 people. There are 793 housing units with 90.8% occupied. 75% of the population is 18 years of age or older and 25% is under the age of 18.

In 1811, Phillip Hedrick and his wife were the first settlers near South Charleston, located on the north bank of the Little Miami River. Hedrick assisted Conrad Critz with platting South Charleston on November 1, 1815. The original plat contained eight squares of four lots each, and was surveyed by John T. Stewart. South Charleston was incorporated in 1833.

Some of the early merchants and business men of South Charleston included Charles Paist, Robert Evans, Maddox & Heiskell, Albert Munson and Thomas Norton. Clement Stickley operated a tannery on the western portion of South Charleston, near the residence of Henry Wilkinson, in 1825. A small schoolhouse was built measuring 12-feet by 18-feet. Christopher Lightfoot was the first teacher, conducting his first lesson in 1826. In 1848, the P. C. & St. L. Railroad was built, contributing to the growth and prosperity of South Charleston.

This growth and prosperity can be seen when looking at population figures from 1850 to 1880. In 1850, there were 413 people residing in South Charleston. From 1850 to 1870, the population steadily rose. By 1880, the population had more than doubled to 933 compared to the population of 1850. www.villageofsouthcharleston.net

Village of South Vienna

The Village of South Vienna is located in the eastern portion of Clark County in Harmony County. It lies along State Route 54 and Interstate 70. It is approximately 11 miles east of Springfield. The Village has a total land area of 0.4 mi². According to the Census of 2010, there are 384 people. There are 166 housing units with 89.2% occupied. 73.2% of the population is 18 years of age or older and 21.8% is under the age of 18.

Vienna was founded and platted in 1833 by John H. Dynes. A post office was established in the community in 1838, and was designated South Vienna. In 1850, a cholera epidemic devastated the Village and affected the population. South Vienna was considered a stock-raising and farming community. The first house erected was a log cabin situated in the west part of the Village. The second house erected was hewed log, and was built by Richard Watkins, of Champaign County. Emanuel Mayne built a two-story frame on the southeast corner of the Village which was eventually removed and replaced by a hotel. Caleb Barrett was the first merchant and began a business in 1834. The first tannery was constructed in the northwestern portion of the Village in 1837 by D. W. Hinkle. An accidental explosion of powder occurred on August 8, 1871, demolishing the brick storeroom of a local store and seriously injuring nine people. The Village of South Vienna was not incorporated until 1901. www.southvienna.org

City of Springfield

Springfield is the county seat of Clark County. It is located in the center of the County, situated on the Mad River. The City has a total land area of 22.5 mi². According to the Census of 2010, there are 60,608 people. There are 24,585 housing units and 16,224 families residing in the City. There are 28,437 housing units.

Springfield was incorporated as a city on March 21, 1850. J. M. Hunt was the first mayor of Springfield. He presided at the first meeting of the city council held May 18, 1850. The City Building was dedicated on February 13, 1890, and served the citizens until the current City Hall opened on June 2, 1979. The name "Springfield" was chosen because of the many springs and abundant waters located in and around the City.

In 1790, John Paul, a member of the Clark Expedition, returned to the area and built a home. He was believed to be the first settler to locate in what became Clark County. One of the County's early settlers was James Demint, who erected a cabin at the confluence of the Mad River and Lagonda (Buck) Creek in 1799. In 1801, a plat on the city was made on Demint's land by surveyor, James Dougherty. The same year, Griffith Foes built the first tavern which became a famous stagecoach stop. In 1804, the first post office was established for Springfield. Simon Kenton built a gristmill and distillery where the old International Harvester plant now stands.



City Hall

John Humphreys, John Ambler and others organized the first Presbyterian Church in Springfield. By 1806, the first Methodist and First Christian churches were organized. The first church building was erected in Springfield in 1810 and was free to all denominations. In 1817, George Smith published the first paper called *The Farmer*. The first presiding judge was Frederick Grimkie. Springfield Female Seminary began in 1851 and was led by the Reverend James L. Rogers. Wittenberg College was organized by the Lutheran denomination. It was patterned after Yale College, Connecticut, in having both collegiate and theological departments under the same board and faculty.

Several factors contributed to the rapid growth of Springfield. The Old National Road was completed through Springfield in 1839 and the railroads of the 1840s provided profitable business to the area. Agriculture, followed by industry, flourished. By the beginning of the Civil War, the two industries had joined to help Springfield become one of the world's leading manufacturers of agricultural equipment. International Harvester Company, now Navistar International, is the manufacturer of farm machinery and became the leading local industry after a native, William Whitely, invented the combined self-raking reaper and mower in 1856.

Over the years, Springfield has had three other nicknames: "Champion City" because the highly successful Champion reaper was produced here in the 1800s, "Home City" because the Masons, Odd Fellows and Knights of Pythias located retirement homes here around the turn of the century and "City of Roses" because by 1919, 33 greenhouses located in Springfield produced more roses than any other city in the world. www.ci.springfield.oh.us

Village of Tremont City

Tremont City is a village located in north central Clark County in German Township. It is approximately 7 miles north of Springfield. The Village has a total land area of 0.3 mi². According to the Census of 2010, there are 375 people. There are 166 housing units with 91% occupied. 79.2% of the population is 18 years of age or older and 20.8% is under the age of 18.

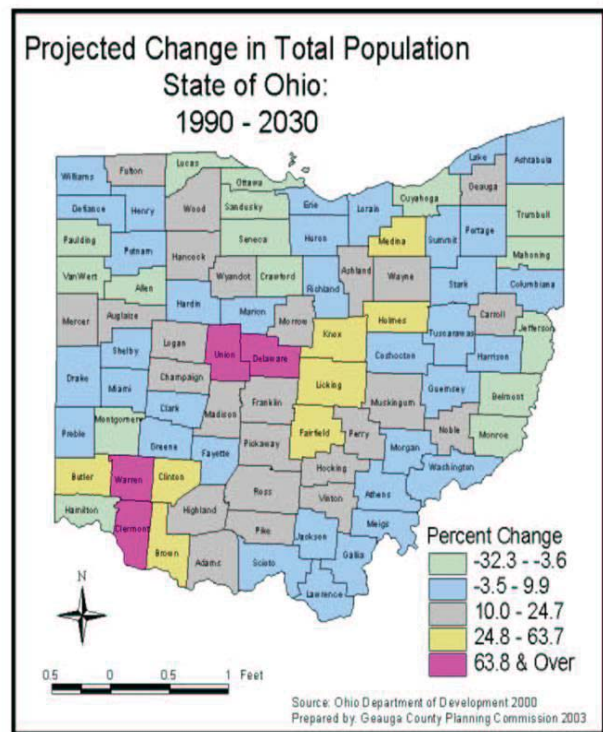
Originally platted as Clarksburg in 1838, Jacob Kiblinger initially built a saw and hemp mill in Section 8, upon Mad River in 1808 which was later to become the Village of Tremont City.

In 1836, upon the site of the Seitz Mill at Tremont, there was a small carding machine and that year John Ross erected a small distillery, both kind of neighborhood affairs. Ross began to plat off and sell lots and shortly thereafter it began to give a village-like appearance. The Post Office was established in 1839 with Dr. Laughlin as Postmaster. The name then was changed to Tremont as there was another town in Ohio named Clarksburg. This occurred in 1839 and the Village was actually incorporated in 1918. Several churches including a large Methodist Church were erected as well as the German Reformed Church.

State Population

The State of Ohio’s population in 2000 was 11,353,140 and it is projected to climb to 12,317,613 by 2030, an increase of 8.5%. However, it appears that the rate at which Ohio’s population is growing is diminishing. Several factors may be contributing to this decline. The birth to death ratio is much smaller than in faster growing states, with Ohio expected to have 4.4 million births and 3.6 million deaths. Net migration is a factor as well.

The projected percentage of population change by county in Ohio from 1990 to 2030 is reflected on the map in this section. Counties surrounding a major metropolitan area – Cincinnati, Columbus, and Cleveland – generally will experience higher growth rates. Counties in the north central and eastern region of the state are projected to experience a decline.



County Population Projection

According to U.S. Census for 2010, the total population of Clark County is 138,333 which have decreased from 144,742 in 2000. Clark County is semi-rural in nature and is considered to be part of the Springfield-Dayton metropolitan area.

The County's inhabitants per square mile compared to the State's inhabitants per square mile are 343.3 versus 257.4 respectively. The area of highest population density is the City of Springfield with 60,608 people.

The population of Clark County has steadily increased from 1820 to 1970. From 1980 to 2010, there has been a gradual decrease in population by 11,903 people. From 1960 to 1970, the population increased by 25,675 people, which was the largest net change experienced by the County. Clark County is expected to decrease in population to 143,960 by 2030.

1.6 Tourism and Points of Interest

Crabill Homestead

The David Crabill House is of late Federal design. It is located in Moorefield Township, Clark County, Ohio, on the grounds of the Clarence J. Brown Dam and Reservoir. It is of the 1825-1830 style of architecture.

Baseball Hall of Fame

The Springfield/Clark County Baseball Hall of Fame was formed in 1959 to honor any person age 25 or over, or a team that has made a significant contribution to baseball in Clark County either, locally, regionally, or nationally. Induction ceremonies are held the second Saturday of January.

Daniel Hertzler House

The Pennsylvania Bank-style house is furnished in the pre-Civil War 1850's period style. The house was built by Daniel Hertzler - a wealthy mill owner, who legend has it, still haunts the house to this day.

Frank Lloyd Wright's Westcott House

Completed in 1908. The Westcott House is Frank Lloyd Wright's only Prairie Style home in Ohio. Located at 1340 East High Street, Springfield, The Westcott House underwent an inch-by-inch \$5.3 million restoration in 2005.

Governor Asa S. Bushnell Mansion

Listed with the National Historical Registry, this house was originally constructed as the personal home of two-term Ohio Governor Asa S. Bushnell, a major industrialist in Springfield and Clark County. Bushnell was president of Warder, Bushnell and Glessner Company, which later became International Harvester.

Heritage Center of Clark County

Located in historic downtown Springfield and built in 1890, the facility extends an entire city block and is now home to Clark County's "Smithsonian". Inside, you will find a research library and archives, museum, exhibition hall, and gift shop.

Knob Prairie Mound

Located on what was called Knob Prairie Mound Farm, the mound was reportedly used by General George Rogers Clark in 1780 as a vantage point prior to the attack on the Shawnee village of Picawey, located less than two miles to the north.

Ohio Historic National Road

Route 40 was recently designated as an All-American Road. The National Road runs straight through the heart of Springfield with many historical stops along the way, including a number of structures originally built to accommodate travelers in Conestoga wagons.

South Charleston Opera House

This historic Opera House, located within South Charleston's Renaissance Revival-style Town Hall, was built in 1879 and returned to active use in 1984. Known for its phenomenal natural acoustics, it has hosted countless musicians, singers and productions.

Springfield Museum of Art

Called "an oasis" and a "hidden gem", the Museum's permanent collections contain American art from the 1700's to present. On exhibit is work by well-known American artists and a significant collection of Ohio artists.

Madonna of the Trail

The "Madonna of the Trail" is the National Society Daughters of the American Revolution (NSDAR) memorial to the pioneer mothers of the covered wagon days. It can be seen adjacent to the entrance of Snyder Park.

The Gammon House

Built in the 1850's, the Gammon House was an Underground Railroad site. Originally owned by a black abolitionist named George Gammon, the famous stop features secret passages leading into the attic and a tunnel into the basement.

Davidson Interpretive Center

The Davidson Interpretive Center is located adjacent to George Rogers Clark Park, the site of the Revolutionary War Battle of Peckuwe. The center includes interpretive displays and educational programs.

D T & I Depot

The D T & I Depot, located in South Charleston, was built in the winter of 1878. This depot and railroad was once owned by Henry Ford to use as transportation to and from Detroit. Excursion train rides are offered once a year.

County Festivals

Fair at New Boston – Labor Day Weekend
Catawba Farm Festival
Clifton Gorge Music and Arts Festival
South Vienna Corn Festival
Springfield Summer Arts Festival
Holiday Lights at Clifton Mill
CultureFest
Lillian Gish Film Festival
New Carlisle Festival of Flight
County Fair – last week in July
Heritage of Flight parade and Festival- New Carlisle

Other Notable Points of Interest

Young’s Dairy
Brandenberry Winery
Millionaire’s Row
Hollandia Botanical Gardens
Little Miami Scenic Trail
A. B. Graham Memorial Park
Lakeview Park
C.J. Brown Reservoir
Snyder Park
Heart of Ohio Antiques

1.7 Community Parks/Recreation Areas

Community Parks and Recreation Areas

Snyder Park
Carelton Davidson Stadium
Clark County Fairgrounds
Gateway Learning Gardens
George Rogers Clark Park
Glen Helen Nature Preserve
H. G. Hartman Rock Garden
Hollandia Botanical Garden
Lower Valley Pike Scenic Byway
Old Reid Park

Recreational Trails

Little Miami Scenic Trail – 78 miles of trail running from Springfield to the Little Miami Golf Center south of Milford.
Buck Creek Trail – in Springfield from Plum Street to Pumphouse Road to C.J. brown Reservoir.
Simon Kenton Trail – Center Street in Springfield to Urbana.
Prairie Grass Trail – London to South Charleston to Lilly Chapel.
Tecumseh Trail - New Carlisle 2.5 Miles

Clark County Golf Courses

Forest Hills Par 3
Locust Hills
National Golf Links
Northwood Hills Country Club
Reid Park Golf Course
Rocky Lakes
Snyder Park Golf Course
Springfield Country Club
Sugar Isle
Windy Knoll Golf Course

Clark County YMCA

300 South Limestone Street, Springfield

1.8 Public Libraries and Education

Public Libraries

Clark County Public Library

Main Library – 201 South Fountain Avenue, Springfield

Enon Branch – 209 East Main Street, Enon

Houston Branch – 5 West Jamestown Street, South Charleston

Park Branch – 119 North Bechtle Avenue, Springfield

Village Branch – 1123 Sunset Avenue, Springfield

New Carlisle Public Library

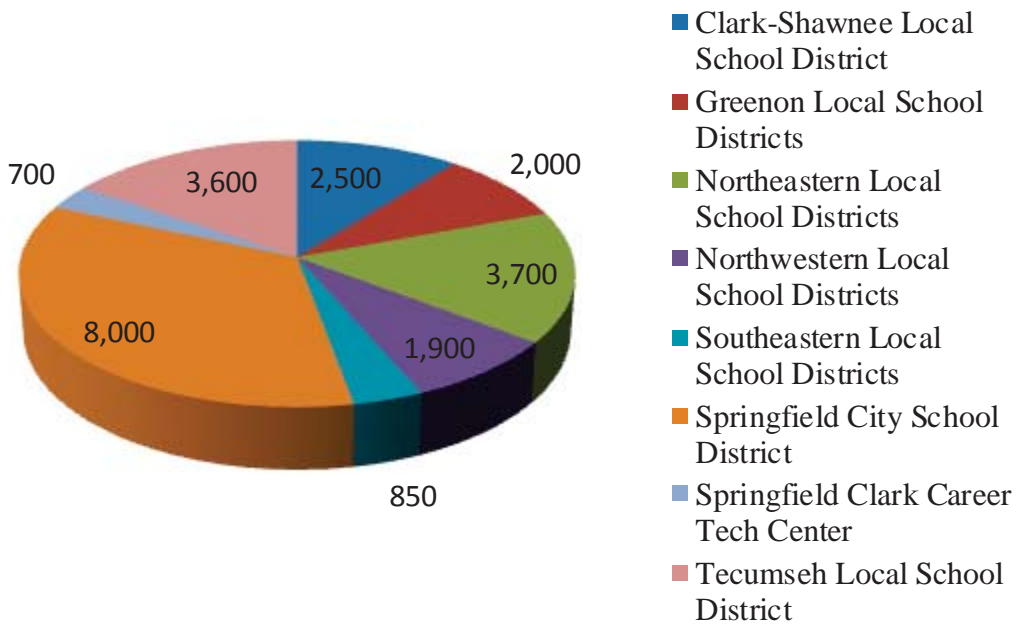
Education

Clark County has six local public school districts, one city district and one career technology center

Public School System

Approximate Enrollment as of 2012

Clark-Shawnee Local School District	2,500
Greenon Local School Districts	2,000
Northeastern Local School Districts	3,700
Northwestern Local School Districts	1,900
Southeastern Local School Districts	850
Springfield City School District	8,000
Springfield Clark Career Tech Center	700
Tecumseh Local School District	3,600



The Clark County Education Services Center provides curriculum leadership and management to the County education system.

Private high schools include:

Catholic Central Schools
Emmanuel Christian Academy
Nightingale Montessori
Twin Oaks SDA Elementary School

Private elementary schools include:

Catholic Central Elementary – Lagonda Campus
Catholic Central Elementary – Limestone Campus
Catholic Central Schools
Derr Road KinderCare
Emmanuel Christian Academy
Enon Montessori
Holy Trinity School
Maiden Lane Educare
Nightingale Montessori
Ridgewood School
Risen Christ Lutheran School
St. John S. Lutheran School & Child Care
Springfield Academy of Excellence
Springfield Christian School
Twin Oaks SDA Elementary School

Career related schools include:

Clark County Career Tech

Advanced education includes:

Wittenberg University
Clark State Community College

1.9 Business and Industry

Clark County is a blend of a strong agricultural and industrial county in southwest Ohio. Major farm products include soybeans, wheat, corn, hogs, livestock, poultry, beef, and dairy products. Clark County has approximately 64% of its land in crop and pasture land and ranks 20th in the State in corn and soybean production and 36th in raising hogs.

In 2009 the total civilian labor force for all industrial sectors in Clark County was 71,400 with 64,000 employed and 7,400 unemployed. The unemployment rate in 2009 was 10.4%.

<u>Employment by Industry</u>	<u>Average Employment</u>
Private Sector	43,539
Goods-Producing	9,285
Natural Resources and Min	640
Construction	1,393
Manufacturing	7,253
Service-Providing	34,254
Trade, Transportation and Utilities	11,051
Information	286
Financial Services	2,973
Professional and Business Services	3,996
Education and Health Services	8,925
Leisure and Hospitality	5,023
Other Services	1,999
Federal Government	698
State Government	253
Local Government	6,484

<u>Major Employers</u>	<u>Type</u>
Assurant, Inc.	Insurance
Community Mercy Health Partners	Service
Dole Fresh Vegetables	Manufacturing
Gordon Food Service	Trade
Marathon/Speedway SuperAmerica LLC	Trade
Mercy Medical Center	Service
Navistar	Manufacturing
Springfield City Schools	Government
Springfield Masonic Community	Service
Wittenberg University	Service

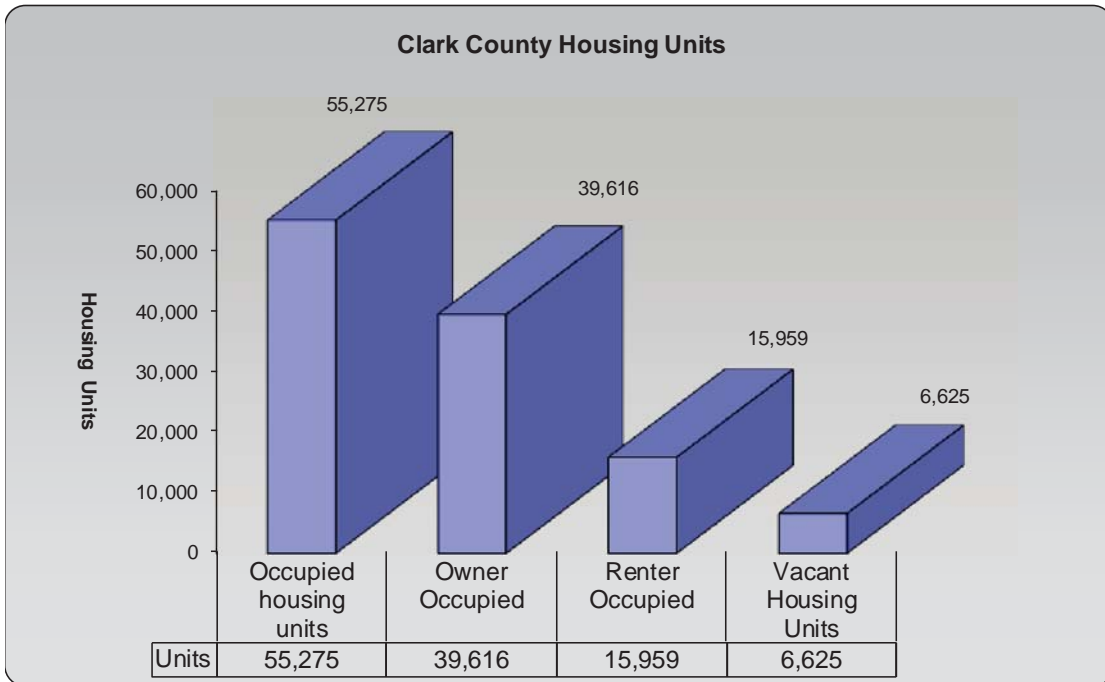
Total Active Business (2008): 2,265

The above information provided from Ohio Department of Development, Office of Policy, Research and Strategic Planning.

1.10 Residential Housing

Clarke County Housing Units

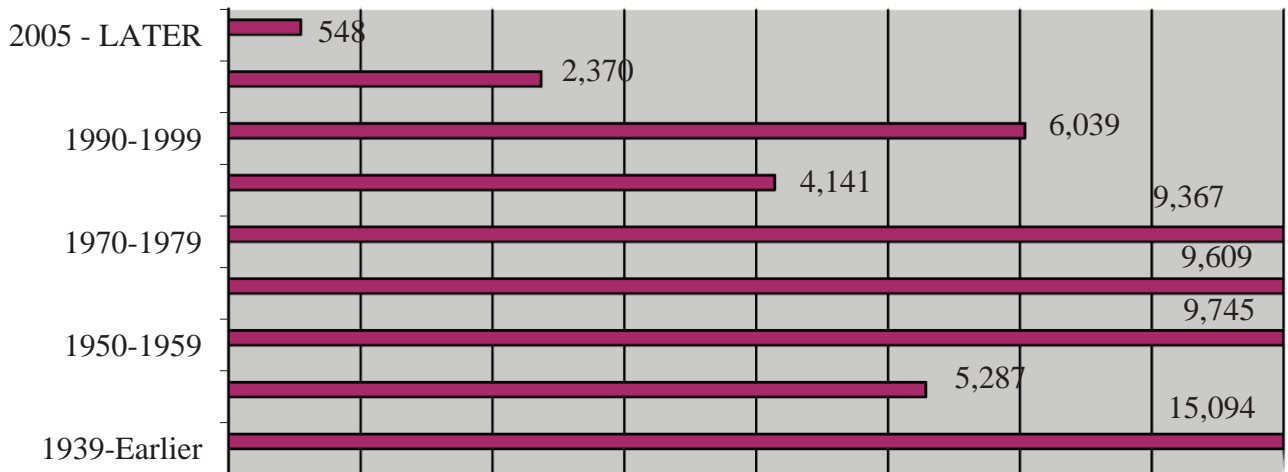
<u>Housing Units</u>	<u>Number</u>	<u>Percentage</u>
Total Housing Units	62,200	100%
Occupied housing units	55,275	92%
Owner Occupied	39,616	78.00%
Renter Occupied	15,959	21.00%
Vacant Housing Units	6,625	7%



Residential Construction Data

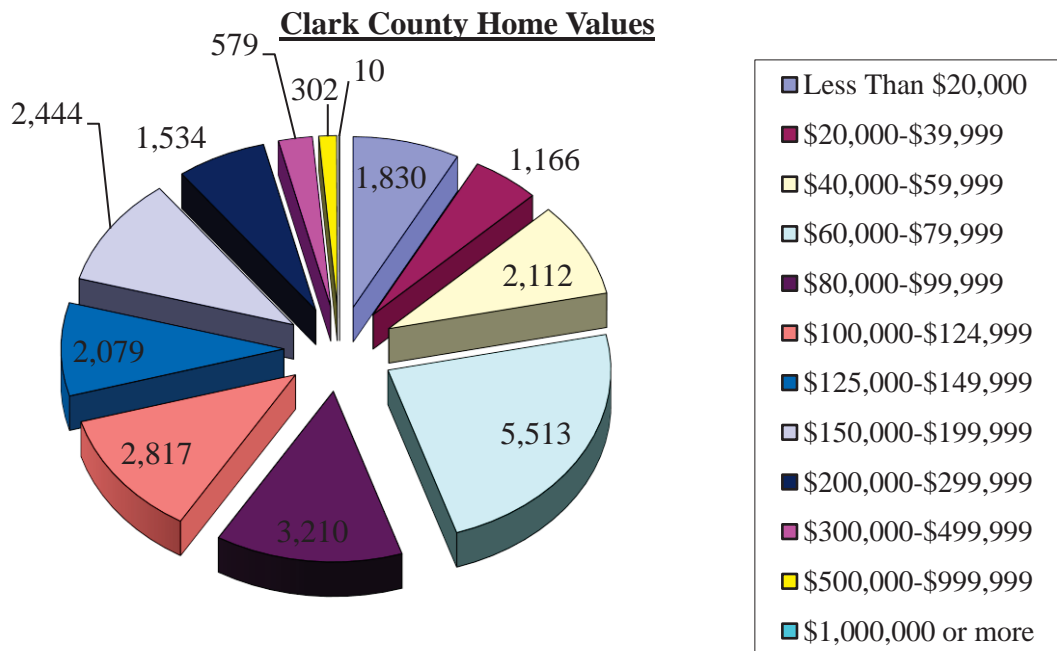
<u>Year Structure Built</u>	<u>No. Built</u>	<u>Percent</u>
2005 & later	548	0.9
2000 to 2004	863	3.8
1990 to 1999	1,938	9.7
1980 to 1989	1,314	6.7
1970 to 1979	3,812	15.1
1960 to 1969	2,544	15.4
1950 to 1959	9,745	15.7
1940 to 1949	5,287	8.5
1939 or earlier	15,094	24.3

Residential Construction Data



Home Values

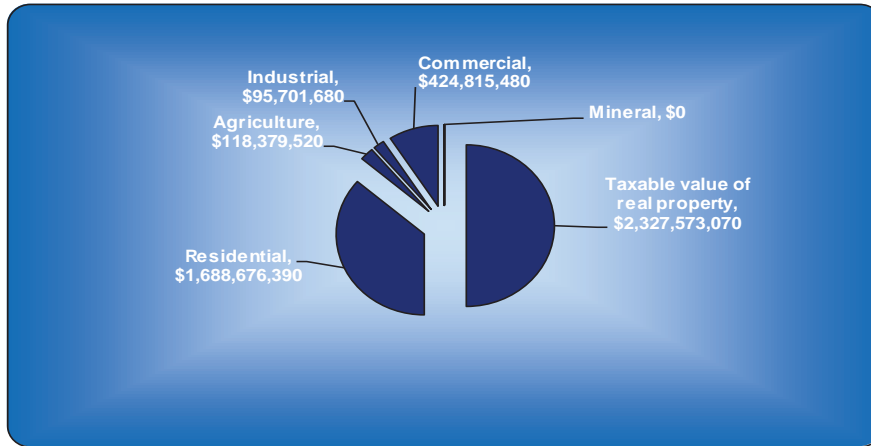
Value	No.	Percent
Specified Owner-Occupied Units	39,616	100.0
Less than \$20,000	1,830	4.6
\$20,000 to \$39,999	1,166	2.9
\$40,000 to \$59,999	2,112	5.3
\$60,000 to \$79,999	5,513	13.9
\$80,000 to \$99,999	6,409	16.2
\$100,000 to \$124,999	6,760	17.1
\$125,999 to \$149,999	4,671	11.8
\$150,000 to \$199,999	5,952	15.
\$200,000 to \$299,999	3,752	9.5
\$300,000 to \$499,999	1,149	2.9
\$500,000 to \$999,999	189	0.5
\$1,000,000 or more	113	0.3



1.11 Tax Value and Land Use

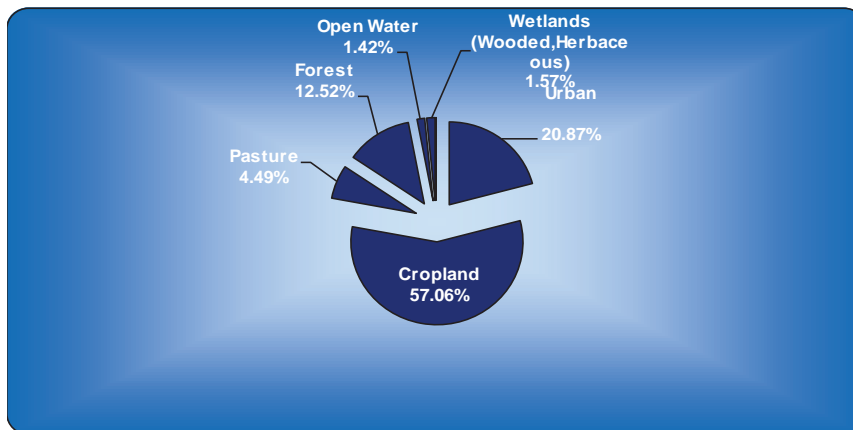
Clark County, Ohio

Taxes	Value
Taxable value of real property	\$2,327,573,070
Residential	\$1,688,676,390
Agriculture	\$118,379,520
Industrial	\$95,701,680
Commercial	\$424,815,480
Mineral	\$0

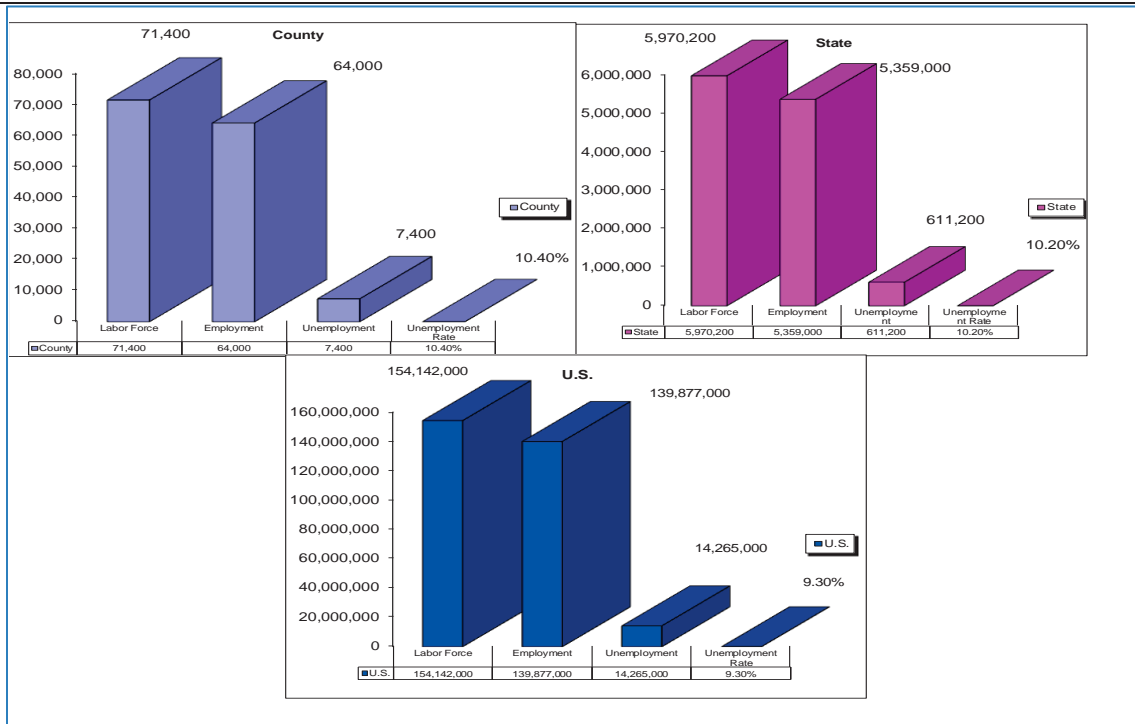
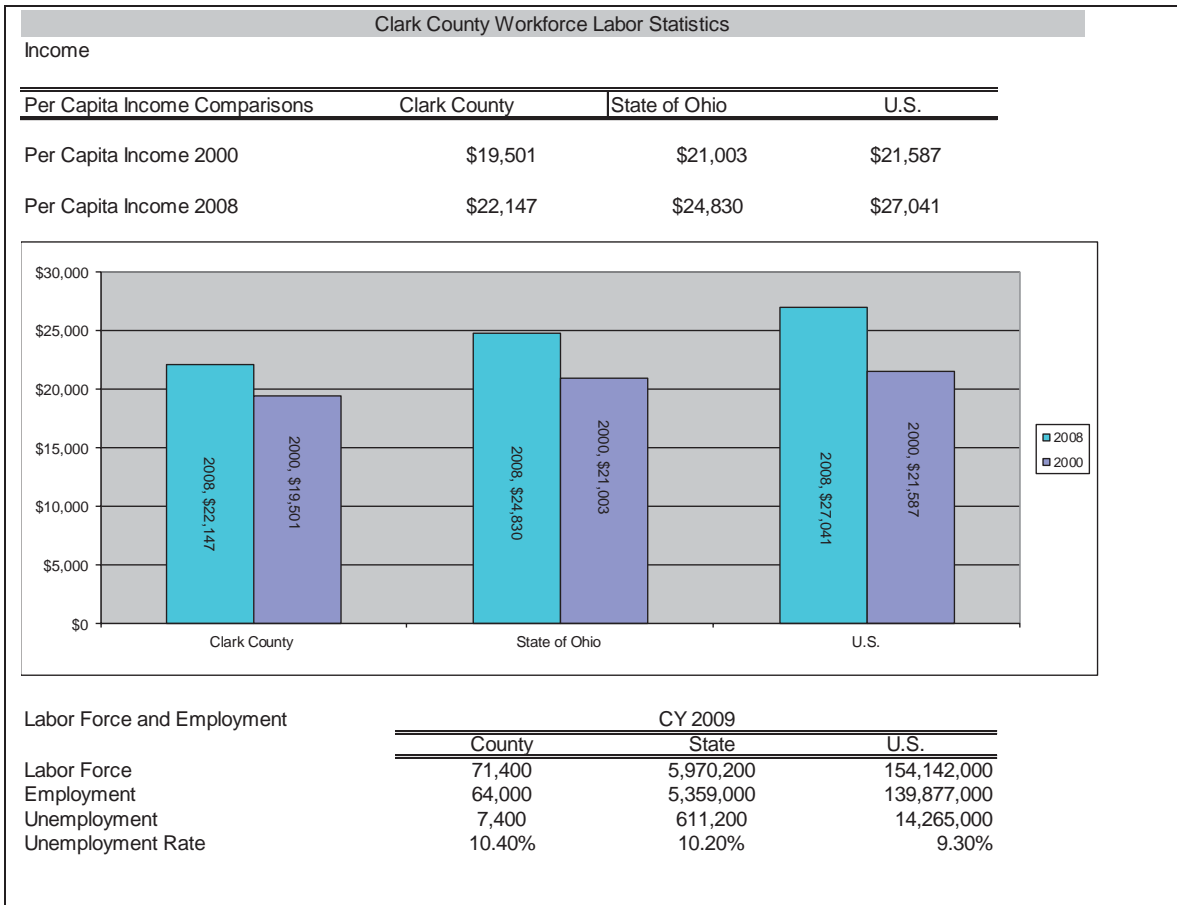


Land Use/Land Cover

Land Use/Land Cover	Percentage
Urban (Res,Comm,Ind,Trans,Urban)	20.87%
Cropland	57.06%
Pasture	6.56%
Forest	12.52%
Open Water	1.42%
Wetlands (Wooded,Herbaceous)	1.57%
Bare/Mines	0.00%



1.12 Workforce Labor Statistics



1.13 Documentation of the Planning Process

Organizing the Process

The planning process to update the Clark County Hazard Mitigation Plan was provided under the leadership of:

- Lisa D’Alessandris, Clark County Emergency Management Director/Committee Chairperson
- Kristie West, Clark County Emergency Management
- Mike Henderson, Mote & Associates, Inc.

The CCHMC members, through the planning process of September 2011 through December 2011. The committee held four public meetings and reviewed the current Clark County Hazard Mitigation Plan and addressed the county’s mitigation needs in order to:

- Put together a good cross representation of public, community, and stakeholders representing all of Clark County.
- Researched consensus on how to achieve a desired outcome of the county’s hazard mitigation challenges.
- Gain widespread support for directing the countywide financial, technical, and human resources towards an agreed upon course of action.
- Describe the planning process and intended outcome so that the description of the planning process serves a permanent record on how decisions were reached.
- Develop a strategy to reduce losses which have been developed by consensus in a methodical and reasonable way.

Involving the Public

The CCHMC held four public planning meetings from September 2011 through December 2012. A public hearing notice was also published in the Springfield News Sun on June 8, 2012, describing the countywide hazard mitigation planning process and encouraged the public to review and participate in the plan update process. The community leaders, City and Village officials were also invited to attend the monthly planning update meetings as documented in the letters per Appendix A. The public monthly meetings were intended to educate the community about the benefits of hazard mitigation planning and seeking the input of citizens during the planning process. The following public planning meetings were held at the conference room of the Clark County Emergency Management Agency which was centrally located in the county.

List of Public Planning Meetings

Meeting	Date	Purpose	Attending
1	September 27, 2010	Kick-off Meeting	Public / CCHMC
2	October 10, 2010	Planning Meeting	Public / CCHMC
3	November 8, 2010	Planning Meeting	Public / CCHMC
4	December 12, 2011	Planning Meeting	Public / CCHMC

Copies of the 5 year plan update were made available for review on the Clark County Emergency Management website: www.clarkcountyohio.gov/ema. Hard copies were made available for review at the County Emergency Management Agency, 3130 East Main St. #1E, Springfield, Ohio, 45503, 937-521-2175.

Having a mitigation committee of community leaders and representatives of various agencies, businesses, farmers, and residents with many years of experience living and working in Clark County was a huge asset in the planning process. Their input led to spirited debate and helped the CCHMC identify problems the county had faced during past hazard events. Likewise, the committee also helped identify and promote all of the positive mitigation activities that have been completed by various agencies over the past several years since the completion of the initial Clark County Hazard Mitigation Plan which was approved in 2006.

Community/Township Participation and Plan Involvement

Every Hazard Mitigation Committee member and community representatives contributed and participated to this Plan update. Some examples of how each community contributed to the success of the planning process are as follows:

- The County Engineer was able to provide his expertise and experience with areas of reoccurring flooding. These areas have been outlined in the plan. His expertise has been invaluable in how completing mitigation activities such as acquiring dedicated green space along the stream corridor, improved drainage ways, elevating reoccurring flooded roadways and bridge and stream improvements has prevented damages and interruptions throughout the county.
- The County Red Cross, GIS Department and EMA have all worked together to identify, map and coordinated emergency shelters where residents can go to seek shelter and safety in the event of a severe hazard occurrence.
- A participating member of the Clark County Combined Health District was able to describe the process of being prepared for health epidemics and special needs requirements and what could be expected should Clark County experience a future epidemic crisis.
- The Citizens Corps Agencies have been able to maintain the Volunteer Reception Center to coordinate volunteers who are willing to help with a severe weather incident.
- The EMA sent out a participation letter and survey to all communities encouraging participation and providing updated information regarding mitigation activities completed and in process within each community.
- Several of the smaller villages do not have Village Administrators or full time staff that could participate on the Hazard Mitigation Committee. However, these communities contributed in the planning process through completing questionnaires as indicated in Appendix A-3. In addition, follow-up contact was made by the EMA office to various village officials for their input. Other community volunteers such as First Responders were contacted by the Clark County EMA office and they participated by helping to update hazard information and risk assessment data for their respective Clark County community.
- The Cities of Springfield, New Carlisle, and Villages of Catawba, Clifton, Enon, North Hampton and Tremont City all reported on flooding issues that still need addressed (see 2.5 Flooding under Location).
- The Village of Tremont City reported on completion of new tornado siren.
- The Village of North Hampton reported on success stories such as water tower, sewer pump stations and emergency generators for Northwestern Schools and Chateau Village Mobile Home Park. The removal of a residence on Saddlebrook Run out of the 100-year flood plain.

- South Charleston and Tremont City reported on large dead trees in right-of-ways that need removed.
- City and Villages reported on critical infrastructure changes in their communities.
- The Villages of Enon, North Hampton and South Vienna reported on a need for emergency back-up generators for their water treatment plant.
- Mad River, Moorefield, and German Townships reported on needs for tornado safe rooms.
- City of Springfield and Springfield Township reported on needs for a property in the 100-year flood plain to be acquired and demolished.
- Harmony Township reported on a need for a community safe room.

The CCHMC reviewed the existing planning documents, studies reports, and technical information to determine if all of the previous plan referenced documents are still pertinent if other new documents and planning mechanisms should be incorporated into the Plan.

Neighboring Community Involvement

The Clark County Emergency Management, in addition to the public announcement, also involved all of the neighboring counties' Emergency Management Agencies to participate in the planning process. Copies of the invitations are included in Appendix A.

The Planning and Review Process

During the plan review and plan update process the Clark County Hazard Mitigation Committee evaluated each section of the 2006 plan, had spirited discussions, and made recommendations for updating the 2006 Clark County Hazard Mitigation Plan. Some of the planning documents referenced to assist the CCHMC in the planning process included:

- FEMA's local Multi-Hazard Mitigation Planning Guidance
- The local Mitigation Plan Review Crosswalk
- The 2011 State of Ohio Enhanced Hazard Mitigation Plan
- Available planning documents from County and Local Municipalities

For this Plan update, it was decided that the CCHMC would primarily address natural disaster mitigation planning. At this time the CCHMC decided not to address manmade hazards as part of the Hazard Mitigation Planning update process.

The CCHMC reviewed draft sections of the Plan and developed the mitigation strategy for the current Plan update process as outlined below:

- 1: Review of Initial Planning Process:
 - Reconvened and expanded hazard mitigation committee and inform public
 - Recommended update of the community profile.
 - Review hazards to determine if there are any changes to be made or additional hazards to be added.
 - Reviewed the following referenced Plans to ensure coordination:
 - Clark County Emergency Operations Plan.
 - Community Comprehensive Plans, Zoning Plans, and Capital Improvement Plans.
 - Review new updated countywide Floodplain Maps.

➤ Review of State Mitigation Plan.

- 2: Review of Risk Assessment Strategy Section:
 - Determine if there is missing data or if more data is needed for future plan updates.
 - Determine if change of conditions over the past five years warrants change of hazard priorities.
 - Determine if other hazards should be added and profiled.
 - Update last 5 years of weather history.
 - Review repetitive losses for the county.
- 3: Re-assessment of Hazard Vulnerability:
 - Discussion on what has changed.
 - Re-evaluate vulnerability of the hazards that can affect the County.
 - Identify and incorporate the changes into the updated Plan.
 - Analyze probability of future events.
 - Evaluate County development trends.
- 4: Review 2006 Plan Goals and Objectives:
 - Discussion on what has changed in the last five years that may have affected vulnerability issues.
 - Identify and discuss new problems.
 - Review progress of current action items.
 - Verify if current strategy goals and objectives are accurate or if need revised.
 - Identify new action items and progress made on current action items.
 - Task out priority action items.
- 5: Evaluate Plan Maintenance Process:
 - Strengthen process to make it a stronger countywide collaborative effort.
 - Detail process on how the local government will incorporate the mitigation strategy into other planning mechanisms.
 - Review and modify process as necessary to continue public participation in the Plan.
- 6: Draft a Revised Plan Document:
 - Review by stakeholders.
 - Modifications as recommended by stakeholders.
- 7: Plan Adoption:
 - Reviews by State Emergency Management Agency, Federal Emergency Management Agency, & FEMA.
 - Make recommended revisions as requested by State EMA and FEMA.
 - Formal adoption by the Clark County Board of Commissioners and all participating communities.

Community Plans

A summary of the known community documents to be incorporated included those shown in the following table:

Municipality Name	Population	Planning Commission	Zoning	Comprehensive Plans	Flood Plain Ordinance	Building Code - Residential	Building Code - Commercial	NFIP	5 Year Capital Improvement Plan
City of Springfield	60,608	•	•	•	•	•	•	•	•
City of New Carlisle	5,785	•	•	•	•	•	•	•	•
Village of Enon	2,415	•	•	•	•		•	•	
Village of South Charleston	1,693	•	•	•		•	•		
Village of North Hampton	478	•	•	•	•	•	•	•	
Village of South Vienna	384	•	•	•		•	•		
Village of Tremont City	375	•	•	•	•		•	•	
Village of Catawba	272	•	•	•		•	•		
Village of Clifton (pt)	48 (part)	•	•	•			•		
Village of Donnelsville	304	•	•	•		•	•		
Unincorporated areas of Clark County including all townships	26,924	•	•	•			•		

County or Plans referenced and to be a part of the Plan include:

- 2011 updated Clark County FIRM Maps
- Clark County Subdivision Regulations
- Clark County Open Space Plan for National Trail Parks and Recreation District.
- Clark County Farmland Preservation Report
- Crossroads: A Comprehensive Plan for Clark County Communities
- Watershed Planning Efforts

1.14 Local Planning Committee & Contact List

The Clark County Hazard Mitigation Planning Committee held four public meetings from September 2011 through December 2012 to guide and participate in the planning update process of the Clark County Hazard Mitigation Plan. The Committee consists of representatives from the following public and private sectors of Clark County.

- Clark County Emergency Management Agency
- Clark County Board of Commissioners
- City of Springfield
- Clark County Township Trustees Association
- Clark County Engineer's Office
- Fire Chief's Association
- Clark County Soil & Water Conservation
- Transportation Committee
- City of New Carlisle
- Clark County Administrator
- Clark County Flood Plain Manager
- Clark County Combined Health District
- Springfield News Sun Representative

The Board of Clark County Commissioners, City and County Representatives and EMA officials had representatives or public officials present and participating on the Clark County Hazard Mitigation Planning Committee. In addition, participation from all smaller villages and communities were documented by:

- Responses received from letters and questionnaires sent to each community.
- Providing community action item update responses returned to the Clark County EMA.
- Receipt of updated community information provided by local fire department personnel, volunteers, or village officials.
- Participation by volunteers from the communities attending hazard mitigation meetings.

The following is the 2011-2012 Clark County Hazard Mitigation Members list. Copies of the community letters, questionnaires and responses can be found in Appendix A.

Clark County 2011-2012 Hazard Mitigation Committee Member List			
<i>Name</i>	<i>Representing</i>	<i>Phone Number</i>	<i>Email</i>
Lisa D'Allessandris	Director, EMA	937-521-2176	ldallessandris@clarkcountyohio.gov
Kristie West	Adm. Assistant, EMA	937-521-2177	kwest@clarkcountyohio.gov
Herb Greer	Twp. Trustee President	937-215-0137	hgreer@woh.rr.com
Kim Jones	City of New Carlisle	937-845-9492	kjones@newcarlisle.net
Nathan Kennedy	County Administrator	937-521-2010	nkennedy@clarkcountyohio.gov
Bryan Heck	City of Springfield	937-324-7300	bheck@ci.springfield.oh.us
Tom Hale	Floodplain Manager	937-521-2160	thale@clarkcountyohio.gov
Chris Simpson	Clark County SWCD	937-521-3850	csimpson@clarkcountyohio.gov
Judy Andrews	Combined Health District	937-390-5600	jandrews@ccchd.com
Glen Massie	Transportation Committee	937-521-2132	gmassie@clarkcountyohio.gov
Tom Hawkins	Springfield News Sun	937-328-0343	thawkins@cox.ohio.com
Otto Larson	Insurance Industry	937-399-5500	olarson@consolidated.ins.com
Andrew Hennigan	Fire Chief's President	937-327-2236	andrew.hennigan@ang.af.mil
John Burr	County Engineer	937-521-1800	engineer@clarkcountyohio.gov
Shayne Gray	GIS Director	937-521-1885	sgray@clarkcountyohio.gov
Mike Henderson	Mote & Associates, Inc.	937-548-7511	mhenderson@moteassociates.com
Ron Darrow	Mote & Associates, Inc.	937-548-7511	rdarrow@moteassociates.com

1.15 Plan Adoption by the Board of Commissioners

The Board of County Commissioners, in and for Clark County, Ohio, met this 23rd day of October, 2013 in regular session, pursuant to adjournment, in accordance with Section 121.22 O.R.C. (Sunshine Law), with the following members present, viz:

Richard L. Lohnes

John Detrick

David Hartley

Resolution 2013-0823

**In the Matter of Resolution of Adopting the Clark County
Multi-Jurisdictional Hazard Mitigation 5 Year Plan Update**

Commissioner Hartley moved to adopt the following:

WHEREAS, the Clark County Emergency Management Agency desires to be compliant with the Disaster Mitigation Act of 2000 (DMA2K) and 44CFR Section 201.6(d)(3). Said Act requires that a Hazard Mitigation Plan meeting program criteria be developed in order that the participating Clark County communities and unincorporated areas of Clark County will be eligible for future pre-disaster and post-disaster mitigation program funds (i.e. Hazard Mitigation Grant Program, Flood Mitigation Assistance Program, etc.)

FURTHER, the mitigation planning regulation at 44CFR Section 201.6(d)(3) states:

A local jurisdiction must review and revise its Hazard Mitigation Plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.

WHEREAS, the Clark County Emergency Management Agency established the Clark County Hazard Mitigation Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event. Public meetings were held and a Countywide Multi-Jurisdictional Hazard Mitigation updated Plan was prepared and submitted to the Ohio Emergency Management Agency for review and comments in August 2011. Said Plan has been completed per the Ohio Emergency Management Agency recommendations. Said Plan is on file at the office of the Clark County Emergency Management Agency and is hereby formally adopted.

WHEREAS, by adopted Resolution 2013-0669, the Clark County Emergency Management Agency has entered into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive Emergency Management activities of the participants, thereof, including the various municipal corporations and unincorporated areas of Clark County, Ohio.

For the reasons stated in the preamble hereto, which is hereby made a part hereof, this Resolution is hereby declared to be an emergency measure and shall take effect and be in force from and after its passage by the Clark County Board of Commissioners, and its adoption by the participating municipalities of Clark County.

Commissioner Detrick seconded the motion and the roll being called for its passage, the vote resulted as follows:

Commissioner Hartley, Yes; Commissioner Detrick, Yes; Commissioner Lohnes, Yes

I, Megan Lokai, Clerk to the Board of County Commissioners, do hereby certify that the above is a true and correct copy of a motion as recorded in the Journal of the Clark County Commissioners, under the date of October 23, 2013.

Megan Lokai

Megan Lokai, Clerk

copy: County Auditor
County Administrator
Requesting Department(s)
EMAP file

1.16 Plan Adoption List**Adoption by Multi-Jurisdictional**

It is anticipated the following public entities will adopt the final FEMA approved plan for the Clark County Multi-Jurisdiction Hazard Mitigation Plan.

**Multi-Jurisdictional Plan Participation
Clark County, Ohio**

Participating Jurisdiction	Position/Title	2006 Plan		2012 Plan		Date of Adoption
		Yes	No	Yes	No	
Incorporated Areas						
City of New Carlisle	Kim Jones, City Manager	X		X		11/04/13
City of Springfield	Jim Bodenmiller, Administrator	X		X		10/29/13
Village of Catawba	Mark Skiba, Mayor	X		X		11/05/13
Village of Clifton (pt)	Alex Bieri, Mayor	X		X		Pending
Village of Donnelsville	Bob Cornwell, Mayor	X		X		Pending
Village of Enon	Chris Lohr, Village Administrator	X		X		11/12/13
Village of North Hampton	Emory Harrod, Mayor Brian Welbaum, President	X		X		11/12/13
Village of South Charleston	Josh Rice, Village Manager	X		X		11/05/13
Village of South Vienna	Toni Keller, Mayor	X		X		11/01/13
Village of Tremont City	Paula Johnson, Mayor Larry Belvins, President	X		X		Pending
Unincorporated areas of Clark County including all townships	James Davidson, Township Trustee President	X		X		10/23/13
Clark County Board of Commissioners	Nathan Kennedy, County Administrator	X		X		10/23/13

* Following Federal approval, the County and its participating jurisdictions intend to formally adopt the plan by Resolution of Ordinance

1.17 Plan Adoption by Municipalities

**A RESOLUTION ADOPTING THE MIAMI COUNTY MULTI-JURISDICTIONAL
HAZARD MITIGATION 5 -YEAR PLAN UPDATE**

RESOLUTION 13-17R

A RESOLUTION ADOPTING THE UPDATE OF THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION FIVE YEAR PLAN

WHEREAS, Clark County has experienced severe damage from several natural hazards on many occasions in the past century, resulting in property loss, loss of life, economic hardship, and threats to public health and safety; and

WHEREAS, the Clark County Emergency Management Agency has established the Clark County Hazard Mitigation Planning Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event; and

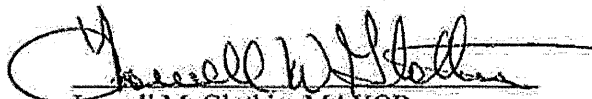
WHEREAS, the Five Year Plan Update recommends many hazard mitigation actions that will protect the people and property affected by the natural hazards that face Clark County; and

WHEREAS, public hearings were held to review the Plan as required by law; and will hereby be implemented, monitored, evaluated, and updated annually by the Clark County Hazard Mitigation Committee. The Clark County Board of Commissioners will be the public authority to promote and oversee the continued maintenance of this Plan.

NOW, THEREFORE, BE IT RESOLVED by the Council of the City of New Carlisle, Ohio, the majority of all members elected thereto concurring, that:

- Section 1: The Clark County Hazard Mitigation Five Year Plan Update is hereby adopted as an official Plan of the City of New Carlisle, Ohio;
- Section 2: The Clark County Emergency Management Agency will enter into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive emergency management activities of the participants, thereof, including the various municipal corporations and townships of Clark County, Ohio; and
- Section 3: The respective County, Township, District, City, and Village officials identified in the strategy of the Plan are hereby directed to implement the recommended actions assigned to them. These officials will report annually on their activities, accomplishments, and progress to the Clark County Hazard Mitigation Committee under the direction of the Clark County Board of Commissioners. This report shall be submitted to the Clark County Board of Commissioners by February 28th of each year.
- Section 4: This resolution shall take effect and be in force from and after the earliest period allowed by law.

Passed this 4th day of November, 2013.


Lowell McGlothlin, MAYOR


Gene Collier, CLERK

APPROVED AS TO FORM:


Miguel A. Pedraza, Jr., DIRECTOR OF LAW

AN ORDINANCE NO. 13.266

Approving and adopting the Clark County Multi-Jurisdictional Hazard Mitigation 5-Year Plan Update for The City of Springfield, Ohio; and declaring an emergency.

...oooOOOooo...

WHEREAS, the Board of County Commission of Clark County, Ohio has approved the Clark County Multi-Jurisdictional Hazard Mitigation 5-Year Plan Update; and

WHEREAS, the Clark County Multi-Jurisdictional Hazard Mitigation 5-Year Plan Update will fulfill the mandates of the Federal Disaster Mitigation Act of 2000, satisfy the requirements of FEMA and Ohio EMA, and meet the needs of The City of Springfield, Ohio to mitigate the harm caused by natural hazards and disasters; and

WHEREAS, the City Commission finds that the Clark County Multi-Jurisdictional Hazard Mitigation 5-Year Plan Update, as applied to The City of Springfield, Ohio will operate to preserve the public peace, health, safety, welfare and property and adoption is in the best interest of the citizens of The City of Springfield, Ohio; and

WHEREAS, it is necessary that this Ordinance become effective immediately in order to comply with FEMA deadlines, which this Commission finds creates an emergency necessitating the immediate effectiveness of this Ordinance: NOW, THEREFORE:

BE IT ORDAINED by the City Commission of The City of Springfield, Ohio, at least four of its members concurring:

Section 1. That the findings set forth in the recitals to this Ordinance are made a part hereof and are hereby adopted by this City Commission.

Section 2. That the Clark County Multi-Jurisdictional Hazard Mitigation 5-Year Plan Update, a copy of which on file in the City Manager's Office, is hereby approved and adopted for The City of Springfield, Ohio.

Section 3. That by reason of the emergency set forth and defined in the preamble hereto, this Ordinance shall take effect and be in force immediately.

PASSED this 29th day of October, A.D., 2013.

Warren R. Copeland
PRESIDENT OF THE CITY COMMISSION

Cornie Chappell
CLERK OF THE CITY COMMISSION

1.17 Plan Adoption by Municipalities

Municipal Resolution No. 637

A RESOLUTION ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION 5-YEAR PLAN UPDATE

WHEREAS, Clark County has experienced severe damage from several natural hazards on many occasions in the past century, resulting in property loss, loss of life, economic hardship, and threats to public health and safety; and

WHEREAS, the Clark County Emergency Management Agency has established the Clark County Hazard Mitigation Planning Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event; and

WHEREAS, the 5-Year Plan Update recommends many hazard mitigation actions that will protect the people and property affected by the natural hazards that face Clark County; and

WHEREAS, public hearings were held to review the Plan as required by law; and will hereby be implemented, monitored, evaluated, and updated annually by the Clark County Hazard Mitigation Committee. The Clark County Board of Commissioners will be the public authority to promote and oversee the continued maintenance of this Plan.

NOW, THEREFORE, BE IT RESOLVED by the Commission of the Village of Catawba, Clark County, Ohio, the majority of all members elected thereto concurring, that:

Section 1: The Clark County Hazard Mitigation 5-Year Plan Update is hereby adopted as an official Plan of Clark County, Ohio;

Section 2: The Clark County Emergency Management Agency has entered into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive emergency management activities of the participants, thereof, including the various municipal corporations and townships of Clark County, Ohio; and

Section 3: The respective County, Township, District, City, and Village officials identified in the strategy of the Plan are hereby directed to implement the recommended actions assigned to them. These officials will report annually on their activities, accomplishments, and progress to the Clark County Hazard Mitigation Committee under the direction of the Clark County Board of Commissioners. This report shall be submitted to the Clark County Board of Commissioners by February 28th of each year.

Section 4: This resolution shall take effect and be in force from and after the earliest period allowed by law.

Passed: 5-0 November 5, 2013

Michael A. Hula Mayor
11-5-2013

Attest: *Amanda M. Warner*

1.17 Plan Adoption by Municipalities

Municipal Resolution No. 13-16

A RESOLUTION ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION 5-YEAR PLAN UPDATE

WHEREAS, Clark County has experienced severe damage from several natural hazards on many occasions in the past century, resulting in property loss, loss of life, economic hardship, and threats to public health and safety; and

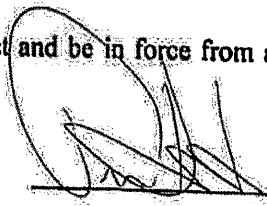
WHEREAS, the Clark County Emergency Management Agency has established the Clark County Hazard Mitigation Planning Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event; and

WHEREAS, the 5-Year Plan Update recommends many hazard mitigation actions that will protect the people and property affected by the natural hazards that face Clark County; and

WHEREAS, public hearings were held to review the Plan as required by law; and will hereby be implemented, monitored, evaluated, and updated annually by the Clark County Hazard Mitigation Committee. The Clark County Board of Commissioners will be the public authority to promote and oversee the continued maintenance of this Plan.

NOW, THEREFORE, BE IT RESOLVED by the Commission of the Village of Eron, Clark County, Ohio, the majority of all members elected thereto concurring, that:

- Section 1: The Clark County Hazard Mitigation 5-Year Plan Update is hereby adopted as an official Plan of Clark County, Ohio;
- Section 2: The Clark County Emergency Management Agency has entered into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive emergency management activities of the participants, thereof, including the various municipal corporations and townships of Clark County, Ohio; and
- Section 3: The respective County, Township, District, City, and Village officials identified in the strategy of the Plan are hereby directed to implement the recommended actions assigned to them. These officials will report annually on their activities, accomplishments, and progress to the Clark County Hazard Mitigation Committee under the direction of the Clark County Board of Commissioners. This report shall be submitted to the Clark County Board of Commissioners by February 28th of each year.
- Section 4: This resolution shall take effect and be in force from and after the earliest period allowed by law.



 Mayor

Passed: 4:4

Attest: ⊙

1.17 Plan Adoption by Municipalities

Municipal Resolution No. 2013-011

A RESOLUTION ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION 5-YEAR PLAN UPDATE

WHEREAS, Clark County has experienced severe damage from several natural hazards on many occasions in the past century, resulting in property loss, loss of life, economic hardship, and threats to public health and safety; and

WHEREAS, the Clark County Emergency Management Agency has established the Clark County Hazard Mitigation Planning Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event; and

WHEREAS, the 5-Year Plan Update recommends many hazard mitigation actions that will protect the people and property affected by the natural hazards that face Clark County; and

WHEREAS, public hearings were held to review the Plan as required by law; and will hereby be implemented, monitored, evaluated, and updated annually by the Clark County Hazard Mitigation Committee. The Clark County Board of Commissioners will be the public authority to promote and oversee the continued maintenance of this Plan.

NOW, THEREFORE, BE IT RESOLVED by the Commission of the Village of North Hempstead, Clark County, Ohio, the majority of all members elected thereto concurring, that:

- Section 1: The Clark County Hazard Mitigation 5-Year Plan Update is hereby adopted as an official Plan of Clark County, Ohio;
- Section 2: The Clark County Emergency Management Agency has entered into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive emergency management activities of the participants, thereof, including the various municipal corporations and townships of Clark County, Ohio; and
- Section 3: The respective County, Township, District, City, and Village officials identified in the strategy of the Plan are hereby directed to implement the recommended actions assigned to them. These officials will report annually on their activities, accomplishments, and progress to the Clark County Hazard Mitigation Committee under the direction of the Clark County Board of Commissioners. This report shall be submitted to the Clark County Board of Commissioners by February 28th of each year.
- Section 4: This resolution shall take effect and be in force from and after the earliest period allowed by law.


Clerk/Treasurer

Passed: 11/12/13

Attest: _____

1.17 Plan Adoption by Municipalities

Municipal Resolution No. 2013-11

A RESOLUTION ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION 5 -YEAR PLAN UPDATE

WHEREAS, Clark County has experienced severe damage from several natural hazards on many occasions in the past century, resulting in property loss, loss of life, economic hardship, and threats to public health and safety; and

WHEREAS, the Clark County Emergency Management Agency has established the Clark County Hazard Mitigation Planning Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event; and

WHEREAS, the 5-Year Plan Update recommends many hazard mitigation actions that will protect the people and property affected by the natural hazards that face Clark County; and

WHEREAS, public hearings were held to review the Plan as required by law; and will hereby be implemented, monitored, evaluated, and updated annually by the Clark County Hazard Mitigation Committee. The Clark County Board of Commissioners will be the public authority to promote and oversee the continued maintenance of this Plan.

~~NOW, THEREFORE,~~ BE IT RESOLVED by the Commission of the Village of So. Charleston, Clark County, Ohio, the majority of all members elected thereto concurring, that:

- Section 1: The Clark County Hazard Mitigation 5-Year Plan Update is hereby adopted as an official Plan of Clark County, Ohio;
- Section 2: The Clark County Emergency Management Agency has entered into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive emergency management activities of the participants, thereof, including the various municipal corporations and townships of Clark County, Ohio; and
- Section 3: The respective County, Township, District, City, and Village officials identified in the strategy of the Plan are hereby directed to implement the recommended actions assigned to them. These officials will report annually on their activities, accomplishments, and progress to the Clark County Hazard Mitigation Committee under the direction of the Clark County Board of Commissioners. This report shall be submitted to the Clark County Board of Commissioners by February 28th of each year.
- Section 4: This resolution shall take effect and be in force from and after the earliest period allowed by law.

Larry J. Sullivan

Passed: 11/5/13

Attest: Cheryl A. Spear

1.17 Plan Adoption by Municipalities

Municipal Resolution No. ^{R-11-} 01-2013

A RESOLUTION ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION 5 -YEAR PLAN UPDATE

WHEREAS, Clark County has experienced severe damage from several natural hazards on many occasions in the past century, resulting in property loss, loss of life, economic hardship, and threats to public health and safety; and

WHEREAS, the Clark County Emergency Management Agency has established the Clark County Hazard Mitigation Planning Committee and they have, through an organized planning process, identified local problems and mitigation activities to help reduce hazards, damages, and loss of life during a natural hazard event; and

WHEREAS, the 5-Year Plan Update recommends many hazard mitigation actions that will protect the people and property affected by the natural hazards that face Clark County; and

WHEREAS, public hearings were held to review the Plan as required by law; and will hereby be implemented, monitored, evaluated, and updated annually by the Clark County Hazard Mitigation Committee. The Clark County Board of Commissioners will be the public authority to promote and oversee the continued maintenance of this Plan.

NOW, THEREFORE, BE IT RESOLVED by the Commission of the Village of SOUTH VILLAGE, Clark County, Ohio, the majority of all members elected thereto concurring, that:

- Section 1: The Clark County Hazard Mitigation 5-Year Plan Update is hereby adopted as an official Plan of Clark County, Ohio;
- Section 2: The Clark County Emergency Management Agency has entered into an agreement, in the manner provided by law, under the Ohio Revised Code, as amended, and has the power to coordinate and unify the comprehensive emergency management activities of the participants, thereof, including the various municipal corporations and townships of Clark County, Ohio; and
- Section 3: The respective County, Township, District, City, and Village officials identified in the strategy of the Plan are hereby directed to implement the recommended actions assigned to them. These officials will report annually on their activities, accomplishments, and progress to the Clark County Hazard Mitigation Committee under the direction of the Clark County Board of Commissioners. This report shall be submitted to the Clark County Board of Commissioners by February 28th of each year.
- Section 4: This resolution shall take effect and be in force from and after the earliest period allowed by law.

Passed: 6

Attest: 0

Joie Keller
Mayor

Marcia Dargatzis
Clerk

Hazard Identification, Risk Assessment & Vulnerability Analysis

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2.1 Overview

Clark County is prone to many natural hazards. Clark County has experienced considerable hazard events resulting in millions of dollars of damage (see Federal Public Assistance Grants Awarded Per Declared Disaster at the end of this section). The previous plan approval was reviewed and approved by FEMA on June 23, 2006.

The purpose of this plan document is to identify the number and frequency of disasters in Clark County and to update and better prepare and deal with them when they occur.

Initial Hazard Assessment

In order to properly update the natural hazards to which Clark County may be susceptible, a three-step process was utilized. This three-step process was completed in order to re-confirm hazards for which Clark County should prepare, and potentially mitigate, in the future. The three steps are described in the following paragraphs.

Step 1 - FEMA's database was researched to determine which hazards FEMA and the State of Ohio had documented as possible natural hazards, including future threats, for the State of Ohio. Several prevalent hazards that are within the Ohio Mitigation Plan include flooding, severe storms, tornadoes and winter storms.

Step 2 - The NCDC was reviewed and historic hazard information was evaluated for the local and county level. The NCDC website presented each type of hazard and the historic information associated with it for each county offering several hazard search parameters. These parameters included: droughts, dust storm, flooding, fog, hail, hurricanes, lightning, tornadoes, wild/forest fires, ocean/lake surf, precipitation, snow and ice, temperature extremes, thunderstorms and high winds.

Because NCDC information did not address earthquakes or dams and dam safety, other sources were reviewed for this data. The information pertaining to earthquake susceptibility was attained from the Ohio Seis data and the Ohio Earthquake Program Manager at OEMA. Dam and dam safety information was gathered from the ODNR's Division of Dam Safety.

Step 3 - The Ohio and Clark County Hazard Analysis and Risk Assessments, were reviewed and the local risk assessment was updated based on the limited resources available. The Ohio Hazard Analysis and Risk Assessment documented both natural and non-natural (technological) hazard event information.

Risk Assessment Ranking

The updated information compiled during the initial hazard assessment was provided to the CCHMC for their review and assessment. The CCHMC re-evaluated all the hazards being considered and ranked them based on the number of historic events and cumulative damage that has occurred.

This section will cover:

- Identifying hazards

- Profiling hazards
- Identifying structures
- Addressing repetitive loss structures
- Overview of community's vulnerability
- Estimating potential losses
- Analyzing development trends
- Multi-Jurisdictional Risk Assessment

Identifying Hazards

Section 201.6(c)(2)(i) requires the risk assessment include a description of the type of all natural hazards that can affect Clark County. This section of the plan presents a list of potential natural hazards that may likely impact Clark County. Clark County is primarily rural; however, it is vulnerable to a number of hazards that threaten its' communities, businesses, public entities, and environment. To determine the hazards that pose the greatest threat to the County, the Clark County Mitigation Committee updated the list of potential hazards by conducting a review of several key resources which include:

- Review of historical data on events that have occurred in the last 50 years.
- Review of 2005 Clark County Hazard Mitigation Plan data.
- Review of the State Hazard Mitigation Plan.
- Collaboration with community experts and agencies on different hazards including representatives from County Board of Commissioners, County EMA, County Engineer, County Health District, Cities/Villages, County Planning & Zoning, Community EMS Agencies, County GIS/Auditors Office, Public at Large, Clark County Red Cross Chapter, and other state and local agencies.
- Review of past events and declared disasters.
- Newspaper articles and internet research.
- County Auditor data.

Profiling Hazards

Section 201.6(c)(2)(i) requires that the risk assessment shall include a description of the location and extent of all natural hazards that can affect Clark County including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate. The risk assessment relies upon information about past hazard events from published sources such as NOAA, USGS, USACE, Ohio EMA, ODNR, and Clark County Records, as well as other agencies.

The risk assessment section for each hazard in this plan includes a description of the location or geographic area that would be affected and areas where it could occur; the extent of magnitude or severity of potential hazard events; the range of magnitude or severity expected of the hazard; past occurrences; and a discussion of probability of future hazard events.

Assessing Vulnerability of Clark County

Section 201.6(c)(2)(ii) requires a description of each jurisdiction's vulnerability to the hazards described and the description shall include an overall summary of each hazard and its impact on the community. The County Hazard Mitigation Committee determined

which structures were considered critical facilities during a disaster. Critical facilities are defined as a facility whose use is necessary during response and recovery efforts following a disaster.

Addressing Repetitive Loss Structures

Section 201.6(c)(2)(ii) requires that the risk assessment also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods. Clark County has identified five repetitive loss structure located within Clark County.

Identifying Structures

Section 201.6(c)(2)(ii) of the risk assessment recommends inclusion of a description of vulnerability in terms of and analysis of the County's vulnerability to the hazards described in this paragraph (c)(2) based on estimates provided in local risk assessments. The County shall describe vulnerability in terms of the communities most threatened by the identified hazards and most vulnerable to damage and loss associated with hazard events. The methodology for this section varies by hazard due to available data and will be more thoroughly discussed within the results of the section for each hazard. Data for various building stock is still needed, but future resources and programming will become more readily available.

Estimating Potential Losses

Section 201.6(c)(2)(ii) of the risk assessment recommends inclusion of a description of vulnerability and analysis of potential losses to identified structures based on estimates. The methodology for this section varies by hazard due to available data and will be more thoroughly discussed within the section for each hazard.

Analyzing Development Trends

Section 201.6(c)(2)(ii) of the risk assessment recommends inclusion of descriptions of vulnerability in terms of providing a general description of land uses and development trends within each community participating in the plan. The County development is generally within the existing City of Springfield, City of New Carlisle and larger villages that have sanitary sewer and water which will support development. This is discussed in more detail within the analyzing development trends section.

Multi-Jurisdictional Risk Assessment

Section 201.6(c)(2)(ii) indicates that the risk assessment must assess each jurisdiction's risk where they vary from the risks facing the entire planning area. This requirement is addressed in detail within the section.

Update Summary

The risk assessment identified a comprehensive list of natural hazards. Developing this data was a collaborative process involving several county agencies. For the 2012 update, the existing analyzed hazards were reviewed for accuracy and availability of improved data.

Federal Public Assistance Grants Awarded Per Declared Disaster

COUNTY:	Clark		
DISASTER NUMBER	DISASTER TYPE	DECLARED	PUBLIC ASSISTANCE
DR-1164	Severe Summer Storm Flooding	3/21/1997	
DR-1227	Flood Severe Summer Storm Tornado	7/5/1998	
DR-1453	Winter Storms	3/15/2003	
DR-1484	Tornadoes Flooding Severe Storms High Winds	8/1/2003	
DR-1507	Flood Mud/Landslide Severe Summer Storm	1/26/2004	
DR-1519	Flood Severe Summer Storm	6/3/2004	
DR-1556	Flood Severe Summer Storm	9/19/2004	
DR-1580	Flood Mud/Landslide Winter Storm	2/15/2005	
DR-1651	Severe Summer Storm Straight Line Winds Flooding	7/2/2006	
DR-1656	Severe Summer Storm Straight Line Winds Flooding	8/1/2006	
DR-1720	Severe Summer Storm Flooding Tornadoes	8/27/2007	
DR-1805	Severe Wind Storm Associated with Tropical Depression IKE	10/24/2008	\$ 1,075,324.50
DR-4002	Flood Severe Summer Storm	7/13/2011	
DR-4077	Severe Summer Storm Straight Line Winds	8/20/2012	
EM-3250	Hurricane Katrina Shelter Operations	9/13/2005	\$ 13,656.03
EM-3198	Snow Storm	11/1/2005	\$ 264,265.51
EM-3286	Record / Near Record Snow Storm	4/24/2008	
EM-3187	Power Outage	9/23/2003	

2.2 Hazard Identification Summary

The hazards evaluated and profiled by the Clark County Hazard Mitigation Committee include:

- | | |
|------------------------------|----------------------------|
| 1. Coastal Erosion | 13. Tornadoes |
| 2. Droughts | 14. Wildfires |
| 3. Earthquakes | 15. Tropical Cyclones |
| 4. Floods | 16. Snow Avalanches |
| 5. Storm Surges | 17. Extreme Summer Weather |
| 6. Landslides | 18. Expansive Soils |
| 7. Land Subsidence | 19. Tsunami |
| 8. Invasive Species | 20. Volcanoes |
| 9. Severe Thunderstorms | 21. Dam Failures |
| 10. Windstorms | 22. Terrorism |
| 11. Hailstorms | 23. Epidemics |
| 12. Severe Winter/Ice Storms | |

By review of the 2005 Plan, compilation of new updated hazard information occurring from 2006-2011, and through a series of 2011 planning sessions, the Clark County Hazard Mitigation Committee re-evaluated the prior list of hazards to the likelihood of future occurrence and the fact that many of the identified hazards are interrelated (i.e., wild fire can be a result of high winds and drought conditions).

Planning documents reviewed and considered included:

- The current Comprehensive Planning documents for Clark County communities.
- Zoning Ordinances and Building Codes.
- Open Space Preservation Documents.
- Clark County Farmland Preservation Report.
- Subdivision Regulations.
- Manufacture of Homes Requirements.
- Flood Plain Regulations.
- Drainage Regulations.
- Natural Resource Protection Documents.
- Emergency Response Documents.
- Evaluation and Sheltering Documents.
- Field Control Documents.

Following this, the list of hazards was reduced to the hazards that are most likely to affect the county and are most likely to pose more serious threats.

For the purpose of ranking hazards affecting the County, in order of importance for mitigating their effects, the FEMA hazard index was assigned on a scale of priority for considering mitigation goals. This index takes into account the anticipated frequency of occurrence, the specific consequences of impact, whether there has been a past declaration for that particular hazard. The process is somewhat subjective, but is intended to assist the Committee to help prioritize mitigation goals based on the potential frequency and likely extent of damage from hazards known to affect the County.

It is important to note that Hazard Identification Risk Assessments, HIRAs, are developed for different purposes. For the purposes of emergency planning and similar functions, the Clark County Hazard Mitigation Committee made updates to the current HIRA as resources would allow. It prioritized hazards utilizing criteria developed to facilitate emergency planning. These criteria include number of deaths and injuries, damage, impact on property, frequency and number of events, and number of disaster declarations. This method assigned a numerical value to vulnerability based on the criteria of impacts on businesses, people, and property. Previously, Ohio HIRA placed more emphasis on life safety issues versus the HIRA performed for the Clark County Hazard Mitigation purposes which place a similar high priority on property/facility damage. Both methods and results tended to closely mirror each other.

Once the hazard ranking was complete an assessment was conducted to narrow the field of hazards to the top ten most likely to occur and impact the county. Several hazards were deleted from the list based on the unlikelihood of occurrence and the potential for a negligible impact on the state should they occur. These include tropical cyclones, snow avalanches, tsunami events, and volcano events. Other hazards were combined, as many of them are factors in larger hazards. The final hazard list includes ten hazards for Clark County, which are listed in order of importance below.

Meteorological Hazards

1. Tornado/High Wind Events
2. Flash & Riverine Flooding
3. Winter Storms Including Sleet/Snow/Ice/Blizzard
4. Severe Summer Storms
5. Drought
6. Extreme Temperatures
7. Wildfire

Biological Hazards

8. Invasive Plants, Pests and Infestations
9. Epidemics

Geological Hazard

10. Earthquakes

This plan discusses each of the hazards in more detail. Technological hazards that may affect Clark County have not been addressed in this plan.

Table 2.2.a

Hazard Index Ranking				
Frequency of Occurrence	Catastrophic	Critical	Limited	Negligible
Very Likely	5 (Highest)	4 (High)	4 (High)	3 (Medium)
Likely	5 (Highest)	4 (High)	3 (Medium)	2 (Low)
Possible	4 (High)	3 (Medium)	2 (Low)	2 (Low)
Unlikely	3 (Medium)	2 (Low)	1 (Lowest)	1 (Lowest)
Highly Unlikely	2 (Low)	1 (Lowest)	1 (Lowest)	1 (Lowest)

Source: FEMA 1997

Table 2.2.b

Frequency of Occurrence	
<i>Highly Likely</i>	Near 100 percent probability in the next year.
<i>Likely</i>	Between 10 and 100 percent probability in the next year, or at least one chance in the next 10 years.
<i>Possible</i>	Between 1 and 10 percent probability in the next year, or at At least one chance in the next 100 years.
<i>Unlikely</i>	Less than 1 percent probability in the next year, less than One chance in the next 100 years.
<i>Highly Unlikely</i>	Little or no probability in the next 100 years.

Source: FEMA 1997

Table 2.2.c

Consequences of Impact	
<i>Catastrophic</i>	Multiple deaths, complete shutdown of facilities for 30 days or more, more than 50 percent of property are severely damaged.
<i>Critical</i>	Multiple severe injuries, complete shutdown of critical facilities for at least 2 weeks, more than 25 percent of property severely damaged.
<i>Limited</i>	Some injuries, complete shutdown of critical facilities for more than a week, more than 10 percent of property severely damaged.
<i>Negligible</i>	Minor injuries, minimal quality-of-life impact, shutdown of critical facilities and services for 24 hours or less, less than 10 percent of property is severely damaged.

Source: FEMA 1997

Table 2.2.d

Hazard Ranking Assessment				
Hazard	Past Federal Declarations	Frequency	Impact	Hazard Ranking
Natural Hazards				
Coastal Erosion	No	Highly Unlikely	Negligible	1
Droughts	No	Likely	Limited	3
Earthquakes	No	Possible	Limited	2
Floods	Yes	Highly Likely	Critical	4
Seiche / Coastal Flooding	No	Highly Unlikely	Negligible	1
Landslides	No	Possible	Negligible	1
Land Subsidence	No	Possible	Negligible	2
Invasive Species	No	Likely	Limited	3
Severe Thunderstorms	No	Highly Likely	Critical	4
Windstorms	Yes	Highly Likely	Critical	4
Hailstorms	No	Likely	Critical	2
Lightning	No	Likely	Limited	3
Severe Winter / Ice Storms	Yes	Highly Likely	Critical	4
Tornadoes	No	Highly Likely	Critical	4
Wildfire	No	Likely	Limited	3
Tropical Cyclones	No	Highly Unlikely	Negligible	1
Snow Avalanches	No	Highly Unlikely	Negligible	1
Extreme Summer Weather	No	Likely	Negligible	2
Expansive Soils	No	Unlikely	Negligible	1
Tsunami	No	Highly Unlikely	Negligible	1
Volcano	No	Highly Unlikely	Negligible	1

Table 2.2.e

HAZARDS TABLE		
Meteorological Hazard	How Identified	Why Identified
2.4	Review of past tornado events per NCDC event data	The county has been hit by at least 17 tornadoes since 1962, including 3 F-3 tornado with injuries
Tornadoes / High Wind Events	Published data from newspaper articles and historical records	4 tornados reported in Clark County from 2007-2011
	Public meeting input/CCHMC meetings	Clark County is located in a 250 MPH zone IV wind speed map for community shelter design
	2006 Hazard Mitigation Plan Data	Large number of vulnerable mobile homes and camping facilities within Clark County
	Web-based information	
2.5	2006 Hazard Mitigation Plan Data	The county has experienced flash flooding, river, and stream flooding periodically since the 1913 flood
Flash & Riverine Flooding	Past flooding events identified	The county has several flood plain areas with structures located within them
	Review of latest county FIRM Maps	Several areas of poor development practices prior to the 1980's
	Review of NFIP repetitive loss properties in the county	Severe flooding June 1, 1997; Flooding of Mad River
	Record of past county problem areas	Severe flooding January 5, 2005/June 4, 2008
	Insurance data	Increased storm runoff
	Public meeting input/ CCHMC meeting	Old and inadequate storm sewers, county, and private drainage systems
	Review of NCDC event data	Storm flooding, caused by log jams due to storm erosions, increased beaver population.
	ODNR Flood Plain Management publications	
2.6	Review of past history events./ NCDC events	Severe winter weather with blowing and drifting snow
Winter Storms Including Sleet/Snow/Ice/Blizzard	Input from county EMA office	Isolation of rural areas during storms
	Public meeting input/ CCHMC meetings	Hazards for responding emergency personnel
	Risk assessment data	1978 blizzard conditions experienced
		Many stranded motorists in past snow storms
		1996 Blizzard (worst since 1978 Blizzard)
		December 22, 2004 record snowfall
		Large percentage of elderly county residents

2.7	Review of past severe storm events/NCDC data	Per NCDC 60 hail events from 1974-2011 causing \$34,000 property damage and \$54,000 in crop damage
Severe Summer Storms	Public input from residents	Per NCDC 150 thunderstorms events 1964-2011 causing \$804,000 in property damages
	NCDC event data; Public input from CCHMC planning meetings	Frequency of storms in Clark County
	Clark County EMA records	Outdoor festival events with large, temporary increases of population
	Web-based information	September 2008 wind storm damage as a result of tropical storm Ike. \$16.7 million in property damage
		May 3, 2011 Thunderstorm and wind caused considerable damage to cars, barns, houses, apartments 6 miles NE of Springfield
2.8	NCDC Event data	Extreme cold February 11, 1995 – 4 Clark County deaths - \$100,000 in damages reported
Extreme Temperatures	2006 Hazard Mitigation Plan Data	December 9, 1995 extreme cold – 1 injury
	Input from CCHMC	February 1, 1996 – extreme cold - \$1.3 million property damage
		July 20, 1999 – extreme heat – caused 13 State of Ohio deaths (10 in Cincinnati metro area – 3 in Dayton metro area)
2.9	NCDC event data	2 Drought events in July & August of 1999
Drought	2006 Hazard Mitigation Plan Data	Large rural agricultural base- 65% of land in Clark County is zoned agricultural use
	Input from CCHMC	Large economic impact with crop losses during drought conditions
		Increased potential for field & woodland fires

2.10	NCDC event data	2 drought events in July & August of 1999
Wildfire	2006 Hazard Mitigation Plan Data	Large rural agricultural base- 65% of land in Clark County is zoned Agricultural use
	Input from CCHMC	Large economic impact with crop losses during drought conditions
		Increased potential for field & woodland fires
Biological Hazard	How Identified	Why Identified
2.11	ODNR, Division of Forestry	1999 Gypsy Moth infestation, 2007 Emerald Ash Borer
Invasive Plants, Pests & Infestation	Web-based information	1999 West Nile Virus
	Discussion and input from CCHMC	2011 Asian Long-horned Beetle (ALB)(found in Clermont County, Ohio)
		Bush Honeysuckle prevalent throughout much of Ohio
		Invasive species causes economic harm or environmental harm or harm to human health
		Major economic impacts to agriculture and woodlands
		Accelerated damage to aging sewers and building foundations due to aggressive root systems
		Threats to human health
		Increased maintenance to gardens, parks, and recreational areas
2.12	Clark County Health Department records	1914 quarantine due to Scarlet Fever and Diphtheria
Epidemic	Web-based information	1918 influenza outbreak
		2009 H1N1 influenza clinics
Geological Hazard	How Identified	Why Identified
2.13	Review of known tremors	Although no known recent past damage, it is likely that future earthquake damage could result
Earthquakes	Published data from Ohio Building Code	
	Discussion and input from CCHMC	Micro Earthquake tremor felt 12/10/1980 centered Greene/Clark county Line
	Web-based information	

2.3 Identifying Assets

Clark County is susceptible to many different kinds of natural hazards as reviewed in the previous section of this plan. If a hazard event struck vacant land, there would not be much cause for concern. However, since Clark County has close to 138,333 residents and thousands of homes, businesses and critical facilities, the potential for damage and injury could be high, especially in higher populous areas such as Springfield, New Carlisle, and North Ridge.

The Clark County Hazard Mitigation Committee reviewed and updated the existing critical facilities list through the assistance of the Clark County GIS Director. The Clark County Hazard Mitigation Planning Committee determined that the essential services facilities list included essential products and services to the general public and which is necessary to preserve the welfare and quality of life in the county. The maps in Appendix Section A5 show critical facilities and essential services necessary to fulfill important public safety, emergency response, or disaster recovery functions. These essential facilities include major north/south highways St. Rt. 4, St. Rt. 68 and Interstate 675 and major east/west highway U.S. Route 40 and Interstate 70. Other state highways include St. Rt. 41, 42, 54, 56, 72, 235, 334, 369, 571, and 794.

2.3.1 List of Essential Services/Critical Facilities Identified

The Clark County Hazard Mitigation Committee determined that critical facilities and essential services are public or private entities that provide essential and critical services to the general public. These services are necessary to preserve and protect the welfare and quality of life for Clark County residents. They maintain the quality of life in the County and fulfill the public safety, emergency response, and/or disaster recovery operations.

Categories of Critical Facilities

1. Agriculture
2. Churches
3. Commercial Assets
4. Communications
5. Dams
6. Emergencies Services
7. Energy, Electricity
8. Energy, Natural Gas
9. Extended Care Facilities
10. Fire & EMS
11. Flooding/Repetitive Loss
12. Government Facilities
13. Law Enforcement
14. Public Health
15. Public Institutions
16. Schools
17. Telecommunications
18. Transportation, Airport
19. Transportation, Highway
20. Transportation, Railway
21. Water
22. Water/Wastewater

The Clark County Emergency Management Agency in partnership with the Clark County GIS Department identified and updated the critical facilities and essential services throughout Clark County's cities, villages and unincorporated areas. Due to confidentiality reasons the critical facilities list has not been included with this document.

2.4 Tornadoes/High Wind Events

Overview

A windstorm is a storm with high winds or violent gusts sometimes called wind shears or micro bursts, but with little or no rain.

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 300 mph or more. Damage paths can be in excess of one (1) mile wide and 50 miles long.

Tornadoes can range in size from massive to small. The majority of them are small and can occur at any time of the day or night and any time of the year. It is difficult to profile the risk of tornadoes. Therefore, estimations must be made based on past history and occurrences. Tornadoes are measured by damage scale for their wind capability.

The duration of tornadoes vary. Most tornadoes have wind speeds of less than 110 mph, are approximately 250 feet across, and travel a few miles before dissipating. The most extreme tornadoes can attain wind speeds of more than 300 miles per hour, stretch more than 2 miles across, and stay on the ground for dozens of miles. A tornado can strike a structure and it can be damaged or destroyed in just a matter of a few minutes.

In 1971, Dr. T. Theodore Fujita of the University of Chicago devised a six-category scale to classify U.S. tornadoes into six damage categories, called F0-F5. F0 describes the weakest tornadoes and F5 describes only the most destructive tornadoes. The Fujita tornado scale (or the “F-scale”) has subsequently become the definitive scale for estimating wind speeds within tornadoes based upon the damage caused by the tornado. It is used extensively by the National Weather Service (NWS) in investigating tornadoes, by scientists studying the behavior and climatology of tornadoes, and by engineers correlating damage to different types of structures with different estimated tornado wind speeds.

The devastating tornadoes in Jarrell, Texas on May 27, 1997 and Moore/Oklahoma City on May 3, 1999 demonstrated to many engineers, emergency managers and meteorologists that the wind estimates in the original F-scale may be too high. Their findings are described in the FEMA document #342: “Building Performance Assessment Team Report, Midwest Tornadoes of May 3, 1999, Observation, Recommendations and Technical Guidance”.

The enhanced Fujita tornado scale or EF-scale was unveiled by the NWS to the public and the full meteorological community early in 2006. On February 1, 2007, the Enhanced Fujita scale replaced the original Fujita scale in all tornado damage surveys in the United States. It is important to note that, despite the improvements, the EF-scale still remains a set of *wind estimates* based on 8 levels of damage to 28 different types of structures and vegetation.

Below is a table comparing the estimated winds in the original F-scale and the operational EF-scale that is currently in use by the NWS.

The Enhanced Fujita Tornado Scale

Fujita Scale			Operational EF-Scale	
F Number	Fastest ¼-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85
1	73-112	79-117	1	86-110
2	113-157	118-161	2	111-135
3	158-207	162-209	3	136-165
4	208-260	210-261	4	166-200

Damages one might expect from the varying intensities are as follows:

- F-0 Light damage to trees and buildings
- F-1 Moderate damage to trees and buildings, roofs peeled off, mobile homes disturbed
- F-2 Considerable damage to trees and buildings, roofs torn off frame houses, mobile homes destroyed, large trees down
- F-3 Severe damage to trees and buildings, roofs and walls torn off well-constructed buildings, trees uprooted, trains overturned
- F-4 Devastating damage, well-constructed houses leveled, large missiles generated
- F-5 Incredible damage, strong houses lifted off foundations and carried considerable distances to disintegration, trees debarked, automobiles fly through the air and become missiles

Ohio and Clark County have a significant history of deadly tornadoes. On the following pages, a chart provides data regarding the known tornado events to occur in Clark County which typically have a higher frequency in the spring and summer months but can occur anytime, such as evidenced by the Jan. 13, 1976 F-1 tornado occurring in Clark County.

Past Occurrences

Clark County has had 17 tornadoes from 1962 to 2004, according to the NCDC. These tornadoes caused \$3.18 million worth of property damage and injured 11 people. The tornado that occurred in 1974 was part of the outbreak that included the Xenia tornado, as discussed previously. The tornado that occurred in Clark County caused \$2.5 million in property damage.

The locations of the 17 tornadoes are not localized to one area of Clark County. Only two of the 13 tornadoes touched down in highly populated areas. The first tornado, occurring in 1965, touched down within the corporate limits of Springfield. The second tornado, occurring in 1976, touched down within the corporate limits of New Carlisle. Fortunately, they were both rated F1 on the Fujita Scale and caused only \$25,000 worth of property damage each.

Several recent tornado events occurring within Clark County included:

On Friday April 15, 2006 strong winds also caused damaged at Shrine Road Mobile Home Park. More than a dozen mobile homes were damaged and one family was trapped inside their home until emergency crews arrived.

On May 5, 2007 an F-0 tornado touched down along Moorefield Road, just to the east of State Route 4. Trees were either uprooted or snapped off towards their tops with additional large limbs down from other trees. Some minor structural damage occurred as well along the 250 yard damage path. The tornado was rated EF-0 with top wind speeds of 70 mph.

On May 8, 2008 an EF-0 tornado briefly touched down near Selma. A shower produced a persistent wall cloud, funnel clouds and several brief tornado touchdowns along a frontal boundary aligned along Interstate 70 in southwest Ohio. Damage was reported as minimal.

On Sept. 7, 2010 several mobile homes were damaged from strong winds at Shrine Road Mobile Home Park. The homes sustained blown off siding, damaged awnings, and a tree fell onto a roof.

On April 27, 2011 an F-0 tornado touched down near a cemetery where several trees were snapped or uprooted in this area. Further to the northeast, an RV dealership on the east side of New Carlisle experienced damage when a roof was partially lifted off the building. Two-by-four roof support beams were driven into the ground. In this same area, large debris was blown into a public pool complex. Snapped trees and power poles were also found in this area. Maximum estimated wind speeds based on damage were around 70 miles per hour. Property damage was limited to \$25,000.

On May 23, 2011 an F-1 tornado North of Villa caused concrete blocks to be lifted onto a roof, convergence was noted in a wheat field south of a farm house, four power poles were knocked down, and one house had insulation pulled out of it due to the tornado. The maximum estimated wind speeds based on damage was around 90 miles per hour. Property damage was limited to \$15,000 & and crop damage was limited to \$3,000.

The following charts indicate past history of high winds and tornado events in Clark County.

Clark County Tornadoes - Past Occurrences					
Date	Location	Magnitude	Damage Amount	Number of Injuries	Deaths
7/20/1962	Countywide	F	\$3,000	0	0
3/17/1965	Countywide	F1	\$25,000	0	0
5/26/1968	Countywide	F1	\$3,000	0	0
2/26/1971	Countywide	F1	\$25,000	1	0
5/10/1973	Countywide	F3	\$3,000	4	0
4/3/1974	Countywide	F5	\$2.5M	0	0
4/3/1974	Countywide	F2	\$250,000	0	0
8/3/1974	Countywide	F0	\$25,000	0	0
1/13/1976	Countywide	F1	\$25,000	0	0
4/20/1986	Countywide	F1	\$250,000	6	0
6/18/1992	Countywide	F0	0,000	0	0
6/18/1992	Countywide	F1	0,000	0	0
5/8/1996	Bethel Twp	F0	\$10,000	0	0
5/15/2007	Springfield	F0	\$20,000	0	0
5/8/2008	Selma	F0	\$1,000	0	0
4/27/2011	New Carlisle	F0	\$25,000	0	0
5/23/2011	Villa	F1	\$15,000	0	0
			3.179M	11	

From the above chart, the known tornado magnitude breakdown in Clark County is as follows:

F - 1
 F-0 - 6
 F-1 - 7
 F-2 - 1
 F-3 - 1
 F-4 - 0
 F-5 - 1

The known reported tornado damage occurring since 1962 is approximately \$3.179 million dollars.

Clark County, Ohio High Wind Events Data Summary from the National Climatic Data Center						
Year	Date of Reported High Wind Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
1993	5/28/1993	High Winds	0	0	5K	0
1994	11/1/1994	High Winds	0	1	500K	0
1994	11/27/1994	High Winds	0	1	50K	0
1997	4/6/1997	High Wind	0	0	19K	0
2000	12/11/2000	High Wind	1	0	100K	0
2002	3/9/2002	High Wind	1	12	971K	0
2003	5/11/2003	High Wind	0	0	0	0
2003	11/12/2003	High Wind	0	0	63K	35K
2006	12/1/2006	High Wind	0	0	10K	0K
2008	9/14/2008	High Wind	0	0	16.7M	0K
2009	12/9/2009	High Wind	0	0	0K	0K
TOTALS:			2	14	18.418M	35K
Sources: From NOAA, NCDC Event Period 01/01/1950 - 04/30/2011						

Probability of Future Events

Between 1962 and 2011, Clark County has experienced 17 tornadoes. This is an average of 1 every 2.9 years. The percentages, based on magnitude to date, have been:

F	1	6%
F-0	6	35%
F-1	7	41%
F-2	1	6%
F-3	1	6%
F-4	0	0%
F-5	1	6%

The percentages of tornadoes by season to strike Clark County since 1962 have been:

Spring:	March 21 – June 20	12	71%
Summer:	June 21 – September 20	2	12%
Fall:	September 21 – December 20	0	0%
Winter:	December 21 – March 20	3	17%

The paths of the tornadoes have occurred throughout the County including northern, central, and southern portions, so no part of the County is exempt from a tornado strike.

Vulnerability Analysis & Loss Estimation

Methodology – Based on the magnitude and the past history, there is a likelihood of the occurrence of an EF-3 or stronger tornado striking Clark County. These relative ratings were determined by review of actual tornado occurrences since the 1974 F-5 tornado.

Mobile homes, camping trailers, temporary shelters, and poorly constructed buildings are more vulnerable to tornado and high wind damage. Clark County has been fortunate there have been no reported deaths from tornados; however, there have been 11 injuries reported in 3 separate tornado events. In addition, there have been two deaths reported during high wind events on December 11, 2000 and March 9, 2002. Based on the frequency of occurrence, Clark County has been assigned into a medium risk category.

Clark County has 3,056 mobile home units built without wind-resistant construction standards and would suffer catastrophic destruction as the result of a strike by an EF-2 or stronger tornado. According to past history reports, severe winds have damaged or overturned numerous mobile homes in Clark County. On a statewide basis, Ohio does not have building codes that address wind resistance for most types of residential dwellings.

By using Clark County Real Estate housing and commercial real estate data, the F-3 tornado was used as a benchmark to determine potential tornado loss damages.

The entire county is vulnerable and susceptible to be struck by a tornado, even though a large percentage of the county area is rural and agricultural. Certainly, the most devastating and damaging would be for an F-5 category tornado to hit one of the larger cities including Springfield and New Carlisle. With the 1974 F-5 Plattsville tornado, history tells us the damage can be significant and quite severe. Since 1962, there have been one F-3 category tornado to hit the County. In adjacent Greene County, the Xenia tornado was 32 miles long resulting in 36 deaths. In overlaying this same destructive path over a portion of Springfield, it is therefore conceivable the damage could even be significantly greater than the City of Xenia tornado. This is due to several factors, mainly that Springfield has a population of about 5 times that of Xenia, and there are considerably more structures and critical facilities that could be affected. The attached estimated potential losses indicate the possible damage that could occur if an F-5 tornado was to strike a similar path across the City of Springfield.

Because the occurrence is moderate, the damage of businesses and residences is considered to be of moderate damage. The property damage from the past 11 tornado events with magnitude ranging from F-0 – F-5 has been \$3,179,000 with no deaths and two injuries. The worst event was an F-5 tornado on April 3, 1974, causing \$2,500,000. Based on today's dollar value the cost if a similar event was to occur in Clark County would be \$4,400,000 in property damages. Due to the infrequencies of tornadoes in Clark County, the County is at moderate risk relating to property damage and low to

moderate risk for loss of life. It is anticipated that a tornado would be a localized event affecting a limited area of the County.

In reviewing the vulnerability to the County for straight-line windstorm damage to the County, no one area is more susceptible to property damage from high winds. However, some physical factors may affect the amount of damage such as large trees may become uprooted and limbs and trees may fall across houses. Features such as open fields may affect the wind intensity on a structure in which case mobile homes become especially vulnerable to windstorms.

Based on NCDC past wind events, there have been 12 high wind events since May 28, 1993, causing \$18,418,000 in damages with two deaths and 14 injuries. That is about an average of one wind event every 20 months. These damages are more than 5 ½ times the amount of property damage suffered from the total County tornadoes. The amount of injuries and deaths are also greater.

The worst single windstorm event to strike Clark County in terms of property damage was in September 2008 when the remnants of Tropical Storm Ike caused \$16,700,000 in damages with no deaths or injuries reported. A high wind event can be a localized event affecting areas of the County; or, as in the case with the remnants of Tropical Storm Ike in 2008, it can be a countywide event which can affect the entire County. The anticipated economic losses anticipated for future county high wind events can range from light damage to moderate damages with injuries and loss of life possible.

Vulnerability & Loss Estimate of EF-5 Tornado Clark County, Ohio			
Municipality	Tornado Risk	Estimated Future Loss	Historical Loss
Plattsville	Medium	-----	2.5 million
Springfield	Medium	309.5 million	-----

Assessing Vulnerability – Estimated Potential Losses – Tornadoes

<u>No. of Structures</u>	<u>Type of Structure/Facility</u>	<u>Est. Value of Structural Losses</u>	<u>Est. No. of Affected Residents</u>	<u>Est. No. of Jobs Temporarily Lost</u>
<i>Downtown Business District & adjoining residential and industrial areas including:</i>				
75	Buildings Moderately Damaged	10.0 million	20	500
8	City Buildings/Fire/Rescue			
1	Courthouse	2.5 million	---	60
1	Public Safety Building			

<u>No. of Structures</u>	<u>Type of Structure/Facility</u>	<u>Est. Value of Structural Losses</u>	<u>Est. No. of Affected Residents</u>	<u>Est. No. of Jobs Temporarily Lost</u>
<i>Downtown Business District & adjoining residential and industrial areas including:</i>				
50	Businesses	20 million	---	60
1	Regional Medical Center	5 million		200
1	Emergency Operations Facility	1 million	---	20
4	Medical Clinics	4 million		40
2	Nursing/Retirement Home Complexes	5 million	180	150
8	Industrial Complexes	25 million	---	400
3	Hazardous Material Sites	12 million		80
10	Elementary Schools	50 million	---	500
5	Private Schools	25 million	---	250
3	Middle Schools	15 million	---	150
1	High School	2 million		100
1	Learning Center	5 million		15
1	Academy School	1 million		25
1	Technology School	5 million		100
1	University	15 million		200
200	Residences - Destroyed	20 million	500	---
300	Residences - Moderate Damage	12 million	750	---
600	Residences – Minor Damage	6 million	1500	---
15	Apartment Complexes–Mod. Damaged	15 million	900	15
1	Wastewater Plant – Mod. Damaged	2 million	---	10
2	Mobile Home Parks	1 million	100	2
2	City Park – Moderate Damage	1 million	---	10
	Transportation Systems	20 million	---	100
	<ul style="list-style-type: none"> • Highways • Railways • Bus • Airports 			
---	Utility Damages	30 million	---	100
	<ul style="list-style-type: none"> • Potable Water System • Wastewater/Stormwater • Natural Gas • Crude Transmission • Electrical Power • Communications 			
<hr/>		<hr/>	<hr/>	<hr/>
1,297	Totals	309.5 million	3,950	3,087

In reviewing this hazard area with the remainder of the county, the affected area would be as follows:

1. Approximately 43.8% of the county residents reside in the City of Springfield.
2. Approximately 8% of the Clark County real estate value is susceptible to an F-3 tornado if it were to hit the heart of the county seat of Springfield, Ohio.
3. A tornado in this location would affect approximately 10% of the county population and almost 8% of the total county employment.

Source: Clark County Auditor GIS Division and Average Clark County Real Estate Values, 2010 Clark County Census, Ohio Department of Development.

2.5 Flooding

Overview

Floods occur when streams or waterways overflow their banks and spill onto adjoining floodplain land areas. Loss of life and property can result when structures are placed in floodplain areas. Prolonged periods of rainfall, frozen ground, inadequate snow melt, and soil conditions affect West Central Ohio every year. Floods are one of the most prevalent hazards in the United States. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories. Every several years serious flooding occurs along one or more of Ohio's rivers and streams. The history of flooding within Clark County indicates that flooding can occur at any time of the year. Most injuries or deaths occur when people are swept away by flood currents. Most damage results from inundation of sediment-filled water and the flooding locations.

Risk Assessment

Several factors determine the severity of floods including intensity and duration of rainfall. A large amount of rainfall over a short time span can create flashflood conditions especially where soil is saturated or frozen on large areas of impermeable surfaces.

Several methods of research identified flooding as a hazard in Clark County, including review of recently updated FIRM maps, reviews of newspaper coverage, reviews of past disaster declarations, discussions with local officials, and public input. The following internet sites were also used to gain information on flooding:

- Association of Dam Safety Officials
- Federal Emergency Management Agency
- Flood Risk and Map Information
- Floodplain Management Association
- General Flood Information
- Latest Hydrological Information (Flooding, Droughts, Snow Conditions and Water Supply)
- Regional River Forecast Centers
- State Floodplain Managers
- United States Army Corps of Engineers (USACOE)
- USGS Streamflow Data Historical

Flooding is an important issue for the residents and business owners of Clark County. Whether it was flash floods or riverine flooding events that have occurred in the past, lives have been disrupted or lost and damage has been extensive. Areas that are prone to flooding in Clark County are within the watersheds of the Mad River, Great Miami River and Little Miami River. Beaver Creek, Buck Creek, Chapman Creek, Donnels Creek, Honey Creek, Mill Creek and Moore Run are all tributaries of these watersheds and also are prone to flooding. Many of the Clark County's communities have structures that are located within the floodplains of these rivers and tributaries as indicated on the FIRM floodplain maps.

Riverine flooding is usually caused by a significant amount of rainfall over a period of days and can be worsened by snow-melt conditions. Riverine flooding is very likely to continue striking these same areas. Areas near the paths of the Mad, Great Miami and Little Miami Rivers and tributaries are particularly low-lying areas. Local officials have enacted regulations to prevent future building and limited appropriate development in these areas. When a severe storm produces a large amount of rainfall in a short time flash flooding may occur. The intensity is generally great but the duration of time is relatively short. Because the majority of Clark County is of relatively flat or gently rolling topography, Clark County is not as vulnerable to flash flooding as is the case in southern and eastern Ohio.

Clark County lies within the Great Miami and Little Miami basins and small portions of the County's eastern boundary lie in the Scioto River Basin. The drainage pattern reflects the influence of the Little Miami, North Fork Little Miami and Mad Rivers. The Mad River is the master stream of the main drainage system entering the County west of Bowlsville and flows southwest through the County. The County's larger streams have cut through glacial drift to the lower courses of bedrock. Steep limestone walls line the Mad River valley beginning in the Springfield area while the Little Miami River has cut a narrow gorge through limestone at Clifton.

Small stream and urban flooding are usually a widespread event, as storm sewer systems, small streams, ditches, retention and detention ponds overflow their banks. City sewers may back up and inundate sump pumps and overload drains. Basements and low lying yard areas are subject to this type of flooding. Drainage problems may also occur on the back side of levees when rainfall capacities exceed the capacity of pumps or other features designed to drain the areas that are protected by the levees.

In the rural portions of Clark County flooding can occur due to broken field tile. Rural flooding can also occur when rainfall exceeds the design capacities of the drainage system. Open fields, past channelization, and removal of woodlands along streams have allowed faster and increased stream runoff. Drainage structures can also become covered and clogged by field debris including corn shocks and soybean residue after harvest as a result of the no-till policies. Roads and bridge structures can also impede the natural flow of water. Log jams along the rivers and streams of Clark County can also affect flooding conditions within the County.

Extensive floodplains are found along Mad River, Little Miami River, North Fork of the Little Miami, as well as many of the related tributaries such as Buck Creek. Floodplains are particularly extensive along the Mad River northwest of Springfield and around I-70 and south to the county line. The County's floodplain regulations manage development and the placement of fill within the 100-year floodplain as mapped by the National Flood Insurance Program (NFIP).

Due to severe flooding in the 1950's a new reservoir and dam was constructed through the United States Corp of Engineers.

Before the 1960's it was generally the philosophy to get the water off the land as quickly as possible and the government invested much effort constructing dams, levees, reservoirs and flood control projects but with little success of controlling the flooding. From the 1960's forward it was realized that it is a natural process of water to utilize the rivers and overflow their banks into the floodplains. Erosion control, floodplain management, quality water management, agricultural responsibility, wetlands, wildlife habitat and recreational use programs became the focus of how to manage the flooding issues of the rivers and streams.

The Little Miami River is designated a state and national scenic river. Its length is about 105 miles. The portion in Clark County is located in Green and Madison Townships, and the Little Miami headwaters are located east of South Charleston.

The Little Miami is the first river in Ohio to be designated a state scenic river and a national scenic river. More than 87 species of fish, 36 species of mussels (including five endangered species) and breeding birds reside along the river. Exceptional water quality supports diverse populations of macro invertebrates.

Many residents of Clark County recognize the important benefits and natural factors of preserving floodplains to be used for natural flood and erosion control, water quality management, wildlife habitat, ground water resources, and agricultural production. The County has in place floodplain management ordinances in most of its communities with the intent to reduce future flood damage.

Clark County recently received updated FEMA Flood Maps and most all flood prone communities are eligible to be in the National Flood Insurance Program (NFIP). The Clark County Communities currently participating in the NFIP include: The Clark County cities of Springfield and New Carlisle and the villages of Clifton, Enon, North Hampton and Tremont City and the unincorporated areas of Clark County are listed as participating in the National Flood Insurance Program (NFIP). Those communities that participate in the NFIP are eligible to receive financial assistance but is the intent of the program to reduce future flood damage within a community through flood plan management ordinances, and provide an insurance alternative to federal disaster relief. The villages of Catawba, Donnelsville, South Charleston and South Vienna currently do not participate in the NFIP.

Special Flood Zone (100-year Floodplain)

Flood Insurance Rate Maps (FIRM) show areas delineated to be special flood hazards. The Base Flood Elevation (BFE) refers to the elevation associated with a special flood zone, or a flood with a 1% chance of occurring in any given year. Areas within a special flood zone area, also known as the 100-year floodplain, have an elevation lower than the BFE and are categorized into zones. Zone "A" is the flood insurance rate zone that corresponds to a special flood zone area that is determined in the Federal Flood Insurance Study by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or depths are shown within this zone. Zone "AE" is the flood insurance rate zone that corresponds to a special flood zone area that is determined in the Federal Flood Insurance Study by detailed methods. In most instances, BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Clark County has special flood zone floodplains identified within the County. The best way to combat a disaster happening within these special zone flood hazard areas is through public awareness. All of Clark County is in compliance with state floodplain management standards and participates in the National Flood Insurance Program (NFIP). Except the the ones previously listed, Village of Catawba, Village of Donnelsville, South Charleston, and South Vienna, the county has been involved since July 2, 1987. The following list gives the incorporated jurisdictions that participate in the NFIP and the date in which they entered the program.

<u>Community</u>	<u>REG-EMER Date</u>	<u>Current Effective Map Date</u>
Clifton	July 8, 1980	March 17, 2011
Enon	April 17, 1987	February 17, 2010
New Carlisle	September 1, 1986	February 17, 2010
North Hampton	September 24, 1984	February 17, 2010
Springfield	December 4, 1985	February 17, 2010
Tremont City	August 13, 1997	February 17, 2010

Repetitive Loss

Recurrence interval, or frequency of occurrence, is defined as the average number of years between storms of a given intensity. Recurrence intervals commonly used in technical studies and design are 2, 10, 25, 50 and 100 years. Recurrence interval addresses how often a flood of a specific depth is expected to occur. Structures located within areas of a higher recurrence interval should be considered at higher risk and should be prioritized higher as it relates to mitigation.

In most counties there are areas that periodically suffer damages from floods. Repetitive loss structure is a term that is usually associated with the National Flood Insurance Program (NFIP). This is a structure, covered by a contract of flood insurance under the NFIP, that has suffered flood damage on two or more occasions over a 10-year period ending on the date when a second claim is made, in which the cost to repair the flood damage, on average, equals or exceeds 25% of the market-value of the structure at the time of each flood loss event. For the Community Rating System (CRS) of the NFIP, a repetitive loss property is any property which the NFIP has paid two or more flood claims of \$1,000 or more in any given 10-year period since 1978. A repetitive loss structure is important to the NFIP since structures that flood frequently put a strain on the flood insurance fund. It should also be important to a community because residents' lives are disrupted and may be threatened by the continual flooding. They are known as "repetitive loss" properties. Repetitive loss properties are defined as properties with structures that have had two or more insurance claims within a 10 year period. The following table indicates the total repetitive flood properties along with the number and amount of losses incurred within Clark County.

County Name	Community Number	Total RFC Structures	Total Losses	Occupancy	Total Building Payment	Total Contents Payment	Total Payment	Total SRL Structures
Clark County	Clark Co. Uninc. 390732	1	4	Non Res.	\$58,471.58	\$6,164.83	\$64,636.41	0
	Clark Co. Uninc. 390732	1	3	Single Fam.	\$10,015.38	\$0.00	\$10,015.38	0
	Clark Co. Uninc. 390732	1	3	Single Fam.	\$73,099.10	\$14,606.11	\$87,705.21	0
	Clark Co. Uninc. 390732	1	2	Other Res.	\$38,574.31	\$0.00	\$38,574.31	0
	New Carlisle 390062	1	2	Single Fam.	\$3,473.58	\$471.56	\$3,945.14	0
	Springfield 390063	1	3	Single Fam.	\$18,637.78	\$4,229.16	\$22,866.94	0
	Springfield 390063	1	3	Non Res.	\$7,386.74	\$1,300.46	\$8,687.20	0
	Springfield 390063	1	2	Single Fam.	\$2,748.63	\$0.00	\$2,748.63	0

Location

Sources of information used to determine flood locations in Clark County are FEMA, Floodplain maps and studies, NOAA data information provided by the Ohio Department of Natural Resources, Division of Soil & Water Resources, State Hazards data, Clark County's agencies such as City and County Engineers, local newspaper articles and past historical data. The primary source is the Flood Hazard Boundary Map (FHBM) and the Flood Insurance Rate Map (FIRM). The maps generally identify 1%-annual chance flood elevations and boundaries for a stream or river reaches into community. The FIRM will include flood elevation information for various flood frequencies and may also delineate floodway boundaries.

Flooding occurs throughout Clark County. See Flood Maps at the end of this section which indicate the designated floodplains within each Clark County Community and the unincorporated areas of Clark County.

In addition to the 100-year flood map locations, frequent reported flooding areas of Clark County include:

City of Springfield:

Street and intersections

1. Crossing Mill Run @ East, York & Burt Streets
2. E. John between York and Sunset
3. Mansfield Avenue
4. North St. between Water and Spring
5. North St. between Fountain and Fisher
6. Wickford Drive between Canterbury and Floral
7. Middle Urbana – Emmanuel Way to SR 334
8. W. John St. between Yellow Springs and Portage Path
9. Oakdale between Belmont and Magnolia

RxR Crossings:

1. Race
2. Isabella
3. Western
4. Zischler

New Carlisle:

1. State Route 571 west of the city by ball field

Bethel Township:

1. Spangler Road
2. Lower Valley Pike

Mad River Township:

1. Old Mill Road

Other Flood Areas:

1. Village of Tremont City – broken down culverts throughout Village
2. Log jams on various rivers and streams
3. Columbus-Cincinnati Road, Tillie Lane, and Mitchell Road
4. Village of Enon – Main Street, Green Vista & Coronado Trail
5. Village of Catawba – State Route 54 and North Champaign Street
6. Village of North Hampton – undersized culvert on State Route 41 west of Asbury Church

Past Occurrences

In March of 1913, the Miami Valley witnessed a natural disaster unparalleled in the region's history. Three storms converged on the state, dumping 9 to 11 inches of rain March 23-25 on ground already saturated from the melting of ice and snow of a hard winter. A 90-percent runoff rate caused the Great Miami River and its tributary streams to overflow. Every city along the river was inundated with floodwaters. More than 360 people lost their lives; property damage exceeded \$100 million (nearly \$2 billion in today's value). In the wake of this tragedy, Miami Valley citizens rallied to initiate plans to prevent future flooding. Some 23,000 citizens contributed more than \$2 million to begin a comprehensive flood protection program on a valley-wide basis. The result was an unflinching flood protection system of five dry dams – Germantown, Englewood, Lockington, Taylorsville, and Huffman – and levees that has protected the Miami Valley, including Clark County, from severe riverine flooding by the Great Miami River since 1922. An independent group of experts in flood control says the Miami Conservancy District (MCD) offers a level of protection rarely seen in the United States. But aging infrastructure will require major reinvestment. MCD engineers have calculated the 1913 flood to be more than a 500-year event and up to a 1,000-year event. The success of the Miami Conservancy District has served as a model to reduce flood risk and damages throughout Clark County and the Miami Valley area.

According to a NCDC Storm Event Record, dated June 1, 1997, from May 31 – June 2, 1997 heavy rainfall caused the Mad River at Springfield to reach a crest of 12.0 feet around 9:00 P.M. on June 1, 1997. Flood stage is at 11.0 feet. Extensive flooding and damages were reported. On January 5th and 6th of 2005 the area received two to four inches of rain in a 24-hour period which increased flooding problems as the ground was already saturated from recent heavy snow melt. Numerous creeks and streams throughout the County were out of their banks. Nearly \$585,000 in property damages was reported within Clark County.

The table below indicates the flooding event history in Clark County since 1995.

Clark County, Ohio Flooding Data Summary from the National Climatic Data Center					
Year	Date of Reported Flood Events	Deaths	Injuries	Estimated Property Damage	Crop Damage
1995	5/18/1995	0	0	\$14,000	0
1995	8/8/1995	0	0	\$105,000	0
1996	4/29/1996	0	0	\$3,000	0
1997	6/1/1997	0	0	\$1,010,000	0
1997	6/2/1997	0	0	\$5,000	0
1998	5/7/1998	1	0	\$50,000	0
2000	6/16/2000	0	0	\$1,000	0
2000	10/5/2000	0	0	\$3,000	0
2001	5/16/2001	0	0	\$0	0
2001	6/11/2001	0	0	\$5,000	0
2001	7/29/2001	0	0	\$0	0
2001	8/30/2001	0	0	\$0	0
2002	6/5/2002	0	0	\$0	0
2002	6/13/2002	0	0	\$10,000	0
2002	9/27/2002	0	0	\$25,000	0
2002	11/10/2002	0	0	\$0	0
2003	5/10/2003	0	0	\$0	0
2003	7/8/2003	0	0	\$0	0
2003	7/31/2003	0	0	\$0	0
2003	8/2/2003	0	0	\$0	0
2003	8/7/2003	0	0	\$0	0
2004	1/4/2004	0	0	\$0	0
2004	6/11/2004	0	0	\$0	0
2005	1/5/2005	0	0	\$585,000	0
2005	1/11/2005	0	0	\$295,000	0
2005	6/30/2005	0	0	\$0	0
2007	3/2/2007	0	0	\$2,000	0
2007	3/14/2007	0	0	\$3,000	0
2008	6/4/2008	0	0	\$10,000	0
2010	7/12/2010	0	0	\$2,000	0
2011	3/5/2011	0	0	\$5,000	0
2011	5/11/2011	0	0	\$48,000	0
	TOTALS	0	0	\$2,183,000	0

Sources: NOAA, NCDC Event Period 01/01/1950 - 10/31/2011

Floods

There have been 29 flood events recorded from 1950 to 2004, according to NCDC. Fifteen of these events have caused \$1.23 million worth of property damage and one death.

March 1913 – Devastation befell Ohio and Indiana in 1913 when a flood hit that began on March 23rd. It rained for five days straight causing streams and rivers throughout Ohio to rise. By the third day, levees were overtopped and flooding occurred. Tons of mud and debris covered streets, homes and businesses throughout the state. In Ohio, it was of such magnitude that it rendered no less than 175,000 people homeless and damage estimated at \$300,000. This total would be the equivalent of \$5,456,746 today. Death tolls reported in Ohio reached 437 and in Indiana reached 496.

August 1995 – On August 8, 1995, thunderstorm rains of one to four inches within eight hours fell on saturated ground and caused flooding of numerous roads, streams and some basements. In Clark County and west of Springfield, 30 to 50 people were evacuated from the Forest Lake Campground due to streams overflowing their banks. Roads remained closed into the late morning hours of August 9. There was \$100,000 in property damage reported for this event.

Probability of Future Events

It is important to establish the probability of occurrence of flooding so the County and its communities can make informed decisions about the sustainability of future development within land areas and to determine the feasibility of proposed mitigation projects.

Typically, FEMA Flood Insurance surveys, FIRM maps, and information are useful tools. Many of the Clark County communities that have 100-year flood zones within their communities participate in the NFIP Program whereby the floodplain maps identify the areas that have a 1% annual chance of being equaled or exceeded in any given year. Smaller floods occur more frequently than larger floods. Therefore, a 10-year flood or 25-year flood has a much greater chance of occurring than a 100-year flood. The following is a table of flood probability.

Flood Occurrence	Chance of Occurrence in Any Given Year
10 years	10%
25 years	4%
50 years	2%
100 years	1%
500 years	.2%

There are several other possible data sources for determining the area affected by a particular probability flood event. The Ohio Department of Natural Resources, Division of Soil and Water Resources, is the State's repository for flood hazard information and has copies of flood hazard information generated by various federal, state, local, and private entities. The State of Ohio Floodplain Management Program maintains current copies of all FEMA; FIS's and flood maps in the State.

Vulnerability Analysis & Loss Estimation

The flood vulnerability assessment for the County focused on each community's assets that are located in the 100-year floodplain. While greater and smaller floods are possible, this Plan's estimate of property damages from flooding are limited to the 100-year floodplain events.

All of the structures in the floodplain were identified using the most recent County's GIS data and Flood Insurance Rate Maps (FIRM). At this time no base flood elevations (BFE) or depth of flooding elevations were calculated. Within this plan individual parcels have not been coordinated with parcel ID and tax information.

The total residential and commercial structures in the floodplain by municipality and surrounding area are as follows:

Clark County Flood Zone Structure Count

Clark Co. (unincorporated) Flood Map

Residential	750
Multi-Family Residential	28
Commercial	78
TOTAL	856

Village of Catawba Flood Map

Residential	0
Multi-Family Residential	0
Commercial	0
Unincorporated Residential	0
TOTAL	0

Village of Clifton Flood Map

Residential	0
Multi-Family Residential	0
Commercial	0
Unincorporated Residential	0
TOTAL	0

Village of Donnelsville Flood Map

Residential	2
Multi-Family Residential	0
Commercial	0
Unincorporated Residential	0
TOTAL	2

City of New Carlisle Flood Map

Residential	0
Multi-Family Residential	1
Commercial	4
Unincorporated Residential	0
TOTAL	5

Village of North Hampton Flood Map

Residential	2
Multi-Family Residential	0
Commercial	0
Unincorporated Residential	0
TOTAL	2

Village of South Charleston Flood Map

Residential	5
Multi	0
Commercial	1
Unincorporated Residential	0
TOTAL	6

Village of South Vienna Flood Map

Residential	0
Multi-Family Residential	0
Commercial	0
Unincorporated Residential	0
TOTAL	0

Village of Springfield Flood Map

Residential	50
Multi-Family Residential	39
Commercial	31
Industrial	25
Unincorporated Residential	0
TOTAL	145

Village of Tremont Flood Map

Residential	17
Multi-Family Residential	5
Commercial	2
Industrial	0
Unincorporated Residential	0
Unincorporated Commercial	0
TOTAL	24

Clark County Flood Zone Structure Count Totals

Residential Total	950
Multi-Family residential	106
Commercial	131

Based on flood information from the NCDC, flooding events in Clark County has caused \$2,183,000 in property damage from 1995 through 2011. This is an average of \$136,438 per year in property damages. This also includes the years 1999, 2002, 2003, 2006, and 2009 in which no property losses were recorded.

Loss of contents has been included based on the values shown in the table below. A value for loss of use or “down time” of the buildings has not been included in this estimate. The amount of residential population displaced from a flood disaster would be approximately 4,500 residents. At risk structures in areas prone to urban and small stream or flash flooding (and that are not within the 100-year Flood Plain) have not been mapped or included in the vulnerability analysis.

Contents Value as a Percentage of Structure Value

Occupancy Class	Value (%)
Residential	50%
Commercial	100%
Industrial/Utility	150%
Medical Facilities	150%
Emergency Services	150%
General Government	100%
Schools/Libraries	100%
Colleges/Universities	150%
Religion/Non-profit	100%
Shelters	100%
Agricultural	100%

The above values are as recommended by FEMA guidance documents.

The flood vulnerability count showed that a total of 1212 structures are located in the 100-year floodplain. Approximately 950 of these structures are single family residences, 106 are multi-family; 131 of these are commercial; 25 are industrial. There are a total of 62,200 residential housing units in Clark County. Therefore, about 2% of the total housing stock is located within the 100-year floodplain. Content losses as a percentage of the property damage value were included. The entire County collectively has approximately \$169,591,600 in total building exposure to flooding for 1% -annual-chance event. A total of 1212 structures can be expected to be damaged. Approximately six critical facilities could be impacted. The overall estimated losses including residential, commercial, industrial, agricultural, utility structure losses and content losses are estimated to be \$169,591,600. See table below:

Clark County Flood Zone Structure Count with Potential Damages*					
Flood Zone Property Values	Flood Zone Structure Count	Property Classification	Building	Contents **	Total
Clark County Unincorporated					
	750	Residential	\$61,614,810.00	\$30,807,405.00	\$92,422,215.00
	28	Multi-Residential	\$166,060.00	\$83,030.00	\$249,090.00
	78	Commercial	\$4,570,220.00	\$4,570,220.00	\$9,140,440.00
Total Structure Count	856	Total Potential Damages			\$101,811,745.00
Catawba					
	0	Residential	\$0.00	\$0.00	\$0.00
	0	Multi-Residential	\$0.00	\$0.00	\$0.00
	0	Commercial	\$0.00	\$0.00	\$0.00
Total Structure Count	0	Total Potential Damages			\$0.00
Clifton					
	0	Residential	\$0.00	\$0.00	\$0.00
	0	Multi-Residential	\$0.00	\$0.00	\$0.00
	0	Commercial	\$0.00	\$0.00	\$0.00
Total Structure Count	0	Total Potential Damages			\$0.00
Donnelsville					
	2	Residential	\$49,500.00	\$24,750.00	\$74,250.00
	0	Multi-Residential	\$0.00	\$0.00	\$0.00
	0	Commercial	\$0.00	\$0.00	\$0.00
Total Structure Count	2	Total Potential Damages			\$74,250.00

Flood Zone Property Values	Flood Zone Structure Count	Property Classification	Building	Contents **	Total
Enon					
	124	Residential	\$15,443,890.00	\$7,721,945.00	\$23,165,835.00
	33	Multi-Residential	\$2,593,320.00	\$1,296,660.00	\$3,889,980.00
	15	Commercial	\$3,414,030.00	\$3,414,030.00	\$6,828,060.00
Total Structure Count	172	Total Potential Damages			\$33,883,875.00
New Carlisle					
	0	Residential	\$0.00	\$0.00	\$0.00
	1	Multi-Residential	\$12,190.00	\$6,095.00	\$18,285.00
	4	Commercial	\$1,040,710.00	\$1,040,710.00	\$2,081,420.00
Total Structure Count	5	Total Potential Damages			\$2,099,705.00
North Hampton					
	2	Residential	\$128,340.00	\$64,170.00	\$192,510.00
	0	Multi-Residential	\$0.00	\$0.00	\$0.00
	0	Commercial	\$0.00	\$0.00	\$0.00
Total Structure Count	2	Total Potential Damages			\$192,510.00
South Charleston					
	5	Residential	\$364,760.00	\$182,380.00	\$547,140.00
	0	Multi-Residential	\$0.00	\$0.00	\$0.00
	1	Commercial	\$62,830.00	\$62,830.00	\$125,660.00
Total Structure Count	6	Total Potential Damages			\$672,800.00
South Vienna					
	0	Residential	\$0.00	\$0.00	\$0.00
	0	Multi-Residential	\$0.00	\$0.00	\$0.00
	0	Commercial	\$0.00	\$0.00	\$0.00
Total Structure Count	0	Total Potential Damages			\$0.00

Flood Zone Property Values	Flood Zone Structure Count	Property Classification	Building	Contents **	Total
Springfield					
	50	Residential	\$1,588,220.00	\$794,110.00	\$2,382,330.00
	39	Multi-Residential	\$4,572,620.00	\$2,286,310.00	\$6,858,930.00
	31	Commercial	\$5,230,800.00	\$5,230,800.00	\$10,461,600.00
	25	Industrial	\$4,870,870.00	\$7,306,305.00	\$12,177,175.00
Total Structure Count	145	Total Potential Damages			\$29,497,705.00
Tremont City					
	17	Residential	\$448,680.00	\$224,340.00	\$673,020.00
	5	Multi-Residential	\$344,140.00	\$172,070.00	\$516,210.00
	2	Commercial	\$84,890.00	\$84,890.00	\$169,780.00
Total Structure Count	24	Total Potential Damages			\$1,359,010.00
* Based on properties located within the 100 year Flood Zone					
** Utilizing FEMA Guidance Documents					

Presidential Disaster Declaration

One Presidential Disaster Declaration DR-1580 was issued for the severe storms and flooding that struck 32+ Ohio Counties including Clark County on December 22, 2004 – February 1, 2005.

Mapping

See the Clark County Floodplain Maps which indicate the graphical representation for floodplain hazards. The Flood Maps are found in the Appendix Section A-5.

2.6 Winter Storms Including Sleet/Snow/Ice/Blizzard

Overview

One or more of the following characterizes a winter storm: heavy snow, ice storms, strong winds, extreme cold; and, at certain times, blowing and drifting snow as well as blizzards.

Winter Storms

A winter storm encompasses several types of storm systems that develop during the late fall to early spring. It deposits any of the following types of precipitation: snow, freezing rain, or ice. Blizzards and ice storms are subcategories of winter storms. A winter storm watch indicates that severe winter weather may affect an area. A winter storm warning indicates that severe winter weather conditions are definitely on the way. Typically, the average mean snow depth for Clark County is 24-36 inches.

Blizzards

A blizzard warning signifies that large amounts of falling or blowing snow and sustained winds of at least 35 mph are expected for several hours. In order to be classified as a blizzard, as opposed to merely a winter storm, the weather must meet several conditions. The storm must decrease visibility to a quarter of a mile for three consecutive hours, include snow or ice as precipitation, and have wind speeds of at least 35 mph. A blizzard is also characterized by low temperatures.

Ice Storms

An ice storm is defined as a weather event containing liquid rain that falls upon cold objects creating 1/4 inch thick or more accumulation of ice buildup. This ice accumulation creates serious damage such as downed trees and power lines leaving people without power and communication. It also makes for extremely treacherous road conditions.

Occasionally, snow will fall after an ice storm has occurred. With the ice cover, it is nearly impossible to determine which travel areas to avoid. When traveling by car this snow covered ice causes accidents and when walking it causes people to fall, possibly sustaining injuries.

Several methods of research identified winter storms as a hazard in Clark County, including reviews of newspaper coverage, reviews of past disaster declarations, interviews with local officials, and reviewing the NOAA/NCDC Clark County weather events.

A severe winter storm could affect the entire county at the same time, virtually bringing all county operations to a stand still. Clark County is highly vulnerable to the wide-ranging effects of snowstorms, blizzards, ice storms, sleet, and severe cold snaps. This type of hazard creates a difficult emergency response effort due to adverse road conditions which impede or prohibit vehicle movement. Since Clark County has over 915 miles roadway within the county, severe winter storms can have a large impact on the

county. Much of the land is rural and slightly rolling which can make for dangerous conditions when blowing and drifting snow occurs.

Research indicates that all of Clark County is equally susceptible to winter storms. Driving is treacherous during winter storms as roadways freeze and become covered with snow and slush. During severe winter storms, heavy snow may cause property damage and power outages. Also, the aforementioned adverse driving conditions may lead to additional property damage. According to a FEMA Winter Storm Fact Sheet, the leading cause of death during winter storms is from automobile and other transportation accidents. Roads are sometimes blocked stranding some rural residents from the incorporated areas where medical and other emergency services are centered. Heavy snowfall and blizzards can trap motorists in their cars. Attempting to walk for help in a blizzard can be a deadly decision. Disorientation and confusion come very quickly in blowing snow.

Health hazards generated from severe winter storms include frostbite and hypothermia. Frostbite is a severe reaction to cold exposure that can permanently damage its victims. A loss of feeling and a white or pale appearance in fingers, toes, or the nose and ear lobes are symptoms of frostbite.

Hypothermia is a condition brought on when the body temperature drops to less than 55 degrees Fahrenheit. Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness, and exhaustion.

Research indicates that winter storms are the third leading weather threat in Ohio. The storms of 1950 and 1978 were of a duration that required extensive mass sheltering or statewide response and recovery efforts. According to the NOAA/NCDC from the period of March 1994 – February 2011, 54 severe winter storms have affected Clark County.

Risk Assessment

Location

Winter storms are generally considered to be non-spatial hazards. It is difficult to determine the exact location of damages that may result from a winter storm event. This hazard affects the entire county and generally the entire county receives 24-26 inches of snowfall annually. During a winter storm event it is not unusual for different areas of the county to receiving varying amounts of snowfall however for many storms snowfall amounts can be about the same countywide.

Past Occurrences

The following is a summary analysis of the Clark County Hazard Mitigation Committee's hazard research findings for severe winter storms: Clark County is approximately 27 miles wide east to west and 17 miles from north to south. As a result, winter weather conditions can vary from one end of the County to the other.

Severe winter storms in Clark County can produce ice, snow, freezing rain, cold temperatures, and wind. Severe winter storms impact highway safety and has a

destructive impact on trees, power lines, and utility services. Extreme periods of cold can have an adverse effect on water lines and water systems. Power outages and drifting and blowing snow, common to the rural parts of Clark County, can have widespread impacts to the residents of Clark County. Destructive snow and ice storms occur on an annual basis. Most county schools have five adverse weather days included in their normal school schedule.

Past history indicates Clark County, and much of Ohio, felt the winter storm effects of the November 25, 1950 blizzard; April 13, 1957 ice storm; January, 1978 blizzard; March 9, 1994 snow storm; and January 2, 1996 and December 22, 2004 snow storm. The 1978 blizzard was the most devastating recent winter storm event. It swept through Clark County on January 25 and 26, 1978 and virtually shut down the entire County.

In Clark County, there were 54 recorded snow and ice events on the NCDC website from 1994-2011. Of these 54 events, ten caused \$17.082 million worth of property damage, five deaths, and injured 34 people.

From January 6 through January 7, 1995, much of the southwest and Miami Valley regions of Indiana, which included Clark County, received 1/4 to 1/2 of an inch glaze of freezing rain and sleet. A freezing rain, sleet, and snow mix occurred towards the end of the event. It was the first major winter storm of the season. Traffic accidents were widespread and brought some roads to a standstill. Although no direct fatalities occurred, at least four fatalities were the result of traffic accidents. Twenty-six injuries occurred from falls on the ice. Of these injuries, 16 injuries were reported in Hamilton County, four in Butler County, four in Ross County, one in Warren County and one in Montgomery County. Localized power outages resulted from downed trees and wires. Property damage reported for this event totaled \$400,000.

From January 21 through January 22, 1995, southwest, west central, parts of Central, and parts of northwest Indiana experienced an extended period of snow accumulation which totaled three to six inches. Northwest winds caused blowing and drifting snow and made travel on secondary roads difficult and dangerous. Several power outages were reported from downed wires due to wind and snow. A woman was found dead after apparently falling and freezing to death in Lucas County. In Butler County, an elderly woman also was found dead of exposure on her front porch after apparently falling. Six injuries were reported due to falls. Numerous traffic accidents were reported resulting from treacherous road conditions. Property damage incurred totaled \$500,000.

From January 6 through January 8, 1996, a massive low pressure system produced the fastest total accumulation of snow at the Greater Cincinnati/Northern Kentucky airport. The airport, which normally receives 23 inches for an entire season, measured 14.3 inches of snowfall for this event. The heaviest snow fell near the Ohio River in the extreme south. Whiteouts occurred in west central areas of Ohio. In Fayette County, the airport reported a wind gust to 56 mph during the height of the storm. Many homes and businesses had their roofs collapse or partially collapse from the weight of the new snow combined with the snow from a storm earlier in the week. A 47-year-old man died of exposure under an overpass in Miami County. A 76-year-old man died of exposure on

his front porch in Montgomery County. There was \$14.3 million in property damage reported for this event. The ice storms that occurred in December 2004 through February 2005 interrupted an eight year period in which Clark County did not suffer any property or crop damage due to winter weather. However, each of the events caused high property losses. The intensity of the ice storms that hit the area results in a high susceptibility to property damage due to winter weather.

On February 21, 2011, an ice storm hit the Ohio Valley beginning late in the evening of January 31st. Low pressure traced from Texas to the lower Great Lakes region, and strengthened as it crossed the Ohio Valley. The precipitation over northern portions of the region began as a snow and sleet mix and changed over to freezing rain, while along and immediately south of the I-70 corridor was all freezing rain. An estimated quarter million power outages were blamed on the storm which brought upwards of a half inch to inch of ice, along with several inches of sleet accumulation to central and west central Ohio and the Whitewater Valley of Indiana. Warmer temperatures southeast of the I-71 corridor led to little if any freezing precipitation. Overnight, ice melted east of I-75 as temperatures in the warm sector ahead of the cold front rose well into the 40s and reached 50 degrees in some locations.

The following table summarizes the winter storms including ice events that have occurred in Clark County:

Clark County, Ohio Winter Storm and Ice Events 1994-2011						
Year	Date of Reported Winter Storm Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
1994	3/9/1994	Heavy Snow	0	0	\$500,000	\$0
1995	1/6/1995	Ice Storm	0	26	\$400,000	\$0
1995	1/21/1995	Snow	2	6	\$500,000	\$0
1995	12/13/1995	Freezing Rain	0	2	\$25,000	\$0
1995	12/19/1995	Heavy Snow	0	0	\$100,000	\$0
1996	1/2/1996	Winter Storm	0	0	\$750,000	\$0
1996	1/6/1996	Winter Storm	2	0	\$14,300,000	\$0
1996	1/11/1996	Heavy Snow	0	0	\$26,000	\$0
1996	3/6/1996	Ice Storm	0	0	\$0	\$0
1996	3/19/1996	Winter Storm	1	0	\$0	\$0
1997	1/24/1997	Ice Storm	0	0	\$0	\$0
1999	1/1/1999	Winter Storm	0	0	\$0	\$0
1999	1/7/1999	Winter Storm	0	0	\$0	\$0
1999	1/13/1999	Winter Storm	0	0	\$0	\$0
1999	3/9/1999	Heavy Snow	0	0	\$0	\$0
2000	1/19/2000	Heavy Snow	0	0	\$0	\$0
2000	12/13/2000	Ice Storm	0	0	\$0	\$0
2002	3/26/2002	Winter Storm	0	0	\$0	\$0
2003	2/15/2003	Winter Storm	0	0	\$0	\$0

Year	Date of Reported Winter Storm Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
2004	1/25/2004	Winter Storm	0	0	\$0	\$0
2004	3/16/2004	Winter Storm	0	0	\$0	\$0
2004	12/22/2004	Winter Storm	0	0	\$451,000	\$0
2005	1/21/2005	Winter Storm	0	0	\$0	\$0
2005	12/8/2005	Winter Storm	0	0	\$0	\$0
2005	12/15/2005	Winter Storm	0	0	\$0	\$0
2007	2/6/2007	Heavy Snow	0	0	\$0	\$0
2007	2/13/2007	Heavy Snow	0	0	\$80,000	\$0
2007	12/4/2007	Heavy Snow	0	0	\$0	\$0
2007	12/4/2007	Winter Weather	0	0	\$0	\$0
2007	12/7/2007	Winter Weather	0	0	\$0	\$0
2008	1/1/2008	Winter Weather	0	0	\$0	\$0
2008	2/20/2008	Heavy Snow	0	0	\$0	\$0
2008	3/7/2008	Winter Storm	0	0	\$0	\$0
2008	12/19/2008	Ice Storm	0	0	\$0	\$0
2008	12/19/2008	Winter Weather	0	0	\$0	\$0
2009	1/14/2009	Heavy Snow	0	0	\$0	\$0
2009	1/27/2009	Heavy Snow	0	0	\$0	\$0
2009	12/19/2009	Heavy Snow	0	0	\$0	\$0
2009	12/19/2009	Winter Weather	0	0	\$0	\$0
2010	1/7/2010	Winter Weather	0	0	\$0	\$0
2010	2/5/2010	Heavy Snow	0	0	\$0	\$0
2010	2/9/2010	Heavy Snow	0	0	\$0	\$0
2010	2/15/2010	Winter Weather	0	0	\$0	\$0
2010	2/26/2010	Winter Weather	0	0	\$0	\$0
2010	3/25/2010	Winter Weather	0	0	\$0	\$0
2010	12/12/2010	Winter Weather	0	0	\$0	\$0
2010	12/16/2010	Winter Storm	0	0	\$0	\$0
2010	12/16/2010	Winter Weather	0	0	\$0	\$0
2011	1/20/2011	Heavy Snow	0	0	\$0	\$0
2011	1/20/2011	Winter Weather	0	0	\$0	\$0
2011	2/1/2011	Ice Storm	0	0	\$0	\$0
2011	2/1/2011	Winter Weather	0	0	\$0	\$0
2011	2/24/2011	Heavy Snow	0	0	\$0	\$0
2011	2/24/2011	Winter Weather	0	0	\$0	\$0
TOTALS:			5	34	\$17,082,000	\$0

All of the 138,333 Clark County residents and 56,000 households are assumed to be at equal risk from a winter storm as are the approximate 60,000 buildings in the county which are estimated to be valued at 10,893 (in millions of dollars). Damage to crops has not been considered as there is a less likely chance of winter crop damage and there has been no damage reported to NCDC per the above winter storm and ice event chart shown above.

Probability of Future Events

Winter storm events have occurred for many years and most likely will continue to occur in the future in Clark County. From March 9, 1994 – February 24, 2011 there have been approximately 54 severe winter events in Clark County according to NOAA/NCDC records. That equates an average to about three severe winter storms per year. However, in the calendar year of 2010 there were nine severe winter storms listed. In any given year it is possible to have considerably more snow and ice events and each winter will vary in snowfall depths of accumulating snow and ice. Future events may be affected by global climate changes but the outcome of these trends is unknown at this time. In terms of probability, Clark County has about a 5% change of exceeding the 24-26 inch average snow depth.

Vulnerability and Loss Estimation**Methodology**

The 17-year winter storm losses for Clark County (1994-Feb. 2011) provided the basis for estimating vulnerability. To yield the per capita 17-year damage total for Clark County, the total damage for this period was divided by the 2010 census population. That figure divided by seventeen, resulted in the annual per capita damage figure for severe winter storms for Clark County.

Results

From March 9, 1994 – February 24, 2011 loss estimates for winter storms in Clark County totaled 17.082 million dollars in property damage. There were also a total of five deaths and 34 injuries reported. Dividing these damages over the 17-year period equates to approximate average losses of 1 million dollars per year for its 138,333 residents. Therefore, the average cost to each resident per year was approximately \$7.23.

2.7 Severe Summer Storms

The National Weather Service classifies a thunderstorm as severe if it has wind gusts greater than 58 mph, hail that is $\frac{3}{4}$ inches in diameter or produces a tornado. Severe thunderstorms can lead to flash flooding, straight-line winds of 100 to 150 mph, damaging hail and tornadoes. A typical thunderstorm is 15 miles in diameter and lasts for 20 to 30 minutes. On average, 100,000 thunderstorms occur in the United States each year with 10% (10,000) classified as severe.

All thunderstorms are dangerous despite the fact that they are generally localized in a small geographical region. It is important to note that every thunderstorm produces lightning, which is responsible for more deaths annually than hurricanes or tornadoes.

Lightning is a major threat during a thunderstorm because it is very unpredictable and it can strike as far as 10 miles away from the actual rainfall area. On average, 62 people are killed from lightning strikes each year with the majority of deaths occurring when people did not seek inside shelter during the storm. Many more injuries occur and some may result in long-term, debilitating symptoms such as memory loss, sleep disorders, attention deficits, irritability, depression and muscle spasms.

Severe summer storms traditionally precede an approaching cold air mass. In the northern hemisphere, the spin of the earth naturally produces weather patterns affecting North America, which travel from west to east across the continent. Key components to the formation of storms are a low pressure zone, high pressure zone and the jet stream.

Thunderstorms develop when large differences exist between adjacent zones combined with significant water vapor. As warm air begins to lift, it eventually starts to cool and condensation takes place. When the moisture condenses, heat is released which further aids in the lifting process. If enough instability is present in the atmosphere, this process will continue long enough for storm clouds to form, which supports lightning and thunder. As water droplets rise into the colder air, they can freeze. When the velocity of wind becomes great enough, the ice pellets are repeatedly lifted and dropped in the storm adding layers of ice with each cycle. Once the wind cannot support the weight of the ice pellet, it falls to the ground in the form of hail.

The National Climatic Data Center considers summer storms as “high wind events” when surface winds meet or exceed approximately 58 mph. However, wind may even exceed 100 mph with wind gusts even stronger.

Risk Assessment

Location:

According to NOAA/NCDC, there were 148 thunderstorm/wind events recorded from April 27, 1994 through September 3, 2011 in Clark County. All areas of Clark County have been affected by severe storms.

Some of the more intense severe storms recorded include:

- **September 14, 2008** – Strong winds of 40 to 50 miles per hour were sustained for several hours. A 61 mph gust was recorded southwest of Springfield. Widespread damage occurred across the region, from trees being blown down on powerlines, to significant crop losses and structural damage. The remnants of hurricane Ike raced northeast through the midwest and merged with a frontal boundary across the lower Ohio Valley Sunday morning. Abundant sunshine promoted deep mixing of the atmosphere, and warm, dry air aloft translated down to the surface. Gusty winds in excess of 70 mph persisted for a period of several hours, causing significant damage and widespread power outages. Property damage received in Clark County was estimated at \$1,600,000.
- **January 30, 2008** - A roof was blown off a mobile home in Medway causing \$10,000 in damages. A line of severe thunderstorms along a strong cold front produced wind damage across southern and western Ohio.
- **April 27, 2011** – A line of storms moved through during the morning hours of April 27th. Numerous trees were reported down, an awning and door were ripped off a building, and roof and siding damage occurred to a residence due to damaging thunderstorm winds resulting in \$15,000 in damages.
- **May 23, 2011** –A quasi-linear convective system moved across an unstable airmass and produced widespread severe weather. Several utility poles were down, a barn was blown off of its foundation, and minor damage occurred to a house and an apartment due to damaging thunderstorm winds. Property damages were reported to be \$70,000.

Past Occurrences

The following NOAA/NCDC tables indicate thunderstorm/wind events, hail events, and lightning events that have occurred in the past throughout Clark County. Those listed are ones that had injuries, deaths, or property damage. Those that had no damage reports, injuries or deaths have not been listed.

All of the 138,333 Clark County residents and 56,000 households are assumed to be at equal risk from a severe summer storm as are the approximate 60,000 buildings in the county which are estimated to be valued at 10,893 (in millions of dollars).

Clark County, Ohio Summer Storm Events Data Summary from the National Climatic Data Center						
Year	Number of Reported Summer Storm Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
1994	4/27/1994	Tstm/Wind	0	0	\$5,000	\$0
1994	8/20/1994	Tstm/Wind	0	1	\$50,000	\$0
1995	5/24/1995	Tstm/Wind	0	0	\$10,000	\$0
1995	6/21/1995	Tstm/Wind	0	0	\$10,000	\$0
1995	6/26/1995	Tstm/Wind	0	0	\$4,000	\$0
1995	6/26/1995	Tstm/Wind	0	0	\$4,000	\$0
1995	7/13/1995	Tstm/Wind	0	0	\$3,000	\$0
1995	7/13/1995	Tstm/Wind	0	0	\$8,000	\$0
1995	7/26/1995	Tstm/Wind/Hail	0	0	\$6,000	\$4,000
1996	4/29/1996	Tstm/Wind	0	0	\$2,000	\$0
1996	4/29/1996	Tstm/Wind	0	0	\$2,000	\$0
1996	5/10/1996	Tstm/Wind	0	0	\$5,000	\$0
1996	6/18/1996	Tstm/Wind	0	0	\$5,000	\$0
1996	7/7/1996	Tstm/Wind	0	0	\$4,000	\$0
1996	7/7/1996	Tstm/Wind	0	0	\$3,000	\$0
1996	11/7/1996	Tstm/Wind	0	0	\$5,000	\$0
1997	1/5/1997	Tstm/Wind	0	1	\$75,000	\$0
1997	5/18/1997	Tstm/Wind	0	0	\$5,000	\$0
1997	7/2/1997	Tstm/Wind	0	0	\$5,000	\$0
1997	7/27/1997	Tstm/Wind	0	0	\$3,000	\$0
1998	5/19/1998	Tstm/Wind	0	0	\$5,000	\$0
1998	5/29/1998	Tstm/Wind	0	0	\$3,000	\$0
1998	6/12/1998	Tstm/Wind	0	0	\$5,000	\$0
1998	6/19/1998	Tstm/Wind	0	0	\$10,000	\$0
1998	7/19/1998	Tstm/Wind	0	0	\$10,000	\$0
1998	8/25/1998	Tstm/Wind	0	0	\$5,000	\$0
1998	11/10/1998	Tstm/Wind	0	0	\$3,000	\$0
1999	5/6/1999	Tstm/Wind	0	0	\$5,000	\$0
1999	7/9/1999	Tstm/Wind	0	0	\$5,000	\$0
1999	7/26/1999	Tstm/Wind	0	0	\$3,000	\$0
1999	10/13/1999	Tstm/Wind	0	0	\$5,000	\$0
2000	4/20/2000	Tstm/Wind	0	0	\$50,000	\$0
2000	4/20/2000	Tstm/Wind	0	0	\$5,000	\$0
2000	5/10/2000	Tstm/Wind	0	0	\$3,000	\$0
2000	6/2/2000	Tstm/Wind	0	0	\$3,000	\$0
2000	6/14/2000	Tstm/Wind	0	0	\$1,000	\$0
2000	6/14/2000	Tstm/Wind	0	0	\$2,000	\$0

Year	Number of Reported Summer Storm Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
2000	6/16/2000	Tstm/Wind	0	0	\$2,000	\$0
2000	6/16/2000	Tstm/Wind	0	0	\$2,000	\$0
2000	7/3/2000	Tstm/Wind	0	0	\$25,000	\$0
2000	8/9/2000	Tstm/Wind	0	0	\$5,000	\$0
2000	8/9/2000	Tstm/Wind	0	0	\$5,000	\$0
2000	9/20/2000	Tstm/Wind	0	0	\$5,000	\$0
2000	11/9/2000	Tstm/Wind	0	0	\$10,000	\$0
2001	6/11/2001	Tstm/Wind	0	0	\$5,000	\$0
2001	6/15/2001	Tstm/Wind	0	0	\$5,000	\$0
2001	7/1/2001	Tstm/Wind	0	0	\$3,000	\$0
2001	10/24/2001	Tstm/Wind	0	0	\$5,000	\$0
2002	5/1/2002	Tstm/Wind	0	0	\$6,000	\$0
2002	5/2/2002	Tstm/Wind	0	0	\$6,000	\$0
2002	5/2/2002	Tstm/Wind	0	0	\$3,000	\$0
2002	5/12/2002	Tstm/Wind	0	0	\$5,000	\$0
2003	7/4/2003	Tstm/Wind	0	0	\$10,000	\$0
2003	7/6/2003	Tstm/Wind	0	0	\$2,000	\$0
2003	7/6/2003	Tstm/Wind	0	0	\$3,000	\$0
2003	7/6/2003	Tstm/Wind	0	0	\$15,000	\$0
2003	7/8/2003	Tstm/Wind	0	0	\$12,000	\$0
2003	7/8/2003	Tstm/Wind	0	0	\$4,000	\$0
2003	7/21/2003	Tstm/Wind	0	0	\$3,000	\$0
2003	8/27/2003	Tstm/Wind	0	0	\$6,000	\$0
2003	8/27/2003	Tstm/Wind	0	0	\$15,000	\$0
2003	8/27/2003	Tstm/Wind	0	0	\$0	\$0
2004	5/24/2004	Tstm/Wind	0	0	\$3,000	\$0
2004	6/15/2004	Tstm/Wind	0	0	\$3,000	\$0
2005	6/5/2005	Tstm/Wind	0	0	\$3,000	\$0
2005	6/30/2005	Tstm/Wind	0	0	\$3,000	\$0
2005	6/30/2005	Tstm/Wind	0	0	\$3,000	\$0
2005	8/11/2005	Tstm/Wind	0	0	\$8,000	\$0
2005	8/20/2005	Tstm/Wind	0	0	\$3,000	\$0
2006	4/2/2006	Tstm/Wind	0	0	\$5,000	\$0
2006	4/14/2006	Tstm/Wind	0	0	\$12,000	\$0
2006	5/25/2006	Tstm/Wind	0	0	\$12,000	\$0
2006	7/11/2006	Tstm/Wind	0	0	\$15,000	\$0
2006	7/14/2006	Tstm/Wind	0	0	\$3,000	\$0
2006	8/3/2006	Tstm/Wind	0	0	\$2,000	\$0
2006	12/1/2006	Tstm/Wind	0	0	\$7,000	\$0

Year	Number of Reported Summer Storm Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
2007	5/15/2007	Tstm/Wind	0	0	\$2,000	\$0
2007	6/26/2007	Tstm/Wind	0	0	0,000	\$0
2007	7/10/2007	Tstm/Wind	0	0	\$2,000	\$0
2007	8/8/2007	Tstm/Wind	0	0	\$2,000	\$0
2007	8/16/2007	Tstm/Wind	0	0	\$4,000	\$0
2007	8/16/2007	Tstm/Wind	0	0	\$4,000	\$0
2008	1/9/2008	Tstm/Wind	0	0	\$3,000	\$0
2008	1/1/2008	Strong Winds	0	0	\$10,000	\$0
2008	6/4/2008	Tstm/Wind	0	0	\$3,000	\$0
2008	6/15/2008	Tstm/Wind	0	0	\$10,000	\$0
2008	6/15/2008	Tstm/Wind	0	0	\$3,000	\$0
2008	6/21/2008	Tstm/Wind	0	0	\$2,000	\$0
2008	6/25/2008	Tstm/Wind	0	0	\$10,000	\$0
2008	6/25/2008	Tstm/Wind	0	0	\$10,000	\$0
2008	7/8/2008	Tstm/Wind	0	0	\$2,000	\$0
2009	8/10/2009	Tstm/Wind	0	0	\$35,000	\$0
2009	8/19/2009	Tstm/Wind	0	0	\$12,000	\$0
2010	6/15/2010	Tstm/Wind	0	0	\$1,000	\$0
2010	8/4/2010	Tstm/Wind	0	0	\$2,000	\$0
2010	9/7/2010	Tstm/Wind	0	0	\$15,000	\$0
2010	10/26/2010	Tstm/Wind	0	0	\$2,000	\$0
2011	4/27/2011	Tstm/Wind	0	0	\$15,000	\$0
2011	5/23/2011	Tstm/Wind	0	0	\$3,000	\$0
2011	5/23/2011	Tstm/Wind	0	0	\$3,000	\$0
2011	5/23/2011	Tstm/Wind	0	0	\$70,000	\$0
2011	5/25/2011	Tstm/Wind	0	0	\$3,000	\$0
2011	7/11/2011	Tstm/Wind	0	0	\$5,000	\$0
2011	7/29/2011	Tstm/Wind	0	0	\$2,000	\$0
2011	9/3/2011	Tstm/Wind	0	0	\$4,000	\$0
TOTALS			0	2	\$237,000	\$4,000

Clark County, Ohio Hail Events Data Summary from the National Climatic Data Center						
Year	Date of Reported Hail Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
1994	6/6/1994	Hail	0	0	\$0	\$50,000
1995	7/26/1995	Tstm/ Winds Hail	0	0	\$6,000	\$4,000
1999	6/11/1999	Hail	0	0	\$1,000	\$0
2002	5/2/2002	Hail	0	0	\$2,000	\$0
2002	5/2/2002	Hail	0	0	\$2,000	\$0
2002	5/2/2002	Hail	0	0	\$2,000	\$0
2004	5/30/2004	Hail	0	0	\$5,000	\$0
2005	6/28/2005	Hail	0	0	\$10,000	\$0
2006	10/4/2006	Hail	0	0	\$5,000	\$0
2008	2/17/2008	Hail	0	0	\$1,000	\$0
2008	6/4/2008	Hail	0	0	\$3,000	\$0
2008	6/4/2008	Hail	0	0	\$3,000	\$0
Totals			0	0	\$40,000	\$54,000
Sources: From NOAA, NCDC Event Period 07/05/1950 - 04/30/2011						

Clark County, Ohio Lightning Events Data Summary from the National Climatic Data Center						
Year	Date of Reported Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
1996	5/10/1996	Lightning	0	2	0	0
2001	6/11/2001	Lightning	0	0	0	0
2001	8/30/2001	Lightning	0	0	0	0
2003	8/4/2003	Lightning	0	1	0	0
Totals			0	3	0	0
Sources: From NOAA, NCDC Event Period 01/01/1950 - 04/30/2011						

Probability of Future Events

Severe summer storms have occurred in the past and will continue to occur in Clark County. There have been a total of 4 lightning events, 60 hail events, and 150 thunderstorm/wind events in Clark County from April 27, 1994 through December 31, 2011. Based on the above data, Clark County, Ohio can expect on average at least 4 severe summer storm events each year along with smaller thunderstorm events. Based on Ohio historical data, Ohio has received 19 presidential declarations from summer storm events for June 1997 through August 2007. All of the 138,333 Clark County residents and 56,000 households are assumed to be at equal risk from a severe summer storm as are the approximate 60,000 buildings in the county which are estimated to be valued at 10,893 (in millions of dollars).

From this information, it is very probable future damaging summer storm events will occur. In any given year Clark County has about a ten percent chance of having a series of severe summer storms more intense than usual.

Vulnerability Analysis & Loss Estimation

According to NOAA/NCDC information, Clark County severe thunderstorms/winds have caused \$237,000 in damages from April 27, 1994 through the end of 2011. In addition, lightning and hail events have caused an additional \$94,000.

Methodology

The 17-year severe summer storm losses for Clark County (1994-Feb. 2011) provided the basis for estimating vulnerability. To yield the per capita 17-year damage total for Clark County, the total damage for this period was divided by the 2010 census population. That figure divided by seventeen years, resulted in the annual per capita damage figure for severe summer storms for Clark County.

Results

From April 27, 1994 – February 24, 2011 reported loss estimates for winter storms in Clark County totaled \$331,000 dollars in property damage. There were also a total of zero deaths and 3 injuries reported. Dividing these damages over the 17-year period equates to approximate average losses of \$19,470 per year for its 138,333 residents. Therefore, the average cost to each resident per year was approximately \$0.14.

2.8 Drought

A drought is a period of abnormally dry weather, which persists long enough to produce a serious hydrologic imbalance. It is a normal occurrence that results in a water shortage that can affect land use, economy, geology and water sources.

Several methods of research identified drought as a hazard in Clark County, including discussions with CCHMC representatives. Drought information was obtained from the following Internet sites.

- Unites States Department of Agriculture
www.usda.gov
- United States Geological Society
www.usgs.gov
- National Oceanic Atmospheric Administration (NOAA)
www.noaa.gov
- Ohio Department of Natural Resources

Drought is a relative term and is used in relation to who or what is being affected by the lack of moisture. Droughts can be categorized in four (4) types – each one affecting the other.

Agricultural Drought – Moisture deficiency seriously injurious to crops, livestock, or other agricultural commodities. Parched crops may wither and die. Pastures may become insufficient to support livestock. Effects of agricultural droughts are difficult to measure because there are many other variables that may impact production during the same growing season.

Hydrological Drought – Reduction in stream flow, lake and reservoir levels, depletion of soil moisture, and a lowering of the groundwater table. Consequently, there is a decrease in groundwater discharge to streams and lakes. A prolonged hydrological drought will affect the water supply.

Meteorological Drought – The amount of dryness and the duration of the dry period. Atmospheric conditions that result in deficiencies of precipitation change from area to area.

Socioeconomic Drought – Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. The supply of many economic goods, such as water, forage, food grains, fish, and hydroelectric power depends on weather. Due to variability of climate, water supply is sufficient in some years but not satisfactory to meet human and environmental needs in other years. The demand for economic goods is increasing as a result of increasing population. Supply may also increase because of improved production efficiency and technology.

Measuring Drought

The Standardized Precipitation Index (SPI) is a way of measuring drought that is different from the Palmer drought index (PDI). Like the PDI, this index is negative for drought, and positive for wet conditions. But the SPI is a probability index that considers only precipitation, while Palmer's indices are water balance indices that consider water supply (precipitation), demand (evapotranspiration) and loss (runoff).

The Palmer Drought Severity index (PDSI) is a soil moisture algorithm. The PDSI was developed by W.C. Palmer in 1965. It is a highly recognized method to measure drought. Many U.S. government agencies and states rely on the PDSI to trigger drought relief programs and responses. (See following chart)

Palmer Drought Severity Index Classifications	
4.0 or greater	Extremely Wet
3.0 to 3.99	Very Wet
2.0 to 2.99	Moderately Wet
1.0 to 1.99	Slightly Wet
0.5 to 0.99	Incipient Wet Spell
0.49 to -0.49	Near Normal
-0.5 to -0.99	Incipient Dry Spell
-1.0 to -1.99	Mild Drought
-2.0 to -2.99	Moderate Drought
-3.0 to -3.99	Severe Drought
-4.0 or less	Extreme Drought

The Palmer Index is typically calculated on a monthly basis, and a long-term archive of the monthly PDSI values for every climate division in the United States exists with the National Climatic Data Center from 1895 through the present. Weekly Palmer Index values are calculated for climate divisions. The State of Ohio currently has ten (10) climate divisions.

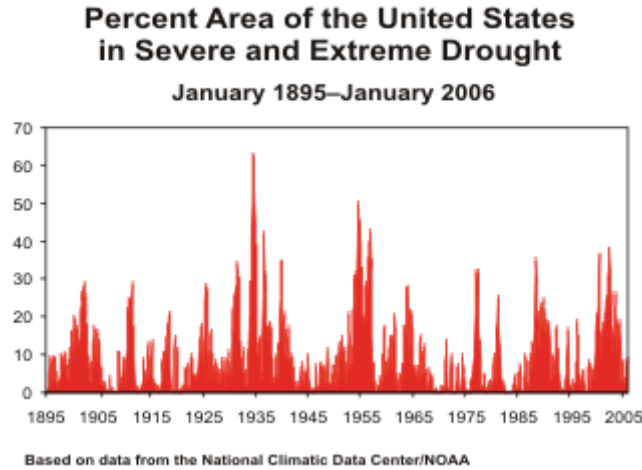
Location

Typically in extreme drought conditions the location of damages that will result from an extreme drought event will affect the entire county.

Risk Assessment

Using Palmer Drought Severity Index data, the National Drought Mitigation Center indicated the most extreme drought in the recent past in the United States occurred in July 1988 when 36% of the country experienced severe drought conditions. The worst ever drought recorded was during July 1935 with 65% of the United States experiencing

extreme drought conditions. Rainfall totals throughout the Midwest were 50-85% below normal.



Past Occurrences

Unlike most hazards, the threat of drought tends to be dismissed because of the relatively long time a drought takes to have damaging effects.

Since severe drought events would be countywide, the entire County population of 138,333 persons would be affected by hot, dry conditions. The overall impact that drought has on the Clark County population is low, except for possible special drinking water demands. But the overall impact on the Clark County assets of crops and animals is moderate. According to the NCDC, two events of extreme drought were recorded between 1995 and 2011. These events were in July and August of 1999. No monetary damage, deaths or injuries were recorded for these events.

Number of Years with Severe or Extreme Drought between 1896 to 1995									
% area of basin/region	>0%	>10%	>25%	>33%	>50%	>66%	>75%	>90%	>100%
Ohio	67	51	34	28	16	12	9	4	3

Rural counties are susceptible to wild land fires especially during drought conditions. When most people think of wild fires, the first thing that comes to mind is the devastating and disastrous western fires that are quite prevalent during the summer months.

With more people than ever living, working, traveling and recreating in the urban/urban interface, the odds of wild land fires are increasing. Causes of wild land fires include the careless burning of debris, household trash and cigarettes, lightning, equipment and vehicles, railroad accidents, electrical fires, and arson.

During an average year in Ohio, an estimated 15,000 wildfires and natural fuel fires occur. Typically, a reported 1,000 wild land fires burn an average between 4,000 to 6,000 acres in Ohio each year.

Clark County, Ohio Drought Event History (1995 – May 2011)

Summer 1999 Drought- July and August

- As much as 50% of crops were considered a total loss in some areas of the county.

Summer 2002

- Severe crop loss due to drought conditions.
- County received federal agricultural funds for losses.

September 23, 2010 Drought Conditions & High Winds

- Clark County field on fire with crops destroyed near the community of Pitchen.
- One house and barn destroyed on Fourman Road in nearby eastern Darke County.
- 2 areas of a field burned in Miami Township, Montgomery County.
- Field fires in nearby Madison County.

Probability of Future Events

Based on historical drought in Southwest Ohio, the probability of a future drought occurrence is likely with an event probable in the next 3 to 4 years and a major drought every 20 to 25 years. Per table 2.2d the frequency of occurrence is likely with limited impact for a medium hazard ranking

Vulnerability Analysis

Because drought is a non-site specific hazard, the effects of a drought would be felt countywide. There are no documented critical facilities, buildings or infrastructures that are considered at-risk as it relates to a drought with exception of wells or well fields for water treatment plants which may be affected during extreme drought conditions.

By itself, a drought does not damage developed property. However, over a long period of time, certain soils can expand and contract resulting in some minor structural damage to buildings. A small percentage of buildings in areas with such soils suffer minor damage during their “useful lives.” Therefore, the overall impact on the County’s infrastructure would be extremely low.

Clark County is within the top 10% of the State’s leading agricultural counties in terms of gross receipts for grain and livestock. A drought can have a large impact on the agricultural economic stability of the County. The most recent 2002 summer drought like conditions indicates the County is very much affected in several ways. In addition to economic loss of reduced crop yields, droughts lead to problems with irrigation and increase the potential for field and grass fires. The significantly less rainfall also can leave reservoirs, water tables and farm ponds significantly lower. Some farmers use their

ponds for livestock watering which can cause significant issues. Damages are not immediately noticed, such as the damages to trees, shrubbery and wildlife.

Drought impacts large areas and crosses jurisdictional boundaries. All existing and future buildings, facilities and populations are exposed to this hazard and could potentially be impacted. However, drought impacts are mostly experienced in water shortages and crop/livestock losses on agricultural lands and typically have no impact on buildings.

Estimated Potential Losses

Drought can have a devastating effect on the Clark County economy. During the 2002 drought, crop yields were cut as much as 50% in comparison to the yields of 2000 and 2001. A moderate countywide drought would affect the 744 farms including the 640 male and 104 female principle farm operators

Based on this recent historic data, a loss of one half the crop yields due to drought in Clark County could result in 50% less farm revenue during a year of moderate drought.

In 2007, Clark County ranked ninth in the State for market value of total agricultural products sold. The market value of agricultural products sold from Clark County farms in 2007 was:

Crop Sales:	\$91,980,000	67%
Livestock Sales:	<u>\$45,065,000</u>	33%
Total Value of Products Sold: \$134,045,000*		

With an approximate 15% increase in farm receipts since 1977 a 50% loss in yearly crop receipts for the entire county during a severe drought growing season would result in an estimated loss of \$52,888,500 in crop receipts for Clark County. The above cost estimate does not take into account any losses to livestock, wildlife or shrubbery as these losses are unknown at this time.

*Source: 2009 Census of Agriculture USDA www.agcensus.usda.gov

2.9 Extreme Temperatures

Overview

Extreme heat is defined as three (3) or more consecutive days with daytime temperatures of 90 degrees F or higher and nighttime temperatures no lower than 85 degrees F, accompanied by high humidity and causing a significant amount of medically treated heat-related illnesses or deaths.

Several methods of research identified extreme heat as a minor hazard in Clark County, including searches of Internet sites such as:

- Extreme Heat Fact Sheet
www.fema.gov
- General Heat Wave Information
www.nfpa.org
- The National Oceanic & Atmospheric Administration
www.noaa.gov

Risk Assessment

Extreme heat is a hazard usually found in more desert regions than Clark County, Ohio. However, extreme heat can and has been a hazard in Ohio causing heat strokes to occur to residents and proving detrimental to crops. The highest reported temperature in Ohio through the year 2011 was 113 degrees Fahrenheit and was reported in Gallipolis on July 21, 1934. Estimates of deaths occurring in Ohio during the week of July 20 – 26, 1934 were about 160.

Health hazards related to extreme heat include sunburns, heat cramps, heat exhaustion, and heat stroke. In a normal year according to USCB 2004, approximately 358 Americans die from extreme heat and 680 Americans die from extreme cold. In August 2007, seven out of eight of the first eight days of August exceeded 90 degrees according to the archived climate data at the Wilmington, Ohio, Branch of the National Weather Service. Young children, the elderly, and those who are sick or overweight are more likely to become victims. According to the 2010 Census, approximately 28% of the total population in Clark County is between the ages of 45 and 64. Because men sweat more than women, men are more susceptible to heat related illnesses because they become more quickly dehydrated.

Location

No one geographical area of Clark County is more susceptible to temperature extreme and heat wave. However, the affects can vary greatly depending on climate control availability.

Past Occurrences

The summer of 1934 ranks as the hottest in Ohio since temperature records began in 1883. The average summer temperature of 75.7 degrees for June, July, and August broke

the old record set in 1901 and was 5% above normal. In 2003, which was a hotter than normal year, the average summer temperature was approximately 73 degrees.

According to a NOAA/NCDC Event Record, the last part of July 1999 was very hot and humid across the state with temperatures reaching into the 90s most days and above 100 for a few days. The dew points and overnight lows were in the 70s through much of the period. The excessive heat contributed to 10 deaths in the Cincinnati metro area. The following tables summarize Temperature Extremes and Heat Waves experienced in Clark County.

Extreme heat wave can cause damages and buckling to pavement, affect proper operation of vehicles and is particularly hard on the elderly and to workers that labor in an outside atmosphere.

One of the biggest problems associated with extreme temperatures is lack of public education and awareness. Citizens are not aware of the warnings and dangers associated with extreme temperatures.

Clark County, Ohio Extreme Temperatures (Hot/Cold) Events Data Summary from the National Climatic Data Center						
Year	Number of Reported Summer Storm Events	Type	Deaths	Injuries	Estimated Property Damage	Crop Damage
1995	2/11/1995	Extreme Cold	4	0	\$100,000	0
1995	12/9/1995	Extreme Cold	0	1	\$2,000	0
1996	2/1/1996	Extreme Cold	0	0	\$1,300,000	0
1999	7/20/1999	Excessive Heat	13	0	\$0	0
Totals			17	1	\$1,362,000	0

Probability of Future Events

From 1995 through 2011 NOAA/NCDC has recorded four extreme weather events. There were three extreme cold weather events, one extreme heat event recorded. The probability of such an event occurring is very likely with about one temperature extreme event every four years.

Vulnerability Analysis & Loss Estimation

Based on historical available data, the most costly extreme weather event to occur across Ohio and in Clark County was the February 1, 1996 extreme cold spell. Almost \$1,300,000 in damages occurred as a result of this hazard event. Power outages, burst water mains, and excessive use of space heaters caused house fires. Drivers were stranded because of the affect the extreme cold had on automobiles. Seventeen deaths and one injury were reported according to the NCDC climate reports.

Using the 2010 U.S. census data estimates and the NCDC extreme temperature event loss data from 1995 through December 2011, the County has experienced extreme temperature event losses of approximately \$1,362,000. The 16-year losses included all residential, commercial, governmental structures, as well as infrastructures and public facilities which affect the entire County population of 138,333 persons. The damage risk would be a low risk of approximately \$0.62 per year per capita and the loss of human life risk would be about one person per year average.

2.10 Wildfires

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke that fills the area for miles around. Other names for wildfire include forest fire, grass fire, brush fire, or field fire.

Although typically Ohio wildfires are more prevalent within the Ohio forests and grasslands in southern and eastern Ohio, under certain dry and windy conditions, they can occur on a smaller scale in Clark County. The conditions that set the stage for wildfires are dry, warm, windy conditions with low humidity. Typically fall and early spring are considered the prime seasons. When you combine these weather conditions with the fall season of dry crops, and vegetation such as dry leaves and a wooded terrain, there is an unpredictable danger for wildfire.

Wildfire Urban Interface (WUI) conditions refer to the zone between unoccupied land and human development. Occasionally, homes and structures are built within or near these woodlands and grasslands.

Risk Assessment

There are no known building codes in Ohio that specifically address consideration for construction methods regarding wildfire. In Ohio, the ODNR Division of Forestry has in place “Firewise Ohio”, a statewide WUI safety initiative in response to the growing WUI situation in Ohio. Local fire departments & Firewise Ohio collaborate to effectively implement wildfire prevention and safety programs at the community level. To date, the program has been a successful partnership.

According to the Ohio Division of Forestry, there are several factors that can contribute to the start of wildfires in Clark County, including arson, equipment fires, open burning of debris, campfires, and lightning. Approximately 10,000 forest fires are started each year by lightning. Clark County contains limited forestland (approximately 12.52% of the County land area), with several recreational campsites and other attractions in designated areas such as the public and private Buck Creek State Park, George Rogers Clark Park, Little Miami & Buck Creek Trails, Prairie Grass Trail, Beaver Valley Campgrounds, Enon Beach Campground, Rei Lakes, and Bass Lake Campground. Campfires, coupled with large numbers of visitors and a large proportion of trees, make wildfires a potential hazard for Clark County.

Members of the volunteer fire departments confirm that small brush fires are a common occurrence during the dry summer months in what is typically known as the “burning season”. These small brush fires are usually handled by local fire departments and often do not cause damage to structures. However, the threat is present that these brush fires could burn out of control and consume many structures, as well as a portion of the nearly 30,720 acres of forestland that exists in Clark County. Dry croplands also are subject to fuel wildfires.

Ohio is considered to have a low fire class rating. However, this can change with climatic conditions. A large period of drought and high heat may dry up many areas of the County and add them to the amount of fuel for a potentially destructive wildfire.

According to the Wildland Fire Assessment System US NFDR's Fuel Model Map, Clark County falls into the classes of Agricultural Land and Hardwood in regard to fuel types. Both of these classes are considered to be low hazards in terms of wildfires. With climatic changes over prolonged periods, the fuel that is not normally considered to be dangerous could become dry and increase the potential for a large-scale wildfire event. The dollar amount of damage will fluctuate according to where the fire occurs. If, for some reason, the area affected by a wildfire interfaced a municipality, the amount of damage could be greatly increased. However, most historical events have not consumed much land or property.

Location

Wildfires or "field fires" that occur in Clark County are most likely to occur in wooded areas, farm fields or grassland/pastureland of the County. These land area classifications make up 76.14% of the land area in Clark County. Typically, the rural unincorporated areas of the County are at greater risk for wildfires (field fires) than the incorporated areas.

Past Occurrences

According to local media reports, on September 24, 2010, fifty mph wind conditions coupled with an extremely dry weather pattern caused numerous field and brush fires throughout the Miami Valley including Clark County. Field fires were reported as well within Champaign, Miami, Montgomery, Madison Counties and other nearby counties throughout the Miami Valley.

During this day in Clark County, according to Pitchen Fire Department Chief Brian Pauley approximately 100 acres of crop land was destroyed by fire near the Clark County Community of Pitchen. No buildings or structures were reported as being lost or damaged; however, the financial losses to crops were substantial to the affected land owner.

In nearby Darke County, on this same date, over 20 fire departments from 3 Ohio counties were called out to respond to a 4-mile wide field fire that consumed a house and barn on Fourman Road on the east side of Darke County.

The number of occurrences, size of wildfires, and severity of burn fluctuate annually in response to a variety of factors including:

- Weather – daily, monthly, seasonal, and long-term trends in:
 - Precipitation
 - Relative humidity
 - Temperature
 - Wind
- Fuels – condition of 1, 10, 100, 1000 hour fuels in terms of:
 - Moisture content
 - Arrangement
 - Accumulation level
 - Availability

- Ignitions – presence or absence of wildfire starts:
 - Human caused
 - Debris burning – compliance of ORC 1503.18, and safe debris burning techniques
 - Incendiary – arsonists at large
 - Wildfire prevention and awareness efforts
- Suppression Response – Capability and timeliness of initial attack
 - Quickness of response to the incident
 - Local / Volunteer fire department capability
 - Availability of state and local resources
 - Number of concurrent wildfires

Probability of Future Events

According to research and past records wildfires more commonly known as field and grassland fires do occur during seasonal dry periods throughout Clark County. These have occurred for many years and will continue to do so. Per table 2.2d the frequency of occurrence is likely with limited impact for a medium hazard ranking. Although difficult to predict there is a less than 5% chance of a wildfire occurrence.

Vulnerability Analysis & Loss Estimation

Wildfires in Clark County have not affected structures or homes in and around the county. There has been no loss of life. Wildfire has affected cropland with some loss of corn crop. 57.06% of Clark County land area is reported as is crop land; it is most likely that a field fire would cause the most degree of damage to a crop ready for harvest.

Considering a burn area of one acre for a field fire and based on an average yield of 160 bushels, an acre of corn at \$5.75 per bushel x 1 acre = \$920 crop loss would occur for each acre of corn crop lost.

The estimated damage for a 100 acre crop loss such as that experienced during the September 24, 2010 field and brush fire would be approximately \$920/acre x 100 acres = \$92,000 total crop loss.

2.11 Invasive Plants, Pests & Infestation

Overview

According to a review of information provided by ODNR Wildlife Division, Clark County is subject to both insect and plant invasive species. Although there are over 3,000 species of plants known to occur in Ohio, about 75% are native or have occurred in Ohio before the time of Europeans (1750).

Some of those that have invaded Ohio displace native plants and disrupt woodlands, prairies, wetlands, and natural areas.

Those plants that typically have been the most invasive for Clark County residents include:

- Bush Honeysuckle
- Garlic Mustard
- Multiflora Rose
- Autumn Olive
- Callery Pear (Bradford Pear)

These nuisance plants spread quickly and force out native spring wildflowers. Other non-native plants impact the County's wetlands. The wildlife depends on native plants for food and cover, so invasive species are problematic.

According to the ODNR Division of Forestry, one of the most prevalent invasive insect species is the Emerald Ash Borer. It is an Asian wood-boring beetle and affects all species of native ash trees found in Ohio. In 2003, it was first found in northwest Ohio feeding on ash trees. The Emerald Ash larvae were active just below the bark and feeding on the living part of the tree, preventing the tree's ability to move water and nutrients through its system. Other invasive species to affect Clark County include the Gypsy Moth Caterpillars and Spider Mites.

Most recently found in southwest Ohio is the Asian Longhorned Beetle (AJB) which attacks broadleaf trees, particularly maples.

An infestation is to spread or swarm in or over in a troublesome manner. Also, to live in or on as a parasite.

According to reviews of online information provided by the Ohio Division of Forestry, Clark County is subject to an infestation primarily of gypsy moths. The impact of gypsy moths includes economic losses through timber mortality, loss of recreational opportunities in severely defoliated areas, and nuisances from gypsy moth caterpillars. Other infestations that could possibly occur in Clark County include Asian long horned beetles (pictured in Figure 1.1), mosquitoes known to be



Figure 1.1

infected with the West Nile Virus, and spider mites, as was the case in 1999.

The probability of an infestation hazard event actually occurring in Clark County is relatively low, with only moderate risk associated with it. Infestation is most likely to occur in the 30,720 acres of forested or the 257,920 acres of farmland and will likely cause no damage to structural assets. Infestation is considered as a hazard in Clark County due to the high percentage of agricultural and forestland in the county.

The Asian Long-Horned Beetle (ALB) has been discovered in Southwest Ohio east of Cincinnati by the U.S. Department of Agriculture. Ohio is the 5th state to detect ALB. These beetles attack a wide variety of broadleaf trees particularly Maples.

Invasive species are defined as:

1. Non-native (or alien) to the ecosystem under consideration, and
2. Whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

Invasive species can be plants, animals, and other organisms (e.g., microbes). Human actions are the primary means of invasive species introductions.

There are about 60 species of invasive plants identified in Ohio. Invasive species can cause economic and environmental damages in communities. Clark County is currently participating in a 22 county Woodland Invasive Species Program launched to promote healthier forests. Invasive Bush Honeysuckle is one of the most prevalent invasive species in Clark County. Invasive species plants are usually characterized by fast growing, rapid vegetation spread, and efficient speed dispersal and germination. Since these plants are not native to Ohio, they lack the natural predators and disease which would naturally control them in their native habitats.

Past Occurrences

Invasive species have been around since the settlers of the 1750's. Movement of people and transportation has made the spread of invasive species more prevalent. The Emerald Ash Borer was introduced in the U.S. in the 1990's from wood packing material from China, first being discovered in Lower Michigan, spreading to Ohio, Maryland, Pennsylvania, northern Indiana, and Chicago.

Probability of Future Events

Invasive species will continue to affect Ohio. With the increase in worldwide trade and the fast modes of transportation, the invasive species will continue to occur.

Just as the Asian Longhorned Beetle has recently been discovered in southwest Ohio, new species of unwanted pests will come. The importance of controlling the natural environment native to Clark County will require local, state, nationwide, and international cooperation to avoid unwanted infestations of invasive species.

The probability of intense invasive species affecting the county is low as indicated in under the Hazard Identification Section Table 2.2a.

Vulnerability Analysis & Loss Estimation

Clark County is vulnerable to the numerous types of invasive species hazards as identified but they would not directly cause loss to structures or loss of life to county residents. However, the invasive species cause the highest exposure of losses in the form of invasive species infiltrating into adjoining crop land. In addition, tree losses are incurred by land owners combating invasive species such as the Emerald Ash Borer. Monetary losses occur in attempts to identify, isolate and remove infected trees. It is estimated in Ohio alone there are five billion ash trees that could become infected with the Emerald Ash Borer. Removal and proper handling of the trees will be costly in itself. Pesticides have to be applied yearly for invasive species control and are labor intensive and costly. It is estimated these treatments alone will be substantial for County residents. Because most of the eradication programs are mainly being performed by private landowners precise figures are not available for Clark County.

Publicly, twenty-two of Ohio's Counties are participating in a "Woodland Invasive Species Program" through the Ohio Department of Agriculture to promote healthier woodlands and forests. Clark County is currently participating in this program. One million dollars in landowner assistance funds and technical advice is available to landowners to help remove these non-native species.

Typically, the rural woodland areas of the County are more at risk for the plant invasive species and the remainder of the County is at an equal risk for tree borers. Therefore, Clark County's rural areas are at a moderate risk and the municipal areas are at a lesser risk for infestations/invasive species.

2.12 Epidemic

An epidemic is a disease, usually contagious, that recurs in a community and attacks a large number of people at the same time. The potential impacts of an epidemic are illness or fatalities, disruption or closing of schools, or the force closure of businesses and industrial operations.

Several methods of research identified epidemics as a hazard in Clark County including discussions with the local Health Department and Ohio Department of Health. Epidemic is a natural hazard risk in Clark County. The probability of an epidemic striking Clark County is relatively low. However, the risk associated with this hazard is very high.

An epidemic has the potential to affect the entire county, but is more probable to occur in densely populated areas, such as the City of Springfield, City of New Carlisle and especially at facilities containing large numbers of occupants. Many commercial and industrial sites contain many facilities at which a large work force is employed. A potential epidemic is of particular concern at these facilities.

Epidemics can develop with little or no warning and quickly erode the capacity of local medical providers. A fast developing epidemic can last several days and extend into several weeks. In some extreme cases, they can last for several months. An epidemic can occur at any time of the year, but the warm summer months when bacteria and microorganism growth are at their highest present the greatest risk.

Epidemic versus Pandemic

An **epidemic** is a classification of a disease that appears as new cases in a given human population, during a given period, at a rate that substantially exceeds what is “expected”; based on recent experience (the number of new cases in the population during a specified period of time is called the “incident rate”).

A **pandemic** is an epidemic that spreads across a large region (for example a continent), or even worldwide.

Simply put, when an epidemic gets out of hand it is called a pandemic. This has two fine distinctions:

Geographical spread – An epidemic that is not localized to a city or a small region but spans a larger geographical area can be called a pandemic.

Incident rate – An epidemic may be localized to a small region but the number of people affected may be very, very large compared to what is “expected”. In this case, it can be called a pandemic even if its geographical spread is not very large. For example, let us say that a disease has an “expected” rate of infection of 15%. When 40% of the population of a state is infected, we have an epidemic on our hands. When 75% of the population is infected, it has reached pandemic proportions.

Location

Clark County comprises the City of Springfield (county seat), City of New Carlisle, 8 other incorporated villages, and 10 townships for a total of 138,333 residents. Many of the places where large numbers of people would gather include factories, hospitals, schools, or well-attended events such as the Clark County Fair. The total area of Clark County is approximately 400 square miles. It is likely that an epidemic would impact the City of Springfield, the largest communities, or the school systems.

Risk Assessment

One objective way to assess the health status of a community is to measure it in terms of mortality (rates of death within a population) and morbidity (rates of the incidence and prevalence of disease). Mortality may be represented by crude rates or age-adjusted rates (AAM) or by cause (disease – cancer and non-cancer or injury – intentional, unintentional). Morbidity may be represented by age-adjusted (AA) incidence of cancer and chronic disease.

Chronic conditions which in many cases can be mitigated or prevented entirely by behavior changes are the primary reason that Clark County has a higher adult death rate than the State of Ohio. At a rate of 1,324 deaths per 100,000 people, approximately 1,867 Clark County residents die each year. Cardiovascular diseases are the biggest killers of Clark County residents, and the community suffers from these at a rate of approximately 468 deaths per year which is more than the State of Ohio's overall rate or the rates of peers. Other chronic diseases like diabetes and emphysema are also more prevalent here. From 2003 to 2005, diabetes alone claimed Clark County lives at the rate of 46.4 per 100,000 people, much higher than Ohio's rate of 29.7. 9.1% of the Clark County population was diagnosed as having diabetes in 2005. The Clark-Champaign Diabetes Association and Clark County Combined Health District conducts community outreach programs and facilities support groups to address this trend.

The preponderance of chronic conditions is accompanied by the fact that Clark County endures higher fatality rates from many types of cancer. This is particularly true in the case of the yearly incidence of lung cancer (71.5 per 100,000 people compared to Ohio's rate of 59.9). Clark County's men are particularly burdened with cancer to a greater extent than its women: an average rate of 293.5 per 100,000 men die each year from cancers of all types in Clark County (Ohio's rate is 273.0), compared to 181.4 per 100,000 women who die (Ohio's rate is 179.4). Clark County's women are not spared negative trends, however. Although the incidence of breast cancer is 120.3 per 100,000 people which is less than Ohio's 130.7, the disease claims a larger proportion of lives (Clark County's mortality rate is 31.6 per 100,000 compared to 29.7 for Ohio).

On the other hand, Clark County's incidence of cervical cancer is similar to Ohio's, but it has a lower mortality rate (5.5 vs. 7.5).

Pneumonia and influenza were the cause of death for about 55 Clark County residents during the 2003-2005 period. This age-adjusted rate was 18.1 per 100,000 people which is higher than the state's average of 17.2. The Clark County Combined Health District

has made concerted efforts to protect our community from infectious diseases like influenza.

Clark County experiences higher rates for injury death than does the State of Ohio. The motor vehicle traffic related death rate is particularly high at 16.5 per 100,000 people, more than Ohio's 11.4 and the rates of its peer counties. Clark County is also beset with a 35% higher unintentional injury mortality rate than Ohio (47.2 per 100,000 vs. 35 per 100,000). A seat belt survey most recent results show that Clark County at a 61% usage rate for all occupants; a 62% usage rate for drivers and a 57% usage rate for the passenger. The Safe Communities Coalition is a program funded by the Ohio Department of Public Safety to reduce the number of injuries and fatalities on local roadways and to achieve a better understanding of motor vehicle-related injuries associated costs within the Clark County community. This Coalition is comprised of local and state law enforcement agencies, public health entities, Fire and EMS, local governments, schools, businesses and advocacy organizations.

The Clark County Combined Health District (CCCHD) prides itself in responding to public health emergencies in a timely manner. By working with other key agencies CCCHD is able to coordinate effective responses to common area epidemics such as the West Nile Virus, H1N1 Influenza and other health concerns. By taking part in mock emergencies and emergency training exercises the CCCHD is prepared for all types of hazard emergencies.

Past Occurrences

The history of epidemics in Clark County is as follows:

- 1913 – Flood
- 1918, 1957, 1968, 2009 - Pandemics
- 1949 – The Clark County Fair was ordered cancelled or postponed by the Board of Health due to a Polio Myelitis outbreak.
- 1949 – Health Department cooperated with the Clark County Tuberculosis and Health Association in sponsoring mass chest x-ray screening program.
- 1950, 1978, 2011 – Blizzard and/or Ice
- 2009 – H1N1 Influenza clinics were held.

Probability of Future Events

Locally recorded pandemics have affected Clark County as early as 1918 (and most likely prior to that date). There is clear precedence set that Clark County will continue to experience epidemic hazard events in the future. While they may not occur frequently based on past history, an epidemic most likely will occur within the next 20-25 years. Per table 2.2d the frequency of occurrence is likely with limited impact for a medium hazard ranking.

Vulnerability and Loss Estimation

The epidemic hazard has the potential to affect the health and welfare of all of its 138,333 residents. The causes of illness and death will differ in a population depending on the age, sex, race and socioeconomic status of individuals within a population. As indicated

in the table below, chronic diseases, particularly heart disease, stroke, diabetes, and cancer, along with unintentional injuries such as poisonings, motor vehicle traffic crashes, and falls, accounted for the majority of all the deaths in Clark County during 2004-2006. These leading causes of death result in extended pain and suffering for the individuals and a decreased quality of life. The diseases on this list are the primary causes of disability and contribute heavily to the burden of health care costs not only for residents of Clark County but for all Ohioans. No dollar costs associated with the medical treatment or expenses of these epidemics are available at this time.

Average Annual Number of Deaths and Average Annual Age-adjusted Mortality Rates (per 100,000 population) among Clark County Residents:

- An average of 1,588 residents died each year during 2004-2006.
- The leading cause of death for residents was heart disease during 2004-2006, causing an average of 402 deaths annually.
- Cancer was the second leading cause of death for Clark County residents resulting in average of 362 deaths each year, while chronic lower respiratory diseases was the third leading cause of death for Clark County residents during 2004-2006.
- Epidemics are hazards that may affect people due to disease.

Clark County Leading Causes of Death			
Causes of Death	Rank	Number of Deaths	Age-adjusted Rate
All Deaths	NA	1,588	921.3
Diseases of the Heart	1	402	227.5
Cancer	2	362	210.3
Chronic Lower Respiratory Diseases	3	105	60.4
Stroke	4	96	54
Diabetes Mellitus	5	78	45.6
Unintentional Injury	6	69	46.5
Alzheimer's Disease	7	63	34.2
Influenza and Pneumonia	8	32	18.1
Nephritis, Nephritic Syndrome and Nephritis	9	29	17.1
Septicemia	10	14	8.2

**Data reference: Clark County, Ohio Community Health Assessment 2008.*

2.13 Earthquakes

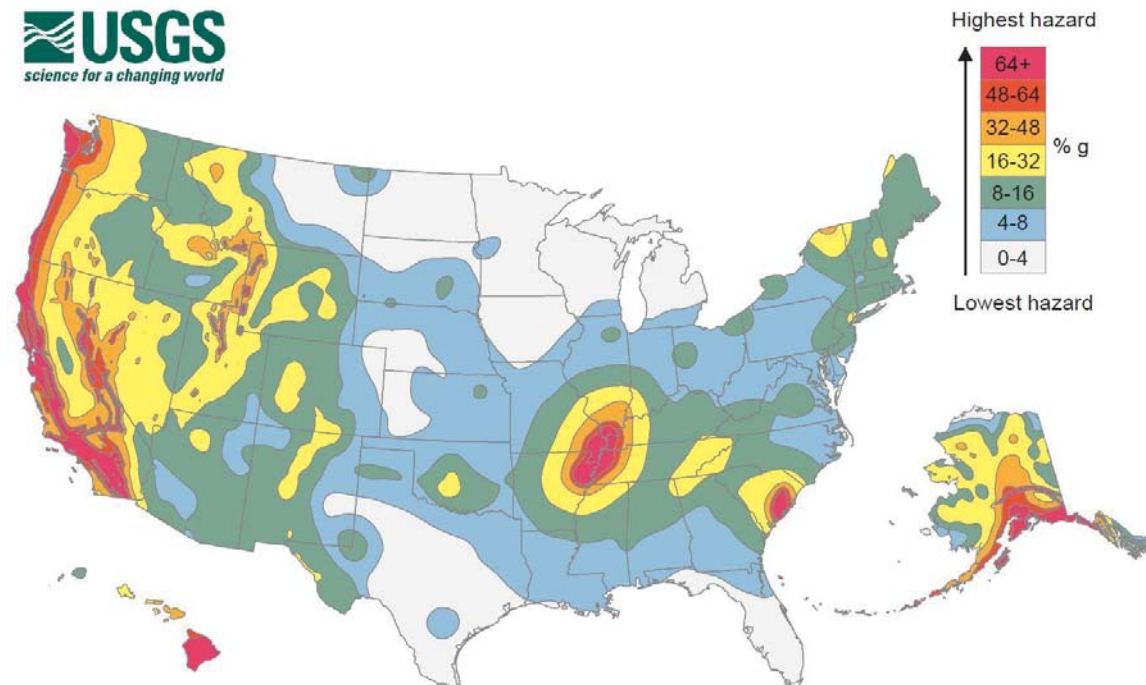
Overview

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and after just a few seconds can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure.

Earthquakes are one of nature's most damaging hazards, and are more widespread than is often realized. The area of greatest seismic activity in the United States is along the Pacific Coast in the states of California and Alaska; however, as many as 40 states can be characterized as having moderate earthquake risk.

Although most people do not think of Ohio as an earthquake-prone state, at least 160 earthquakes with epicenters in Ohio have been felt since 1776. Most of these events caused no damage or injury. Fifteen earthquakes have resulted in property damage. Several methods of research identified earthquakes as a hazard in Clark County, including the USGS Hazards Earthquake Program.

According to the USGS, Clark County is listed in the 4-8% g hazard range in regards to earthquakes (see map below).



Earthquake activity in Clark County would probably stem from an event in the New Madrid Seismic Zone. Ohio is on the periphery of the New Madrid Seismic Zone. An area in Missouri and adjacent states was the site of the largest earthquake sequence to occur in historical times in the continental United States.

The table to the right is the Modified Mercalli Scale, which is the general relationship between epicentral Modified Mercalli intensities and magnitude. Intensities can be highly variable depending on local geologic conditions. The Mercalli Scale is a semi-quantitative linear scale, whereas the Richter Scale is a quantitative logarithmic scale. The Richter Magnitude Scale was developed in 1935 by Charles F. Richter of the California Institute of Technology as a mathematical device to compare the size of earthquakes. It is illustrated in the table to the right. The magnitude of an earthquake is determined from the logarithm of the amplitude of waves recorded between the various seismographs. Adjustments are located for the variation in the distance between the various seismographs and the epicenter of the earthquake. On the Richter scale, magnitude is expressed in whole numbers and decimal fractions. For example, a magnitude 5.3 might be computed for a moderate earthquake, and a strong earthquake might be rated as magnitude 6.3. Because of the logarithmic basis of the scale, each whole number increase in magnitude represents a tenfold increase in measured amplitude.

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
VI	Felt by all, many frightened and run outdoors; falling plaster and chimneys, damage small	4
VII	Everybody runs outdoors; damage to buildings varies depending on quality of construction; noticed by drivers of autos	4.5
VIII	Panel walls thrown out of frames; walls, monuments, chimneys fall; sand and mud ejected; drivers of autos disturbed	5
IX	Buildings shifted off foundations, cracked, thrown out of plumb; ground cracked; underground pipes broken	5.5
X	Most masonry and frame structures destroyed; ground cracked, rails bent, landslides	6
XI	Few structures remain standing; bridges destroyed, fissures in ground, pipes broken, landslides, rails bent	6.5
XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up into air	7

Severity	Scale	
	Magnitude	Mercalli
Mild	0-2.9	I-III
Moderate	2.9-4.1	IV-V
Intermediate	4.1-5.4	VI-VII
Severe	5.4-7.3	VIII-X
Catastrophic	7.3 +	XI-XIII

Risk Assessment

Many of the buildings in Clark County are three stories or less. However in the City of Springfield which has a population of greater than 100,000 people, damage and injuries from a major earthquake could be significant. The damage experienced here would most likely be significantly less than a larger, metropolitan area. Residentially most of the houses in Clark County are wood or wood frame and brick veneer. A few of the older houses are of solid brick masonry which would be more susceptible to damage.

Several of the older downtown districts such as found in the City of Springfield, the City New Carlisle, Village of Enon, and the Village of South Charleston have non-reinforced brick structures and would be considerably more vulnerable to damage.

Other vulnerable facilities would be some of the underground gas, water piping, sewage systems, and communication systems. A substantial earthquake may also affect performance of water wells.

Many of the industrial buildings in the County are of pre-engineered steel design with braced steel frames which would be less vulnerable to damage. However, the older masonry industrial structures could receive significant damage from a large earthquake event. All of the school districts in Clark County who have newly constructed schools within the past ten years are designed to current earthquake standards.

Clark County has approximately 186 miles of state highways and 305 miles of county roadways and 424 miles of township roadways with approximately 185 federally qualifying county bridges. Infrastructure can be very vulnerable to earthquake damage. Fortunately for the Clark County residents, the County Engineers replaced 10 county bridge structures in 2011.

The most risk to the County from an earthquake are the non-reinforced brick and concrete block masonry structures, the hazardous materials facilities, water, sewer, and natural gas pipelines, and public and private property structures. Also at risk from earthquakes is a dam failure. The largest risk would be from the two Class I dam areas which include the properties below Clarence J. Brown reservoir, and the properties along Buck Creek which include downtown Springfield.

A moderate to severe earthquake in the County would disrupt critical services which are essential to the lifeline of the community. Disruption of county transportation, industry, and business when stopped could have a tremendous economic impact on the County.

The impact would be that possible death and injury could occur from falling equipment, buildings, downed power lines, and impaired natural gas lines. Fire threats and debris costs would also be factors to be considered.

Past Occurrences and Locations

Ohio is on the periphery of the new Madrid Seismic Zone. At least 14 moderate sized earthquakes have caused minor to moderate damage in Ohio. There have been no deaths and only a few minor injuries reported. Clark County has been the epicenter of only one small earthquake since recording began in 1776. It occurred on Oct. 4, 1980 near the southern County line. It had a magnitude of 2.0. However, neighboring Shelby County, to the northeast of Clark County, and some of the other counties surrounding Shelby County have been some of the most active earthquake areas in Ohio. Numerous earthquakes in this area have occurred since 1875. Earthquakes in 1930, 1931 and 1937 caused minor to moderate damage. The March 2 and March 9, 1937 (4.5 Richter magnitude) caused significant damage in the nearby community of Anna in Shelby County. See Earthquake Epicenters in Ohio and Adjacent Areas Map at the end of this section. Other recent earthquake epicenters have been in northern Mercer County in 2004, 2005, and two in Allen County in 2006. Clark County has experienced, since 1950, only a few periodic earthquake tremors that are of a magnitude to be felt.

Probability of Future Events

Because at least 170 earthquake events have affected Ohio since 1776, it is anticipated one can expect future earthquake events. The probability of a future event has been developed per the USGS map located in this section. The measurement used in this estimation is based on the chance of ground shaking over time. From past history, future earthquake events are likely to occur in Ohio. To date the state has not experienced any loss of life due to earthquakes. Damages are commonly limited to older structures that have not been built to earthquake design standards which have been incorporated into the building codes over the past 20 years. In this analysis, Clark County has one chance in 43.5 years based on historical record that an earthquake may happen.

Vulnerability Analysis & Loss Estimation

Vulnerability Analysis

The geographic size of Clark County is 403.03 square miles and contains 43 census tracts. It is estimated that there are over 56 thousand households and an estimated 60 thousand buildings in Clark County which have an aggregate total replacement value of 10,893 (in millions of dollars). Of this total 8,121 (in millions of dollars) are residential and 2,771 (in millions of dollars) are non residential. Approximately 93% of the buildings (and 75% of the building value) are associated with residential housing.

The replacement value of the transportation and lifeline systems is estimated to be 1,962 and 1154 (in millions of dollars), respectively. They include 7 transportation systems, 6 utility systems, including 142 miles of highway and 169 bridges. The full inventory is attached in the HAZUS-MH: Earthquake Event Report for Clark County in Appendix A, Section A-6.

The critical facilities are divided into (2) groups: essential facilities and high potential loss facilities. Essential facilities include hospitals, medical clinics, schools, fire and

police stations, emergency operations. Clark County has estimated 2 hospitals, 64 schools, 22 fire stations, and 8 police stations.

High potential loss facilities include: dams, levees, military installations, nuclear power plants, and hazardous materials sites.

There are 7 dams identified and of these 2 are “high hazard”. The inventory also includes 26 hazardous materials sites.

Fires often occur after an earthquake and because of disruption to fire protection systems they can burn out of control. Excess debris is also generated by earthquake events and debris must be removed. Generally, the debris is divided into 2 categories: a) “brick and wood” b) Reinforced concrete/ steel. This is due to different types of materials handling equipment being needed.

Emergency Shelters are needed to house those residents displaced from their homes. Using the HAZUS-HM Earthquake Event Report, it is estimated 797 people will be displaced and 561 people out of the total county population will seek temporary shelter.

A full HAZUS-MH: Earthquake Event Report for Clark County is included and can be found in Appendix A, Section A-6.

Earthquake Loss Estimation

Transportation and Utility Lifeline Loss

Estimated to be 10.9 (in millions of dollars).

Building Loss Estimates would be as follows

Single Family	472.61 (in millions of dollars)
Other Residential	170.53 (in millions of dollars)
Commercial	254.86 (in millions of dollars)
Industrial	70.93 (in millions of dollars)
Others	66.34 (in millions of dollars)

For a total of: \$1,035.27 (in millions of dollars)

Essential Facility Damage

Before the earthquake, the region had 430 hospital beds available for use. On the day of the earthquake, the model estimates that only 161 hospital beds (38.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 54.00% of the beds will be back in service. By 30 days, 81.00% will be operational.

Fire Following Earthquake

HAZUS uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 12

ignitions that will burn about 0.74 sq. mi 0.18% of the region's total area. The model also estimates that the fires will displace about 1,547 people and burn about 107 (millions of dollars) of building value.

Debris Generation

The model estimates that a total of 0.330 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 59.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to any estimated number of truckloads, it will require 13,240 truckloads @ 25 tons/truck) to remove the debris generated by the earthquake.

Casualties

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows:

Severity Level 1: Injuries will require medical attention but hospitalization is not needed.

Severity Level 2: Injuries will require hospitalization but are not considered life-threatening.

Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.

Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 A.M., 2:00 P.M. and 5:00 P.M. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 A.M. estimate considers that the residential occupancy load is maximum; the 2:00 P.M. estimate considers that the educational, commercial and industrial sector loads are maximum; and 5:00 P.M. represents peak commute time.

Full details of the HAZUS-MH: Earthquake Event can be found in the full report found in Appendix A, Section A-6.

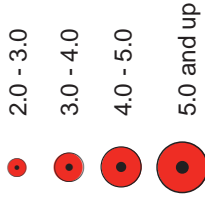
EARTHQUAKE EPICENTERS IN OHIO



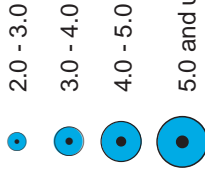
EXPLANATION

Instrumental Epicenters Historical Epicenters

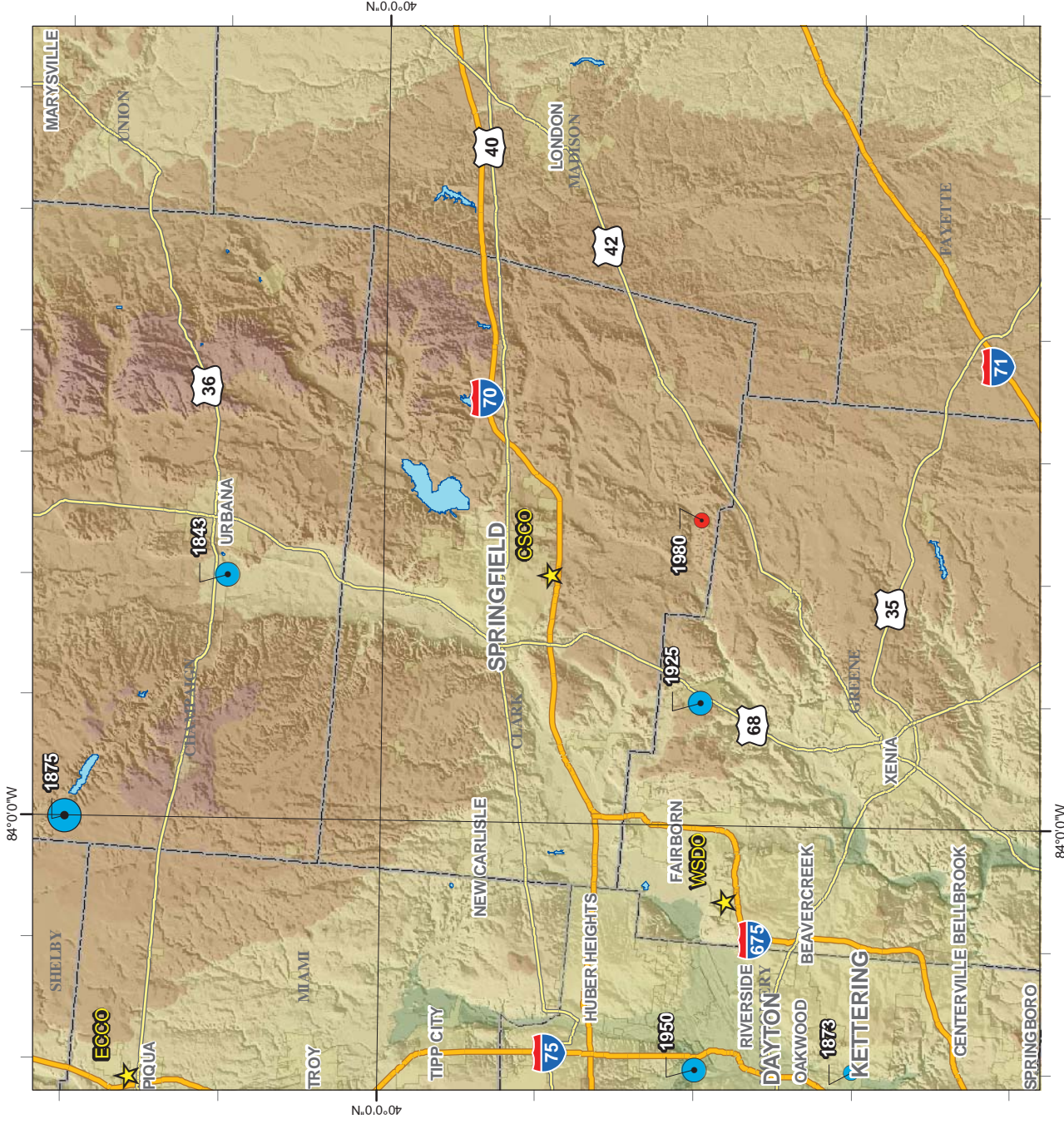
Magnitude, mbLg



Magnitude, Mercalli



Seismic Stations



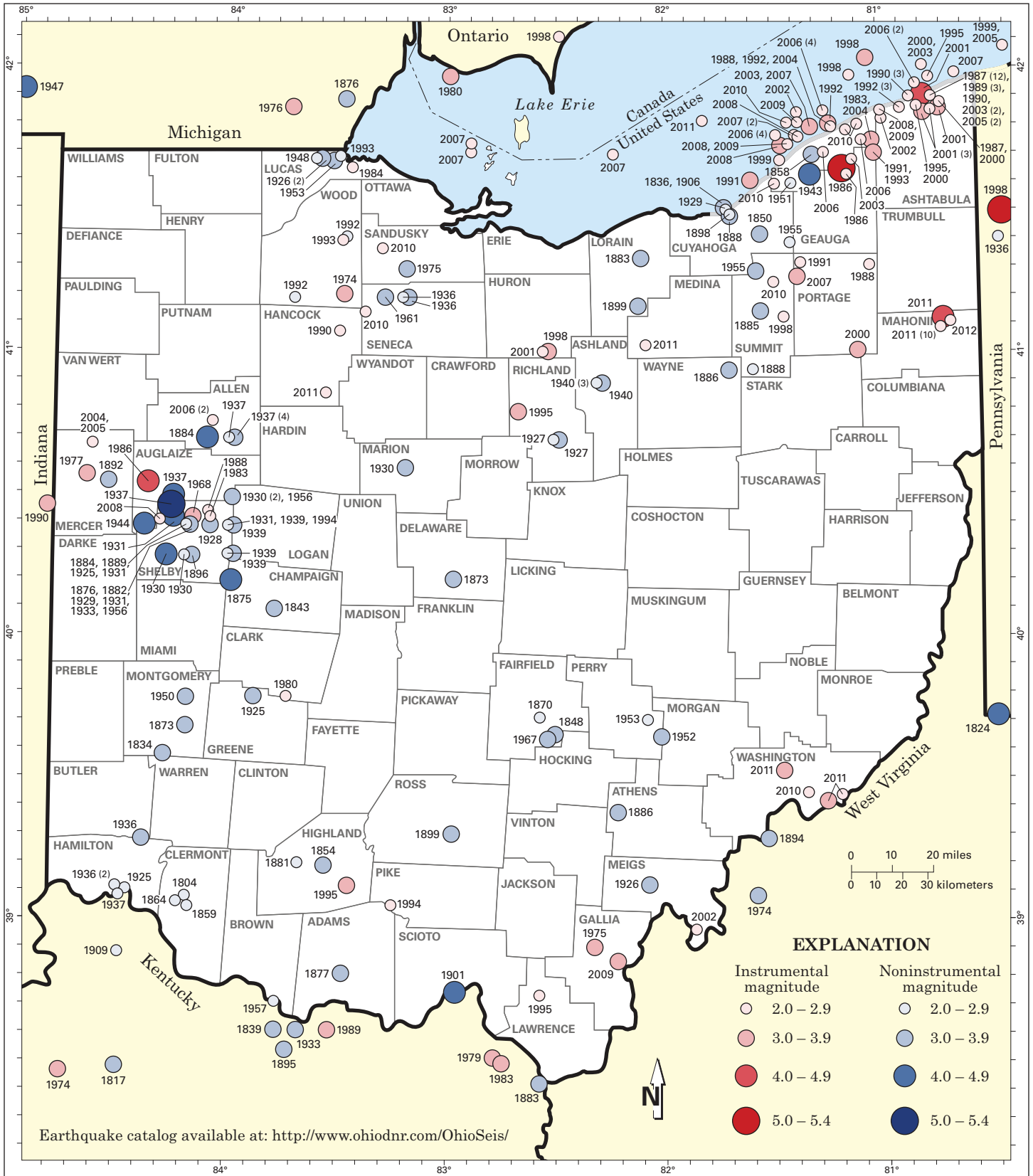
DISCLAIMER

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Recommended bibliographic citation:

2002 (Revised 2008), Earthquake epicenters in Ohio and adjacent areas; Ohio Division of Geological Survey Map EG-2, Internet Mapping Service, <http://www.dnr.state.oh.us/website/geosurvey/earthquakes/viewer.htm>

EARTHQUAKE EPICENTERS IN OHIO AND ADJACENT AREAS



Earthquake catalog available at: <http://www.ohiodnr.com/OhioSeis/>



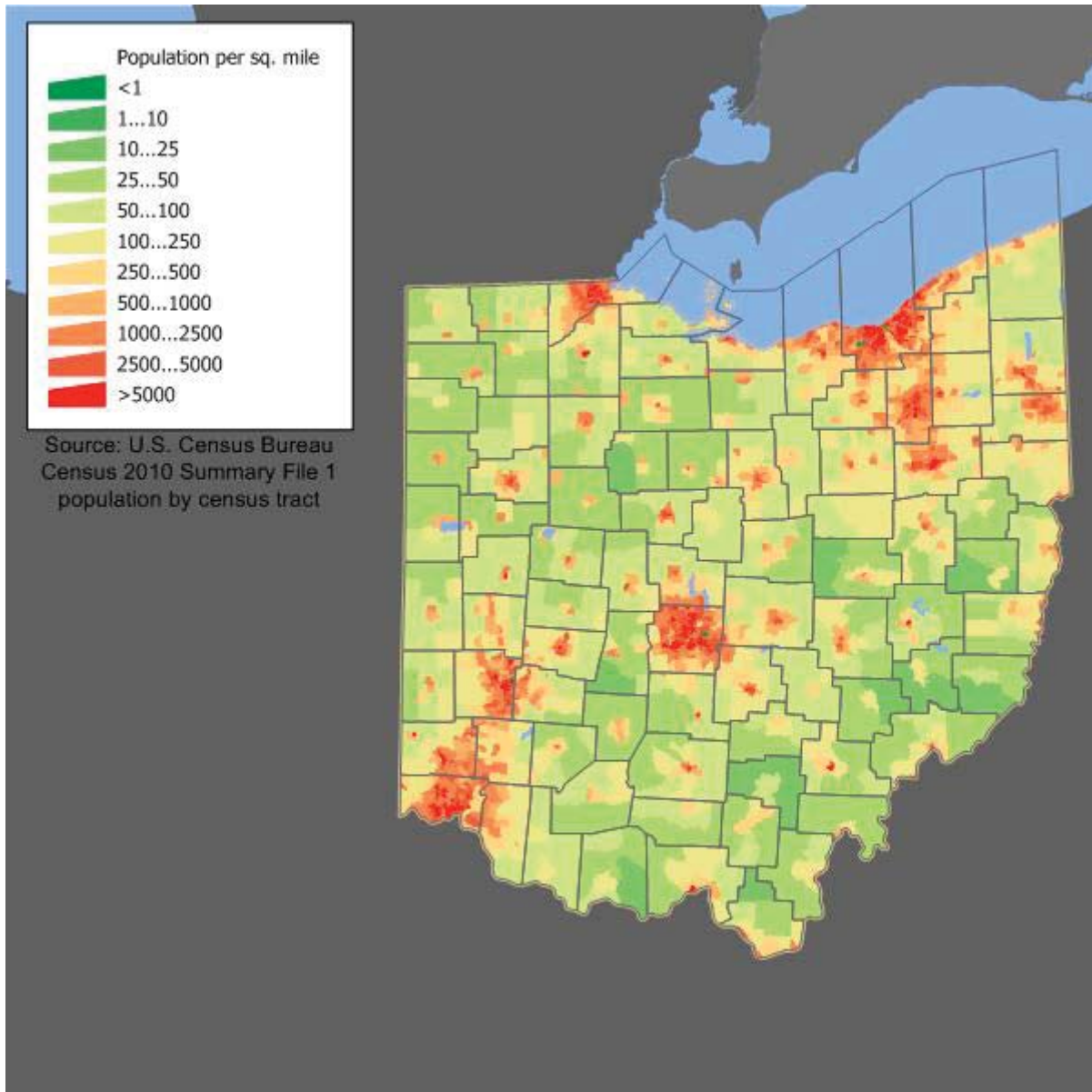
Recommended citation: Ohio Division of Geological Survey, 2012, Earthquake epicenters in Ohio and adjacent areas—color version: Ohio Department of Natural Resources, Division of Geological Survey Map EG-2, generalized page-size version, 1 p., scale 1:2,000,000.



2.14 Development Trends

County Population Projection

According to U.S. Census for 2010, the total population of Clark County is 138,333. Clark County is semi-rural in nature and is considered to be part of the Springfield-Dayton metropolitan area. The area of highest population density is the City of Springfield with 60,608 people.



**Table 2-1
POPULATION
TABLE**

Year	Total Population	Year	Total Population
1800	NA	1910	66,435
1810	NA	1920	80,728
1820	9,533	1930	90,936
1830	13,114	1940	95,647
1840	16,882	1950	111,661
1850	22,178	1960	131,440
1860	25,300	1970	157,115
1870	32,070	1980	150,236
1880	41,498	1990	147,548
1890	52,277	2000	144,742
1900	58,939	2010	138,333

A Clark County demographic profile is also available on the ODOD's website and provides more specific information for Clark County and its political jurisdictions.

([http://www.odod.state.oh.us/osr/profies/pdf/.](http://www.odod.state.oh.us/osr/profies/pdf/))

County Land Use and Future Land Use - Topography

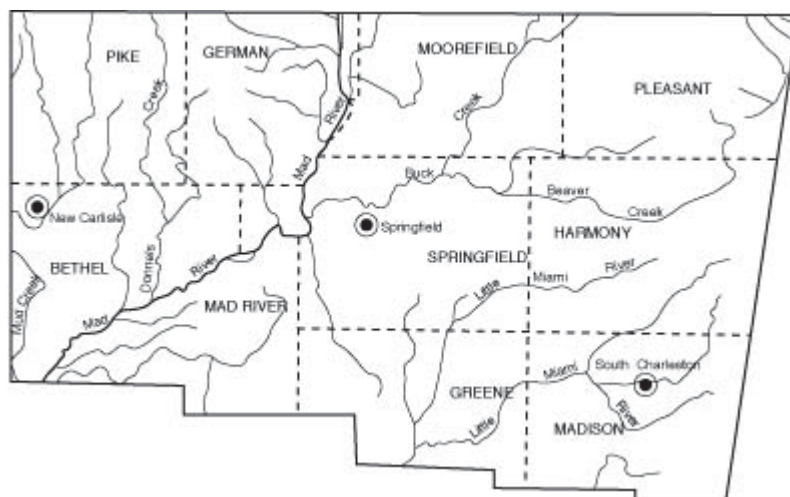
Clark County is composed of rolling till plains with local end moraines. The County contains 30 different soil types, the majority of which are poorly-drained clays and well-drained loams. The County is situated in the ecoregion known as the Eastern Corn Belt Plain. There are three distinct types of Eastern Corn Belt Plain topography located in Clark County. They are the Mad River Interlobate Area, Loamy High Lime Till Plains and Darby Plains. The majority of the County is comprised of Mad River Interlobate Area. This ecoregion is flanked by end moraines that once received concentrated outwash deposits that filled preglacial valleys. Abundant groundwater feeds its distinctive cold water streams that contain an abundance of riffle-inhabiting fish species. Originally, beech forest, mixed oak forest and extensive fresh water fens/wet prairies were common in this region. Today, extensive corn, soybean, dairy and livestock farms as well as urban activity flourish. Woodland still grows on steep sites and along riparian corridors and fresh water fens/wet prairies can also be found locally.

The western and southern portions of Clark County contain the ecoregion known as Loamy High Lime Till Plains. This ecoregion contains soils that developed from loamy, limy, glacial deposits of Wisconsinian age. These soils typically have better natural drainage than those of surrounding ecoregions. Beech forests, oak-sugar maple forests and elm-ash swamp forests once grew on the nearly level terrain. Today, corn, soybean and livestock production is widespread.

Darby Plains is the last ecoregion occupying Clark County and is located in the eastern portion of the County. This ecoregion once had a distinct assemblage of mixed oak forest, with many prairies occurring on its end moraines, gravel-filled pre-glacial valleys and seasonally wet areas. Today, tree density has diminished and very large and productive crop and livestock farms flourish on its level to undulating terrain.

Three different watersheds influence drainage in Clark County: the Mad River, Great Miami River and Little Miami River. Local waterways include the Mad River that enters Clark County from just west of the middle of the County’s northern boundary, and flows southerly leaving the County at the southwestern corner. Principal tributaries are Logonda/Buck Creek, Donnels Creek and Honey Creek. Beaver Creek is a large branch of Buck Creek. The Little Miami River rises in the southeast part of the county and leaves through the middle of the southern border. North Fork and Lisbon Fork are principal branches of the Little Miami River.

The Mad River basin accounts for about 80% of the drainage area in Clark County and has an area of approximately 656 square miles. The County's supply of surface water includes about 2,710 water acres in lakes and approximately 220 linear miles of streams. The following map details the generalized surface water locations in Clark County and was adapted from the Ohio Department of Natural Resources (ODNR) Division of Water river basin maps (http://ohioline.osu.edu/aex-fact/0480_12.html).



County Land Use

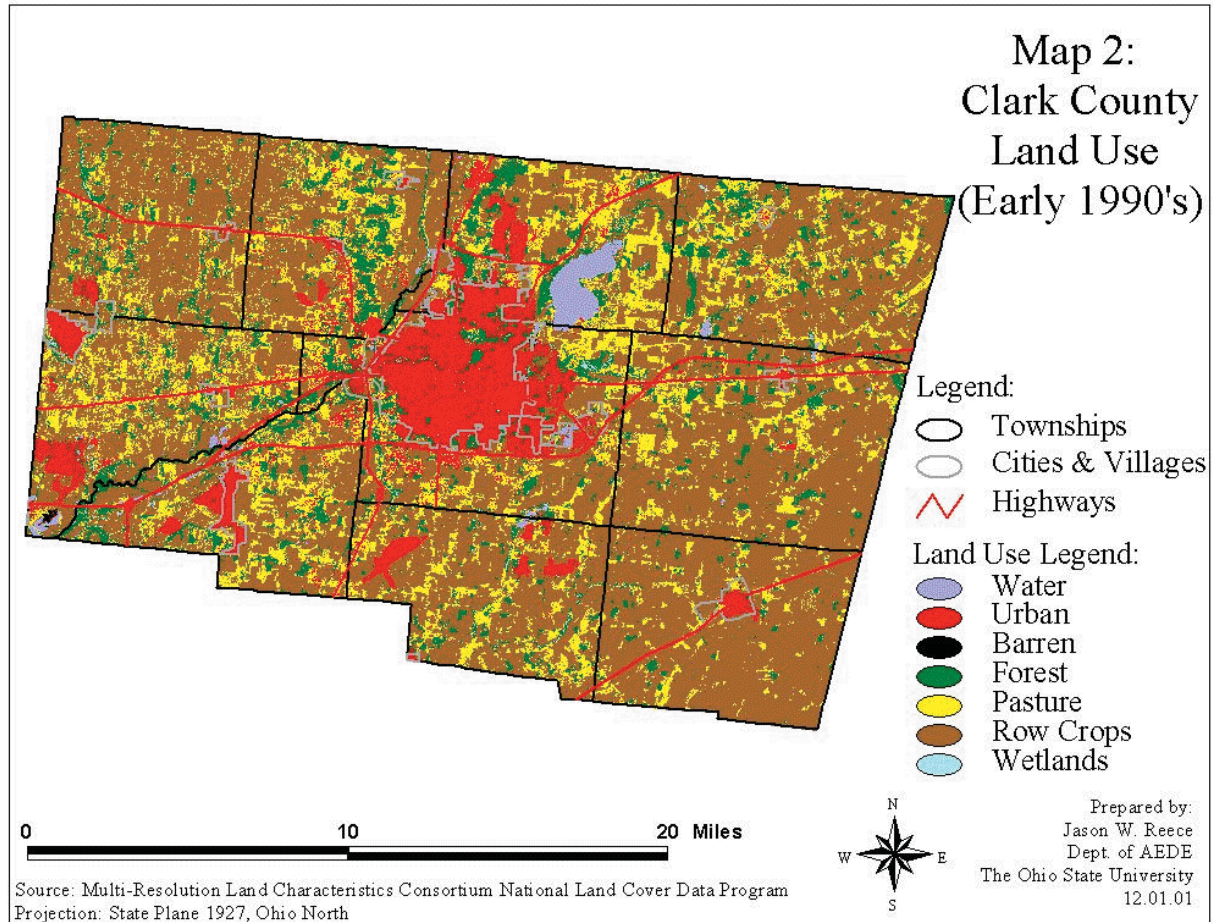
Clark County consists of 257,920 acres. The chart below depicts the breakdown by type of land use/cover.

**Table 2-3
Existing Land Use Clark County: 2010**

Community	Acres	Percent (%)
Urban (Residential/Commercial/Industrial/Transportation/Urban Grasses)	53,827	20.7
Cropland	147,169	57.06
Pasture	16,919	6.56
Forest	32,291	12.52
Open Water	3,662	1.42
Wetlands (Wooded/Herbaceous)	4,049	1.57

Source: Ohio Department of Development 2010 Census data

The following map illustrates Clark County's land use from the early 1990's.



Future Land Use

The Dayton-Springfield and Columbus regions are continually expanding into the rural landscape. Suburban and exurban development accounts for the majority of new housing construction in these areas. The result is a continuation of sprawl into the countryside, which is also adversely impacting agriculture. The five surrounding counties are experiencing similar growth trends, placing additional pressure on Clark County's rural landscape. Of these surrounding counties, the most significant growth trends through 2025 are forecasted for Madison (29%), Green (18%) and Miami (17%) counties.

Electric, Telephone and Gas

The electric power for Clark County is provided by three utility companies. The Dayton Power and Light Company is the principal subsidiary of DPL Incorporated. Ohio Edison is a subsidiary of First Energy Corporation. The third company providing service to Clark County is South Vienna Electric.

Phone companies that service Clark County include Verizon North and SBC Ohio.

Natural and bottled gas is provided by Columbia Gas of Ohio, Columbia Gas Transmission, The Springfield Gas Co., Inc. (treatment landfill), South Vienna Gas and Vectren.

Water and Wastewater

Clark County has 84 public water systems. These systems serve communities ranging from small trailer courts to the City of Springfield..

Groundwater is the only source used by public water systems in Clark County. Further, nearly 23% of all households have a private well.

Nearly all of the municipalities have central sanitary sewer service in Clark County. Catawba, New Carlisle, South Charleston, South Vienna and Springfield all operate their own wastewater treatment plants. The County manages a portion of the Village of Enon's wastewater treatment plant. North Hampton is serviced by the wastewater treatment plant located in New Carlisle. The Villages of Harmony and Tremont City do not have wastewater treatment plants and rely on private on-site septic systems.

According to the Clark County Health Department, there have been an estimated 23,000 private on-site septic system permits filed in the County since 1948. In addition, there have been 7,420 well permits filed with the Health Department and are pursuant to existing records from the County Water Resources Department.

2.15 Multi-Jurisdiction Risk Assessment

In evaluating the countywide risk assessment to determine where jurisdiction risks may vary from the entire planning area, the following hazards distinctions were noted:

- Dam failure
- Flooding
- Landfill Sites
- Water Aquifers
- Flooding
- Tornadoes and Windstorms
- Public Utilities
- Transportation Corridors
- Airport Traffic

Dam Failure

The ODNR's Division of Water has been involved in dam safety since 1963. During this year, the first Ohio law requiring construction permits for building new dams was enacted. In addition, following the failure of several dams in northeast Ohio during the severe flood of 1969, the General Assembly revised the law to include periodic inspections of existing structures. Inspections were required to help assure that the continued operation and use of a dam, dike or levee does not pose a hazard to life, health, or property. In 1972, the failure of Buffalo Creek Dam in West Virginia, which caused great loss of life and severe property damage, led to the enactment of the National Dam Safety Act. This law, administered by the U.S. Army Corps of Engineers, called for an inventory of dams in the United States and the inspection of those dams that could create the most hazards if they failed. The Corps contracted with the Division of Water to inventory roughly 4,500 non-federal dams in Ohio.

According to Ohio Administrative Code Rule 1501:21-13-01, dams are classified as follows:

Class I: A dam shall be placed in Class I when failure of the dam would result in probable loss of human life. Dams having a storage volume greater than 5,000 acre-feet or a height of greater than 60 feet shall be placed in Class I.

Class II: Dams having a storage volume greater than 500 acre-feet or a height of greater than 40 feet shall be placed in Class II. A dam shall be placed in Class II when failure of the dam would result in at least one of the following conditions, but loss of human life is not envisioned.

According to the ODNR, Clark County has 21 dams within its boundaries. The number of dams and their classifications are as follows:

- Class I - 2
- Class II - 2
- Class III - 3
- Class IV - 6
- Abandoned/Exempt- 8

In addition, Clark County has two abandoned dams and six exempt dams which have been determined by the ODNR's Chief of the Division of Water to not constitute a hazard of life, health or property in the event of a failure.

There are several predetermined areas within Clark County that may require evacuation in the event of a Class I Dam Failure:

- Area below the dam at Clarence J. Brown Reservoir
- Areas along Buck Creek, especially in downtown Springfield

In addition, the following damages and losses could also occur in these areas:

- (a) Possible health hazard, including but not limited to, loss of a public water supply or wastewater treatment facility.
- (b) Probable loss of high-value property, including but not limited to, flooding of residential, commercial, industrial, publicly owned, and/or valuable agricultural structures, structural damage to downstream Class I, II, or III dams, dikes or levees, or other dams, dikes or levees of high value.
- (c) Damage to major roads, including but not limited to, interstate and state highways and roads which provide the only access to residential or other critical areas such as hospitals, nursing homes or correctional facilities as determined by the Chief of ODNR's Division of Water.
- (d) Damage to railroads, or public utilities.

Class III: Dams having a height of greater than 25 feet, or a storage volume of greater than 50 acre-feet, shall be placed in Class III. A dam shall be placed in Class III when failure of the dam would result in at least one of the following conditions, but loss of human life or hazard to health is not envisioned.

- (a) Property losses, including but not limited to, rural buildings not otherwise listed as high-value property in paragraph (A) of this Rule and Class IV dams, dikes and levees not otherwise listed as high-value property in paragraph (A) of this Rule. At the request of the dam owner, the Chief of ODNR's Division of Water may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property.
- (b) Local roads including but not limited to roads not otherwise listed as major roads in paragraph (A) of this rule.

Class IV: When failure of the dam would result in property losses restricted mainly to the dam and rural lands, and not loss of human life or hazard to health is envisioned, the dam may be placed in Class IV. Dams which are twenty-five feet or less in height and have a storage volume of fifty acre-feet or less, may be placed in Class IV. No proposed dam shall be placed in Class IV unless the applicant has submitted the preliminary design report required by Rule 1501:21-5-02 of the Administrative Code.

Class IV dams are exempt from the permit requirements of Section 1521.06 of the Revised Code pursuant to paragraph (A) of Rule 1501:21-19-01 of the Administrative Code. (www.dnr.ohio.gov/water/dsafety/whatdam.htm)

Landfill Sites

Prior to 1995, the Clark County residents waste was disposed at the Tremont City Landfill Site. However, in 1995 the landfill was closed because of on-site contamination of groundwater.

The Tremont City Landfill Site is located at 3108 Snyder-Domer Road, Tremont City, Clark County, Ohio. The site lies approximately 300 feet north of Chapman Creek. The entire site is approximately 80 acres and is divided into three areas: the former waste transfer facility comprised of 14 acres, the closed sanitary landfill comprised of 58 acres and the closed industrial waste disposal chemical waste landfill comprised of 8.5 acres. The former waste transfer facility was permitted in 1977 as a hazardous waste treatment facility and subsequently underwent clean closure pursuant to Ohio EPA's hazardous waste rule requirements in 1985 when operations ceased. The sanitary landfill was permitted as a solid waste disposal facility in 1969. The sanitary landfill was closed under Ohio EPA's solid waste rules in 1995 and is currently engaged in post-closure monitoring and undertaking corrective actions pursuant to those rules. This process is being overseen by Ohio EPA's Division of Solid and Infectious Waste Management and the Clark County Combined Health District. The industrial waste area, also known as the barrel fill area, closed under a Resource Conservation Recovery Act (RCRA) issued in 1979. The industrial waste area is discussed in further detail in the following paragraphs.

The U.S. EPA and Ohio EPA's Division of Emergency and Remedial Response launched an investigation of the closed Tremont City Landfill Site in 1999 in response to a citizen's petition filed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, or the "Superfund" Law) by a local environmental advocacy group called the Citizens for Water. The agencies conducted a three phase investigation including gathering baseline data, collecting groundwater, surface water, landfill leachate and gas, soil and sediment samples, testing residential wells, conducting a geophysical survey and evaluating the landfill cap design and integrity. The agencies concluded that contamination existed at the site which migrated from the disposal areas and affected environmental media including groundwater, soils and sediments.

The agencies are currently focusing their attention on the barrel fill area. The barrel fill area was operated from 1976 to 1979 as a drum and barrel disposal area. Historical records indicate that 47,000 drums of industrial wastes were disposed in this area. These drums and other bulk liquids and sludge, estimated at 52,000 gallons, were placed in a series of cells or trenches that were excavated to a depth of 15 to 25 feet within the glacial till. These disposal cells were then covered with soil. Potentially hazardous waste streams include paint sludges, glues, resins, asbestos and ink sludges.

As of October 2011 the U.S. EPA approved the Record of Decision that outlined EPA's plan for cleaning up waste and contaminated soil at the Tremont City Barrel Fill Site. EPA's final cleanup plan is to:

- Dig up all contaminated soil and waste from 50 waste cells in the barrel fill site.
- Consolidate hazardous and non-hazardous solid waste and soil in a specially built waste cell on the property.
- Move liquid waste to an off-site facility for treatment and disposal.
- Construct a cap over the new waste cell.
- Slope the bottom of the waste cell to collect and remove liquids.
- Build a special underground barrier called a slurry wall around the waste cell along with a liquid collection system.
- Monitor ground water.

The estimated cost of the cleanup is \$28 million. The cleanup will protect people and the environment over the long-term, comply with state and federal regulations, can be implemented, and is cost-effective as an alternative for excavating the contaminated soil and waste.

Water Aquifers

An aquifer is any rock or sediment with spaces that hold water, and through which significant quantities of water move. The water contained in these underground spaces is called groundwater. Although groundwater can flow freely through large underground spaces, more often it seeps slowly through the intricate small pores of rock or sediment. Examples of aquifers include: sand and gravel layers (i.e., buried river systems and flood plains); fracture systems in brittle rocks (i.e., granite or quartzite); and fracture systems or solution cavities in easily dissolved rocks, such as limestone. Aquifers have connected pores or open fractures through which fluid may flow.

The quantity of groundwater that is available to Ohio residents varies in different areas of the State. Some areas of the State have aquifers that can produce over 500 gallons per minute and are the source of water for many of Ohio's cities and villages. In many portions of the State development is focused around such aquifers. Other aquifers may only be able to produce 1 or 2 gallons per minute and can only provide water to small businesses and individual residences. Southern Ohio has very few aquifers that can support cities and villages, so any contamination that enters those aquifers could threaten the economy of the whole region.

In Ohio, 97% of all cities, villages, schools, businesses and industry rely on groundwater as their source of drinking water, process water and irrigation water. More than 3,282,000 people are provided groundwater by community public water systems, and more than 700,000 people have their own wells to meet all their water needs.

In Clark County, the potential for groundwater pollution is high. See the following map - *According to the Groundwater Pollution Potential of Clark County, Ohio Report No. 38*, published by the Ohio Department of Natural Resources, Division of Water, Ground Water Resources Section, the problem areas include areas along the Mad River stretching

the entire length of the County, portions of Beaver Creek in Springfield and Harmony Townships, Buck Creek in portions of Springfield Township, Moorefield and Pleasant Townships and Sinking Creek in portions of Harmony and Pleasant Townships.

The need for protection and management of ground water resources in Ohio has been clearly recognized. About 42% of Ohio citizens rely on ground water for drinking and household use from both municipal and private wells. Industry and agriculture also utilize significant quantities of ground water for processing and irrigation. In Ohio, approximately 700,000 rural households depend on private wells; over 6,500 of these wells exist in Clark County.

The characteristics of the many aquifer systems in the state make ground water highly vulnerable to contamination. Measures to protect ground water from contamination usually cost less and create less impact on ground water users than clean-up of a polluted aquifer. Based on these concerns for protection of the resource, staff of the Division of Water conducted a review of various mapping strategies useful for identifying vulnerable aquifer areas. They placed particular emphasis on reviewing mapping systems that would assist in state and local protection and management programs. Based on these factors and the quantity and quality of available data on ground water resources, the DRASTIC mapping process (Aller et al., 1987) was selected for application in the program.

Considerable interest in the mapping program followed successful production of a demonstration county map and led to the inclusion of the program as a recommended initiative in the Ohio Ground Water Protection and Management Strategy (Ohio EPA, 1986). Based on this recommendation, the Ohio General Assembly funded the mapping program. A dedicated mapping unit has been established in the Division of Water, Water Resources Section to implement the ground water pollution potential mapping program on a county-wide basis in Ohio.

The purpose of the ODNR report and map is to aid in the protection of our ground water resources. This protection can be enhanced by understanding and implementing the results of this study and by evaluating an area's potential for ground water pollution. The mapping program identifies areas that are more or less vulnerable to contamination and displays this information graphically on maps. The map and report can be combined with other information to assist in prioritizing local resources and in making land use decisions.

Under Ohio Revised Code, local jurisdictions having established wellhead protection areas may regulate development outside of their corporation limits to ensure groundwater protection. The following describes each wellhead protection area and the potential for contamination as determined by the Ohio Department of Natural Resources, Division of Water.

1. **Springfield** – The Springfield Wellhead Protection Area is situated in the vicinity of the US 68 and SR 72 interchange and has a medium high to high pollution potential.

2. **New Carlisle** – The New Carlisle Wellhead Protection Area is situated in the north and northeast quadrants of the city following SR 235 to the north and has a medium pollution potential.
3. **Fairborn** – The Fairborn Wellhead Protection Area is situated south of SR 4 along Osborn Road and has a high pollution potential.
4. **Dayton** - The Dayton Wellhead Protection Area is situated northeast of the I-70 and I-675 interchange and has a high pollution potential.
5. **Enon** – The Enon Wellhead Protection Area is situated around the I-70 and Enon Road interchange and has a high pollution potential.

Flooding

Only certain cities and villages are considered to have a portion of their residents located within a 100-year flood plain. These cities are more susceptible than other areas of the County and include the portion of the cities of Springfield and New Carlisle and the villages of Enon, North Hampton and Tremont City.

Tornadoes and Windstorms

Several mobile home parks and campgrounds are located throughout Clark County. Past history has shown that mobile homes and camping trailers can be more vulnerable to windstorms and can sustain greater damages than traditional housing stock.

Public Utilities

The entire County does not have centralized city sanitary sewer and water provided. Therefore, the more populated areas of Clark County are more vulnerable should there be a water or sanitary system failure.

Transportation Corridors

The heavily traveled I-70 corridor and the areas of the County with operating rail systems tend to be more vulnerable from transportation accidents, hazardous chemical spills and threat to loss of life. This is due to the greater volume of traffic than the other roadways throughout the County.

Airport Traffic

Wright Patterson Air Force Base in Bethel and Mad River Townships and the Springfield Airport in Springfield and Green Townships have special zoning restrictions due to the airport traffic in these locations. The risks from air traffic may be greater within these airport zoning designated areas.

Mitigation Strategy

- 3.1 Overview
- 3.2 Successfully Completed Hazard Mitigation Projects
- 3.3 Re-Evaluating Clark County's Problems
- 3.4 Mitigation Strategy – Goals – 2012
- 3.5 Implementation of Priority Action Items
- 3.6 Priority Action Items – Countywide
- 3.7 Priority Action Items - Community

3.1 Overview

Clark County has experienced numerous natural hazard events and disasters throughout history and has made progress in completing hazard mitigation activities since the approval of the 2006 Multi-Jurisdictional Hazard Mitigation Plan. The County has been very proactive with mitigation progress as indicated with the following highlights:

- A good portion of Clark County is located within the Great Miami River Watershed. The Miami Conservancy District was created in 1915 as a result of the 1913 flood. The Miami Conservancy District (MCD) is one of the most comprehensive flood management authorities in the region and has extensive flood control measures in place. It is designed to contain runoff that is 40% more than the 1913 flood which is well over a 1,000 year flood level.
- All incorporated cities and villages within Clark County participated in and adopted the 2006 Clark County Multi-Jurisdictional Mitigation Plan.
- The cities of Springfield and New Carlisle and the villages of Clifton, Enon, North Hampton and Tremont City are all participating communities with the National Flood Insurance Protection Program (NFIP). There are areas where the 100-year flood zones exist within their communities. The county has been very proactive in promoting that homeowners and businesses that are within flood prone areas to participate in the NFIP program.
- Clark County has completed and participated in numerous mitigation activities as outlined in Section 3.2 Successfully Completed Hazard Mitigation Projects.
- The utilization of open spaces such as Buck Creek, Little Miami Scenic and Simon Kenton Trails bike way corridor, which meanders along the path of Buck Creek and the Little Miami Scenic River and through the County.
- The August 26, 2010, dedication of the Great Miami, Stillwater, and Mad Rivers as official state water trails. The Mad River flows through Clark County.
- In October 2010 the Buck Creek Whitewater Park was dedicated. Removal of a low dam in Buck Creek along with man-made rapids to create a recreation area for kayak enthusiasts. The Whitewater feature will draw boaters from all over the region.
- A series of public planning meetings were held by the Clark County Mitigation Committee from September 2011 through December of 2011 to re-evaluate the current plan goals, objectives, actions, and to address any needs or changes necessary to update the Clark County Mitigation Plan.
- The Committee re-evaluated and ranked the natural hazards in order of priority with the top 3 being:
 - 1. Tornado/High Wind Events
 - 2. Flash and Riverine Flooding
 - 3. Winter Storms including sleet/snow/ice/blizzards

The Clark County Hazard Mitigation strategy in this section of the plan utilizes the following terminology based on FEMA's State and Local Mitigation Planning How-To Guide:

- *Goals* – General guidelines that explain what is desired to be achieved. They are usually broad policy-type statements, long term, and represent global visions.
- *Objectives* – Strategies or implementation steps to attain identified goals. Unlike goals, objectives are specific and measurable.
- *Mitigation Actions* – Specific actions to achieve a plan goal and its objectives. The action items are prioritized mitigation actions which identify a lead or coordinating agency for implementation, a time line and a method to track implementation status.

Progress on 2006 Goals, Objectives, and Action Items;

The format used to report the goals, objectives, and mitigation actions in the 2012 plan update has been revised since the plan was approved in June of 2006. The Clark County Hazard Mitigation Team reviewed the past problem statements and updated hazard mitigation goals to coincide with countywide plans and activities. The action item list has been updated to reflect the completed action items as well as to incorporate new action items. The list includes the name of the public entity, the hazard category type, the action item to be performed, the lead agency in charge of the project, timeline, priority level, and plan goals to be addressed. Overall, approximately 22 mitigation action items have been successfully completed from 2006-2011 by the various county entities and agencies.

Some of the projects and action items completed include:

- Development of regional mutual aid agreements between fire departments, law enforcement agencies, adjoining counties, townships' public works, engineering and private sector.
- Implementation of mass notification systems throughout the County.
- Critical facility backup – emergency generator awareness and generator upgrades.
- Public education regarding NOAA radios and family disaster plan is at annual community events.
- Shelter upgrades for extended medical care facilities for medical dependent residents.
- Upgraded emergency communication systems throughout the County including advanced warning systems.
- Completion of the County FIRM Flood Plain Mapping updates.
- Replacement of several bridges and culverts throughout the County.
- Completion of the Lawrenceville water system.

Non-completion of several goals and action items was a result of: large ongoing workload with limited staff and volunteer resources; state, county and local budget issues; and lowering of priority or the goals became irrelevant based on current data, information, or processes.

The Clark County Mitigation Committee reviewed the progress and appropriateness of the former goals and found that while many of the goals are still appropriate some of the objectives have been modified to address current trend issues and priorities.

The following sections of this plan addresses the current status and progress of county mitigation action items and re-evaluates the County's mitigation problems, goals and objectives.

3.2 Successfully Completed Hazard Mitigation Projects

The Clark County communities have benefited from the initial Mitigation Planning Sessions that occurred as a part of the 2006 Hazard Mitigation Planning Activities. Numerous problems and issues were brought forth to the Clark County Hazard Mitigation Committee at that time. Problem statements were developed, goals and objectives were set, and a list of actual items was developed. Action items were identified and handed off to responsible coordinating agencies and organizations to address. In reviewing and updating the Clark County Natural Hazards Mitigation Action Items, approximately 22 action items were successfully completed since 2006. Several items were deleted for various reasons. Some are in process and several were not completed. Although the initial Clark County Hazard Mitigation Committee didn't meet on an annual basis, the participating organizations continued their mitigation efforts to achieve success. Under implementation of Priority Action Items found on page 138 of the 2006 FEMA Approved Plan, the following action items were identified as high priority and were tasked out. The County has had much mitigation success with the implementation and completion with most all of these priority action items.

Status of 2006 Hazard Mitigation Plan High-Priority Projects

2006 Goal	Public Entity	Project	Status	Result
Develop regional mutual aid agreements between fire departments, law enforcement agencies and other counties, to assist in clean up process after an event.	EMA/CCHMC Township Public Works/Engineering and Private Sector	Mutual Aid Agreement	Completed 2010	Improved collaboration after a hazard event
Install an interoperable, multi-purpose siren system that would alert residents of approaching severe weather or other emergencies.	EMA/CCHMC	Warning Siren	Ongoing	Two new sirens installed One in German Twp and one in New Carlisle Six more to be added in 2012
Develop a mapping system to identify existing shelters, where residents can go to seek safety in the event of severe weather. Coordinate with the Red Cross on identifying existing shelters.	Red Cross, EMA and Engineers	Shelter Identification	Completed 2010	Added to County GIS Identified all potential shelters
Provide NOAA weather radios for all critical facilities within the County.	EMA/CCHMC	Address lack of NOAA radios	Ongoing	Schools received radios from OEMA Provided education to Tier II facilities @site visits and at personal preparedness presentation to residents

2006 Goal	Public Entity	Project	Status	Result
Provide back-up generators for critical facilities, including shelters, which need to maintain continuous power to protect human life.	EMA/CCHMC	Back-up generators for critical facilities	On-going	EMA generator trailer upgraded/Generators purchased for Utilities/SHSGP More scheduled for 2012
Seek funding to increase manpower and equipment for townships and villages for snow and debris removal	EMA/CCHMC	Seek funding for Townships and Villages during storm events	Completed 2008,2010	Received public assistance in declared event EM 1850
Upgrade existing and provide additional shelters where residents, especially the medically fragile, can seek safety from severe weather. Provide at least one shelter for each jurisdiction.	Red Cross/Clark County EMA	Provide Medical facility –Extended care via MOU for medically dependent	Completed 2008	Addresses Medical Dependent Needs
Upgrade the radio communications system throughout the County for all public safety services.	Clark County public safety services	Enhance County Communications /Develop common template	On-going	Improved Communications More upgrades planned for 2012
Seek funding to provide early warning system, such as reverse 9-1-1, to warn residents of emergency situations.	Countywide	Seek funding for reverse 911	Completed 2008	Installed mass notification system
Develop a public education program for informing residents of the hazards associated with severe weather, such as medical conditions and driving conditions, as well as what to do after an event occurs.	Countywide	Develop public education program for hazards of severe weather	On-going	Education material handed out annually 10-12 times a year at public events.
Seek funding to acquire additional four wheel drive vehicles and other types of all terrain vehicles for emergency operations.	Countywide	Seek funding for emergency vehicles to use during hazard events	Completed 2010	Added additional resources for four wheel drive vehicles to Countywide Resource Directory to be utilized during a hazard event
Seek funding to restore historical sites, if they suffer severe damage from a severe weather event.	Countywide	Seek funding for historical restoration	Completed 2009	No funding/Assisted Historical Society in creating a plan in case of damage due to severe weather event

2006 Goal	Public Entity	Project	Status	Result
Seek funding to develop a Volunteer Reception Center for coordinating volunteers who are willing to help with the mitigation of a severe weather incident.	Countywide	Seek funding for Volunteer Reception Center	On-going	Set up Volunteer reception Center with MOU, United Way using funding with CCCGP
Provide designated locations/facilities to house displaced animals after severe storm events.	Countywide	Provide designated shelter areas for animals	Completed 2011	Developed Animal Handling Plan with Humane Society/Added extra crates/added locations for 364 displaced animals
Provide an alternate potable water source in the event that existing water supplies are disrupted or contaminated.	Countywide	Provide alternate potable water sources	Completed 2008	Resources available through SRMC (Springfield Regional Medical Center) through grant funding
Provide temporary facilities for non-life threatening emergencies to alleviate the overloading of the medical facilities.	Countywide	Provide temporary facilities for non-life threatening emergencies	Completed 2009	Developed plan with Extended care and Surgery Center facilities in the event of overcrowding of Hospitals
Provide temporary housing facilities for residents displaced by a disaster.	Countywide	Seek temporary housing facilities	Completed 2005	Developed an agreement with SRHMA for temporary housing for displaced residents after a disaster
Seek funding to purchase additional communication equipment for use by the EMA in communicating with relief workers.	Countywide	Seek funding for additional communication equipment	Completed 2009-2011	Purchased and upgraded various mobile radio communication equipment for relief workers
Seek funding to install new infrastructure in areas susceptible to low level flooding and ponding, outside of the 100-year floodplain.	Countywide	Seek funding for new infrastructure outside of 100 year flood plain	On-going	Applied for HMEP and awarded in 2009/Applied for HMEP in 2011 and is still pending

2006 Goal	Public Entity	Project	Status	Result
Repair and replacement of bridges and levees that suffer damage from a severe storm/flooding event.	Countywide	Repair or replace structures damaged during storm event	Completed 2009-2011	Structures were repaired or replaced after two flash flood event in 2009 and 2011
Identify and provide warning signage and/or roadway markings for roadways that are susceptible to repeated flooding regardless of the amount of rainfall.	Countywide	Identify and provide warning signage for susceptible roads	Completed 2009	Purchased and utilized additional warning signage
Develop and implement a domestic water management/conservation program.	Countywide	Develop Conservation program	Completed 2005	After looking into this action item it was discovered that this is already handled through the Soil and Water Conservation program
Develop a public education program concerning the hazards associated with droughts and water restrictions during drought conditions.	Countywide	Develop Public Education program	Completed 2011	Information provided to the public through MOU with the help of CCCHD
Develop and implement a plan to process donations, acquire feeds and provide potable water supplies for livestock	Countywide	Develop a program for Livestock in case of hazard event	On-going through 2011	Currently working with Farm Bureau on developing a AG Plan
* A few small communities have dual purpose fire siren/tornado sirens				

In addition, some other County Mitigation Action Items that have been accomplished include:

- Red Cross training by the Clark County Red Cross Unit throughout the County on emergency preparedness.
- Clark County SWCD ODNR Emmanuel Christian Academy Bio-Retention Site.
- Davis Westland Mitigation Site.
- Completion of numerous county bridge and roadway projects such as Redmond Road bridge, Steyer Drive bridge and Dayton Road bridge.
- Completion of numerous County culvert projects such as North Hampton Road, Ballentine Road and Old Columbus Road.
- Firm Flood Plain maps were updated for Clark County.
- Flood Plain Ordinances updates have been adopted by many NFIB participating Cities and Villages.

While Clark County has made progress in completing the above mitigation actions, many items listed in the Action Item list still remain to be completed. The reasons for not completing all the identified action items include:

- Lack of funding resources.
- Lack of adequate staff members on various coordinating agencies and stakeholders.
- Personnel changes within several of the stakeholder offices.

3.3 Re-Evaluating Clark County's Problems

Overview

During the Four Planning Meetings from September 2011 – December 2011, the Clark County Hazard Mitigation Committee re-evaluated the hazards that affect the county, redefined problem statements, re-examined goals, identified additional mitigation activities, prioritized mitigation activities and modified action plans that will help mitigate or lessen some of the hazard impacts for Clark County.

The Clark County Hazard Mitigation Committee decided to streamline the current goals for various hazards into one main goal which will coincide with all hazards that can affect Clark County. The Committee focused on the County resources and agencies available which included the Clark County Emergency Operations Plan, Clark County Zoning and Subdivision Regulations, Local Township and Village Zoning Regulations, Clark County Combined Health District, Floodplain Management, Stormwater Management and Drainage Regulations, Clark County Park District's open space and conservation objectives as well as the agricultural influence and soil and watershed studies.

The Clark County Emergency Management Agency is pleased that the Clark County community and its leaders have taken a proactive role with the completion of many of the 2006 priority mitigation activities. The township public works, county and city engineering departments, law enforcement agencies and other adjacent County representatives have developed mutual aid agreements to assist their neighbors during a time of need. German Township and the City of New Carlisle have installed interoperable sirens that alert residents to approaching severe weather systems. Countywide mass notification systems are also in place.

The Red Cross GIS and Clark County EMA have developed a mapping system to identify existing shelters where residents can go to seek safe shelter in the event of severe weather.

The County EMA has put together a resource directory to have on hand equipment, tools, manpower, and four-wheel drive vehicles should hazard events warrant their need. From 2009-2011 The Clark County EMA sought and received funding to purchase additional communication equipment to purchase and upgrade 800 VHF portable radios, purchase of mobile MARCS, batteries or approximately 800 batteries for the radios.

The County EMA Office and CCCHD participate in approximately 10-12 each community public information outreach events each year to inform residents about the benefits of having NOAA Radios and Family Disaster Plans, which will help them better respond in an emergency situation. The Clark County EMA promotes placement of NOAA weather radios in the local medical and care facilities, schools, daycare centers, and industries with a large number of employees. This is an ongoing educational process that will benefit public with this information of advanced weather warnings.

Although much progress has been made with promotion and completion of mitigation activities, there is more work to be done. Many flash flooding issues still exist due to rapid development, lack of adequate drainage systems and limited inspections for homes and developments built prior to the 1970's. As a result of these problems, several countywide flash flooding areas have been identified below. The Clark County Hazard Mitigation Committee also identified other flooding issues including river line and field flooding caused by log jams and corn fodder residue blocking drainage grates.

As a result of flooding problems brought forth in the 2006 Hazard Mitigation Planning, several countywide drainage problems have been addressed. However several flood areas still need to mitigate such as Columbus-Cincinnati Road, Tillie Lane, Mitchel Road, and South Charleston Pike. Other re-occurring flooding areas also include:

City of Springfield:

Street and intersections

1. Crossing Mill Run @ East, York & Burt Streets
2. E. John between York and Sunset
3. Mansfield Avenue
4. North St. between Water and Spring
5. North St. between Fountain and Fisher
6. Wickford Drive between Canterbury and Floral
7. Middle Urbana – Emmanuel Way to SR 334
8. W. John St. between Yellow Springs and Portage path
9. Oakdale between Belmont and Magnolia

RxR Crossings:

1. Race
2. Isabella
3. Western
4. Zischler

New Carlisle:

1. State Route 571 west of the city by ball field

Bethel Township:

1. Spangler Road
2. Lower Valley Pike

Mad River Township:

1. Old Mill Road

The City of Springfield and the City of New Carlisle as well as many of the villages have storm water design standards and regulations so that pre-development runoff will not exceed post-development runoff. Clark County unincorporated areas, the City of Springfield, City of New Carlisle and several Clark County communities recently received updated FEMA Flood Maps and many of the flood prone communities are

eligible to be in the National Flood Insurance Program (NFIP). The Clark County Communities currently participating in the NFIP include: The Clark County cities of Springfield and New Carlisle and the villages of Clifton, Enon, North Hampton and Tremont City and the unincorporated areas of Clark County are listed as participating in the National Flood Insurance Program (NFIP). Those communities that participate in the NFIP are eligible to receive financial assistance and it is the intent of the program to reduce future flood damage within a community through flood plan management ordinances, and provide an insurance alternative to federal disaster relief.

From evaluation of current regulations and as brought forth by the Clark County Planning Commission, Building Regulations Department, and local township and zoning officials, many of the tools are in place to curb new development within the established 100-Year Floodplains. Clark County also has several watershed organizations established to study, monitor and make recommendations to improve the water quality of the County's rivers and its tributaries.

Clark County has several populated areas that do not currently have tornado or warning sirens in place. This is an ongoing action item with the EMA's goal to promote and complete installation of tornado warning sirens in all of Clark County's heavily populated neighborhoods, cities and villages. Placement is dependent on available finances and the communities desire to install these warning devices.

Communication systems and technology are continually changing and it is essential that timely updates are made to the County's communication systems. Effective communication in general is key to successfully being able to address the counties problems and therefore is a high priority for all emergency responders.

While many positive mitigation activities have successfully been completed and are in process, the Clark County Hazard Mitigation Committee is aware of several new problems and are cognizant of the past issues that still exist.

3.3.2 Problem Statement Redefined for 2012 plan

The Clark County Hazard Mitigation Committee re-evaluated the 2006 problem statements outlined in the 2006 Hazard Mitigation Plan. The committee put together a chart of the statements and through a collaborative effort process determined if each statement was still valid or not. For those statements found not to be valid a change of the actions and reasons were noted.

The following table indicates the discussion, actions and comments suggested subsequently regarding the 2006 problem statements.

2006 Problem Statements Discussion			
	Problem Statements	T/F	Changes/Actions
1	There are no permanent structures for designated emergency shelters in any of the mobile home parks or campgrounds in Clark County.	TRUE	
2	Clark County does not have an adequate early warning system (i.e. sirens, Public Service Announcements) in most communities in the County.	FALSE	Have adequate system, but needs public education and to seek additional enhancements
3	The County lacks a countywide comprehensive 9-1-1 system, which could be used to advise residents of dangerous severe weather conditions.	FALSE	Have adequate system, but not everyone is on it, needs additional public education to get more cell phone numbers
4	Roads blocked by deep snow cause delay in emergency response. The County does not have enough emergency response resources in the event of severe (disastrous) storms.	FALSE	Have adequate resources through mutual aid
5	Debris in roadways, including downed utility lines, caused by high winds block roadways causing delays in emergency response.	TRUE	No real way to mitigate that
6	Clark County lacks four-wheel drive vehicles for emergency operations.	FALSE	EMA maintains a list of ATV drivers
7	There is a lack funding for transporting mission essential personnel to critical facilities	FALSE	Clark County no longer provides this service

2006 Problem Statements Discussion			
	Problem Statements	T/F	Changes/Actions
8	Critical facilities, those facilities that need to maintain power at all times, are not equipped with back-up generators in the event of a power outage.	TRUE	Add the word "some" to critical facility to make it more accurate
9	All communities located in Clark County may not be able to communicate with each other based on the type of communication used within a particular community (actual equipment used, radios, etc).	TRUE	
10	There needs to be better communication between the County, surrounding counties, and state and federal government agencies during and after severe storm events.	TRUE	
11	The County lacks regional mutual aid agreements between fire departments, law enforcement agencies and other counties, for such things as borrowing equipment for response and cleanup.	FALSE	Have access to mutual aid through Ohio Fire Chief's Response Plan and Ohio Law Enforcement Response Plan, as well as local mutual aid for public works
12	Severe storms can have drastic effects on public and critical utilities in Clark County due to downed power lines, tree limbs, etc.	TRUE	
13	There is a lack of lightning detection equip in Clark County.	TRUE	
14	The County lacks portable generators for sensitive populations who may need power for life support systems, in case of an extended power outage.	TRUE	EMA maintains a list of those facilities and there is a limited number of them. Plans are to send the effected general population to extended care facilities or fire departments
15	There are limited tree maintenance programs within the County and incorporated jurisdictions (e.g. pruning, tree trimming and removal).	FALSE	
16	Older structures in the County may not be up to current building codes.	FALSE	Planning Director suggested taking it out completely as a problem statement

2006 Problem Statements Discussion			
	Problem Statements	T/F	Changes/Actions
17	The County lacks resources and funding to restore historical sites, if they suffer severe damage.	TRUE	But group decided to take it out as a problem statement.
18	There is a lack of NOAA weather warning radios in households throughout County, especially in areas that would receive the greatest impact of severe weather.	TRUE	Take out the word "Households"
19	There is a lack of public education concerning what to do after an event occurs.	TRUE	
20	There not enough shelters for the medically fragile, which are those people who do not have AC units or proper heat in their homes.	TRUE	Change the word "proper" to "adequate"
21	There is a lack of coordination for volunteers after an event.	FALSE	Clark County now has a Volunteer Reception Center
22	There is a lack of public education for residences and businesses concerning the dangers of fuel tanks (e.g. securing them to a permanent structure, ensuring adequate tank structure strength).	TRUE	But group decided to take it out as a problem statement.
23	Animal removal and protection during severe storms is difficult.	TRUE	Add the word "carcass" to Animal, to read Animal carcass removal.
24	There is a lack of essential supplies (e.g. food, clothing) for designated emergency shelters.	FALSE	
25	There is a lack of community education on the hazards associated with flooding, such as driving through standing water.	TRUE	
26	Roads blocked by flood waters cause delay in emergency response.	TRUE	Add the words "and bridges" after roads.
27	The County lacks emergency trained personnel and equipment for underwater recovery.	FALSE	

2006 Problem Statements Discussion			
	Problem Statements	T/F	Changes/Actions
28	Many bridges and culverts are susceptible to flood damage and need to be mapped for emergency response operations.	TRUE	Take out the portion of needs to be mapped.
29	Many roads have been constructed below the 100-year floodplain elevation and are continually blocked by flood waters causing delays in emergency response due to finding alternate routes.	TRUE	But add to #26
30	The County lacks an early warning system for communities downstream of C.J. Reservoir dam.	FALSE	But included as part of #2 and #3
31	Individual communities must rely on the Sheriff's Dept. to actuate sirens and are unable to actuate the siren themselves until after a formal protocol is followed by the Sheriff's Dept. to verify the sighting of a funnel cloud.	FALSE	
32	Clark County does not have any type of debris management program in place.	FALSE	
33	Clark County lacks a domestic water management-conservation program.	FALSE	
34	The County does not have established enforceable open burning bans during droughts.	UNSURE	Need to investigate with fire departments
35	Farmers may not have adequate feed and water for livestock during drought conditions.	TRUE	
36	The County lacks adequate emergency response personnel and equipment for firefighting due to wild land fires.	FALSE	Accomplished through mutual aid
37	The electrical grid is taxed because of excess use of AC, which causes brownouts.	FALSE	
38	Clark County has a problem with residential water wells going dry during extremely hot, dry conditions.	FALSE	

2006 Problem Statements Discussion			
	Problem Statements	T/F	Changes/Actions
39	There is a lack of Crop Insurance across the County and no marketing to farmers to carry such insurance.	FALSE	
40	There is a problem with log jams in rivers and streams that can cause/contribute to flooding	NEW	
41	There is a problem with crop residue in rivers and streams that can cause/contribute to flooding	NEW	
42	Infrastructure improvements are needed in floodplain and related areas to assist is water flow	NEW	

The updated problem statements were rewritten to address the current County issues necessitating mitigation action.

The top 3 problem areas were identified to be:

- Communication
- Public Education in all respects including before, during, and after a hazard event
- Maintaining a power source at all critical facilities

The final list of updated problem statements were summarized in the following table and identified as true statements.

2012 Problem Statements Redefined			
	Problem Statements	T/F	Changes/Actions
1	There are no permanent structures for designated emergency shelters in any of the mobile home parks or campgrounds in Clark County.	TRUE	
2	Debris in roadways, including downed utility lines, caused by high winds block roadways causing delays in emergency response.	TRUE	No real way to mitigate that
3	Some critical facilities, those facilities that need to maintain power at all times, are not equipped with back-up generators in the event of a power outage.	TRUE	Add the word "some" to critical facility to make it more accurate

2012 Problem Statements Redefined			
	Problem Statements	T/F	Changes/Actions
4	All communities located in Clark County may not be able to communicate with each other based on the type of communication used within a particular community (actual equipment used, radios, etc).	TRUE	
5	There needs to be better communication between the County, surrounding counties, and state and federal government agencies during and after severe storm events.	TRUE	
6	Severe storms can have drastic effects on public and critical utilities in Clark County due to downed power lines, tree limbs, etc.	TRUE	
7	There is a lack of lightning detection equip in Clark County.	TRUE	
8	The County lacks portable generators for sensitive populations who may need power for life support systems, in case of an extended power outage.	TRUE	EMA maintains a list of those facilities and there is a limited number of them. Plans are to send the effected general population to extended care facilities or fire departments
9	The County lacks resources and funding to restore historical sites, if they suffer severe damage.	TRUE	But group decided to take it out as a problem statement.
10	There is a lack of NOAA weather warning radios throughout the County, especially in areas that would receive the greatest impact of severe weather.	TRUE	
11	There is a lack of public education concerning what to do after an event occurs.	TRUE	
12	There are not enough shelters for the medically fragile, which are those people who do not have AC units or adequate heat in their homes.	TRUE	
13	There is a lack of public education for residences and businesses concerning the dangers of fuel tanks (e.g. securing them to a permanent	TRUE	But group decided to take it out as a problem statement.

2012 Problem Statements Redefined			
	Problem Statements	T/F	Changes/Actions
	structure, ensuring adequate tank structure strength).		
14	Animal carcass removal and protection during severe storms is difficult.	TRUE	Add the word "carcass" to Animal, to read Animal carcass removal.
15	There is a lack of community education on the hazards associated with flooding, such as driving through standing water.	TRUE	
16	Roads and bridges blocked by flood waters cause delay in emergency response.	TRUE	Add the words "and bridges" after roads.
17	Many bridges and culverts are susceptible to flood damage and need to be mapped for emergency response operations.	TRUE	Take out the portion of needs to be mapped.
18	Many roads have been constructed below the 100-year floodplain elevation and are continually blocked by flood waters causing delays in emergency response due to finding alternate routes.	TRUE	But add to #26
19	The County does not have established enforceable open burning bans during droughts.	UNSURE	Need to investigate with fire departments
20	Farmers may not have adequate feed and water for livestock during drought conditions.	TRUE	
21	There is a problem with log jams in rivers and streams that can cause/contribute to flooding	NEW	
22	There is a problem with crop residue in rivers and streams that can cause/contribute to flooding	NEW	
23	Infrastructure improvements are needed in floodplain and related areas to assist in water flow	NEW	

3.4 Mitigation Strategy – Updated Goals

I. Mission

It is the intent of the Clark County Hazard Mitigation Committee to provide one common goal as reflected in this plan, along with their corresponding objectives to increase awareness and guide future mitigation activities within Clark County. The process is necessary to reduce loss of life, property damage, and risk to the citizens of Clark County by implementing these goals.

Comment: The plan mission remains the same as per the 2006 plan with simplification of one common goal throughout the various hazards that may affect Clark County.

II. Public Participation

The overall goal of the Clark County Hazard Mitigation Planning Committee has been established from input of the professionals serving on the committee and from the four open public planning meetings and collaboration efforts from recommendations of the many local, county and state agencies that have assisted with mitigation strategies. The Clark County Hazard Mitigation Committee has examined the issues of the general public, public agencies, and their representatives, private organizations and community planning organizations to prepare a plan that best addresses the County's needs.

Comment: Revisions reflect the outcome of the April, 2011 planning session meetings.

III. Review of Clark County's Mitigation Goals

The CCHMC reviewed the 2006 goals and determined that the following goals should be promoted throughout all of the hazards that may affect Clark County. The goals and objective for all hazards were streamlined as follows:

Goal 1: Promote and educate citizens about the emergency management cycle and reduce the impact of hazards.

Objectives:

1. Promote development standards.
2. Promote safe rooms and shelters.

Goal 2: Enhance public safety services for alert & notification and response capabilities.

Objectives:

1. Improve communication and warning systems.

2. Increase response and recovery capabilities.
3. Support and maintain critical facilities during hazard events.

Goal 3: Conduct mitigation efforts in known and potential flooding areas.

Objectives:

1. Mitigate structures and roadways in flood prone areas.
2. Preserve floodplain areas along river corridors.

3.5 Implementation of Priority Action Items

As the history and vulnerability analysis indicates, the potential for loss of life and destruction during hazards events is very real for Clark County.

For hazard events, advance warning and a safe place to be is essential in reducing the number of injuries or loss of life. The essentials of good communication, public education (before, during and after hazard events) and power at critical facilities all were determined to be of high priority.

In accordance with the history and vulnerability analysis, flooding of various types continue to create problems for many of the townships, cities, and villages throughout Clark County. Several of these problems are ongoing and need resolve. Many have been identified in other existing county, city, and village planning documents. The Clark County Hazards Mitigation Planning Committee has seen the successful completion of many of the high priority items identified in the 2006 plan. As a result of these positive actions, the Clark County Hazard Mitigation Committee re-evaluated the remaining action items in the 2006 plan as well as new action items that have been added to the current plan.

The Clark County Hazards Mitigation Planning Committee used similar criteria for evaluating each set of activities based on grouping by hazard. The ranking criteria used are as follows:

ACTION ITEM PRIORITIZATION

Range of Points Awarded:	Likely 1	Unlikely 5
1. Are there sufficient staff and resources for implementation of the mitigation activity?		
2. Is the action item consistent with community plans and goals?		
3. Will financial and social benefits be achieved?		
4. Does it address a hazard where there have been repetitive impacts or occurrences?		
5. Is the action item cost effective?		
6. Will the action item, to the extent possible, contribute to a long term solution to the problem it is intended to address?		
7. Is there funding currently available to complete the action?		

Once the Action Items were rated they were categorized as high, moderate, or low priority items based on the scores.

The Clark County Hazard Mitigation Countywide and Community Action Items follow and indicate which goal is to be met and with each update whether it is a new, completed, unchanged or deleted action item.

There is a description of the action item to be addressed, the name(s) of the coordinating organization or agency in charge of implementation and type of funds needed or to be utilized to complete the item.

A timeline identifies the years the project is anticipated to be completed as well as the priority level determined from the rating process of the action items. Some action items are ongoing year after year and therefore do not have a completion date established.

The Clark County Hazard Mitigation Countywide and Community Action Items are shown on the following pages.

3.6 CLARK COUNTY HAZARD MITIGATION ~ COUNTYWIDE ACTION ITEMS

January 2012- 5 Year Plan Update

Revised 8-27-13

Action Item Number	New	Completed	Deleted	Unchanged	Ongoing	City Village Township Countywide	Hazard Type				Action Item	Coordinating Organization or Service Agency	Potential Funding Source	Funding Cost Level	Timeline (Begin)	Timeline (End)	Priority Level	Plan Goals Addressed		
							Flooding	Tornados	Severe Storm	Other								Goal 1: Education & Hazard Impact Reduction	Goal 2: Public Safety Service Response	Goal 3: Flood Mitigation Efforts
1					X	Countywide	X	X	X	X	Continue public education program for informing residents of the hazards associated with severe weather.	Citizen's Corps Agencies	Existing Budget	Low	8/17/2012	8/17/2017	HIGH	X		
2				X		Countywide	X	X			Encourage property owners of proper utilities maintenance, including trimming trees or burying power lines.	Local Jurisdictions and Utilities Agencies	Existing Budget	Low	8/17/2012	8/17/2017	LOW	X		
3				X		Countywide	X		X		Develop and implement a domestic water management/conservation program, to include livestock.	Utilities, Agricultural Society, and Soil & Water Conservation	Existing Budget	Medium	8/17/2012	8/17/2017	MED	X		
4				X		Countywide	X	X	X		Promote NOAA weather radio usage for the County.	EMA and Core Group	Existing Budget	Low	8/17/2012	8/17/2017	HIGH		X	
5				X		Countywide	X	X	X		Seek funding to purchase additional communication equipment for use by Public Safety.	EMA and Public Safety Agency	Special Funding	Medium	8/17/2012	8/17/2017	HIGH		X	
6	X					Countywide	X	X	X		Develop and implement a communications plan between the surrounding counties, regional and state government agencies during and after hazard events.	EMA and Public Safety Communications	Special Funding	Low	8/17/2012	9/1/2013	HIGH		X	
7				X		Countywide	X	X	X		Seek funding to review and revise existing storm water ordinances to address existing developments.	Local Jurisdictions	Local/Special	Medium	8/17/2012	8/17/2017	LOW			X
8	X					Countywide	X				Seek funding to elevate to elevate low laying roadways that continuously flood.	Local Jurisdiction, Engineer, and EMA	Special Funding	Medium	8/17/2012	8/17/2017	LOW			X
9	X					Countywide	X				Remove debris in river and streams that contributes to flooding.	EMA and Jurisdictions having Authority	Property Owners / Special	Medium	8/17/2012	8/17/2017	MED			X
10	X					Countywide	X				Mitigate structures within respective flood areas.	EMA and Local Jurisdictions (FEMA)*	Special Funding	High	8/17/2012	8/17/2014	HIGH			X
11	X					Countywide	X				Infrastructure improvements are needed in floodplain and related areas to assist in water flow.	EMA and Local Jurisdictions	Special Funding (FEMA)*	High	8/17/2012	8/17/2016	MED			X

* Benefit Cost Analysis Required

3.6 CLARK COUNTY HAZARD MITIGATION ~ COUNTYWIDE ACTION ITEMS

January 2012- 5 Year Plan Update

Revised 8-27-13

Action Item Number	Action Taken					City Village Township Countywide	Flooding	Tornadoes	Severe Storm	Other	Action Item	Coordinating Organization or Service Agency	Potential Funding Source	Funding Cost Level	Timeline (Begin)	Timeline (End)	Priority Level	Plan Goals Addressed		
	New	Completed	Deleted	Unchanged	Ongoing													Goal 1: Education & Hazard Impact	Goal 2: Public Safety Service Response	Goal 3: Flood Mitigation Efforts
12				X		Countywide	X	X	X	X	Update mapping system to identify existing shelters, where residents can go to seek safety in the event of severe weather. Coordinate with the Red Cross on identifying existing shelters.	Red Cross, GIS and EMA	Existing Budget	Medium	8/17/2012	8/17/2017	HIGH		X	
13					X	Countywide	X	X	X		Provide back-up generators for critical facilities, including shelters, which need to maintain continuous power to protect human health and life.	Red Cross and EMA	Special Funding	Medium	8/17/2012	9/1/2014	MED		X	
14				X		Countywide	X	X	X		Provide permanent shelters for mobile home parks and campgrounds, where citizens may seek safety.	Local Jurisdiction and EMA	Special Funding (FEMA)*	High	8/17/2012	9/1/2016	LOW		X	
15				X		Countywide	X				Mapping existing critical culverts and storm drainage ditches near residential areas, roadways and low lying areas throughout the County.	GIS	Existing Budget	Medium	8/17/2012	8/17/2017	LOW		X	
16				X		Countywide	X	X	X		Develop and coordinate use of temporary facilities for non-life threatening emergencies to alleviate the overloading of the medical facilities.	EMA, Health District, and Hospital	Existing Budget	Low	8/17/2012	9/1/2016	MED		X	
17				X		Countywide	X	X	X		Maintain the Volunteer Reception Center for coordinating volunteers who are willing to help with a severe weather incident.	Citizen's Corps Agencies	Special Funding	Medium	8/17/2012	8/17/2017	HIGH		X	
18					X	Countywide	X	X	X		Provide designated locations/facilities to house displaced animals after hazard events.	Agricultural and Humane Societies	Existing Budget	Low	8/17/2012	8/17/2017	MED		X	
19				X		Countywide	X	X	X		Develop plan for mass animal carcass disposal to prevent spread of disease after a hazard event.	Agricultural and Humane Societies and Health District	Existing Budget	Medium	8/17/2012	9/1/2016	LOW		X	
20	X					Countywide	X	X	X		Incorporate functional needs into existing plans and procedures.	Health District, Red Cross and EMA	Existing Budget	Medium	8/17/2012	9/1/2015	HIGH		X	

* Benefit Cost Analysis Required

3.7 CLARK COUNTY HAZARD MITIGATION ~ COMMUNITY ACTION ITEMS
January 2012- 5 Year Plan Update

Revised 8-27-13

Action Item Number	Action Taken				City Village Township Countywide	Hazard Type				Action Item	Coordinating Organization or Service Agency	Potential Funding Sources	Level of Cost	Timeline (Begin)	Timeline (End)	Project Priority Level	Plan Goals Addressed		
	New	Completed	Deleted	Unchanged		Ongoing	Flooding	Tornados	Severe Storm								Other	Goal 1: Education & Hazard Impact Reduction	Goal 2: Public Safety Service Response
1				X	City of Springfield	X	X	X	X	Continue public education program for informing residents of the hazards associated with severe weather.	City Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low	X		
2				X	City of New Carlisle	X	X	X	X	Continue public education program for informing residents of the hazards associated with severe weather.	City Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low	X		
3				X	City of Springfield		X	X	X	Encourage property owners of proper utilities maintenance, including trimming trees or burying power lines.	City Officials	Existing Budget	Med	8/17/2012	8/17/2017	Low	X		
4				X	City of New Carlisle		X	X	X	Encourage property owners of proper utilities maintenance, including trimming trees or burying power lines.	City Officials	Existing Budget	Med	8/17/2012	8/17/2017	Low	X		
5	X				Mad River Township		X	X		Provide tornado sirens.	Township Officials	Special Funding (FEMA)*	Med	8/17/2012	9/1/2014	High		X	
6	X				Moorefield Township		X	X		Provide tornado sirens.	Township Officials	Special Funding (FEMA)*	Med	8/17/2012	9/1/2014	High		X	
7			X		City of Springfield/ Springfield Township	X				W. First Street flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	Low	8/17/2012	8/17/2017	Med			X
8			X		City of Springfield/ Springfield Township	X				Lower Valley Pike flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	Med	8/17/2012	8/17/2017	Med			X
9			X		City of Springfield/ Springfield Township	X				Tillie Lane flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	High	Completed	Completed	Med			X
10			X		City of Springfield/ Springfield Township	X				Upper Valley Pike flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	Med	8/17/2012	8/17/2017	Med			X

* Cost Benefit Analysis Required

3.7 CLARK COUNTY HAZARD MITIGATION ~ COMMUNITY ACTION ITEMS

January 2012- 5 Year Plan Update

Revised 8-27-13

Action Item Number	Action Taken				City Village Township Countywide	Hazard Type				Action Item	Coordinating Organization or Service Agency	Potential Funding Sources	Level of Cost	Timeline (Begin)	Timeline (End)	Project Priority Level	Plan Goals Addressed		
	New	Completed	Deleted	Unchanged		Ongoing	Other	Flooding	Tornadoes								Severe Storm	Other	Goal 1: Education & Hazard Impact Reduction
11				X	City of Springfield/ Springfield Township	X				S. Scarff Road flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	Low	8/17/2012	8/17/2017	Med			X
12				X	City of Springfield/ Springfield Township	X				Kenton Street flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	Low	8/17/2012	8/17/2017	Med			X
13				X	City of Springfield/ Springfield Township	X				Mitchell Boulevard flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	Low	8/17/2012	8/17/2017	Med			X
14				X	City of Springfield/ Springfield Township	X				South Charleston Pike flooding acquisition project.	City/Township Officials	Special Funding (FEMA)*	High	8/17/2012	8/17/2017	Med			X
15	X				City of New Carlisle	X				Flooding: State Route 571 west of city by ballfield.	City Officials	Special Funding	High	8/17/2012	8/17/2017	Med			X
16	X				Village of Catawba	X				Flooding: State Route 54 North and Champaign Street.	Village Officials	Special Funding	High	8/17/2012	8/17/2017	Med			X
17	X				Village of Enon	X				Flooding: Main Street, Green Vista & Coronado Trail.	Village Officials	Special Funding	High	8/17/2012	8/17/2017	Med			X
18	X				Village of North Hampton	X				Flooding: Undersized culvert at State Route 41 west of Asbury Church.	Village Officials	Special Funding (FEMA)*	High	8/17/2012	8/17/2017	Med			X
19	X				Village of Trenton	X				Flooding due to older undersized culverts	Village Officials	Special Funding (FEMA)*	High	8/17/2012	8/17/2017	Med			X
20	X				Bethel Township	X				Flooding @ Spangler Road and Lower Valley Pike.	Township Officials	Special Funding	High	8/17/2012	8/17/2017	Med			X
21	X				Mad River Township	X				Flooding at Old Mill Road.	Township Officials	Special Funding	High	8/17/2012	8/17/2017	Med			X

* Cost Benefit Analysis Required

3.7 CLARK COUNTY HAZARD MITIGATION ~ COMMUNITY ACTION ITEMS

January 2012- 5 Year Plan Update

Revised 8-27-13

Action Item Number	Action Taken				City Village Township Countywide	Hazard Type				Action Item	Coordinating Organization or Service Agency	Potential Funding Sources	Level of Cost	Timeline (Begin)	Timeline (End)	Project Priority Level	Plan Goals Addressed		
	New	Completed	Deleted	Unchanged		Ongoing	Flooding	Tornados	Severe Storm								Other	Goal 1: Education & Hazard Impact Reduction	Goal 2: Public Safety Service Response
22	X				Village of Enon	X	X	X	X	Secure and install emergency generator for water facility.	Village Officials	Special Funding	Med	8/17/2012	9/1/2016	High		X	
23	X				Village of North Hampton	X	X	X	X	Secure and install emergency generator for water facility.	Village Officials	Special Funding	Med	8/17/2012	9/1/2016	High		X	
24	X				Village of South Vienna	X	X	X	X	Secure and install emergency generator for water facility.	Village Officials	Special Funding	Med	8/17/2012	9/1/2016	High		X	
25	X				German Township		X	X		Provide tornado safe room.	Township Officials	Special Funding (FEMA)*	High	8/17/2012	9/1/2017	High			X
26	X				Harmony Township		X	X		Provide tornado safe room.	Township Officials	Funding (FEMA)*	High	8/17/2012	9/1/2017	High			X
27	X				Village of Donnelsville		X	X		Removal of dead trees within public right-of-way.	Village Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X
28	X				Village of Clifton		X	X		Community assessment for high wind event mitigation projects.	Village Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X
29	X				Village of South Charleston		X	X		Community assessment for high wind event mitigation projects.	Village Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X
30	X				Village of Tremont City		X	X		Removal of dead trees within public right-of-way.	Village Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X
31	X				Green Township		X	X		Removal of dead trees within public right-of-way.	Township Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X
32	X				Pike Township		X	X		Removal of dead trees within public right-of-way.	Township Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X
33	X				Pleasant Township		X	X		Removal of dead trees within public right-of-way.	Township Officials	Existing Budget	Low	8/17/2012	8/17/2017	Low			X

* Cost Benefit Analysis Required

Plan Maintenance Process

- 4.1 Overview
- 4.2 Monitoring the Plan
- 4.3 Evaluating the Plan
- 4.4 Updating the Plan
- 4.5 Incorporating Clark County's Plan into Existing Planning Mechanisms
- 4.6 Continued Public Involvement

4.1 Overview

This Multi-Jurisdictional County Hazard Mitigation Plan is a prerequisite for receipt of Hazard Mitigation Assistance Grant Project Funds under the Disaster Mitigation Act of 2000 (DMA 2000). FEMA has established mitigation planning requirements for local jurisdictions to meet. Each plan must demonstrate that the proposed mitigation actions are the result of a thorough planning process that describes the inherent risk and the capabilities of Clark County and its communities. All incorporated municipalities participated in the current planning process and all municipalities adopted the previously approved 2006 Clark County Hazard Mitigation Plan.

It is anticipated over time through good planning efforts and coordination between State and County Emergency Management Agencies and communities that all mitigation plans will become more enhanced and refined. It is the intention of the Clark County Hazard Mitigation Planning Committee to support pre-disaster planning and project activities that can help reduce risk and mitigate future disaster costs for Clark County.

4.2 Monitoring The Plan

The Clark County Emergency Management Agency under the direction of the Clark County Board of Commissioners shall monitor the Plan. The Clark County EMA shall at the end of each year collect and update reports from each coordinating organization indicating the status and progress on each action item or activities that occurred during the preceding year.

The Clark County EMA shall obtain information on each project activity as to whether the activity is completed, deleted, ongoing, or unchanged. If the activity is deleted or unchanged, the County EMA should report the reasoning as to why the action item was deleted or unchanged. The Clark County EMA shall also request consideration for new activities. This information will be requested from the coordinating organizations at the beginning of each year so that the Clark County EMA can prepare a report to be provided to the Clark County Hazard Mitigation Committee (CCHMC) and distributed to CCHMC members along with the yearly meeting agenda at the annual Hazard Mitigation Committee meeting to be held in February of each year.

The Clark County Hazard Mitigation Committee shall then utilize the report to assist in evaluating the Plan each year.

Table 4.2A

Plan Monitoring Schedule		
Timeline	Action	Responsible Party
December 31st	Year's activity reporting, cycle ends	Coordinating organizations
January 15th	Coordinating organizations' status reports due to Clark County EMA	Coordinating organizations
February 1st	Clark County EMA yearly reports due to Chairperson of Clark County Hazard Mitigation Committee (CCHMC)	Clark County EMA
February 15th	Chairperson of CCHMC distributes agenda and reports to CCHMC and stakeholders	Chairperson of CCHMC
Last week of February	CCHMC holds annual mitigation meeting	CCHMC
March 15th	Minutes of annual meeting distributed to CCHMC members and stakeholders	Chairperson and Secretary of CCHMC
April 15th	Plan amendments/updates shall be added to Plan	Clark County EMA

4.3 Evaluating The Plan

The Clark County Hazard Mitigation Committee (CCHMC) will be the lead organization to evaluate the Plan. The CCHMC will meet yearly at an annual public meeting to evaluate the mitigation strategies of the Plan. The yearly meeting shall be scheduled in February of each year by the Chairperson of the CCHMC. Prior to the meeting, the Clark County Emergency Management Agency shall prepare a yearly progress report indicating the status for all the mitigation activities outlined in the Plan. The meeting shall be open to the public with all CCHMC members invited. An agenda shall be prepared and the meeting shall include the following:

- Review of past years mitigation activities.
- Evaluating if past years conditions warrant any changes to the Plan.
- Determine if any action items need added, deleted, or if actions are ongoing or completed.
- Consideration if other stakeholders or organizations need to be invited to be represented on the committee.
- Review of project funding sources.

Minutes of the meeting shall be prepared and distributed to all CCHMC members and stakeholders. Special meetings of the Clark County Hazard Mitigation Committee may be held any time throughout the year as conditions warrant and when requested by the Chairperson of the Clark County Hazard Mitigation Committee.

4.4 Updating The Plan

The Clark County Emergency Management Agency under the direction of the Clark County Board of Commissioners shall be the responsible party for updating the Clark County Hazard Mitigation Plan. It shall be updated by addendum on an annual basis. The schedule for monitoring, evaluating, and updating the Plan is shown in Table 4.2A under Section 4.2 of this Plan.

The Plan updates will include a summary of changes including:

- Status of mitigation/activity items.
- Changes in prioritization of mitigation activity items.
- New mitigation activities/items to be added and the priority of the activities/items.
- The Plan updates shall identify the completed, deleted, ongoing, or unchanged action items from the prior year's activities; and, if not according to the benchmark schedule, a description of why activities have been deleted or changed.
- One year prior to the expiration of the 5-year FEMA plan approval date, the Clark County Hazard Mitigation Plan shall be reevaluated and reviewed per the 5-year Planning Update Process required by law.

4.5 Incorporating Clark County's Plan into Existing Planning Mechanisms

Summary

Clark County has two cities, 8 incorporated villages, and 10 township governments that are located within the boundary of the County. The population of the 8 villages range from 49 residents in the Clark County portion of the Village of Clifton to the Village of Enon with 2,638. The two cities are City of Springfield population 60,608 and the City of New Carlisle population 5,785. With such diverse population from rural to metropolitan, 100% participation of all public entities incorporating the mitigation goals and objectives into their planning mechanisms can be a difficult task.

However, Clark County and its government entities have for many years supported comprehensive planning and zoning efforts. The following planning mechanisms assist in coordinating a positive endeavor of hazard mitigation activities in Clark County.

4.5.1 Comprehensive Planning

Comprehensive plans and land use plans specify how a community should be developed (and where development should not occur). Through these plans, uses of land can be tailored to match the land's hazards. Comprehensive planning reflects what a community wants to see happen to their land in the future. A comprehensive plan can look 5, 10, or even 20 years into the future to help a community plan and shape how they envision their community. However, planning is only one part of the puzzle and usually has limited authority. Tied with zoning comprehensive planning can be more effective.

Crossroads: A Comprehensive Plan for Clark County Communities

Clark County has developed a comprehensive land use plan that provides general guidance regarding important land use and capital improvement decisions affecting Clark County and its communities. This plan was originally adopted by the Clark County Planning Commission on February 24, 1999, the Board of Clark County Commissioners on May 4, 1999, and the Springfield City Planning Board on May 11, 1999. Amendments were adopted in April 2001 by the Clark County Planning Commission, in May 2001 by the Board of Clark County Commissioners and in July 2001 by the Springfield City Planning Board.

This Plan included six goals, 17 objectives and 103 strategies which are outlined in the chapter entitled: Goals, Objectives and Strategies. The essence of the Plan was to manage the County's growth while preserving farmland and open space, diversifying the economic base and ensuring sufficient utility services. When considering all the strategies together, the following themes emerged:

- Encourage well-managed growth in Springfield and other communities in central and southwestern Clark County with a focus on in-fill development before expansion, and where current development trends support such growth and where utility services are available.
- Encourage countywide cooperation to manage growth, supporting central utility systems and discourage on-site utilities through stronger regulations, and encourage adoption of access management standards.

- Strengthen the transportation system through coordinated planning, adopting countywide access management standards, ensuring pedestrian access, creating a countywide transit system, improving infrastructure and maximizing funding.
- Diversify the County's economic base by supporting workforce development, supporting industrial parks and encouraging industrial expansion and encourage commercial revitalization in city and village downtowns.
- Encourage the preservation of prime agricultural areas by directing development away from such areas, creating a non-profit land trust, updating regulations to discourage development and adopting incentives.
- Coordinate countywide parks master planning, stabilize parks funding, create additional public parkland and expand bike path systems.
- Protect and manage the County's natural resource base through creation of a non-profit land trust, institute a county wide geographic information system, implement the Transportation Plan and strengthen development regulations.

A. Zoning Ordinance and Building Codes

A zoning ordinance regulates development by dividing the community into zones or districts and establishing the type of development allowed within each district. The floodplain can be designated as one or more separate zoning districts in which development is prohibited or allowed only if it is not susceptible to flood damage. Some districts that are appropriate for floodplains are those designated for public use, conservation or agriculture. Zoning works best in conjunction with a comprehensive plan or “road map” for future development and building codes.

Clark County adopted County zoning regulations in 1984, which apply to the following townships: Bethel, Green, Harmony, Mad River, Madison, Moorefield and Pleasant. German, Pike and Springfield townships have separate zoning regulations. All other townships enforce their own zoning regulations and standards.

Building codes provide some of the best methods of addressing all the hazards in this plan. They are the prime measure to protect new property from damage by high winds, tornadoes, earthquakes, hail, and winter storms. When properly designed and constructed according to code, the average building can withstand the impact of most of these forces.

The Clark County Building Regulations is a certified building department authorized by the State of Ohio to enforce residential and commercial building codes at a local level. They are State Certified and adhere to all related codes and regulations to which the State of Ohio adheres. These codes include International Codes related to building, mechanical, plumbing, fire, maintenance and electrical work. The Clark County Building Department also enforces Heating, Ventilating and Air Conditioning (HVAC) codes, electrical codes and flood damage prevention codes. They have jurisdiction in the unincorporated areas of Clark County and the following incorporated areas: Catawba, South Vienna, South Charleston, North Hampton, Donnelsville, New Carlisle and Enon (Commercial Only).

Clark County Zoning Regulations

The Clark County Zoning Regulations were approved on May 1, 1984. Since that time,

the regulations have been amended 17 times with the last amendment occurring on September 3, 2004. These regulations work in conjunction with the Clark County Land Use Plan and the provisions outlined in the Clark County Subdivision Regulations, to help regulate and/or protect the location and use of land, buildings and structures for agricultural and resource protection and for residential, commercial and industrial development. The regulations are the minimum requirements necessary for the promotion of the public health, public safety and general welfare. However, the 17 amendments changed the zoning regulations to go beyond the minimum requirements as stated in the original document.

The Regulations are divided into 10 Chapters and include, but are not limited to, General Zoning District Regulations, Overlay Zoning District Regulations, Off-Street Parking and Loading/Unloading, Supplementary Regulations and Administration and Support.

City of Springfield Zoning Regulations

The City of Springfield Zoning Regulations were adopted in their entirety by Ordinance No. 01-236 on June 26, 2001, and were updated and signed into legislation on March 9, 2004. There are 40 Chapters that comprise these regulations.

Some of the chapters included in these regulations are General Provision, Green Space, Park and School District, Ohio Flood Plain (OFP) Overlay District, Off-Street Parking Requirements, Sign Requirements and Tree Regulations. The purpose of these regulations is to protect the property rights of all individuals of the City of Springfield by assuring the compatibility of uses and practices within districts; to facilitate the provision of public utilities and public services; to lessen congestion on public streets, roads and highways; and to provide for the administration and enforcement of this ordinance, including the provision of penalties for its violation.

Village of South Vienna Zoning Ordinance No. 75-2

The purpose of the South Vienna zoning ordinance is to promote the public health, safety and morals; to conserve and protect property and property values; to secure the most appropriate use of land to regulate the density of population and to facilitate adequate and economical provisions for public improvements, all in accordance with a comprehensive plan for the desirable future development of the Village; and to provide a method of administration and to prescribe penalties for the violations of provision hereafter described – all as authorized by the Ohio Revised Code and by the Charter of the Village of South Vienna, Ohio. The ordinance contains 17 articles that include, but are not limited to Districts and Boundaries Thereof, General Provisions, Residence “R1” Districts and Commercial “C1” Districts.

B. Open Space Preservation

Open space preservation is a technique that can be used to not only preserve floodplains but to preserve lands that may be crucial to controlling runoff that adds to flood problems. Existing undeveloped areas can be preserved as open space through zoning ordinances. Lands that ought to be set aside as open space but are already being put to other uses can be

converted to public ownership (acquisition) or to public use (easement). Once the land is owned by the county, municipality, or state, buildings and other development that are subject to flood damage can be removed or prohibited. Open space lands and easements do not always have to be purchased outright. Developers can be required to dedicate land to the public for a park and/or to provide easements for flood flow, drainage, or maintenance.

Open Space Plan for National Trail Parks and Recreation District (NTP&RD) and Clark County Park District (CCPD)

The National Trail Parks and Recreation District (NTP&RD) and Clark County Park District (CCPD) combined resources to implement and adopt *The Open Space Plan for National Trail Parks and Recreation District and Clark County Park District*. It was adopted by the NTP&RD on April 9, 2001 and by the CCPD on April 2, 2001. This plan intends to be a guide to define, designate and describe open space parklands throughout Clark County. Included in the plan is an analysis of the existing parklands in the County, and strategies for maintaining and protecting open space throughout Clark County to expand park and recreation systems to ensure accessibility for all residents. The following list is some of the strategies discussed:

- Work toward stable and diverse funding sources.
- Work with planning and zoning organizations to adopt open space/parks dedication requirements in subdivision regulations.
- Promote good stewardship of land, air and water resources.
- Use the Crossroads Comprehensive Land Use Plan as a part of the planning process.
- Establish a “docent” program for all open space parks, especially those with limited access.

Clark County Farmland Preservation Report

In February 1999, the Board of Clark County Commissioners appointed a 15 member panel to be the Clark County Farmland Preservation Task Force. The members of the Task Force represented a cross section of public and private sector interests. Resource agencies included the Clark County Planning Commission, the Clark County Auditor, the Clark County Soil and Water Conservation District (SWCD) and Ohio State University (OSU) Extension Agency. The primary objective of the Task Force was to prepare recommendations to be included in a County farmland preservation plan by the end of 1999 for presentation to the Board of County Commissioners.

In October 1999, The Clark County Farmland Preservation Report was adopted. The purpose of the report was to review data, analyze trends and provide suggestions and recommendations for various boards and agencies to use when making decisions that affect agricultural areas of Clark County. The following are 10 recommendations the Task Force regarded as the most important to consider when implementing agricultural preservation strategies.

1. Develop consistency between the existing Clark County Comprehensive Plan, the Clark County Water and Sewer Plan and future farmland preservation efforts.

2. Support efforts at the State level to eliminate the 5 acre exemption, improve Heath Department installation, inspection and maintenance of on-site septic systems, increase Current Use Agricultural Value (CUAV) minimums and provide funding for easement acquisition programs in long-term agricultural primacy areas.
3. Focus agricultural zoning concepts in Harmony, Green, Madison and Pleasant townships and work with Pike and German townships to coordinate county facility expansion plans to support existing and future agricultural zoning concepts.
4. Adopt zoning standards that clearly articulate development locations to be sited on non-prime sites and allow increased density based upon percentage of non-prime soils.
5. Target agricultural primacy areas and consider utilizing it to secure frontage development areas if purchase of development rights becomes a viable financial option.
6. Adopt strict Access Management Guidelines at the County level to control location and amount of curb cuts allowed on state and county roads.
7. Develop zoning and subdivision language that allows for or requires conservation development subdivisions.
8. Explore alternatives to current on-site septic systems, such as evapotranspiration systems, constructed wetlands, etc.
9. Identify areas of continued animal agriculture and adopt strict agricultural zoning standards with large required setbacks in surrounding areas.
10. Require more development, especially residential, to be served by public sewer and water.

C. Subdivision Regulations

Subdivision Regulations govern how land will be broken up into individual lots. These regulations set construction and location standards for the infrastructure built by the developer, including roads, sidewalks, utility lines, storm sewers, storm water retention or detention basins, and drainage ways.

Clark County Subdivision Regulations

On October 22, 1975, Clark County enacted subdivision regulations. They are administered by the Clark County Planning Commission and the Clark County Commission. They were last amended on December 18, 2002 by the Clark County Planning Commission and on February 11, 2003 by the Clark County Commission. The subdivision regulations were adopted to provide an adequate urban pattern for allocating sufficient and convenient open areas for traffic, utilities, recreation, light, air and the avoidance of congestion of population. Each municipality has its own planning commission. Therefore, subdivision regulations are adopted and enforced at the municipal level.

Clark County Subdivision Technical Specifications

The construction specifications for subdivision development were adopted in April 1978 and revised twice, first in March 1979 and again in November 1995. This document was

prepared by the Clark County Engineer and provides engineering, materials and construction specifications to be used when creating detailed construction drawings for new roads and drainage improvements in Clark County. It is divided into six articles: Article I, Engineering Drawings; Article II, Street Design Standards; Article III, Drainage Design Standards; Article IV, Sanitary Sewers; Article V, Water Mains; and Article VI, Standard General Notes.

Subdivision Regulations for Springfield, Ohio

Subdivision Regulations for the City of Springfield have been in effect since February 1968 and have been updated eight times, with the last update occurring in 2003. The City Planning Board is authorized to adopt rules and regulations governing plats and subdivisions of land within its jurisdiction. A regional planning commission established by exercise of the City Planning Board's powers is also authorized to adopt rules and regulations concerning plats and subdivisions of land within its jurisdiction. The subdivision regulations were adopted to provide an adequate urban pattern for allocating sufficient and convenient open areas for traffic, utilities, recreation, light, air and the avoidance of congestion of population.

D. Manufactured Homes

Previously, the location and installation of manufactured and mobile homes were regulated at the local level of government, with the construction and fabrication standards being set by the United States Department of Housing and Urban Development (HUD). All mobile type homes constructed after 1976 must comply with HUD's National Manufactured Home Construction and Safety Standards. These standards apply uniformly across the country and it is illegal for a local unit of government to require additional construction requirements.

The installation of manufactured homes in Clark County is currently regulated by Senate Bill 102, which became effective on August 6, 2004. This bill created the Ohio Manufactured Homes Commission to regulate the installation of manufactured housing, which includes mobile and manufactured homes, and vests it with the exclusive authority to regulate manufactured housing installers, the installation of manufactured housing and manufactured housing foundations and support systems. The bill set forth that municipal corporations and other political subdivisions are preempted from regulating and licensing installers and regulating and inspecting the installation of manufactured housing and manufactured housing foundations and support systems. The Commission has exclusive power to adopt rules of uniform application throughout the state to govern the installation of manufactured housing, the inspection of manufactured housing, the inspection of manufactured housing foundations and support systems, the training and licensing of manufactured housing installers, and the investigation of complaints concerning manufactured housing installers. No political subdivision of the state or any other department or agency of the state may establish any other standards.

The Commission must establish standards by rule that govern the installation of manufactured housing, with the minimum standards being the model standards the Secretary of the United States Department of HUD adopts. The standards established by the Commission must be consistent with, and not less stringent, than the standards adopted by

the Department of HUD. The Commission has the exclusive authority to make rules regarding “blocking” and “tiedowns” of mobile and manufactured homes. The Commission must also approve permanent foundations to which a mobile or manufactured home may be affixed.

The City of Springfield Zoning Regulations discuss measures that need to be taken for a manufactured home that is not subject to the manufactured home requirements of Ohio Revised Code Section 3733.01, but is located within all areas of special flood hazard areas where the BFE has been determined. There are two standards stated with this determination:

1. Manufactured homes shall be anchored in accordance with Subsection 1127.20(a)
2. Manufactured homes shall be elevated on a permanent foundation such that the lowest floor of the manufactured home is at or above the BFE.

E. Floodplain Regulations

Communities that adopt and enforce a floodplain management ordinance, to regulate new and existing development within the floodplains can significantly reduce the effects of flood damage. Communities typically adopt minimum standards that are recommended by FEMA. The objective of these regulations is to ensure that development will not aggravate existing flooding conditions and that new buildings will be protected from flood damage. Zoning and open space preservation work to keep damage-prone development out of hazardous or sensitive areas while floodplain development regulations impose construction standards on what is allowed to be built in the floodplain.

On July 2, 1987, Clark County adopted Flood Damage Prevention Regulations pursuant to authorization contained in Section 307 of the Ohio Revised Code. These regulations apply to all areas of special flood hazard within the jurisdiction of Clark County. The purpose of the implementation of these flood regulations is to protect human life and health, minimize public money expenditure for flood control projects, minimize need for rescue and relief efforts associated with flooding, minimize prolonged business interruptions, minimize damage to public facilities and utilities, maintain a stable tax base by providing for the proper development in flood prone areas to minimize future flood blight areas, ensure potential buyers are aware that property lies in a floodplain and to ensure that those who occupy flood hazard areas assume responsibility for their actions. The regulations consist of five sections that outline definitions, general provisions, such as which lands need to comply, administration, such as permitting and general and specific standards, such as construction materials and methods and floodways. In addition to meeting the minimum standards for the State of Ohio, they require construction of buildings or structures to be two feet above the highest adjacent grade elevation.

The City of Springfield Zoning Regulations discuss methods of reducing flood loss in Chapter 1127, Flood Plain Overlay District, including the following:

- Restrict or prohibit uses which are dangerous to health, safety and property due to water hazards, or which result in damaging increases in flood heights or velocities.
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction.
- Control the alteration of natural flood plains, stream channels and natural protective barriers which help accommodate or channel flood waters.

- Control filling, grading, dredging and other development which may increase flood damage.
- Prevent or regulate the construction of flood barriers that will unnaturally divert flood waters or that may increase flood hazards in other areas.

Incorporated areas are also required to have floodplain regulations pursuant to authorized information in Section 307 of the Ohio Revised Code. These regulations are the same as the Flood Damage Prevention Regulations described previously.

All of Clark County is in compliance with state floodplain management standards and participates in the NFIP as previously discussed in Section 4.4.1.

F. Drainage Regulations

In order to protect a county's natural resources a community can implement regulations such as County Water Management and Sediment Control (WMSC) Regulations. The purposes of these regulations are to protect the county's water resources by ensuring that the proper storm water and erosion and sediment control measures are in place. Erosion and sediment control measures are called Best Management Practices (BMPs), and when installed and maintained correctly, they help prevent soil from leaving the site. Storm water control measures ensure that the volume of storm water runoff remains the same as before development occurs.

Some examples of what can go into a County WMSC Ordinance are as follows:

- Submit a WMSC Plan for proposed commercial, industrial, or residential development sites on parcels greater than five acres.
- Submit an abbreviated plan for sites on parcels less than five acres and part of a larger plan of development.
- Submit a plan for residential dwellings only if a village, township, or city zoning requires them to do so. They must check with the appropriate community for this information.
- Comply with the regulations whether or not a plan is required. All county residents are responsible for being familiar and complying with the regulations.

A designated agency should inspect sites to ensure that the regulations are being followed correctly. The designated agency should also work diligently to review plans and perform site inspections to ensure that these erosion and sediment control measures are in place.

The Codified Ordinances of Springfield, dated August 1995, contains Part Nine: Streets, Utilities, and Public Service Code, Title Six: Storm water Regulations. The storm water regulations include planning standards to achieve a level of management and conservation practices that will control wind and water erosion of the soil and minimize the degradation of water resources by soil sediment in conjunction with land grading, excavating, filling or other soil-disturbing activities on land used or being developed for non-farm commercial, industrial, residential or other non-farm purposes, and establish criteria for determination of the acceptability of such management and conservation practices. These standards are designed to implement applicable water quality management and non-point source management plans adherent to the Federal Water Pollution Control Act.

The Clark County Subdivision Technical Specifications under Article III: Drainage Design Standards contains a storm water runoff policy. It discusses certain design principles required to emphasize control of storm water on-site, through the use of retention, detention, storage and other measures. The design principles include hydrologic and hydraulic design and calculations, as well as tables that provide storm frequency and intensity and duration of storms within Clark County. The application of these control measures are expected to have beneficial downstream effects by increasing infiltration and reducing both peak runoff and total short term runoff.

Miami Conservancy District Phase II Storm Water Management Program

The Miami Conservancy District (MCD) is required to submit a storm water management plan (SWMP) in accordance with 40 CFR Part 122.32 and Ohio Law. This document contains that program which will be executed during the five years of coverage under Ohio's General Permit. The program will reduce the discharge of pollutants to the maximum extent practicable, to protect water quality, and to satisfy the appropriate requirements of the Clean Water Act in accordance with the National Pollutant Discharge Elimination System and Ohio EPA's Phase II Storm water program. The SWMP addresses the six minimum control measures as required by federal and state regulations. The Notice of Intent (NOI) and SWMP were submitted to the Ohio EPA I March of 2003. The MCD, as a watershed-based organization whose mission includes the conservation of water resources, accepts responsibility for implementing BMPs under minimum control measures of public education and outreach on storm water impacts, public involvement and participation and illicit discharge detection and elimination within the five year permit period.

4.5.2 Natural Resource Protection

A. Riparian Buffer/Wetland Protection

Riparian area refers to the vegetated area next to a watercourse often thought of as the floodplain and its connected uplands. Riparian buffers can protect water resources from non-point source pollution and provide bank stabilization, flood storage and aquatic wildlife habitat. They can be a natural resource management tool used to limit disturbance within a certain distance of a water course to maintain streamside vegetation. Some communities in the State of Ohio have proceeded to adopt riparian buffer overlays and zoning ordinances to reap the benefits of such protection.

Establishing vegetation is discussed in *The Codified Ordinances of Springfield Part Nine: Streets, Utilities, and Public Service Code, Title Six: Storm water Regulations*. The document states that a permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. It further discusses the definition of permanent vegetation, which is not considered established until adequate ground cover is achieved, is mature enough to control soil erosion satisfactorily and is able to survive adverse weather conditions. The City Engineer determines whether or not these standards are met.

B. Urban Forestry

Eighty percent of Ohioans live and/or work within urban areas. The quality of life for them and their families is dependent upon the urban environment. Healthy trees enhance this environment by promoting clean air and water, increasing property values, reducing erosion and storm water runoff, providing wildlife habitat, moderating temperature, lessening energy demands, and offering year-round enjoyment.

Ohio's Urban Forestry Program was created in 1979 within the ODNR to promote trees and other vegetation as tools to enhance the quality of life within cities and villages. The purpose of the Urban Forestry Program is to provide community officials and allied agencies with the organizational and technical ability to effectively manage the trees along streets, within parks, and on public grounds. Through a statewide network of regional urban foresters, the program helps communities manage their urban forest resources to meet their local needs.

Trees are particularly subject to damage by tornadoes, wind, ice and snow storms. Downed trees and branches break utility lines and damage buildings, parked vehicles, and anything else beneath them. An urban forestry program can reduce the damage potential of trees. A properly written and enforced urban forestry plan can reduce liability, alleviate the extent of fallen trees and limbs caused by wind and ice build-up, and provide guidance on repairs and pruning after a storm. Such a plan helps a community qualify to be a Tree City USA.

Ohio has been the Tree City USA national leader for the past 23 years. There are 233 Tree Cities USA in Ohio. Counties are not eligible for the program but can implement the credited activities. In Clark County, Springfield and New Carlisle are members of the Tree City USA program. The City of Springfield has permanent employees on staff for tree maintenance.

The City of Springfield Zoning Regulations contains Chapter 1158, entitled Tree Regulations. The purpose of the regulations is to assure that trees are planted and/or preserved with the development or redevelopment buildings and parking areas, and with the establishment of conversion of uses according to the best ecological concepts, environmental objectives and site planning principles. Chapter 1158 also discusses the recommended species to plant, planting sizes and placement of trees on specific areas, such as within right-of-ways, parking areas and residential property.

C. Flood Compensation Banking

A flood compensation bank is a detention basin that is used for floodplain encroachment compensation or for flood storage in which the basin's volume may be purchased to mitigate the effects of new development. A development may purchase storage volume from a bank to compensate for floodplain encroachment or to satisfy storm water detention requirements provided the basin is within the appropriate zone of influence.

Clark County has criteria established for retention and detention basins for controlling storm water runoff. The basic premise is that land uses and developments which increase the runoff rate and volume shall be required to control the discharge rate of runoff prior to its release to an off-site outlet which may be a retention or detention basin. Any increase in the

volume of site surface drainage water resulting from accelerated runoff caused by site development shall be controlled so that the post development peak rate of runoff does not exceed that of the predevelopment stage, for all 24-hour storms between a one year frequency and the critical storm frequency. These criteria can be found in the Clark County Subdivision Technical Specifications, which are administered by the Engineer's Office.

D. Watershed Planning Efforts

Three different watersheds influence drainage in Clark County: the Mad River, Great Miami River and Little Miami River. Local waterways include the Mad River that enters Clark County from just west of the middle of the County's northern boundary, and flows southerly leaving the County at the southwestern corner. Principal tributaries are Logonda/Buck Creek, Donnels Creek and Honey Creek. Beaver Creek is a large branch of Buck Creek. The Little Miami River rises in the southeast part of the County and leaves through the middle of the southern border. North Fork and Lisbon Fork are principal branches of the Little Miami River.

Currently, Clark County does not have a watershed management plan enacted. However, plans for implementation have begun through the SWCD office.

E. Habitat Restoration

In urbanized watersheds, some stream and/or rivers suffer the effects of increased erosion and water quality problems because of the amount of development that is occurring in a given area. Bioengineering techniques can help prevent further degradation and also provide water quality and habitat benefits.

Biotechnical practices use vegetative or other natural materials to achieve stream management objectives, usually erosion control. One of the chief advantages of biotechnical practices is that they help restore natural stream features, like in-stream habitat and streambank vegetation. The materials used for biotechnical practices are generally less expensive than for more traditional approaches, but installation is more labor intensive and they may require more frequent maintenance.

The ODNR has published a *Stream Management Guide #10*. This Guide is one of a series of Ohio Stream Management Guides covering a variety of watershed and stream management issues and methods of addressing stream related problems. It maps and briefly describes some of the many projects that have been constructed in Ohio using biotechnical practices, including the installation date. In 1992, 150 linear feet of willow posts were installed to control stream bank erosion in Green Township, Clark County.

The Clark County SWCD currently promotes several habitat restoration programs and projects as described in the following paragraphs.

Continuous Conservation Reserve Program (CCRP)

The Continuous Conservation Reserve Program (CCRP) program is for landowners with cropland planted to commodity crops. The CCRP helps farmers establish grassed

waterways, vegetative filter strips, water control structures, shallow water wetlands and riparian forest buffers. The cost share pays for approximately 90% of the establishment costs. In order to become eligible, the land must have been cropped four of the past six years. In Clark County, there is a continuous sign-up period for CCRP and applications are ranked and funded once per year, on a statewide funding availability basis.

Conservation Reserve Program (CRP)

The Conservation Reserve Program (CRP) provides technical and financial assistance to eligible farmers and ranchers to address soil, water and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State and tribal environmental laws, and encourages environmental enhancement. CRP is administered by the Farm Service Agency, with the National Resource Conservation Service (NRCS) providing technical land eligibility determinations, conservation planning and practice implementation.

The CRP reduces soil erosion, protects the ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat and enhances forest and wetland resources. The program encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost sharing is provided to establish the vegetative cover practices. The cost share for establishing vegetative cover is 50%. In Clark County, announcements concerning the amount of funding available are made annually.

Wildlife Habitat Incentives Program (WHIP)

Wildlife Habitat Incentives Program (WHIP) is a voluntary cost-share program for people who want to improve terrestrial and aquatic habitat for fish and wildlife on private lands. The program provides technical and financial assistance for implementing conservation plans to improve wildlife habitat. Emphasis is placed on warm-season grassland habitat and wetland habitat creation. The program uses 5 to 15 year cost-share agreements and cost share rates are 75% for establishment of practices. Landowners may chose to bid-down their cost share rate to improve chances of funding. In Clark County, there is a continuous sign-up period for WHIP and applications are ranked and funded once per year, on a statewide funding availability basis.

Wetland Reserve Program (WRP)

The Wetland Reserve Program (WRP) program aims to restore wetlands and permanently protect streams in the county. Seventy-five to 100% cost shares are provided to restore areas that were once wetlands in agricultural areas. The restoration practices include grade stabilization structures, riparian forest buffers, tree establishment, warm season grass establishment and sediment filtering basins. Permanent stream protection is achieved through conservation easements. The United States Department of Agriculture (USDA) can

reimburse landowners up to \$2,000/acre for conservation easements along streams. The easement requires the landowner to make a commitment to leave the stream natural for this payment. In Clark County, there is a continuous sign-up period for WRP and applications are ranked and funded once per year, on a statewide funding availability basis.

Environmental Quality Incentive Program (EQIP)

The Environmental Quality Incentive Program (EQIP) was established in the 1996 Farm Bill, and reauthorized in the 2002 Farm Bill, to provide a voluntary conservation program to assist farmers and ranchers who are faced with serious threats to soil, water and related natural resource concerns.



EQIP assisted farmland

The EQIP provides educational assistance to landowners and promotes agricultural production and environmental quality as compatible national goals. The EQIP also offers financial and technical help to assist eligible participants install or implement structural and management conservation practices on eligible agricultural land. Eligible practices include waste storage structures, pasture water supply and fencing practices, erosion control practices and others.

On September 21, 2004, an additional \$1,000,000 in funds was allocated to Ohio livestock producers to improve manure and forage management. This additional money will bring the statewide money available to \$13,000,000 and will now provide assistance to more than 1200 EQIP contracts. The USDA is in charge of determining the awards and awarded Clark County \$25,991 as shown in the table below:

Environmental Quality Incentive Program Additional Funds

Ohio County	Additional Funds	Ohio County	Additional Funds	Ohio County	Additional Funds
Adams	\$96,065	Gallia	\$49,725	Miami	\$24,412
Ashland	\$4,630	Geauga	\$2,740	Monroe	\$13,418
Athens	\$9,000	Guernsey	\$34,560	Morgan	\$5,200
Belmont	\$3,025	Harrison	\$5,450	Morrow	\$46,084
Carroll	\$21,190	Highland	\$6,240	Muskingum	\$3,700
Clark	\$25,991	Hocking	\$5,700	Perry	\$27,130
Coshocton	\$26,470	Holmes	\$45,685	Preble	\$36,416
Crawford	\$34,324	Huron	\$83,681	Richland	\$18,662
Cuyahoga	\$1,350	Jefferson	\$8,375	Washington	\$13,840
Darke	\$169,176	Knox	\$44,652	Wayne	\$58,940
Delaware	\$36,167	Lorain	\$6,279	Wood	\$22,275
Erie	\$10,692	Meigs	\$4,950	TOTAL	\$1,006,194

F. Watershed Protection Projects

The Clark SWCD is actively involved with three watershed protection projects aimed to improve water quality in the streams, creeks and lakes of Clark County: Lower Mad River Watershed Protection Project, Honey Creek Watershed Protection Project and Upper Little Miami and Caesar Creek Watershed Project.

The Upper Little Miami and Caesar Creek Watershed Project was awarded \$496,270 on October 17, 2002. The project offers various types of agricultural cost-share to implement agricultural BMPs in the watershed that lies in Greene, Clinton, Warren, Montgomery and Clark Counties. The project also addresses on-site septic problems by providing cost-share funds for maintenance. The state/local match is \$923,820.

G. Watershed Groups

B-W Greenway Community Land Trust

The B-W Greenway Community Land Trust works to educate the public about the value of wetlands and the importance of connecting the Beaver Creek and Wenrick Wetlands with a greenway. The organization works with seven jurisdictions and attempts to incorporate the greenway into their comprehensive plans. The organization also partners with the Beavercreek Wetlands Association and the Clark County Park District (CCPD) and other organizations, educates landowners and the community on the importance of wetlands for Clark County and actively participates in inventory and restoration projects.

The Honey Creek Watershed Association

The Honey Creek Watershed Committee was originally known as The Honey Creek Watershed Association. It is a chartered non-profit organization. The Honey Creek Watershed Association is devoted to the protection and enhancement of the outstanding water resources of the Honey Creek which flows through Champaign, Miami, Clark and Montgomery Counties.



Little Miami Incorporated (LMI)

The Little Miami Incorporated (LMI) is a citizen non-profit organization founded in 1967, and is dedicated to conserving the natural splendor of the Little Miami National and State Scenic River. The LMI currently protects over 30 nature preserves along the Little Miami and its tributaries, working with riverfront landowners, developers, local officials and others to preserve critical riparian lands for wildlife habitat, quiet public enjoyment and a source of clean drinking water.

Little Miami River Partnership

The Little Miami River Partnership is a non-profit organization formed in 1996 that works to coordinate and support efforts to maintain and improve the entire Little Miami River watershed through partnerships, planning, education and commitment.

The following are some of the organization's major accomplishments:

- Completed a watershed restoration plan for the Upper Little Miami and Caesar Creek sub-watersheds that has been approved by both Ohio EPA and U.S. EPA.
- Re-activated the Technical Committee that is working on watershed-wide data identification, collection, storage and availability for water quality and land use data.
- Created a draft Strategic Planning document that the Partnership uses as a guide to reach goals and objectives over the next several years.
- Coordinated efforts with other watershed management efforts including the Upper Little Miami 319 grant project and the East Fork Watershed project.

Miami Conservancy District (MCD)

The MCD is a watershed-based organization that was established in 1915 to provide flood protection for the Miami Valley after the Great Flood of 1913. The challenge for the conservancy group is to maintain and continue upgrading the region's flood protection system, while working to protect and preserve the Great Miami River watershed and the region's valuable water resources. The MCD's Watershed Initiatives Team works with other local watershed coordinators and community leaders with the goal of combining forces to have the most positive impact on water quality in the Great Miami River watershed. This partnership group has been calling themselves the Great Miami River Watershed Alliance. The Watershed Alliance meets quarterly to discuss items of mutual concern, share ideas, review projects and effectively leverage resources. Members of the Alliance include watershed coordinators, soil and water conservation professionals, OSU Extension personnel, environmental planners, as well as representatives from local governments, state agencies and universities.

H. City of Springfield Wellhead and Well Field Protection Management Plan

In February 1999, the City Commissioners of Springfield adopted *The City of Springfield, Ohio Wellhead and Well Field Protection Management Plan*. The Commissioners, in cooperation with the Ohio EPA joined together with various members of the County that included local farmers, members of the OEMA and members of Springfield's Environmental Risk Office to establish this program. The main focus of the plan is to protect the City of Springfield's well field, and subsequently the drinking water provided to the citizens of the greater Springfield area.

The plan development process was an arduous one and took 10 years to complete. The plan contains nine sections that include, but are not limited to, inspection procedures, a contingency plan, a monitoring plan and a pollution source inventory. It is through this plan that monitoring and inventories of agricultural, commercial/industrial and storage tanks can be generated. These inventories and site inspections were performed in 1999, 2001 and 2003. All documentation is kept on file at the Clark County Health District. The contingency plan included short-term and long-term alternate sources for drinking water.

I. Groundwater Pollution Potential of Clark County, Ohio Report No. 38

In March 1995, The Groundwater Pollution Potential of Clark County, Ohio was prepared. The purpose of the report and map generated during the report writing process is to aid in the protection of groundwater resources in Clark County. The Depth to Water, Net

Recharge, Aquifer Media, Soil Media, Topography, Impact of the Vadose Zone Media and Hydraulic Conductivity of the Aquifer (DRASTIC) system, a mapping system developed by the ODNR Division of Water, was used to evaluate an area's potential for groundwater pollution. The ground water pollution map has been prepared to assist planners, managers and state and local officials in evaluating the relative vulnerability of areas to groundwater contamination from various sources of pollution. This information can be used to help direct resources and land use activities to appropriate areas, or to assist in protection, monitoring and clean-up efforts.

4.5.3 Emergency Services

Emergency Services protect people before, during, and after a disaster. A good emergency management program addresses all hazards, natural and man-made. It involves the active participation and involvement of all County's departments and municipalities. Emergency services include:

- Threat Recognition
- Warning
- Response
- Evacuation and Sheltering
- Post-Disaster Recovery and Mitigation

A. Threat Recognition

The first step in responding to a hurricane, flood, tornado, or other natural hazard is knowing when weather conditions are such that an event could occur. With a proper and timely threat recognition system, adequate warnings can be disseminated.

B. Warning

After there is a potential hazard recognized following steps must be taken to notify the public of its possible onset. Early and specific warnings allow more people the ability to set protection procedures in motion.

The NWS issues notices to the public using two levels of notification:

Watch: conditions are right for flooding, thunderstorms, tornadoes or winter storms.

Warning: a flood, tornado, etc. has started or has been observed.

A more specific warning may be disseminated by the community in a variety of ways. The following are the more common methods:

- Commercial or public radio or TV stations
- The Weather Channel
- Cable TV emergency news inserts
- Telephone trees/mass telephone notification
- NOAA Weather Radio
- Tone activated receivers in key facilities
- Outdoor warning sirens
- Sirens on public safety vehicles

- Door-to-door contact
- Mobile public address systems
- E-mail notifications
- Text messaging
- Social media
- Text messaging

In Clark County, the City of New Carlisle has manually activated sirens within its jurisdiction, which can be used to notify residents of potential hazards. Currently, only German Township and New Carlisle have sirens.

Cable television is available throughout Clark County and has a system available for providing warnings to all cable television viewers of potential hazards. Weather alert radios, local radio broadcasting stations and local television stations and a mass notification system to reach residents' home and cell phones are also used to provide warning to the jurisdiction. Many schools and extended care facilities in Clark County have weather alert radios. Cell phones, telephones and radios are utilized to notify Emergency Operations Center (EOC) staff and emergency personnel.

The local Emergency Alert System stations that provide continuous public information about emergencies are listed as follows:

- WHIO (Broadcast System)
- WTUE/WONE (Broadcast System)

Special warning capabilities are required for emergencies at the Buck Creek State Park and the Clark County Fairgrounds between May and October for those occupying campground areas. Special warning capabilities are also required for those residents living below the Clarence J. Brown Reservoir in the event of a possible dam failure. In the event of problems in these areas, law enforcement personnel with mobile public address systems and fire departments conducting door-to-door notifications alert the public.

C. Response

The protection of life and property is the most important task of emergency responders. Concurrent with threat recognition and issuing warnings, a community should respond with actions that can prevent or reduce damage and injuries.

Typical actions and responding parties include the following:

- Activate the emergency operations center (emergency preparedness)
- Close streets or bridges (sheriff or public works)
- Shut off power to threatened areas (utility company)
- Pass out sand and sandbags (public works)
- Hold children at school/releasing children from school (school superintendent)
- Open evacuation shelters (Red Cross)
- Monitor water levels (EMA)
- Establish security and other protection measures (police/sheriff)

An emergency operations plan ensures that all bases are covered and that the response activities are appropriate for the expected threat. These plans are developed in coordination with the agencies or offices that are given various responsibilities.

The Clark County EOP is a requirement of the Ohio Revised Code, Section 5502.271. The purpose of the Clark County EOP is to outline predetermined emergency management activities and operations for response agencies within Clark County that will allow rapid response, efficient use of resources, and maximize recovery from emergencies.

The EOP is designed to work for all types of natural and man-made disasters. The document has a Basic Plan which defines and identifies areas of potential risk, lists people and organizations involved in response situations, and discusses plan development and maintenance.

The Basic Plan is augmented with Emergency Support Function (ESF) Sections that describe the details of various aspects of emergency response. Some examples of these ESF include Communications, Law Enforcement, Public Health and Medical, and Resource Management. There also are annexes that discuss terrorism.

The plan contains guidelines with respect to roles and responsibilities. The EOC is responsible for coordinating the conduct of emergency operations from that center, or from an alternate facility during emergencies. The EOC, in coordination with the Incident Commander at the site and the EMA, is the point of contact for all operating/responding departments and agencies, other counties and the State.

The EOP also lists the following plans that have been adopted in Clark County.

- A. Clark County HAZMAT Plan 2011
- B. Clark County Mass Casualty Plan 2005
- C. Clark County Terrorism/Weapons of Mass Destruction Plan 2002
- D. Clark County Data Directory (Updated Annually)
- E. Clark County Dam Safety Plan (ODNR)

City of Springfield Emergency Management Plan

The City of Springfield Emergency Management Plan combines standard operating procedures from various city departments and complies with Clark County, State of Ohio and FEMA plans and regulations. The plan has been reviewed by all department heads and the City Manager and adopted, by ordinance, by the Springfield City Commission and was adopted on June 25, 2003. The plan assigns tasks and responsibilities to Springfield City department heads, specifying their roles during an emergency or disaster situation.

The purpose of the plan is to prepare, to the best degree possible, those actions to be taken by responsible officials during disaster and emergency conditions. It establishes capabilities for protecting citizens from the effects of disasters, effective response to actual occurrences of disasters and provisions for recovery in the aftermath of any emergency involving extensive damage or other debilitating influence on the normal pattern of life within the City.

By City Charter, responsibility for command during times of public danger and emergencies belongs to the Mayor of Springfield. If the Mayor is not available, succession of command is passed in accordance with the City Charter.

The plan is organized in the same manner as the *Clark County EOP*. The document has a Basic Plan which defines and identifies areas of potential risk, lists people and organizations involved in response situations, and discusses plan development and maintenance.

The Basic Plan is augmented with 18 annexes that describe the details of various aspects of emergency response. Some examples of these annexes include Notification, Warning, & Evacuation Procedures, Recovery & Reconstruction, Fire/Rescue Division, Law Department, Personnel and Planning & Development.

D. Evacuation and Sheltering

There are five key components to a successful evacuation:

1. Adequate warning
2. Adequate routes
3. Traffic control
4. Knowledgeable travelers
5. Care for special populations (i.e. handicapped, prisoners, school children)

In Clark County, the first fire department on the scene or the Incident Commander has certain responsibilities with regard to evacuation. Upon arriving at the scene of an emergency, he or she must evaluate the need for evacuation and organize forces should an evacuation be required. Depending on the nature of the hazard and the community to be evacuated, fire department personnel may notify the population by mobile public address systems, radio television or door-to-door notification, or a combination of these methods. They are required to maintain intelligence about hazard locations and coordinate with the American Red Cross (ARC) in order to determine the safest routes to shelters. Coordination is necessary with the Clark County EMA Director and the Public Information Officer in the Clark County EOC in order to determine the safest routes to shelters. Coordination is also necessary with other response and recovery personnel such as communications, utility providers, and building inspectors as necessary to determine when it is safe for evacuees to return home.

E. Shelter

Shelter is required for those who cannot get out of harms way. Typically, the ARC will staff a shelter and ensure that there is adequate food, bedding and washing facilities. Shelter management is a specialized skill. Managers must deal with problems like scared children, families that want to bring their pets and the potential for an overcrowded facility.

Tornadoes, storms, hazardous materials (HAZMAT) incidents and floods are among the top incidents that could cause emergency sheltering and mass care to be activated in Clark County. As such, shelters should be located out of the floodplain and have adequate structural integrity to withstand high winds and other natural hazards. Shelters should be capable of being sealed for protection from HAZMAT that may be involved at a nearby incident. The Clark County EMA maintains an agreement with the ARC for emergency

shelter and mass care services. The ARC also drills with the Clark County EMA accordingly. Extended care facilities in Clark County that provide long-term care have shelter provisions addressed in the Clark County Annual Community-Wide Transfer Procedure/Agreement.

F. Post-Disaster Recovery and Mitigation

After a disaster, communities should undertake activities to protect public health and safety and facilitate recovery. Appropriate measures include:

- Patrol evacuated areas to prevent looting
- Provide safe drinking water
- Monitor for diseases
- Vaccinate residents for tetanus
- Clear streets
- Clean up debris and garbage

Throughout the recovery phase, everyone wants to return to their daily routines. The problem is when recovery efforts are being instituted; people may be performing a quick fix that returns them to their daily routines faster. However, it is imperative that during this recovery phase every effort should be made to think about how to prevent repeated damage from happening if another disaster were to strike. Some efforts include:

- Advise residents through public information activities to advise residents about mitigation matters they can incorporate into their reconstruction work
- Evaluate damaged public facilities to identify mitigation measures that can be included during repair
- Acquire substantially or repeatedly damaged properties from willing sellers
- Plan for long term mitigation activities
- Apply for post-disaster mitigation funds.

In Clark County, the responsibility for damage assessment ultimately lies with the chief elected officials of Clark County, who use EMA damage assessments when dealing with private dwellings. Damage assessment personnel receive training through the Clark County EMA so that fast and accurate information can be collected and provided to the Clark County EOC. Damage assessment teams assigned by the Clark County EMA conduct initial damage assessments using fire and police reports and trained teams as soon as possible following the emergency and provide this initial report of damages to the Clark County EMA. This information is passed on to the Ohio EMA within 12 hours of the emergency since state and federal assistance programs are dependent on these assessments.

4.5.4 Flood Control

Flood control projects have traditionally been used by communities to control or manage floodwaters. They are also known as “structural” projects that keep flood waters away from an area as opposed to “non-structural” projects, like retrofitting, that do not rely on structures to control flows.

A. Flood Control Measures

The most common type of measures that keep flood waters away from an area are

reservoirs and dams, diversion channels, levees and floodwalls, and flood compensation banking.

B. Reservoirs and Dams

Reservoirs and dams impound water to reduce the amount of water that reaches an area at one time. A reservoir holds high flows behind a dam or in a storage basin. Water is released at a controlled rate. Reservoirs and dams are generally perpendicular to a stream or river.

The C.J. Brown Dam and Reservoir is located near Springfield and encompasses 2,120 acres. In September 1966, work was started by the U.S. Army Corps of Engineers to impound Buck Creek as a flood control project. In 1974, a cooperative management effort between the Corps of Engineers and the ODNR Divisions of Parks & Recreation and Natural Areas and Preserves was established. The lake serves to reduce flood stages downstream from the dam along the Ohio River Basin. The lake provides water supply storage and operates to increase natural low-flow conditions downstream of the dam in the interest of water quality control. The Corps of Engineers conducts an active natural resource management program to preserve natural areas and to provide suitable habitat for native fish and wildlife.

During the fall and winter months, the lake is kept at a relatively low level referred to as winter pool. Should heavy rains occur, surface water runoff is stored in the lake until the swollen streams and rivers below the dam have receded and can handle the release of the stored water without damage to lives or property. Within C. J. Brown Dam and Reservoir's relatively short history, it has prevented over \$3.4 million in possible flood damages.

C. Low Head Dams

A low head dam is a dam of low height, usually less than 15 feet, made of timber, stone, concrete, and other structural material, or some combination there of, that extends from bank to bank across a stream channel. Low head dams are constructed across the river channel to create a pool of water in the stream. They are built for a variety of purposes including, but not limited to diversion, grade control, water supply, gravel barriers, recreation, aesthetics and protection for utility crossings. Concrete, large rocks, wood, steel sheet piling and various combinations of the above are all common building materials in low head dams.

Table below lists the five lowhead dams recorded in Clark County.

Clark County Lowhead Dams

Waterway	Township	Longitude	Latitude	Descriptions
Buck Creek	Moorefield	-83.75	39.95	Buck Creek State Park dam northeast of Springfield, portage river right or left
Buck Creek	Moorefield	-83.75	39.95	Lowhead dam below earthen dam at Buck Creek State Park northeast of Springfield off Old Road
Buck Creek	Springfield	-83.81	39.93	Cliff Park/Veteran's Memorial Park off Fountain Street in Springfield, portage river right
Buck Creek	Springfield	-83.82	39.93	Snyder Park east of Plum Street in Springfield, portage river left at railroad trestle
Buck Creek	Springfield	-83.79	39.94	Adjacent to International Harvester Manufacturing Plant

D. Diversion Channels

A diversion is a new channel or overflow weir that sends floodwater to a different location, thereby reducing flooding along a watercourse. During normal flows, the water stays in the old channel. During flood flows, the stream spills over to the diversion channel.

According to the Clark County SWCD, there are no diversion channels located in Clark County.

E. Levees and Floodwalls

Levees and floodwalls restrain the flow of the stream or river. During a flood, the stream or river flow is not reduced; only confined. Levees and floodwalls are generally parallel to the flow of the stream.

According to the Clark County SWCD and the Clark County Engineer's Office, there are levees that run along portions of the Mad River and are located southwest of Springfield along State Route 4 near Snyder Park and extend north to the county line and beyond. There are also some levees that run along portions of Buck Creek from the east side of the downtown area of Springfield and extend northeast to the C.J. Brown Reservoir and through a portion of Snyder Park.

F. Drainage Maintenance

Man-made ditches and storm sewers help drain areas where the surface drainage system is inadequate, or where underground drainage ways may be safer or more practical. Particularly appropriate for depressions and low spots that will not drain naturally, drainage and storm sewer improvements are designed to carry the runoff from smaller, more frequent storms. There are three types of drainage improvements that are usually pursued to reduce storm water flooding: putting drainage ways in underground pipes, channelization, and removing obstructions caused by stream crossings, such as culverts and bridges with small openings. Because drainage ditches and storm sewers convey water faster to other locations, improvements are only recommended for small local problems where the receiving stream or river has sufficient capacity to handle the additional volume and flow of water. To reduce the cumulative downstream flood impacts of numerous small drainage projects, additional detention or run-off reduction practices should be provided in conjunction with the drainage system improvements.

Clark County's drainage improvements and maintenance activities are implemented through the County Engineer's office. Of the 10 townships located in Clark County, the Engineer's office maintains projects in eight of these townships. There are 24 ongoing projects located in the County. These include 23.8 miles of open ditch, 5.5 miles of waterway/tile, 1/4 of a mile of storm sewer and four retention ponds. Approximately 2/3 of the projects are located in the Mad River watershed while the remaining 1/3 are located in the Little Miami watershed.

The Engineer's Ditch department maintains those ditches that have been petitioned for cleaning, which then become a County maintained ditch. The Ditch department performs annual maintenance on these ditches. Annual maintenance activities include brush control, washout repair, debris and log jam removal, sandbar removal, slope stabilization and regrading ditches when necessary. A mowing program has also been implemented, with an attempt to mow each project area two to three times a year. Most County maintained ditches are in sufficient condition for drainage purposes.

4.5.5 Public Information

A successful hazard mitigation plan program involves both the public and private sectors. Public information activities advise property owners, renters and businesses about hazards and ways to protect people and property from these hazards. These activities can motivate people to take the steps necessary to protect themselves and others. Information can initiate voluntary mitigation activities at little or no cost to the government. Property owners mitigated their flooding problems long before there was government funding programs.

A. Outreach Projects

Outreach projects are the first step in the process of orienting property owners to the hazards they face and the concept of property protection. They are designed to encourage people to seek out more information in order to take steps to protect themselves and their properties. Research has proven that outreach projects work. However, awareness of the hazard is not enough; people need to be told what they can do about the hazard, so projects should include information on safety, health and property protection measures. Research has

also shown that a properly run local information program is more effective than national advertising or publicity campaigns. Therefore, outreach projects should be locally designed and tailored to meet local conditions.

The Clark County SWCD offers a number of environmental education classroom presentations. One that is geared toward lower elementary school children (grades K-3) is called “Water Flows/Soil Goes” and “Rock Milkshakes,” which teaches the concepts of weathering and erosion. Upper elementary, middle school and high school presentations include “Enviroscape Model,” in which students learn about water pollution and simple ways erosion and water contamination can be greatly reduced.

The Clark County EMA’s office distributes fliers at the Clark County Fair each year. They include Developing a Family Communications Plan, Getting Disaster Assistance, and How to Make a Kit of Emergency Supplies. The EMA office also issues news releases that include tips on preparing for a certain disaster as well as immediate news releases that warn residents of problem areas to avoid. Please see Appendix J for examples of these fliers and news releases.

The Clark County EMA’s office also sponsored Community Emergency Response Team (CERT) training. The last certification training was held at various times and locations in the Fall of 2004. This program was implemented by FEMA in 1994 and was designed to help prepare communities when a natural disaster occurs. The goal is for emergency personnel to train members of neighborhoods, community organizations or workplaces in basic resource skills. Members of CERT are then integrated into the emergency resource capability for their area.

B. Real Estate Disclosure

Many times after a natural disaster, people say they would have taken steps to protect themselves if only they had known they had to purchase a property that is exposed to a natural hazard. By reaching out to residents in a community to become informed as to what hazards are a potential in the community, the community has armed them with information that they did not have previously. This knowledge allows them to make an informed decision on purchasing insurance to cover their potential losses.

C. Federal Law

Federally regulated lending institutions must advise applicants for a mortgage or other loan that is to be secured by an insurable building whether the property is in a floodplain as shown on the FIRM. If so, flood insurance is required for buildings located within the floodplain if the mortgage or loan is federally insured. However, because this requirement has to be met only 10 days before closing, often the applicant is already committed to purchasing the property when he or she first learns of the flood hazard.

D. State Law

The state of Ohio’s Department of Commerce has a Residential Property Disclosure Form pursuant to section 5302.30 of the Revised Code and rule 1301:1-4-10 of the Administrative Code. It is to be completed by the owners who want to sell their property. Under a good faith stipulation, they are to note any areas of the house that may be dangerous

which include being in a floodplain/Lake Erie Coastal Erosion Area, whether there are drainage/erosion problems, and if there are zoning/code violations.

Clark County's and surrounding areas' multiple listing service does not include a listing of whether a property is in a flood zone or wetland. Disclosure practices are left up to the individual broker or agent.

E. Libraries and Websites

Clark County maintains a website of general County information such as departments and auditor's information (<http://www.co.clark.oh.us>). The County's General Plan as well as subdivision regulations can be found on the County's website.

The County website also features Global Information System software that enables a homeowner to locate their property and determine whether or not it lies in special zone flooding areas (<http://www.gis.co.clark.oh.us>).

Future Actions

The Clark County Mitigation Planning Committee will oversee and regularly monitor the progress of the Plan. The Clark County Hazard Mitigation Committee will strive to create sustainable communities that are resistant to human and economic costs of disasters. The local planning collaborative and sources will include:

- Elected officials and local administrators including:
 - County Commissioners and County Administrators
 - Mayors and Village Administrators
 - Township Trustees Association
- Planning expertise:
 - Clark County Planning Commission
 - Clark County Engineer
 - Springfield City Engineer
 - GIS Mapping
 - Community Development
 - Flood Plain Management
 - NFIP Insurance representative
- Local Boards and Services
 - Clark County Combined Health District
 - Clark County Park District
 - Clark County Soil and Water
 - Clark County Fire Chiefs Association
- Non-Profit Partners and Business Organizations
 - Clark County Red Cross Chapter
- Citizens
 - Local volunteers
- State Agencies
 - Ohio Emergency Management Agency
 - Ohio Department of Natural Resources
 - Ohio Department of Development

- Ohio Environmental Protection Agency
- Academic Institutes
 - Wittenberg University
 - Clark State Community College
- Media
 - Springfield News Sun

The Clark County Hazard Mitigation Committee will work through the above-referenced administrative officials and collaborative to begin to integrate the goals of the Clark County Hazard Mitigation Committee into the countywide general operations. By working within these established community organizations and representatives, this Plan will more efficiently implement and finance the hazard mitigation projects and programs. The goal is to update the work plans, policies, and procedures to include sound mitigation concepts into the daily operations of all administration programs.

Instead of relying solely on funding from hazard mitigation programs or external sources, the Clark County Hazard Mitigation Committee recommends that all Clark County communities including projects that address Mitigation activities.

The County, Cities, Villages, and Townships will include planning activities through their various departments and agencies to evaluate and carry out mitigation activities and initiatives. The Clark County Community Development will be encouraged to provide, as a part of its latest Plan, revised, effective up-to-date mechanisms for integrating mitigation practices into its comprehensive planning. A primary benefit of combining these processes is that they both influence the location, type, and characteristics of physical growth, specifically buildings and infrastructure.

The Clark County Hazard Mitigation Committee further recommends that awareness programs be developed to stimulate momentum to undertake mitigation initiatives. Public/private partnerships and the use of community volunteers and community public awareness are ways to help further the County's mitigation goals.

It is recommended by the Clark County Hazard Mitigation Committee to develop a written statement of mutual agreement for the various agencies and organizations that:

- A. Defines the duties and specific responsibilities among the different agencies and organizations.
- B. Provides a clear statement of values, principles, and community hazard mitigation goals and establishes an organization structure to assist in measuring and evaluating the Plan process.

The written statement of mutual agreement between various entities and partners shall include:

- The organization lead.
- The timeline.
- How the mutual agreement statement process is to be reviewed or revised.

- A statement on how decisions will be made.
- A statement on describing the circumstances under which each partner should consult each other.
- A statement requiring each partner or organization to submit periodic or annual updates on the progress or program.
- A statement on responsibility for actions.
- A statement on how each partner or organization with staff, provide technical resources and funding that the department, agency, or organization is expected to provide.

Upon commitment from all partners and organizations involved for each mitigation activity or process, the partner or organization shall provide annual updates to the Clark County Hazard Mitigation Committee which details the following information:

- The hazard mitigation action's objectives.
- Who the lead and supporting agencies responsible for implementation are.
- How long the project should take, including a delineation of the various states of work along with timelines (milestones should be included).
- Whether the resources needed for implementation, funding, staff time, and technical assistance are available, or if other arrangements must be made to obtain them.
- The types of permits or approvals necessary to implement the action.
- Details on the ways the actions will be accomplished within the organization, and whether the duties will be assigned to agency staff or contracted out.
- Current status of the project, identifying any issues that may hinder implementation.

It is the goal of the Clark County Hazard Mitigation Committee to break down the mitigation projects into smaller, more manageable tasks. This way the responsible agency, department, or organization can determine the particular details in order to incorporate these additional considerations into the routine of their daily operation.

Clark County Combined Health District Coordination during Hazard Events

Natural Hazards can affect the community with health risks. The Clark County Combined Health District must collaborate with the lead agency, Clark County Emergency Management as well as other support agencies during a hazard event. The following tables indicate hazards and how the public may be at risk. These tables also indicate some of the consequences that may be experienced by hazard event responders for the natural hazard event.

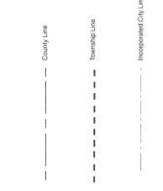
How does this Hazard Impact the local Public Health (PH) District? = Clark County Combined Health District (CCCHD)					
Hazards	Local Community What are the public health risks (Consequences) to the Local Community for the identified hazard.	Responders Identify who is Primary & who are the support agencies / responders for the identified hazard. What are the public health risks to responders for the identified hazard?	PH Capabilities	PH Resources	PH Operations
Natural Disaster: -Earthquake -Flood -Tornado -Excessive wind damage	-Mold -Communicable Disease -Contaminated Water / Wells -Vector Control -Debris Removal--- Landfill or other facility -Animal Decomposition -Contaminated food service facilities -Mass Casualty / Mass Fatality -Power outages -Functional Needs population issues	Lead Agency: Clark County Emergency Management Agency (CCEMA) Support Agencies: CCCHD, Red Cross, Greater Dayton Area Hospital Association (GDAHA), Law Enforcement (LE), Fire / EMS, County Coroner, Utility Services, County Engineer Responder Risks: -Search and Rescue Operations in damaged areas -Communicable Disease -Mental Stress -Over Exertion -Tetanus -Hepatitis -Lack of correct equipment	CCCHD: -Food inspection -Disease Surveillance -Mass Prophylaxis -Public Information -Water Testing -Damage assessment -Septic System Inspections -Shelter Inspections -Vital Statistics	CCCHD Resources: -Epidemiologist -Infectious Disease Control Nurse -Public Information Officers (PIO) -Vaccines -Hepatitis A -Tetanus -CCCHD staff -Academic Nursing Coalition for Disaster Preparedness (ANCDP) -CCCHD Management Team -Incident Command System (ICS) staff -POD supplies Potential hazard Impact to CCCHD resources listed: -Damage to PH facilities -Lack of personnel -Supply issues -Communication issues	CCCHD: -Open Department of Operations Center (DOC) -PIO Information release -Activate COOP -Send staff to Emergency Operations Center (EOC) if activated -Initiate a Point of Dispensing (POD) site if needed for vaccine administration -Assist other West Central Ohio (WCO) Local Health Districts (LHD)

<p>Terrorism/ CBRNE</p>	<ul style="list-style-type: none"> -Contaminated Water/Wells -Hazardous Material exposure -Mental Health -Radiation -Biological contamination -Crowded health care facilities -Disposition of dead -Prophylaxis of citizens -Casualty / Mass Fatality -Contaminated food service 	<p>Lead Agency: HAZMAT / Law Enforcement / FBI / CCCHD (if biological)</p> <p>Support Agencies: CCEMA, GDAHA, Red Cross, Fire / EMS</p> <p>Responder Risks: -Mental Stress -Over exertion -Search and Rescue Operations in damaged areas -Secondary Devices</p>	<p>CCCHD:</p> <ul style="list-style-type: none"> -Public Information -Chemical Health Advisories -Inspections -Surveillance – if biological -Activate POD sites -Activate Strategic National Stockpile (SNS) Mass Prophylaxis 	<p>CCCHD Resources:</p> <ul style="list-style-type: none"> -Management Staff -ICS Staff -PIOs -Multiple POD locations -CCCHD Staff -ANCDP <p>Potential hazard Impact to CCCHD resources listed: -Facility loss -Infrastructure loss -Reduced personnel -Lack of supplies</p>	<p>CCCHD:</p> <ul style="list-style-type: none"> -Open DOC if indicated -Staff to EOC if activated -Public Information messages -Epi & Surveillance -POD site activation when indicated -Assist other WCO LHDs
<p>Epidemic</p>	<ul style="list-style-type: none"> -Public Fear -Social Distancing & Quarantine Issues -Vaccination -Crowded Health Care Facilities -Lack of Care givers due to illness -Biological contamination -Prophylaxis of citizens -Functional Needs population issues 	<p>Lead Agency: CCCHD</p> <p>Support Agencies: CCEMA, GDAHA, Red Cross, Fire / EMS</p> <p>Responder Risks: -Exposure -Mental Health -Family members ill</p>	<p>CCCHD:</p> <ul style="list-style-type: none"> -Epidemiological disease surveillance -Activate SNS -Establish PODs -Mass Prophylaxis / vaccination -Public Information / education -Social Distancing -Isolation / Quarantine if feasible 	<p>CCCHD Resources:</p> <ul style="list-style-type: none"> -Management Team - ICS staff -PIOs -Multiple POD locations -CCCHD Staff -ANCDP -County Drop site <p>Potential hazard Impact to CCCHD resources listed: -Reduced personnel -Lack of supplies -Delayed decision-making from state or federal government.</p>	<p>CCCHD:</p> <ul style="list-style-type: none"> -Open DOC -Staff to EOC if activated -Public Information education / messages -Epi & Surveillance -POD activation when indicated -Assist other WCO LHDs

HAZMAT	<ul style="list-style-type: none"> -Chemical Exposure -Shelter-in-Place vs. Evacuation -Duration of Emergency -Respiratory distress 	<p><u>Lead Agency:</u> HAZMAT Team</p> <p><u>Support Agencies:</u> CCEMA, LE, Fire / EMS, CCCHD</p> <p><u>Responder Risks:</u> -Exposure -Over exertion</p>	<p><u>CCCHD:</u></p> <ul style="list-style-type: none"> -Public Information -Chemical Health Advisories -Inspections -Surveillance 	<p><u>CCCHD Resources:</u></p> <ul style="list-style-type: none"> -Management Team -ICS Staff -PIOs <p>Potential hazard <u>Impact to CCCHD resources listed:</u></p> <ul style="list-style-type: none"> -Facility loss -Infrastructure loss -Reduced personnel -Lack of supplies 	<p><u>CCCHD:</u></p> <ul style="list-style-type: none"> -Open DOC if indicated -Staff to EOC if activated -Public Information messages -Epi & Surveillance -POD activation
<p>Extreme Temperature (heat or cold)</p> <p>Winter Event (Ice, snow, blizzard)</p>	<ul style="list-style-type: none"> -Health of elderly and other at-risk (Functional Needs) populations – either event -Heat stroke / exhaustion -Respiratory distress -Hypothermia -Driving difficulties -Carbon Monoxide -Power outage 	<p><u>Lead Agency:</u> CCEMA / CCCHD</p> <p><u>Support Agencies:</u> LE, Fire / EMS, GDAHA / Cooling centers / ARC</p> <p><u>Responder Risks:</u> -Heat / Cold related injuries: Heat Stroke / Hypothermia -Dehydration -Hazardous Roads</p>	<p><u>CCCHD:</u></p> <ul style="list-style-type: none"> -PIO release safety information for Extreme heat or cold safety -Promote influenza vaccinations per ODH yearly guidelines 	<p><u>CCCHD Resources:</u></p> <ul style="list-style-type: none"> -Management Team -ICS Staff -PIOs -CCCHD Vehicles <p>Potential hazard <u>Impact to CCCHD resources listed:</u></p> <ul style="list-style-type: none"> -Lack of personnel due to weather event 	<p><u>CCCHD:</u></p> <ul style="list-style-type: none"> -Open DOC if indicated -Staff to EOC if activated -Public Information education / messages

Ground Water Pollution Potential of CLARK COUNTY

by
Michael P. Angie, Wayne Jones,
and
Joel D. Vormelker

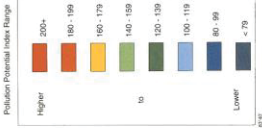


Description of Map Symbols

Hydrologic Region: 7A46
 9B1 - Revised Pollution Potential
 9B2 - Ground Water Quality

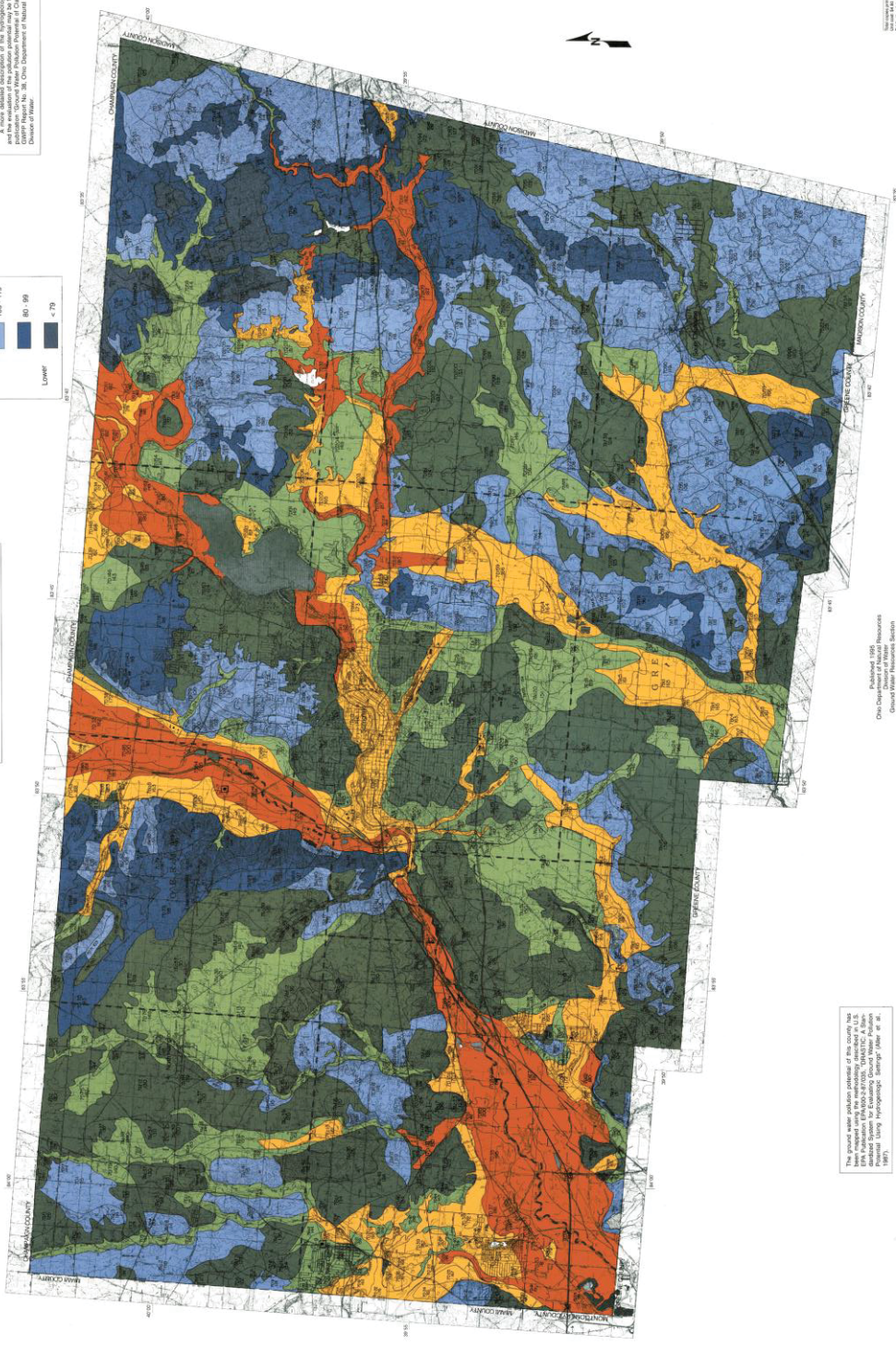
Observation Well Sites: Observation Well Sites

Observation well sites indicate the location of wells used to collect observations and monitor hydrographs of the water levels recorded at these sites. Hydrographs of the water levels recorded at these sites are available from the Missouri Department of Natural Resources, Division of Water.



Hydrologic Settings

7A4 - Grand Tower Reservoir Secondary Risk
 7A5 - Grand Tower Reservoir
 7B1 - Grand Tower Reservoir of Grand Tower
 7B2 - Grand Tower Reservoir
 7B3 - Grand Tower Reservoir
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 7Z9 - Grand Tower Reservoir



This report is a preliminary assessment of the ground water pollution potential of Clark County, Missouri. It is based on a review of available data and a field survey of selected areas. The report is intended to provide a general overview of the ground water pollution potential of Clark County and to identify areas of high potential. It is not intended to provide a detailed assessment of the ground water pollution potential of any specific area.

David S. Dr. Co-Chairman
 Clark County Ground Water Committee

Clark County, Missouri
 1999
 Clark County, Missouri
 1999



4.6 Continued Public Involvement

Clark County has had past success in promoting and keeping the public involved in mitigation activities. It is the Clark County Hazard Mitigation Committee's desire to achieve continued improvement in involving the public and be forward thinking in accomplishing mitigation activities for the benefit of the entire county. To involve the public, the CCHMC will incorporate the following public involvement to future planning efforts:

1. Invite the public by posting the hazard mitigation annual public meeting notices on the Clark County EMA website, Commissioner's website, and in the local newspaper. In addition, the Clark County Hazard Mitigation Committee will incorporate an action item into this Plan update that will promote public input and keep the county residents informed as to the benefits of mitigation activities. Some of the action steps could include such items as published quarterly articles on mitigation success stories or articles posted on the County EMA website.

APPENDIX

A -1 Public Article



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

PUBLIC NOTICE

June 7, 2012

The Clark County Hazard Mitigation Planning Committee is seeking public comments for the recommended changes to the Clark County Multi-Jurisdictional Hazard Mitigation Plan.

The Clark County Hazard Mitigation Committee held four planning workshops in the fall of 2011 for the purpose of reviewing and recommending updates to the countywide coordinated plan. The countywide plan has been developed as a Multi-Jurisdictional Hazard Mitigation Plan that includes all hazards to which Clark County and its municipalities are susceptible as per Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The Clark County Hazard Mitigation Planning Committee has drafted recommended updates to the goals, objectives and strategies to mitigate against the hazards that have been identified in the county. The mitigation measures for the county have been analyzed and prioritized and they are hereby open for public review and comments.

The purpose of the plan updates is to review the goals and objectives as set forth in the countywide Federal Emergency Management Agency Approved Plan and to determine their relevance to changing situations in the county. The Clark County Hazard Mitigation Planning Committee will continue to report on the progress and status of current projects as outlined in the plan and will consider any recommended changes as well as any additional mitigation projects not currently in the plan.

Comments will be received until July 6, 2012 and may be directed to: Lisa D'Allessandris, Clark County Emergency Management Director, by email: ldallessandris@clarkcountyohio.gov.

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountyohio.gov

Kristi West, Admin Assist
Office: 937-521-2177
kwest@clarkcountyohio.gov

Thu, Jun 07, 2012
11:38:27

Receipt No

Advertising COX Ohio Publishing Receipt

Acct NL001139
Phone 9373284586
E-Mail
Client
Name CLARK CO EMERGENCY MGM
Address C/O ROBERT HUPP, DIRECTOR
 4075 LAYBOURNE RD
City SPRINGFIELD **State** OH **Zip** 45505
Caller: 2012-07-06

Ad Name 15665144A **Reply Request**
Ad Id 15665144 **Standby Type**

Start 06/08/12 **Issues** 1 **Stop** 06/08/12
Class 1235 **Rate** NLG **Pay Type** BI
Copy Line CLARKCOUNTYEMERGENCYMAN **Rep** Angela Pace **Colors** 0
Editions NDLY/WEBC/ **G. D. #** **Tear sheets**

Earliest Production Deadline: 00/00/00

Lines.....	99
Depth.....	8.14
Columns...	1
Price	222.75
Other Charges	0.00
Discounts	0.00
Total	222.75

**CLARK COUNTY EMERGENCY
MANAGEMENT AGENCY
PUBLIC NOTICE**

From: Lisa D'Allesandro, Director
Clark County Emergency
Management Agency
Date: June 6, 2012

The Clark County Hazard Mitigation Planning Committee is seeking public comments for the recommended changes to the Clark County Multi-jurisdictional Hazard Mitigation Plan.

The Clark County Hazard Mitigation Planning Committee held two planning workshops in the fall of 2011 for the purpose of reviewing and recommending updates to the countywide coordinated plan. The countywide plan has been developed as a Multi-jurisdictional Hazard Mitigation Plan that includes all hazards to affect Clark County and its municipalities and incorporates all per Section 102 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

The Clark County Hazard Mitigation Planning Committee has drafted recommended updates to the goals, objectives and strategies to mitigate against the hazards that have been identified in the county. The mitigation measures for the county have been analyzed and prioritized and they are hereby open for public review and comments.

The purpose of the plan updates is to review the goals and objectives set forth in the Countywide Federal Emergency Management Agency Approved Plan and to determine their relevance to changing situations in the county. The Clark County Hazard Mitigation Planning Committee will continue to report on the progress and status of current projects as outlined in the plan and will consider any recommended changes, as well as any additional mitigation projects not currently in the plan.

The 2012 updated draft plan is available for review on the Clark County website at <http://www.clarkcountyoemg.com> or in hard copy at any local library branch.

Comments will be received until July 4, 2012 and may be directed to: Lisa D'Allesandro, Clark County Emergency Management Director, by email: ludallesandro@clarkcountyoemg.com or by phone: 937-328-4586.

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APPENDIX

A -2 Meeting Agendas & Notices



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

Clark County Mitigation Committee Agenda - Mitigation Planning Meeting #1

Thursday September 29th, 2011
10:00 AM – 11:45 AM

**Springview Government Center
3130 East Main Street, Room 151
Springfield, Ohio 45505**

1. Introductions
2. Appointment of Committee Chairperson or Co Chair
3. PowerPoint Presentation–Explanation of the 5-year Mitigation Plan Update Process
4. Review of the current sections in the plan
 - a. Introduction
 - b. Community Information
 - c. Countywide Planning Process
 - d. Hazard Profile
 - e. Vulnerability Assessment
 - f. Goals
 - g. Hazard Mitigation Practices
 - h. Matrix Results
5. Develop Timeline
6. Assignment of Tasks
7. Adjourn 11:45 AM

2011 Meeting Schedule, Thursdays

October 20
November 15
December 17



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

Mitigation Meeting 9-29-2011

Opening: Meeting started at 10:04am with 12 people present (see sign-in sheet)

Handouts: Meeting Agenda, Clark County Hazard Events per NCEM, State mitigation planning goals, and tentative timeline.

Lisa introduced Mike Henderson, from Mote & Associates – it was noted that this committee is all new members from previous Planning committee.

Starting the process of updating the Mitigation Plan for Clark County

1. Why Mitigate? Learning from the past to plan for the future. Reduce the impact of disasters by; reducing loss of life & property damage, recover more rapidly, and lessen financial impact.
2. Old Plan was approved by FEMA June 2006, needs renewed every five years. Our plan was multi-jurisdictional
3. Planning Requirements – Administrative items and plan revision
 - Approve plan, but revise
 - a. Validate or revise current plan (make additions such as new hospital)
 - b. Review or revise – list of hazards
 - c. Prioritize your actions
 - d. Look at action items 2006 list
 - e. Can add new items, but need to prioritize and update items
 - Public involvement
 - Letter to neighboring EMA directors
 - local jurisdiction to submit a plan
 - Adopt the plan by resolution – have 1 year to complete
 - If you don't participate / NO grant money
4. Discussion
 - Public Health aspects should be addressed in the Plan
 - Sirens– each jurisdiction does their own including activating
 - Should livestock be in critical infrastructure? Yes
5. Risk Assessment
 - Critical Facilities
 - Large Population Facilities
 - High Risk Event
 - Transportation & Infrastructure
 - Special Needs – recommended
 - High Profile community locations / Assets



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

6. How to involve the public?
 - Post the plan on our websites
 - Take a hard copy to the library
 - Announce meetings dates, time, and locations in the newspaper
 - Write a press release in the newspaper – directed them to our website, library and announcements
 - Evening meeting to accommodate for working hours
 - Invitations to people who have been impacted by disasters in the past
7. How to get communities to participate?
 - Committee members attend council meetings
 - Send out a letter/survey to each village to collect information
 - Each village should designate a representative to liaison with the committee
8. Committee should consider meeting at least once every year to review current status of plan.
9. Next Steps:
 - All committee members to review the Plan's problems statement and action items and be ready to discuss.
 - a. Items risks are repetitive, so focus on at least the first 1 or 2 action items
 - Mike will print a hard copy of the Plan for Herb Greer
 - Mike will send Lisa a sample letter/survey for villages to be able to participate
10. Future Meeting Dates: (same time and place)
 - 10-20-2011
 - 11-17-2011
 - 12-15-2011

Adjourn: 11:30am

Minutes Submitted by: Kristie West

Meeting Sign-In Sheet

Project: CLAX COUNTY HAZARD MITIGATION		Meeting Date: SEPTEMBER 29, 2011			
Start Time: 10:00 AM		End Time:			
Person In Charge: LISA DALLESSANDRIS		Place/Room: SPRINGVIEW GOVERNMENT CENTER ROOM 151			
Purpose of Meeting: 5 YEAR PLAN UPDATE - SESSION #1					
Name	Title	Organization	Phone		
			Email		
			Signature		
Lisa Dallessandris	Director	EMA	937-521-2174	ldallessandris@clarkcountyohio.gov	Lisa Dallessandris
MERRIS GREER	Pres. Comm. Co. Trip Ass		937-215-0137	mgreer@wobn.net	Merris Greer
KIM JONES	CITY MANAGER	CITY OF NEW CARLSUE	937-845-9492	KJONES@NEWCARLSUE.NET	Kim Jones
Nathan Kennedy	County Administrator	Clark County	937-521-2010	nkenney@clarkcountyo.org	Nathan Kennedy
Bryan Heck	Asst to City Mgr	City of Springfield	937-324-7300	bhecke@springfield.ohio.us	Bryan Heck
TOM HALL	Dir. Comm. Dev.	Clark County	937-521-2160	thall@clarkcountyo.org	Tom Hall
Chris Simpson	Dist. Admin Clark SWCD		937-521-3880	CSimpson@clarkcountyo.org	Chris Simpson
Kristie West	EMA Admin. Assistant	EMA	937-521-2177	kwest@clarkcountyo.org	Kristie West
Judy Anderson	Emergency Prep Coord.	CECHD	390-5600 x228	janderson@cechd.com	Judy Anderson
GEN MASSIE	Planner	TCU	521-2132	genmassie@clarkcountyo.org	Gen Massie
Tom Hawkins	Trusty/Planner	SP, Newson	3280343	THawkins@clarkcountyo.org	Tom Hawkins
Otto Larson	Consolidated	Consolidated	931-399-5500	olarson@consolidated-ins.com	Otto Larson

(Signature of Official in Charge of Meeting) I hereby certify this meeting was conducted attended by those participants listed above. This form adheres to guidance IAW OMB Cir A-87 and 2 CFR Part 225



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

Clark County Mitigation Committee Agenda - Mitigation Planning Meeting #2

Thursday October 20th, 2011
10:00 AM

**Springview Government Center
3130 East Main Street, Room 151
Springfield, Ohio 45505**

1. Welcome
2. Introductions
3. Appointment of Committee Chairperson or Co Chair? (I think I forgot to do this last meeting)
4. Presentation and Review of County Hazards
5. Methodology and Ranking of County Hazards
6. Review of Past County Problem Statements
7. Discussion of County Problem Statements
8. Update and Include New Problem Statements
9. Review Categories of Hazard Mitigation Activities:
 - a. Preventative
 - b. Property Protection
 - c. Emergency Services Measures
 - d. Structural Projects
 - e. Natural Resource Protection
 - f. Public Information
10. Discussion of County Mitigation Action Items
11. Assignment of Tasks
12. Adjourn

2011 Meeting Schedule, Thursdays

November 15
December 17

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountyohio.gov

Kristie West, Admin Assistant
Office: 937-521-2177
kwest@clarkcountyohio.gov

Mitigation Minutes – October 20, 2011

Meeting began at 10:00am with Mike Henderson from Mote & Associates presenting

1. Members Present:

County Administrator	Nathan Kennedy	Absent
Township Trustee President	Herb Greer	Absent
City of Springfield	Bryan Heck	
City of New Carlisle	Kim Jones	
Emergency Management	Lisa D’Allessandris	
County Engineer	John Burr	
Floodplain Manager	Tom Hale	
Soil and Water	Chris Simpson	
Fire Chief’s President	Andrew Hennigan	Absent
Transportation Committee	Glen Massie	
Combined Health District	Judy Andrews	
Springfield News Sun	Tom Hawkins	
Insurance Industry	Otto Larson	Absent
GIS Director	Shayne Gray	
Committee Secretary	Kristie West	

2. Handouts

1. Meeting Agenda 10-20-11
2. Clark County Action Plan
3. Hazard Mitigation Practices

3. New Business

1. Lisa D’Allessandris nominated as Committee Chair
2. Review of County Hazards
 - Biological
 1. Group decided to accept list as presented
 - Geological
 1. Group decided to accept list as presented
 - Meteorological
 1. Group decided to accept list as presented
3. Methodology and ranking of County hazards
 - Data collected from National Climatic Data Center (NCDC)
 - Group decided to accept list as presented
4. Update and include new problem statements
 - See spreadsheet attachment of “Problem Statements Discussion 10-20-11”

4. Old Business

1. Haz-Mat and Terrorism will be addressed in other plans.

5. Assignments

1. Review the hand-out “Hazard Mitigation Practices”
2. Provide updates to the list at the next meeting. We do not need a copy of the plan, only the date of the last approved version or update

6. Next Meeting

1. November 17, 2011
2. December 15, 2011

Mitigation Meeting
 October 20th 2011
 Sign-In

	Agency	First Name	Last Name	Signature
1	Clark SWCD	Chris	Simpson	<i>[Signature]</i>
2	GIS	Shayne	Grey	<i>[Signature]</i>
3	NEW CARUSLE	KIM	JONES	<i>[Signature]</i>
4	COS	Bryan	Heckle	<i>[Signature]</i>
5	CCC#1	Judy	Rudruss	<i>[Signature]</i>
6	EMA	Kristie	west	<i>[Signature]</i>
7	MOTR ASSOC	MIKE	HENDERSON	<i>[Signature]</i>
8	Comm. DEV	Tom	HALL	<i>[Signature]</i>
9	Tom [unclear]			
10	Uzwy-Son	Tom	Hankins	<i>[Signature]</i>
11	CLARK COUNTY EN	JOHN	BURR	<i>[Signature]</i>
12	[unclear]			
13	TCE	GLSEN	MASSIE	<i>[Signature]</i>
14	Lisa D//ClarkEMA	Lisa	D'Allesandris	<i>[Signature]</i>
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Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

Clark County Mitigation Committee Agenda - Mitigation Planning Meeting #3

Thursday November 17th, 2011
10:00 AM

**Springview Government Center
3130 East Main Street, Room 151
Springfield, Ohio 45505**

1. Welcome
2. Introductions
3. Discussion on Planning Document Updates
4. Follow-up of County Problem Statements
5. Review Categories of Hazard Mitigation Activities:
 - a. Preventative
 - b. Property Protection
 - c. Emergency Services Measures
 - d. Structural Projects
 - e. Natural Resource Protection
 - f. Public Information
6. Discussion of former Mitigation Plan Goals
7. Updating the Hazard Mitigation Plan Goals
8. Discussion of County Mitigation Action Items
9. Assignment of Tasks
10. Adjourn

Next Meeting: Thursday December 15th 10:00 am

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountyohio.gov

Kristie West, Admin Assistant
Office: 937-521-2177
kwest@clarkcountyohio.gov

Mitigation Minutes – November 17th, 2011

Meeting began at 10:05 am with Mike Henderson from Mote & Associates presenting

1. Members Present:

County Administrator	Nathan Kennedy	Absent
Township Trustee President	Herb Greer	
City of Springfield	Bryan Heck	
City of New Carlisle	Kim Jones	
Emergency Management	Lisa D’Allessandris	
County Engineer	John Burr	
Floodplain Manager	Tom Hale	Absent
Soil and Water	Chris Simpson	
Fire Chief’s President	Andrew Hennigan	Absent
Transportation Committee	Glen Massie	Absent
Combined Health District	Judy Andrews	
Springfield News Sun	Tom Hawkins	
Insurance Industry	Otto Larson	
GIS Director	Shayne Gray	
Committee Secretary	Kristie West	

2. Handouts

1. Problem Statements Discussion
2. State of Ohio Enhanced Hazard Mitigation Plan
3. Clark County Hazard Mitigation – Action Items

3. Old Business

1. Make sure our plan references other county plans
2. Reviewed Problem Statements
3. List – Problem Goals (Top three)
 - Communication
 - Public Education – should state before, during & after
 - Power @ Critical Facilities
4. Reviewed Action Items
5. Discussion of former Mitigation Plan – group decided to change the wording of goals and objections, which was too repetitive, and to better align with the action items and the State’s Mitigation Plan (see below in New Business for the start of re-wording)

4. New Business

1. **Goal:** To reduce loss of life, injury, property damage in Clark County.
2. **Objectives:**
 1. To educate the County's Citizens to increase awareness, preparedness, response, and recovery activities during natural hazard events.
 - Action item #1
 2. Continue to improve communication & warning systems.
 - Action item #4
 3. Promoting proper development standards.
 4. Support & maintain critical facilities & emergency services during hazard events. Promote safe rooms/shelters.
 - Action item #3, 5
 5. Increase the county ability to respond & recovery from Hazard Events.
 - Action item #6, 7, 8

5. Assignment of Tasks

Review Action Items – to place objectives in a category

6. Next Meeting

December 15th, 2011

7. Minutes Submitted by

Kristie West

Mitigation Meeting
November 17th, 2011
Sign-In

	Agency	Name	Signature
1	County Administrator	Nathan Kennedy	
2	Township Trustee President	Herb Greer	<i>Herb Greer</i>
3	City of Springfield	Bryan Heck	<i>Bryan Heck</i>
4	City of New Carlisle	Kim Jones	<i>Kim Jones</i>
5	Emergency Management	Lisa D'Allessandris	<i>Lisa D'Allessandris</i>
6	County Engineer	John Burr	<i>John Burr</i>
7	Floodplain Manager	Tom Hale	
8	Soil and Water	Chris Simpson	<i>Chris Simpson</i>
9	Fire Chief's President	Andrew Hennigan	
10	Transportation Committee	Glen Massie	
11	Combined Health District	Judy Andrews	<i>Judy Andrews</i>
12	Springfield News Sun	Tom Hawkins	
13	Insurance Industry	Otto Larson	<i>Otto Larson</i>
14	GIS Director	Shayne Gray	<i>Shayne Gray</i>
15	Committee Secretary	Kristie West	<i>Kristie West</i>
16	Mote & Associates, Inc.	Mike Henderson	
17			
18			
19			
20			



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

Clark County Mitigation Committee Agenda - Mitigation Planning Meeting #4

Thursday December 15th, 2011
10:00 AM

**Springview Government Center
3130 East Main Street, Room 151
Springfield, Ohio 45505**

1. Welcome
2. Public Comments
3. Discussion on Planning Document Updates
4. Review and Discussion of Draft Mitigation Plan Goals and Objectives
5. Review and Discussion of the Updated Hazard Mitigation Activities
6. Prioritizing the Updated Hazard Mitigation Activities
7. Discussion on Monitoring and Implementing the Plan
8. Assignment of Tasks
9. Adjourn

Next Meeting: Thursday January 19th 10:00 am

Mitigation Minutes – 12-15-2011

Meeting began at 10:00am with Mike Henderson from Mote & Associates presenting

1. Members Present:

County Administrator	Nathan Kennedy	Absent
Township Trustee President	Herb Greer	
City of Springfield	Bryan Heck	Absent
City of New Carlisle	Kim Jones	
Emergency Management	Lisa D’Allessandris	Absent
County Engineer	John Burr	Absent
Floodplain Manager	Tom Hale	
Soil and Water	Chris Simpson	Absent
Fire Chief’s President	Andrew Hennigan	Absent
Transportation Committee	Glen Massie	Absent
Combined Health District	Judy Andrews	
Springfield News Sun	Darryl Bauer	Absent
Insurance Industry	Otto Larson	
GIS Director	Shayne Gray	
Committee Secretary	Kristie West	
Mote & Associates, Inc	Mike Henderson	

2. Handouts

1. Action Item Prioritization
2. Action Items / Edited 12-7-2011
3. Hazard Analysis: Clark County Combined Health District
4. Monitoring the Plan

3. Old Business

1. Not on the agenda – Clarified flooding areas that we wanted included in our plan.
2. Clarified the Goal & Objectives
 - Updated the wording in the 3rd goal.
3. Reviewed updated action items.
There is a concern about the Citizen’s Corp. being the lead agency?

4. New Business

1. Prioritizing the updated action items- Maybe – low – medium – high?
2. Meet on yearly basis, Mike will compile everything.
 - Give information to Lisa and she would compile everything.

5. Assignment of Tasks

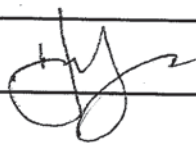
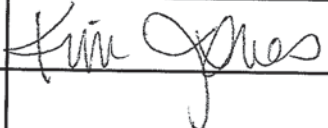

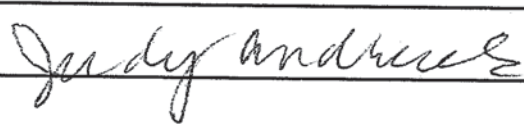
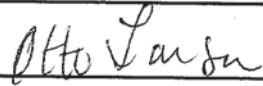
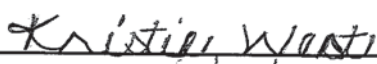
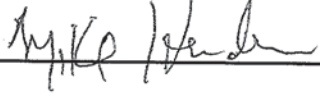
1. Need everyone's updated plans.

6. Next Meeting

1. February – maybe?
2. Meet on yearly basis

7. Adjourn

Mitigation Meeting
 December 15th, 2011
 Sign-In

	Agency	Name	Signature
1	County Administrator	Nathan Kennedy	
2	Township Trustee President	Herb Greer	
3	City of Springfield	Bryan Heck	
4	City of New Carlisle	Kim Jones	
5	Emergency Management	Lisa D'Allessandris	
6	County Engineer	John Burr	
7	Floodplain Manager	Tom Hale	
8	Soil and Water	Chris Simpson	
9	Fire Chief's President	Andrew Hennigan	
10	Transportation Committee	Glen Massie	
11	Combined Health District	Judy Andrews	
12	Springfield News Sun	Darryl Bauer	
13	Insurance Industry	Otto Larson	
14	GIS Director	Shayne Gray	
15	Committee Secretary	Kristie West	
16	Mote & Associates, Inc.	Mike Henderson	
17			
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APPENDIX

A -3 Invitations to City and Villages



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

January 20, 2012

The Clark County Emergency Management Agency has received a Hazards Mitigation Planning Grant to complete five-year planning updates to the Countywide Multi-jurisdictional Hazards Mitigation Plan. This planning process is legislated by the Disaster Mitigation Act of 2000 (Public Law 106-390) in order to reduce risk, loss of life, and damage from natural and manmade hazards that periodically affect the county. Local Plans must be updated and resubmitted to the Federal Emergency Management Agency (FEMA) every five years in order to continue eligibility for FEMA Hazard Mitigation Grant Programs.

The Clark County Hazard Mitigation Committee and its consultant, Mote & Associates, Inc., are currently in the process of updating the countywide plan. The Disaster Mitigation Act requires representatives from each community to participate in the updating of the countywide Hazard Mitigation planning process in order to be eligible for funds. Each community shall identify local problems and mitigation activities to help reduce damage and loss of life during a natural or manmade hazard event.

Attached is a brief Hazard Mitigation Questionnaire to be completed by your community. Also attached are countywide mitigation actions that have been identified to be included in the Countywide Multi-jurisdictional Plan for the County and your community. Your community may also submit additional mitigation projects or activities to be included in the updated plan. Some examples of Hazard Mitigation Grant Program projects that may qualify for future project funds are:

- Acquisition of real property for willing sellers and demolition or relocation of buildings to convert the property to open space use.
- Retrofitting structures and facilities to minimize damages from high winds, earthquake, flood, wildfire, or other natural hazards.
- Elevation of flood prone structures.
- Development and initial implementation of vegetative management programs.
- Minor flood control projects that do not duplicate the flood prevention activities of other Federal agencies.
- Localized flood control projects, such as certain ring levees and floodwall systems, which are designed specifically to protect critical facilities.
- Post-disaster building code related activities that support building code officials during the reconstruction process.

Please respond by returning the attached questionnaire with your community's action item updates by mailing or emailing to the Clark County Emergency Management Agency, 3130 East Main Street, Suite 1E, Springfield, Ohio 45505; Fax: 937-327-3862 or Email: ldallessandris@clarkcountyohio.gov. **Please respond no later than Monday, February 13, 2012.**

Once updated, the Draft Plan will be posted on the County EMA website clarkcountyyema.gov by June 1, 2012, for review and comments. Thereafter, the plan will be submitted for FEMA plan approval pending adoption. Once FEMA has approved the plan, your community will be asked to pass a resolution adopting the plan. The adoption must be done within one year after FEMA's approval has been given. I will be scheduling a time to get on your agendas for the adoption of the plan. There is no cost to the community to participate in the planning process. Those communities not participating in the plan will be ineligible for Pre and Post Hazard Mitigation Grant Program Funds.

Please do not hesitate to contact me should you have any questions or would like additional information. We look forward to serving Clark County in preparing these plan updates and we encourage your community's participation.

Sincerely,

Ms. Lisa D'Allessandris, Director
Clark County Emergency Management

Enclosures

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountyohio.gov

Kristie West, Admin Assistant
Office: 937-521-2177
kwest@clarkcountyohio.gov

CLARK COUNTY HAZARDS MITIGATION SURVEY UPDATE-2012

1. Community Name

VILLAGE OF CATAWBA

2. Name, phone number, fax and e-mail address of contact for this community information:

MARK SKIBA, MAYOR 937-828-1657

3. Please provide any updated information changes for addresses/phone numbers of all your critical facilities. Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, water, wastewater treatment facilities, prisons etc. Has your community added any new critical facilities such as Nursing homes, Schools, fire/Police Stations, Government buildings, water/sewer plants since the 2006 Hazard Mitigation Plan?

N/A

4. Provide a list of any new facilities constructed since 2006 that have the ability to hold large crowds such as arenas, and sporting events, etc. Please give the name and location of these new facilities.

N/A

5. Has your community added any type of early warning detection system(s) within your village since the last County Hazard Mitigation Plan update in 2006? Please describe:

N/A

6. Since 2006 are you aware of new natural hazard concerns that need to be addressed within your community?

N/A

7. Are any of the following natural hazards a serious concern in your community?

Hazards	YES	NO
Floods		
f 100-year Floodplain Floods - defined with the NFIP Maps		✓
f Flash Floods - defined as flooding that follows heavy rain	✓	
f Non-Flood Zone Floods - defined as flooding that occurs in areas not defined as floodplains, usually in areas that have been developed at a fast rate.		
Tornadoes		
f Tornadoes		✓
Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria.		
f Ice Storms		✓
f Hail		✓
f Winter Storms		✓
f Thunderstorms		✓
f High and Low Temperatures		✓
f Lightning		✓
f High Winds		✓
Earthquakes		
f Earthquakes		✓
Droughts		
f Wild land Fires		✓

If answering yes, please describe your concerns.

ONE AREA FLOODS AFTER HEAVY RAINS (HAS FOR YEARS) ON ST. RT. 54 (N. CHAMPAIGN ST.), DRAINAGE ACROSS & UNDER W. NORTH ST. & DRAINAGE OFF OF E. PLEASANT ST.

8. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?

THE AREA THAT DRAWS INTO THE TILE UNDER ST. RT. 54 (ABOVE) AND THE TILE THAT DRAINS ACROSS WESTWORTH ST., ALSO ALONG E. PLEASANT DRAINAGE WE ARE HOPING TO OBTAIN CDBG FUNDING FOR THESE AREAS OVER THE NEXT 3 YEARS.

9. Are you aware of any structures that have been removed from the 100 Yr. Flood Plain within your community since the 2006 Clark County Hazard Mitigation Plan Update?

No

10. Have any of the following documents been revised within your community since the last County Hazard Mitigation Plan Update in 2006?

- | | | |
|--|-----|-------------------------------------|
| 1. <u>Comprehensive Plan(s)</u> | YES | <input checked="" type="radio"/> NO |
| 2. <u>Floodplain Ordinance(s)</u> | YES | <input checked="" type="radio"/> NO |
| 3. <u>Land Use Ordinance(s)</u> | YES | <input checked="" type="radio"/> NO |
| 4. <u>Organized Watershed Group(s)</u> | YES | <input checked="" type="radio"/> NO |

Are there any other planning document updates in your community since 2006?

No

CLARK COUNTY HAZARDS MITIGATION SURVEY UPDATE-2012

RECEIVED

FEB 08 2012

CLARK COUNTY

E. M. A.

1. Community Name

Village of Clifton

2. Name, phone number, fax and e-mail address of contact for this community information:

Sue Chasnov - (937) 767-1767 ; Voice Mail 342-2175

schasnov@netzero.net

no fax

3. Please provide any updated information changes for addresses/phone numbers of all your critical facilities. Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, water, wastewater treatment facilities, prisons etc. Has your community added any new critical facilities such as Nursing homes, Schools, fire/Police Stations, Government buildings, water/sewer plants since the 2006 Hazard Mitigation Plan?

no new facilities / no changes for address/phones

4. Provide a list of any new facilities constructed since 2006 that have the ability to hold large crowds such as arenas, and sporting events, etc. Please give the name and location of these new facilities.

none

5. Has your community added any type of early warning detection system(s) within your village since the last County Hazard Mitigation Plan update in 2006? Please describe:

None

6. Since 2006 are you aware of new natural hazard concerns that need to be addressed within your community?

none

7. Are any of the following natural hazards a serious concern in your community?

Hazards	YES	NO
Floods		
<i>f</i> 100-year Floodplain Floods - defined with the NFIP Maps		✓
<i>f</i> Flash Floods - defined as flooding that follows heavy rain		✓
<i>f</i> Non-Flood Zone Floods - defined as flooding that occurs in areas not defined as floodplains, usually in areas that have been developed at a fast rate.		
Tornadoes		
<i>f</i> Tornadoes		✓
Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria.		
<i>f</i> Ice Storms		✓
<i>f</i> Hail		✓
<i>f</i> Winter Storms		✓
<i>f</i> Thunderstorms		✓
<i>f</i> High and Low Temperatures		✓
<i>f</i> Lightning		✓
<i>f</i> High Winds		✓
Earthquakes		
<i>f</i> Earthquakes		✓
Droughts		
<i>f</i> Wild land Fires		✓

If answering yes, please describe your concerns.

no changes over 2006 plan

8. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?

None

9. Are you aware of any structures that have been removed from the 100 Yr. Flood Plain within your community since the 2006 Clark County Hazard Mitigation Plan Update?

None

10. Have any of the following documents been revised within your community since the last County Hazard Mitigation Plan Update in 2006?

- | | | |
|---------------------------------|-----|-------------------------------------|
| 1. Comprehensive Plan(s) | YES | <input checked="" type="radio"/> NO |
| 2. Floodplain Ordinance(s) | YES | <input checked="" type="radio"/> NO |
| 3. Land Use Ordinance(s) | YES | <input checked="" type="radio"/> NO |
| 4. Organized Watershed Group(s) | YES | <input checked="" type="radio"/> NO |

Are there any other planning document updates in your community since 2006?

None

CLARK COUNTY HAZARDS MITIGATION SURVEY UPDATE-2012

1. Community Name

Village of Donnellsville

2. Name, phone number, fax and e-mail address of contact for this community information:

Bob Cornwell, 882-1375 (Fax & Phone) donnellsvillemayor@yahoo.com

3. Please provide any updated information changes for addresses/phone numbers of all your critical facilities. Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, water, wastewater treatment facilities, prisons etc. Has your community added any new critical facilities such as Nursing homes, Schools, fire/Police Stations, Government buildings, water/sewer plants since the 2006 Hazard Mitigation Plan?

NONE

4. Provide a list of any new facilities constructed since 2006 that have the ability to hold large crowds such as arenas, and sporting events, etc. Please give the name and location of these new facilities.

NONE

5. Has your community added any type of early warning detection system(s) within your village since the last County Hazard Mitigation Plan update in 2006? Please describe:

NONE

6. Since 2006 are you aware of new natural hazard concerns that need to be addressed within your community?

NONE

7. Are any of the following natural hazards a serious concern in your community?

Hazards	YES	NO
Floods		
<i>f</i> 100-year Floodplain Floods - defined with the NFIP Maps		✓
<i>f</i> Flash Floods - defined as flooding that follows heavy rain		✓
<i>f</i> Non-Flood Zone Floods - defined as flooding that occurs in areas not defined as floodplains, usually in areas that have been developed at a fast rate.		✓
Tornadoes		
<i>f</i> Tornadoes		✓
Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria		
<i>f</i> Ice Storms		✓
<i>f</i> Hail		✓
<i>f</i> Winter Storms		✓
<i>f</i> Thunderstorms		✓
<i>f</i> High and Low Temperatures		✓
<i>f</i> Lightning		✓
<i>f</i> High Winds		✓
Earthquakes		
<i>f</i> Earthquakes		✓
Droughts		
<i>f</i> Wild land Fires		✓

If answering yes, please describe your concerns.

8. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?

NONE

9. Are you aware of any structures that have been removed from the 100 Yr. Flood Plain within your community since the 2006 Clark County Hazard Mitigation Plan Update?

NO

10. Have any of the following documents been revised within your community since the last County Hazard Mitigation Plan Update in 2006?

- | | | |
|---------------------------------|-----|-------------------------------------|
| 1. Comprehensive Plan(s) | YES | <input checked="" type="radio"/> NO |
| 2. Floodplain Ordinance(s) | YES | <input checked="" type="radio"/> NO |
| 3. Land Use Ordinance(s) | YES | <input checked="" type="radio"/> NO |
| 4. Organized Watershed Group(s) | YES | <input checked="" type="radio"/> NO |

Are there any other planning document updates in your community since 2006?

NO

CLARK COUNTY HAZARDS MITIGATION SURVEY UPDATE-2012

1. Community Name

Village of Enon

2. Name, phone number, fax and e-mail address of contact for this community information:

Kristy Thome 937.864.7870

Fax 937.864.5644

kthome@enonohio.com

3. Please provide any updated information changes for addresses/phone numbers of all your critical facilities. Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, water, wastewater treatment facilities, prisons etc. Has your community added any new critical facilities such as Nursing homes, Schools, fire/Police Stations, Government buildings, water/sewer plants since the 2006 Hazard Mitigation Plan?

no - updated in

4. Provide a list of any new facilities constructed since 2006 that have the ability to hold large crowds such as arenas, and sporting events, etc. Please give the name and location of these new facilities.

n/a

5. Has your community added any type of early warning detection system(s) within your village since the last County Hazard Mitigation Plan update in 2006? Please describe:

n/a

6. Since 2006 are you aware of new natural hazard concerns that need to be addressed within your community?

n/a

7. Are any of the following natural hazards a serious concern in your community?

Hazards	YES	NO
Floods		
<input type="checkbox"/> 100-year Floodplain Floods - defined with the NFIP Maps		<input checked="" type="checkbox"/>
<input type="checkbox"/> Flash Floods - defined as flooding that follows heavy rain	<input checked="" type="checkbox"/>	
<input type="checkbox"/> Non-Flood Zone Floods - defined as flooding that occurs in areas not defined as floodplains. usually in areas that have been developed at a fast rate.		<input checked="" type="checkbox"/>
Tornadoes		
<input type="checkbox"/> Tornadoes	<input checked="" type="checkbox"/>	
Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria.		
<input type="checkbox"/> Ice Storms		<input checked="" type="checkbox"/>
<input type="checkbox"/> Hail		<input checked="" type="checkbox"/>
<input type="checkbox"/> Winter Storms		<input checked="" type="checkbox"/>
<input type="checkbox"/> Thunderstorms		<input checked="" type="checkbox"/>
<input type="checkbox"/> High and Low Temperatures		<input checked="" type="checkbox"/>
<input type="checkbox"/> Lightning		<input checked="" type="checkbox"/>
<input type="checkbox"/> High Winds		<input checked="" type="checkbox"/>
Earthquakes		
<input type="checkbox"/> Earthquakes		<input checked="" type="checkbox"/>
Droughts		
<input type="checkbox"/> Wild land Fires		<input checked="" type="checkbox"/>

If answering yes, please describe your concerns.

Council is reviewing Tornado sirens

Flooding in Residential areas

8. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?

A few areas of concern within the corp. limits of Enon.

Main Street -

Green Vista - Colorado TR - drainage issues

9. Are you aware of any structures that have been removed from the 100 Yr. Flood Plain within your community since the 2006 Clark County Hazard Mitigation Plan Update?

no

10. Have any of the following documents been revised within your community since the last County Hazard Mitigation Plan Update in 2006?

1. <u>Comprehensive Plan(s)</u>	YES	NO
2. <u>Floodplain Ordinance(s)</u>	YES	NO
3. <u>Land Use Ordinance(s)</u>	YES	NO
4. <u>Organized Watershed Group(s)</u>	YES	NO

Are there any other planning document updates in your community since 2006?

n/a

RECEIVED

MAR 05 2012

CLARK COUNTY

CLARK COUNTY HAZARDS MITIGATION SURVEY UPDATE-2012

1. Community Name

VILLAGE OF NORTH HAMPTON

2. Name, phone number, fax and e-mail address of contact for this community information:

EMORY HARROD (937) 964-1362

3. Please provide any updated information changes for addresses/phone numbers of all your critical facilities. Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, water, wastewater treatment facilities, prisons etc. Has your community added any new critical facilities such as Nursing homes, Schools, fire/Police Stations, Government buildings, water/sewer plants since the 2006 Hazard Mitigation Plan?

YES

4. Provide a list of any new facilities constructed since 2006 that have the ability to hold large crowds such as arenas, and sporting events, etc. Please give the name and location of these new facilities.

WATER TOWER NORTHWESTERN SCHOOLS, SEWER PUMP STATIONS

WITH GENERATORS AT NORTHWESTERN SCHOOLS + CHATEAU ESTATES
MOBILE HOME PARK

5. Has your community added any type of early warning detection system(s) within your village since the last County Hazard Mitigation Plan update in 2006? Please describe:

NO

6. Since 2006 are you aware of new natural hazard concerns that need to be addressed within your community?

NO

7. Are any of the following natural hazards a serious concern in your community?

Hazards	YES	NO
Floods		
f 100-year Floodplain Floods - defined with the NFIP Maps		X
f Flash Floods - defined as flooding that follows heavy rain		✓
f Non-Flood Zone Floods - defined as flooding that occurs in areas not defined as floodplains, usually in areas that have been developed at a fast rate.		X
Tornadoes		
f Tornadoes	✓	
Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria.		
f Ice Storms	✓	
f Hail		✓
f Winter Storms	X	
f Thunderstorms		✓
f High and Low Temperatures		✓
f Lightning	✓	
f High Winds	X	
Earthquakes		
f Earthquakes		✓
Droughts		
f Wild land Fires		✓

If answering yes, please describe your concerns.

8. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?

COLVERT UNDER ST. RT. 41 WEST OF ASBURY CHURCH

9. Are you aware of any structures that have been removed from the 100 Yr. Flood Plain within your community since the 2006 Clark County Hazard Mitigation Plan Update?

YES 230 SADDLE BROOK RUN

10. Have any of the following documents been revised within your community since the last County Hazard Mitigation Plan Update in 2006?

1. <u>Comprehensive Plan(s)</u>	YES	NO
2. <u>Floodplain Ordinance(s)</u>	YES	NO
3. <u>Land Use Ordinance(s)</u>	YES	NO
4. <u>Organized Watershed Group(s)</u>	YES	NO

Are there any other planning document updates in your community since 2006?

CLARK COUNTY HAZARDS MITIGATION SURVEY UPDATE-2012

1. Community Name

VILLAGE OF TREMONT CITY

2. Name, phone number, fax and e-mail address of contact for this community information:

LARRY BLEVINS PH# 937-969-8659

EMAIL - Larry.VLBEE@AOL.com

FAX# 937-969-8281

3. Please provide any updated information changes for addresses/phone numbers of all your critical facilities. Critical facilities are defined as hospitals, schools, nursing homes, fire and police stations, government building, water, wastewater treatment facilities, prisons etc. Has your community added any new critical facilities such as Nursing homes, Schools, fire/Police Stations, Government buildings, water/sewer plants since the 2006 Hazard Mitigation Plan?

No

4. Provide a list of any new facilities constructed since 2006 that have the ability to hold large crowds such as arenas, and sporting events, etc. Please give the name and location of these new facilities.

No

5. Has your community added any type of early warning detection system(s) within your village since the last County Hazard Mitigation Plan update in 2006? Please describe:

YES - TORNADO SIREN

6. Since 2006 are you aware of new natural hazard concerns that need to be addressed within your community?

No

7. Are any of the following natural hazards a serious concern in your community?

Hazards		YES	NO
Floods			
<input type="checkbox"/> 100-year Floodplain Floods - defined with the NFIP Maps			
<input type="checkbox"/> Flash Floods - defined as flooding that follows heavy rain		<input checked="" type="checkbox"/>	
<input type="checkbox"/> Non-Flood Zone Floods - defined as flooding that occurs in areas not defined as floodplains, usually in areas that have been developed at a fast rate.			
Tornadoes			
<input type="checkbox"/> Tornadoes			
Severe Storms - Please Note: Severe storms are a "catch all" of hazards that do not meet other specific criteria.		<input checked="" type="checkbox"/>	
<input type="checkbox"/> Ice Storms			
<input type="checkbox"/> Hail		<input checked="" type="checkbox"/>	
<input type="checkbox"/> Winter Storms		<input checked="" type="checkbox"/>	
<input type="checkbox"/> Thunderstorms		<input checked="" type="checkbox"/>	
<input type="checkbox"/> High and Low Temperatures		<input checked="" type="checkbox"/>	
<input type="checkbox"/> Lightning		<input checked="" type="checkbox"/>	
<input type="checkbox"/> High Wind		<input checked="" type="checkbox"/>	
Earthquakes		<input checked="" type="checkbox"/>	
<input type="checkbox"/> Earthquake			
Droughts			
<input type="checkbox"/> Wild land Fires		<input checked="" type="checkbox"/>	

If answering yes, please describe your concerns.

LARGE OLD TREES THAT COULD COME DOWN DUE TO WEATHER COND. / POOR DRAINAGE OF STORM WATER

8. What infrastructure concerns does your community have as it relates to flooding (for example, please list any intersections, culverts, and or bridges that have systemic flooding issues)? If you are not familiar with these, can you provide the name of a contact person in your community that may know?

SEVERAL CULVERTS THAT ARE IN NEED OF REPLACING
LARRY BLEVINS CHAIRMAN - STREETS SIDEWALKS DRAIN & DITCHES

9. Are you aware of any structures that have been removed from the 100 Yr. Flood Plain within your community since the 2006 Clark County Hazard Mitigation Plan Update?

NO

10. Have any of the following documents been revised within your community since the last County Hazard Mitigation Plan Update in 2006?

- | | | |
|--|-----|-------------------------------------|
| 1. <u>Comprehensive Plan(s)</u> | YES | <input checked="" type="radio"/> NO |
| 2. <u>Floodplain Ordinance(s)</u> | YES | <input checked="" type="radio"/> NO |
| 3. <u>Land Use Ordinance(s)</u> | YES | <input checked="" type="radio"/> NO |
| 4. <u>Organized Watershed Group(s)</u> | YES | <input checked="" type="radio"/> NO |

Are there any other planning document updates in your community since 2006?

APPENDIX

A – 4 Invitations to Neighboring Emergency Management Agencies



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

September 5, 2012

Mr. Craig Evan, Director
Champaign County Emergency Management Agency
1512 State Route 68, Suite C103
Urbana, Ohio 43078

Dear Mr. Evans,

The Clark County Hazard Mitigation Committee is preparing the 5 year plan updates for the Clark County Hazard Mitigation Plan. We invite neighboring counties, communities, and agencies involved in hazard mitigation activities the opportunity to be involved in the Clark County Hazard Mitigation planning process. Your input and comments are appreciated. The plan is completed it can be viewed by going to the Clark County EMA website – www.clarkcountyohio.gov. If you have any questions or comments, please do not hesitate to contact me. My contact information is below.

Sincerely,

A handwritten signature in blue ink that reads 'Lisa D'Allessandris'.

Lisa D'Allessandris, Director
Clark County Emergency Management Agency
3130 East Main St. Suite 1E
Springfield, OH 45505
937-521-2176
email: ldallessandris@clarkcountyohio.gov

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountvohio.gov

Kristi West, Admin Assist
Office: 937-521-2177
kwest@clarkcountyohio.gov



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

September 5, 2012

Ms. Roseanne Anders, Director
Greene County Disaster Services
45 North Detroit Street
Xenia, Ohio 45385

Dear Ms. Anders,

The Clark County Hazard Mitigation Committee is preparing the 5 year plan updates for the Clark County Hazard Mitigation Plan. We invite neighboring counties, communities, and agencies involved in hazard mitigation activities the opportunity to be involved in the Clark County Hazard Mitigation planning process. Your input and comments are appreciated. The plan is completed it can be viewed by going to the Clark County EMA website – www.clarkcountyohio.gov. If you have any questions or comments, please do not hesitate to contact me. My contact information is below.

Sincerely,

A handwritten signature in cursive script that reads "Lisa D'Allessandris".

Lisa D'Allessandris, Director
Clark County Emergency Management Agency
3130 East Main St. Suite 1E
Springfield, OH 45505
937-521-2176
email: ldallessandris@clarkcountyohio.gov

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountyohio.gov

Kristi West, Admin Assist
Office: 937-521-2177
kwest@clarkcountyohio.gov



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

September 5, 2012

Mr. Kenneth Artz, Director
Miami County Emergency Management Agency
210 Marybill Drive
Troy, Ohio 45373

Dear Mr. Artz,

The Clark County Hazard Mitigation Committee is preparing the 5 year plan updates for the Clark County Hazard Mitigation Plan. We invite neighboring counties, communities, and agencies involved in hazard mitigation activities the opportunity to be involved in the Clark County Hazard Mitigation planning process. Your input and comments are appreciated. The plan is completed it can be viewed by going to the Clark County EMA website – www.clarkcountyohio.gov. If you have any questions or comments, please do not hesitate to contact me. My contact information is below.

Sincerely,

A handwritten signature in black ink that reads 'Lisa D'Allessandris'.

Lisa D'Allessandris, Director
Clark County Emergency Management Agency
3130 East Main St. Suite 1E
Springfield, OH 45505
937-521-2176
email: ldallessandris@clarkcountyohio.gov



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

September 5, 2012

Mr. Roger Roberts, Director
Madison County Emergency Management Agency
271 Elm Street
London, Ohio 43140

Dear Mr. Roberts,

The Clark County Hazard Mitigation Committee is preparing the 5 year plan updates for the Clark County Hazard Mitigation Plan. We invite neighboring counties, communities, and agencies involved in hazard mitigation activities the opportunity to be involved in the Clark County Hazard Mitigation planning process. Your input and comments are appreciated. The plan is completed it can be viewed by going to the Clark County EMA website – www.clarkcountyohio.gov. If you have any questions or comments, please do not hesitate to contact me. My contact information is below.

Sincerely,

A handwritten signature in cursive script that reads "Lisa D'Allessandris".

Lisa D'Allessandris, Director
Clark County Emergency Management Agency
3130 East Main St. Suite 1E
Springfield, OH 45505
937-521-2176
email: ldallessandris@clarkcountyohio.gov

Lisa D'Allessandris, Director
Office: 937-521-2176
Mobile: 937-605-0576
ldallessandris@clarkcountyohio.gov

Ken Johnson, Deputy Director/Planner
Office: 937-521-2178
Mobile: 937-605-2692
kjohnson@clarkcountyohio.gov

Kristi West, Admin Assist
Office: 937-521-2177
kwest@clarkcountyohio.gov



Clark County Emergency Management Agency

3130 East Main Street 1E
Springfield, Ohio 45505

24 Hour: 937-605-0576
Fax: 937-327-3862

September 5, 2012

Mr. Jeffrey Jordan, Director
Montgomery County Emergency Management Agency
117 South Main Street, Suite 721
Dayton, Ohio 45422

Dear Mr. Jordan,

The Clark County Hazard Mitigation Committee is preparing the 5 year plan updates for the Clark County Hazard Mitigation Plan. We invite neighboring counties, communities, and agencies involved in hazard mitigation activities the opportunity to be involved in the Clark County Hazard Mitigation planning process. Your input and comments are appreciated. The plan is completed it can be viewed by going to the Clark County EMA website – www.clarkcountyohio.gov. If you have any questions or comments, please do not hesitate to contact me. My contact information is below.

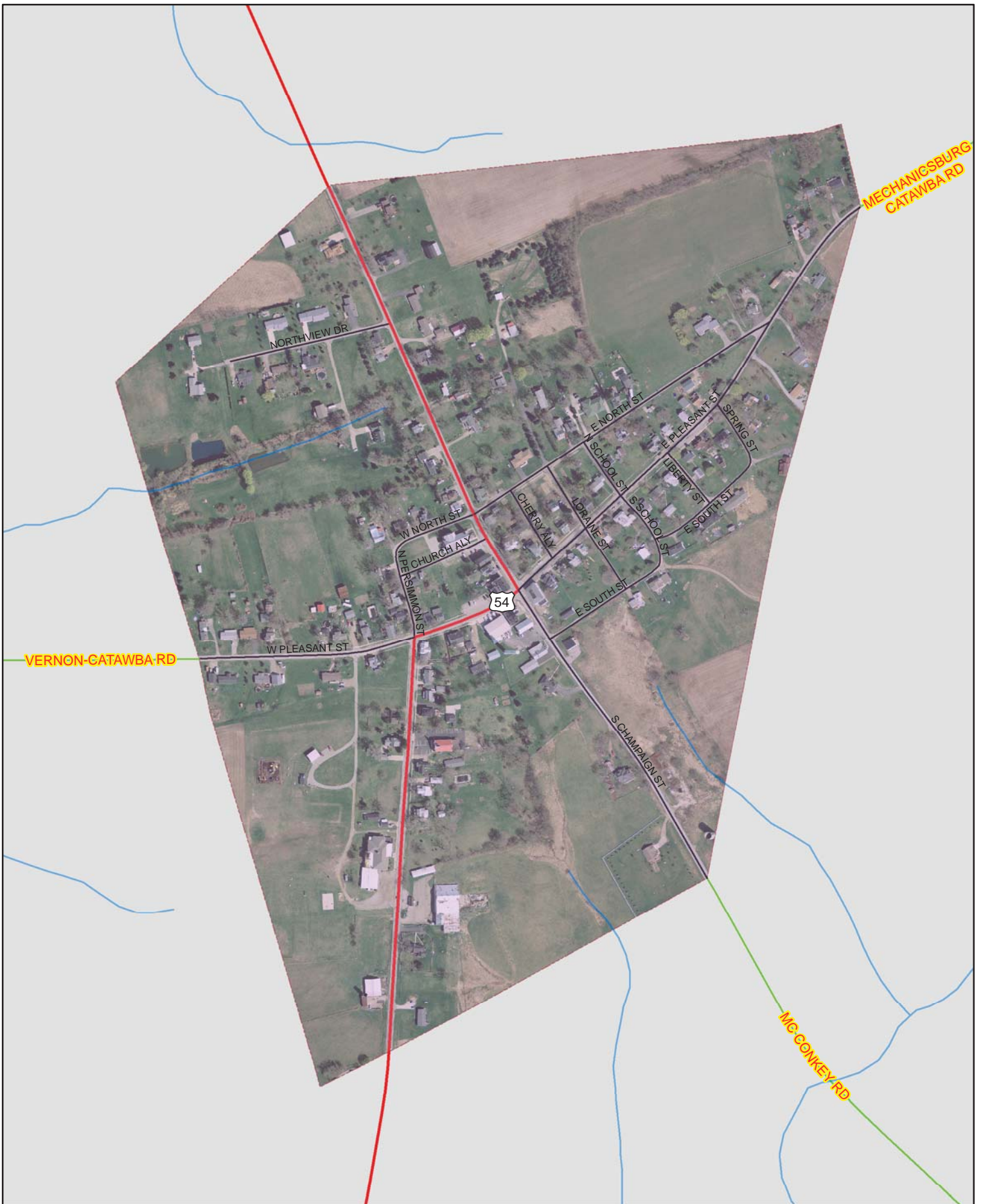
Sincerely,

A handwritten signature in cursive script that reads 'Lisa D'Allessandris'.

Lisa D'Allessandris, Director
Clark County Emergency Management Agency
3130 East Main St. Suite 1E
Springfield, OH 45505
937-521-2176
email: ldallessandris@clarkcountyohio.gov

APPENDIX

A – 5 County and Municipal Maps

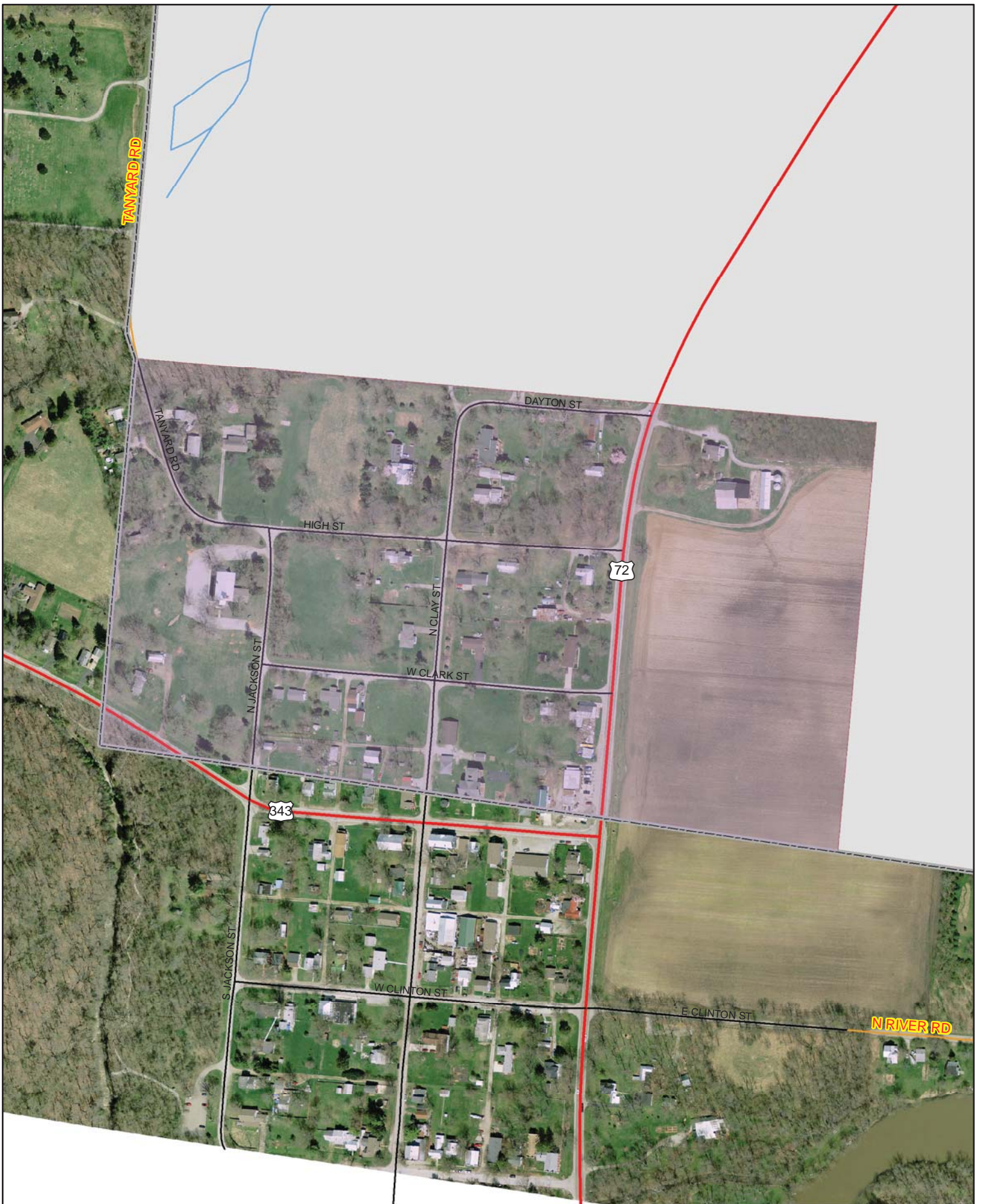


CATAWBA

Legend

- ★ Critical Facilities
- Waterways
- Lake
- County Line
- Flood Areas
- At-Risk Structures
- Township Lines
- County Routes
- Interstate Routes
- Township Roads
- Municipal Streets
- Ramps
- State Routes
- US Routes





CLIFTON

Legend

- ★ Critical Facilities
- Waterways
- Municipalities
- Lake
- County Line
- Flood Areas
- At-Risk Structures
- Township Lines
- County Routes
- Interstate Routes
- Municipal Streets
- Ramps
- State Routes
- Township Roads
- US Routes





DONNELSVILLE

Legend

- ★ Critical Facilities
- County Line
- County Routes
- State Routes
- Waterways
- Flood Areas
- Interstate Routes
- Township Roads
- At-Risk Structures
- Municipal Streets
- US Routes
- Municipalities
- Township Lines
- Ramps
- Lake



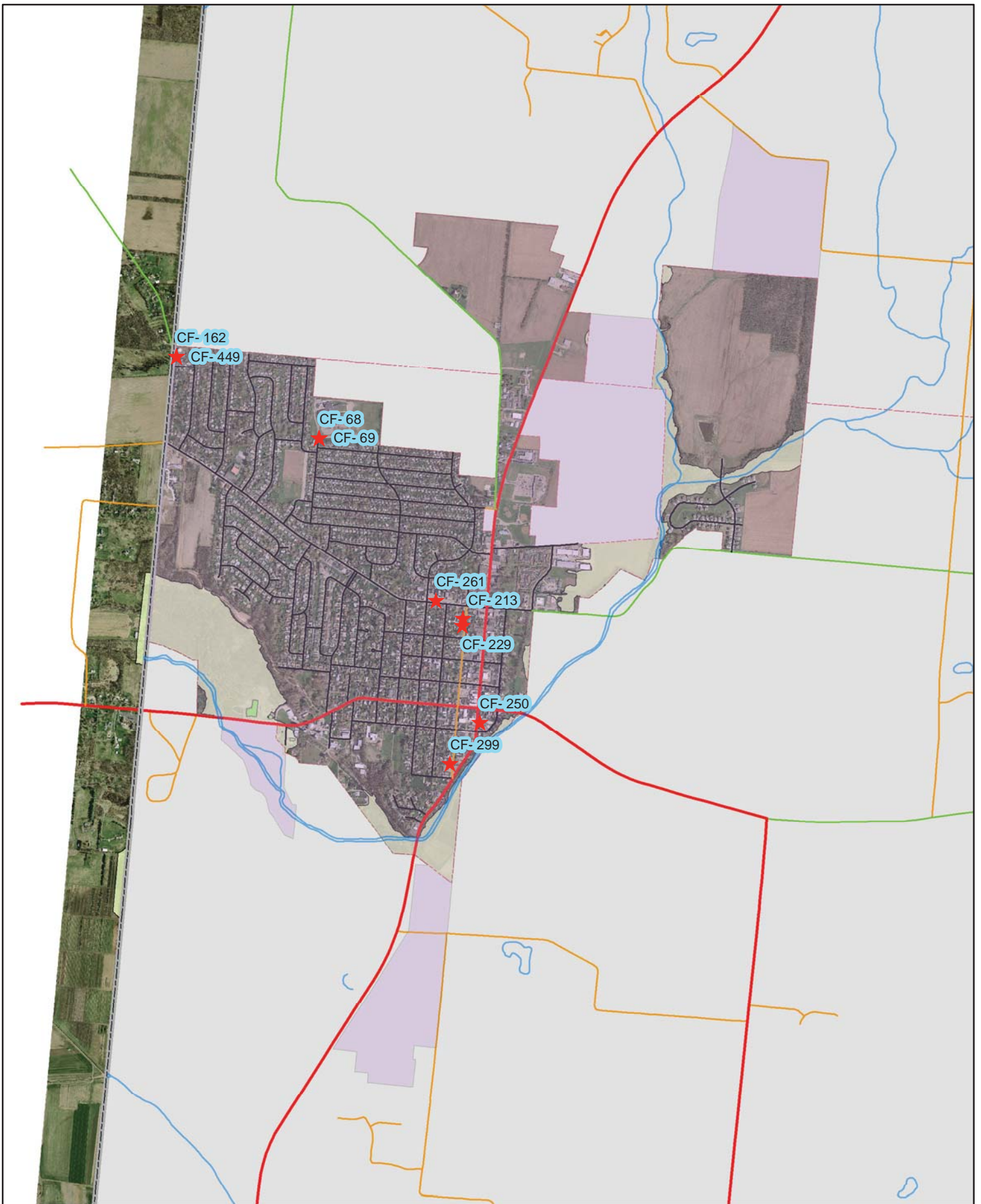


ENON

Legend

- ★ Critical Facilities
- County Line
- Flood Areas
- At-Risk Structures
- Township Lines
- Municipalities
- County Routes
- Interstate Routes
- Township Roads
- Municipal Streets
- State Routes
- US Routes
- Waterways
- Ramps
- Lake



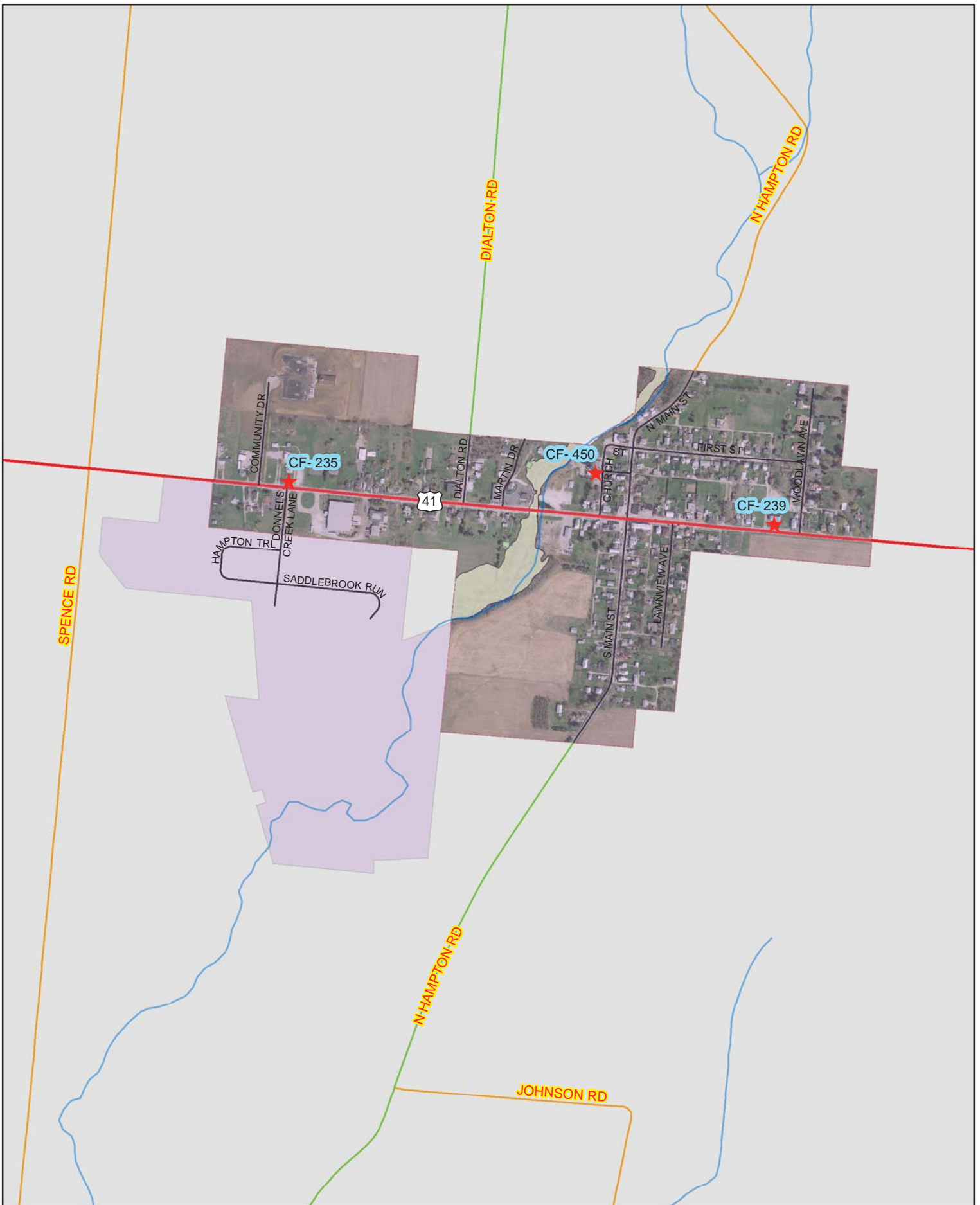


NEW CARLISLE

Legend

- ★ Critical Facilities
- County Line
- Flood Areas
- At-Risk Structures
- Municipalities
- Township Lines
- Waterways
- Lake
- County Routes
- Interstate Routes
- State Routes
- Township Roads
- Municipal Streets
- Ramps
- US Routes



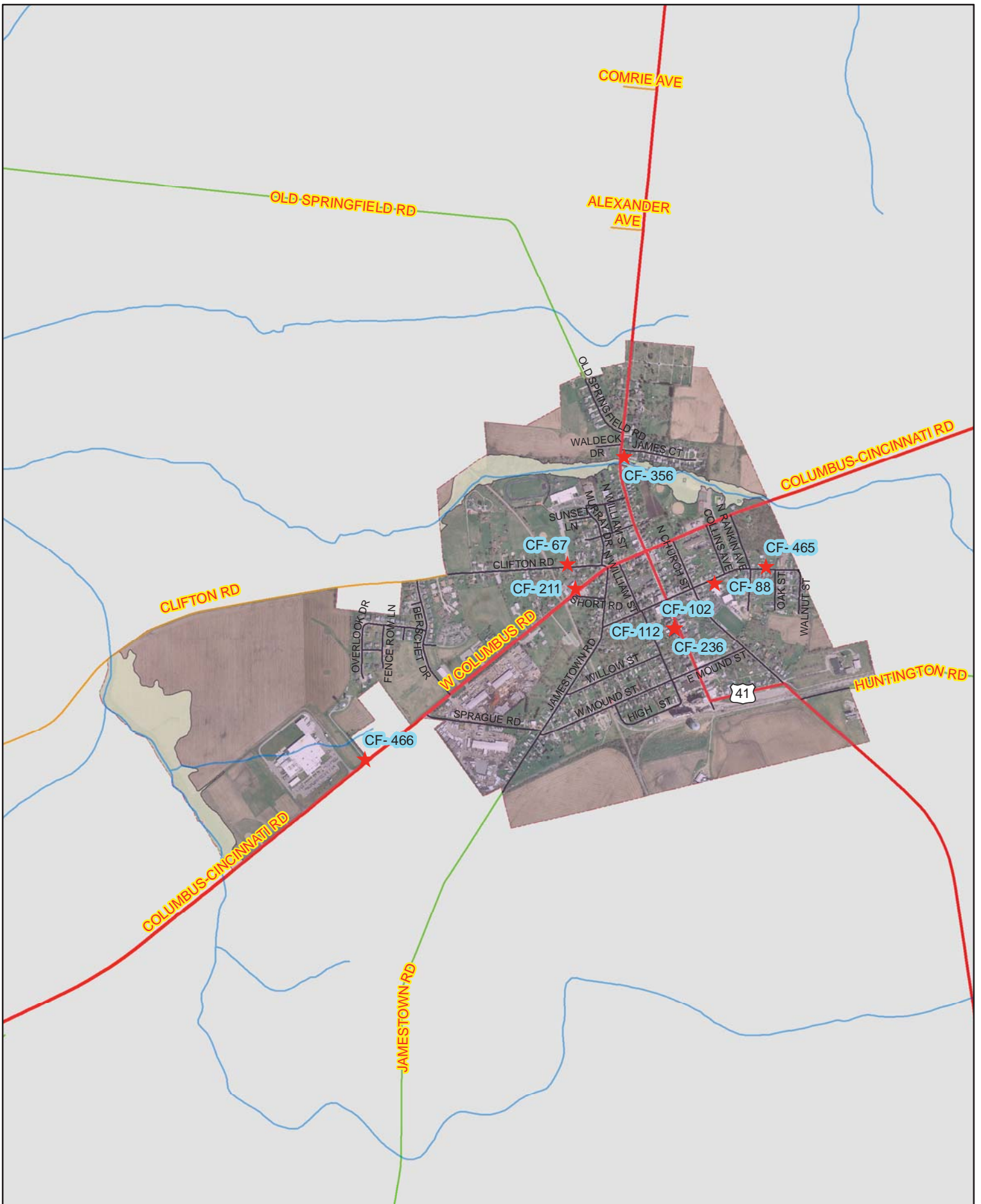


NORTH HAMPTON

Legend

- ★ Critical Facilities
- County Line
- Flood Areas
- At-Risk Structures
- Township Lines
- Ramps
- County Routes
- Interstate Routes
- Township Roads
- State Routes
- US Routes
- Waterways
- Municipalities
- Lake
- Municipal Streets
- Ramps



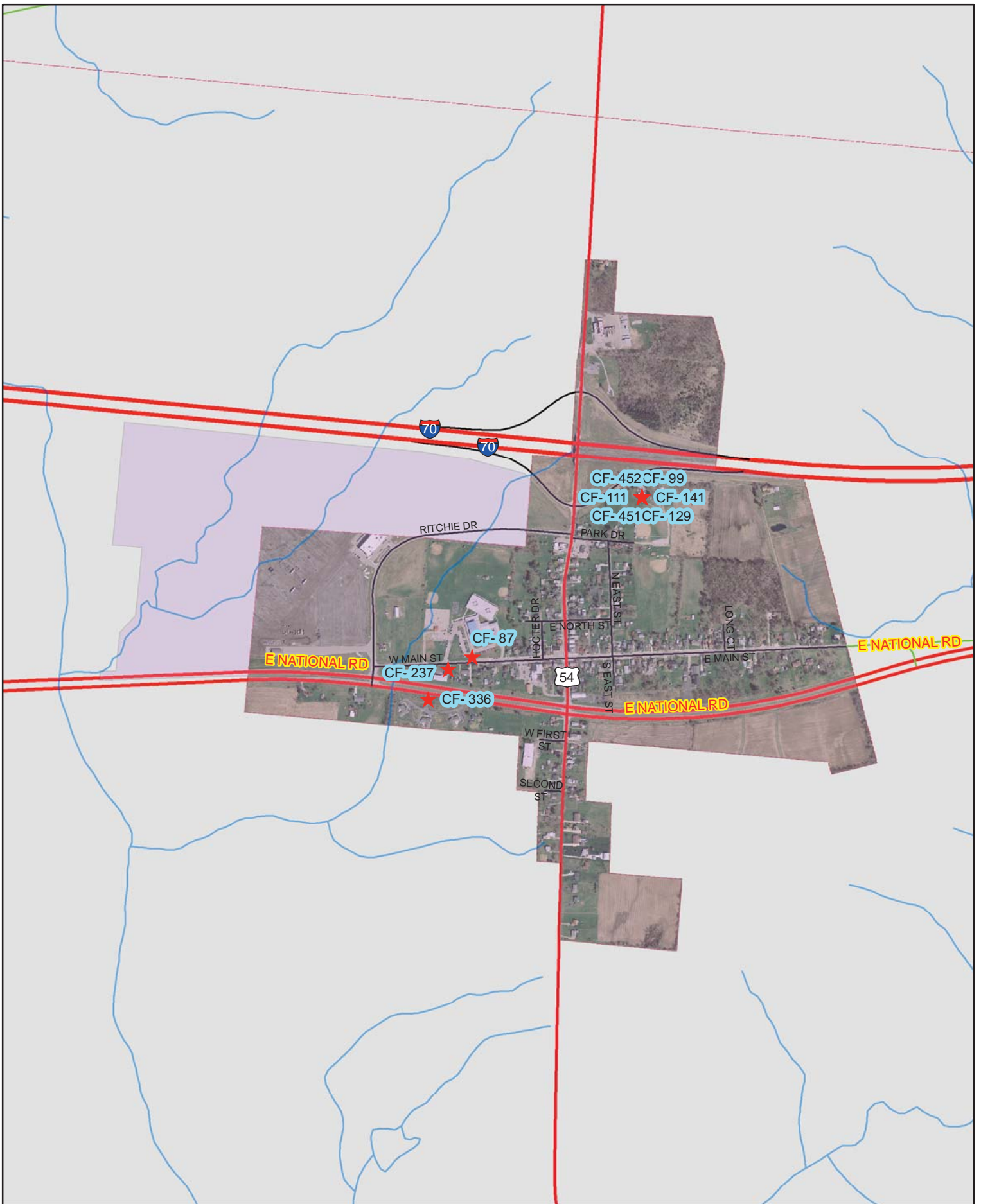


SOUTH CHARLESTON

Legend

- ★ Critical Facilities
- County Line
- County Routes
- State Routes
- Waterways
- Flood Areas
- Interstate Routes
- Township Roads
- Municipalities
- At-Risk Structures
- Municipal Streets
- US Routes
- Township Lines
- Ramps



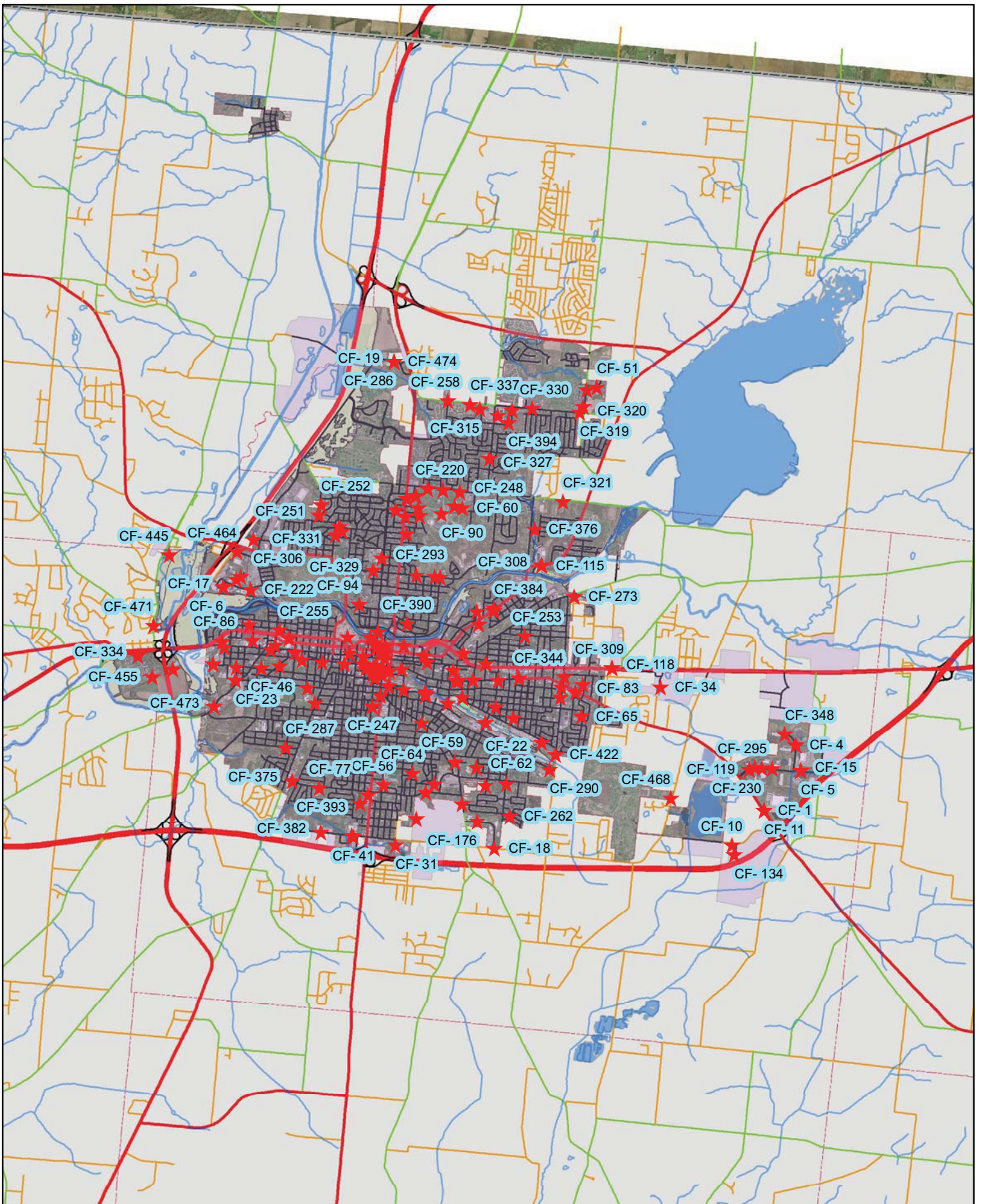


SOUTH VIENNA

Legend

- ★ Critical Facilities
- County Line
- Flood Areas
- At-Risk Structures
- Township Lines
- County Routes
- Interstate Routes
- Township Roads
- State Routes
- US Routes
- Waterways
- Lake
- Municipalities
- Municipal Streets
- Ramps



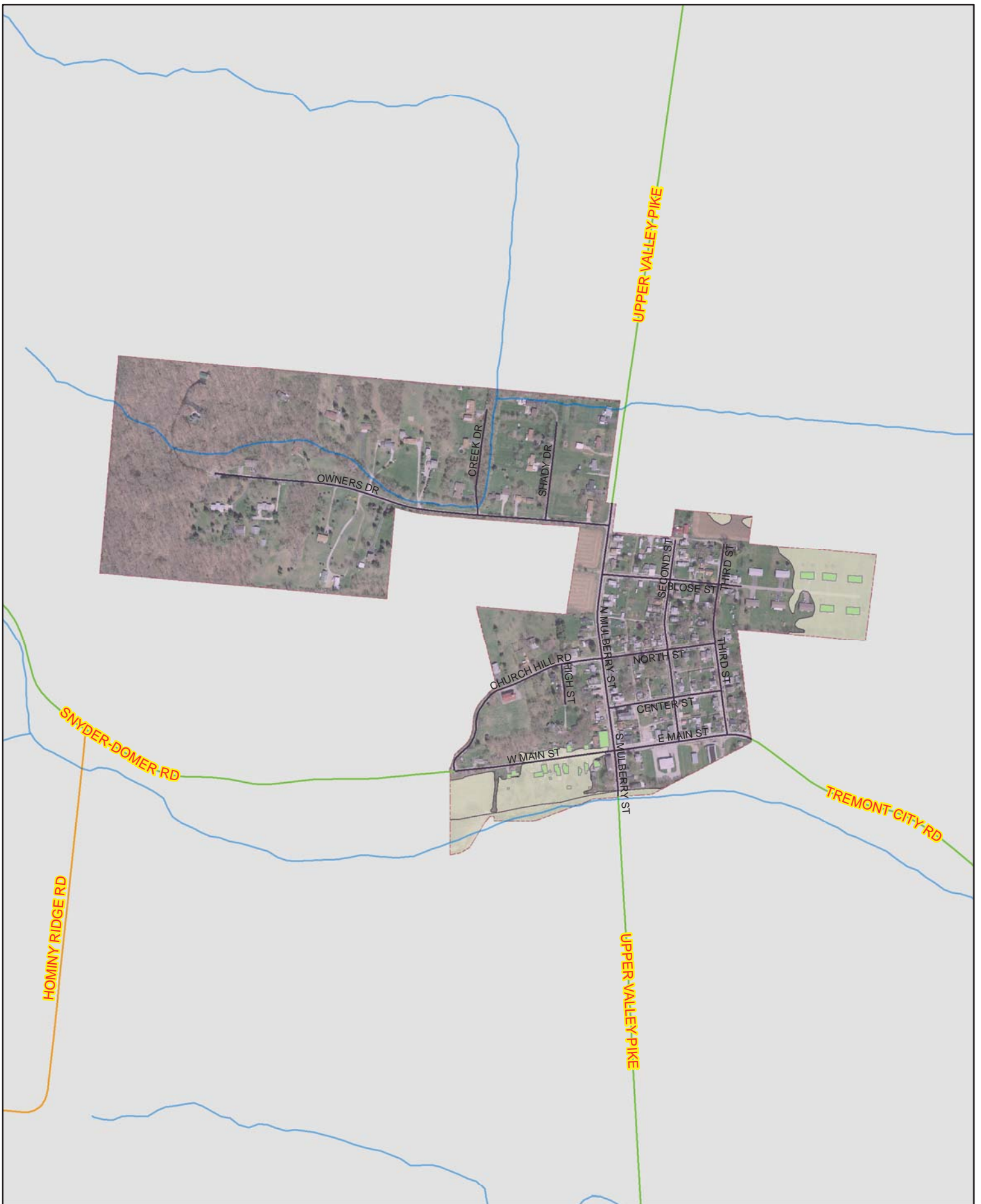


SPRINGFIELD

Legend

- ★ Critical Facilities
- County Line
- County Routes
- State Routes
- Waterways
- Flood Areas
- Interstate Routes
- Township Roads
- Municipalities
- At-Risk Structures
- Municipal Streets
- US Routes
- Lake
- Township Lines
- Ramps



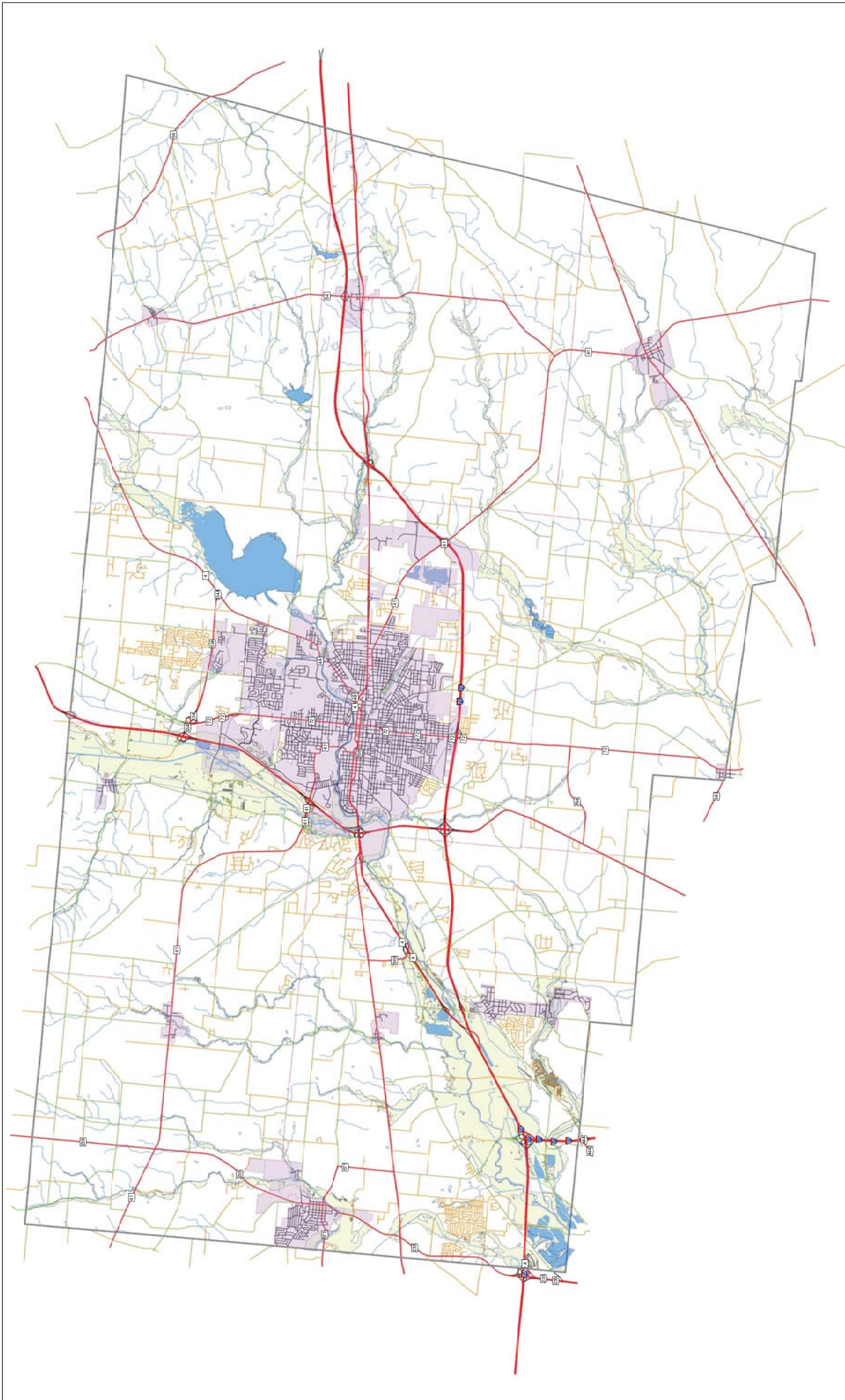


TREMONT CITY

Legend

- ★ Critical Facilities
- Waterways
- Municipalities
- Lake
- County Line
- Flood Areas
- At-Risk Structures
- Township Lines
- County Routes
- Interstate Routes
- Municipal Streets
- Ramps
- State Routes
- Township Roads
- US Routes





Legend

- Municipality
- Macdonalds
- Lake
- County Line
- Road
- Rural Roads
- Branch Line
- Municipal Streets
- Range
- County Roads
- Commercial Streets
- Municipal Streets
- US Routes
- Branch Line
- Municipal Streets
- US Routes
- Range
- County Line



CLARK COUNTY

APPENDIX

A – 6 HAZUS-MH – Earthquake Event Report

HAZUS-MH: Earthquake Event Report

Region Name Clark Co OH Quake

Earthquake Scenario: Springfield OH Quake Scenario

Print Date: August 27, 2012

Totals only reflect data for those census tracts/blocks included in the user's study region.

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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Shelter Requirements	
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 Appendix A: County Listing for the Region	
Appendix B: Regional Population and Building Value Data	

HAZUS is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of HAZUS is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Ohio

Note:

Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 403.03 square miles and contains 43 census tracts. There are over 56 thousand households in the region and has a total population of 144,742 people (2000 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 60 thousand buildings in the region with a total building replacement value (excluding contents) of 10,893 (millions of dollars). Approximately 93.00 % of the buildings (and 75.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,962 and 1,154 (millions of dollars) , respectively.

Building Inventory

HAZUS estimates that there are 60 thousand buildings in the region which have an aggregate total replacement value of 10,893 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 68% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

HAZUS breaks critical facilities into two (2) groups: essential facilities and high potential loss (HPL) facilities. Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 2 hospitals in the region with a total bed capacity of 430 beds. There are 64 schools, 22 fire stations, 8 police stations and 0 emergency operation facilities. With respect to HPL facilities, there are 7 dams identified within the region. Of these, 2 of the dams are classified as 'high hazard'. The inventory also includes 26 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within HAZUS, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 3,116.00 (millions of dollars). This inventory includes over 229 kilometers of highways, 169 bridges, 4,608 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	169	241.80
	Segments	105	1,423.80
	Tunnels	0	0.00
	Subtotal		1,665.50
Railways	Bridges	3	0.40
	Facilities	2	5.30
	Segments	46	154.90
	Tunnels	0	0.00
	Subtotal		160.60
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
	Subtotal		0.00
Bus	Facilities	1	1.10
	Subtotal		1.10
Ferry	Facilities	0	0.00
	Subtotal		0.00
Port	Facilities	0	0.00
	Subtotal		0.00
Airport	Facilities	2	21.30
	Runways	3	113.90
	Subtotal		135.20
	Total		1,962.50

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	46.10
	Facilities	1	35.00
	Pipelines	0	0.00
	Subtotal		81.10
Waste Water	Distribution Lines	NA	27.70
	Facilities	16	1,118.90
	Pipelines	0	0.00
	Subtotal		1,146.50
Natural Gas	Distribution Lines	NA	18.40
	Facilities	0	0.00
	Pipelines	0	0.00
	Subtotal		18.40
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
	Subtotal		0.00
Electrical Power	Facilities	0	0.00
	Subtotal		0.00
Communication	Facilities	5	0.50
	Subtotal		0.50
	Total		1,246.50

HAZUS uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	Springfield OH Quake Scenario
Type of Earthquake	Arbitrary
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	NA
Longitude of Epicenter	-83.80
Latitude of Epicenter	39.93
Earthquake Magnitude	5.40
Depth (Km)	0.00
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	CEUS Event

Building Damage

HAZUS estimates that about 10,284 buildings will be at least moderately damaged. This is over 17.00 % of the total number of buildings in the region. There are an estimated 443 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	175	0.50	56	0.38	49	0.63	18	0.88	3	0.60
Commercial	1,438	4.07	600	4.06	505	6.44	181	9.10	35	7.81
Education	48	0.14	20	0.13	18	0.23	6	0.32	2	0.39
Government	44	0.12	17	0.11	15	0.19	4	0.22	1	0.26
Industrial	450	1.27	164	1.11	147	1.87	54	2.69	8	1.89
Other Residential	5,662	16.00	2,459	16.61	1,542	19.65	343	17.23	63	14.24
Religion	180	0.51	79	0.53	63	0.80	24	1.18	5	1.21
Single Family	27,380	77.39	11,408	77.07	5,509	70.19	1,363	68.38	326	73.60
Total	35,378		14,802		7,848		1,993		443	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	26,358	74.50	10,537	71.18	3,827	48.76	470	23.57	28	6.39
Steel	719	2.03	237	1.60	273	3.48	101	5.08	10	2.18
Concrete	201	0.57	68	0.46	59	0.76	16	0.83	1	0.27
Precast	179	0.51	56	0.38	78	0.99	41	2.04	3	0.77
RM	130	0.37	33	0.22	45	0.57	21	1.05	1	0.22
URM	6,159	17.41	3,205	21.65	2,942	37.49	1,241	62.27	393	88.62
MH	1,631	4.61	667	4.51	624	7.95	103	5.17	7	1.56
Total	35,378		14,802		7,848		1,993		443	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 430 hospital beds available for use. On the day of the earthquake, the model estimates that only 161 hospital beds (38.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 54.00% of the beds will be back in service. By 30 days, 81.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	At Least Moderate Damage > 50%	# Facilities	
			Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	2	0	0	0
Schools	64	0	0	12
EOCs	0	0	0	0
PoliceStations	8	0	0	4
FireStations	22	0	0	6

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	After Day 7
Highway	Segments	105	0	0	105	105
	Bridges	169	0	0	169	169
	Tunnels	0	0	0	0	0
Railways	Segments	46	0	0	46	46
	Bridges	3	0	0	3	3
	Tunnels	0	0	0	0	0
	Facilities	2	2	0	2	2
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	1	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	2	2	0	2	2
	Runways	3	0	0	3	3

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, HAZUS performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	Total #	# of Locations			
		With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	1	0	0	1
Waste Water	16	11	0	0	16
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	5	5	0	3	5

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	2,304	84	21
Waste Water	1,383	67	17
Natural Gas	922	71	18
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	56,648	0	0	0	0	0
Electric Power		39,051	24,369	9,360	1,569	49

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. HAZUS uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 12 ignitions that will burn about 0.74 sq. mi (0.18 % of the region's total area.) The model also estimates that the fires will displace about 1,547 people and burn about 107 (millions of dollars) of building value.

Debris Generation

HAZUS estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.330 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 59.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 13,240 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 797 households to be displaced due to the earthquake. Of these, 561 people (out of a total population of 144,742) will seek temporary shelter in public shelters.

Casualties

HAZUS estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	2	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	3	1	0	0
	Industrial	2	0	0	0
	Other-Residential	72	15	2	4
	Single Family	204	42	5	11
	Total	282	59	7	15
2 PM	Commercial	110	24	3	6
	Commuting	0	0	0	0
	Educational	45	10	1	3
	Hotels	1	0	0	0
	Industrial	12	2	0	1
	Other-Residential	17	4	0	1
	Single Family	48	10	1	3
	Total	232	51	7	13
5 PM	Commercial	88	19	3	5
	Commuting	0	0	0	0
	Educational	5	1	0	0
	Hotels	1	0	0	0
	Industrial	8	2	0	0
	Other-Residential	28	6	1	2
	Single Family	81	18	2	4
	Total	212	46	6	11

The total economic loss estimated for the earthquake is 1,309.08 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 1,054.37 (millions of dollars); 16 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 61 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates
(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	3.15	26.02	1.50	2.33	32.99
	Capital-Related	0.00	1.34	20.35	0.95	0.66	23.30
	Rental	10.02	11.04	12.78	0.61	0.97	35.42
	Relocation	37.05	7.49	21.23	2.71	9.38	77.85
	Subtotal	47.07	23.02	80.38	5.77	13.34	169.57
Capital Stock Losses							
	Structural	56.97	14.66	25.21	6.74	10.07	113.66
	Non_Structural	253.13	98.18	85.23	31.79	32.24	500.58
	Content	115.43	34.67	61.80	26.22	23.49	261.62
	Inventory	0.00	0.00	2.23	6.18	0.55	8.95
	Subtotal	425.54	147.51	174.48	70.93	66.34	884.80
	Total	472.61	170.53	254.86	76.69	79.68	1,054.37

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, HAZUS computes the direct repair cost for each component only. There are no losses computed by HAZUS for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

HAZUS estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1,423.78	\$0.00	0.00
	Bridges	241.75	\$0.49	0.20
	Tunnels	0.00	\$0.00	0.00
	Subtotal	1665.50	0.50	
Railways	Segments	154.90	\$0.00	0.00
	Bridges	0.38	\$0.00	0.08
	Tunnels	0.00	\$0.00	0.00
	Facilities	5.33	\$2.30	43.18
	Subtotal	160.60	2.30	
Light Rail	Segments	0.00	\$0.00	0.00
	Bridges	0.00	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Bus	Facilities	1.14	\$0.51	44.71
	Subtotal	1.10	0.50	
Ferry	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Port	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Airport	Facilities	21.30	\$7.64	35.87
	Runways	113.89	\$0.00	0.00
	Subtotal	135.20	7.60	
Total		1962.50	10.90	

Table 13: Utility System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	\$0.00	0.00
	Facilities	35.00	\$7.75	22.16
	Distribution Line	46.10	\$0.38	0.82
	Subtotal	81.05	\$8.13	
Waste Water	Pipelines	0.00	\$0.00	0.00
	Facilities	1,118.90	\$234.85	20.99
	Distribution Line	27.70	\$0.30	1.09
	Subtotal	1,146.53	\$235.15	
Natural Gas	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Distribution Line	18.40	\$0.32	1.74
	Subtotal	18.44	\$0.32	
Oil Systems	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	\$0.00	
Electrical Power	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	\$0.00	
Communication	Facilities	0.50	\$0.16	31.39
	Subtotal	0.53	\$0.16	
Total		1,246.55	\$243.77	

Table 14. Indirect Economic Impact with outside aid
 (Employment as # of people and Income in millions of \$)

	LOSS	Total	%
First Year			
	Employment Impact	0	0.00
	Income Impact	(7)	-0.30
Second Year			
	Employment Impact	0	0.00
	Income Impact	(22)	-0.95
Third Year			
	Employment Impact	0	0.00
	Income Impact	(29)	-1.23
Fourth Year			
	Employment Impact	0	0.00
	Income Impact	(29)	-1.23
Fifth Year			
	Employment Impact	0	0.00
	Income Impact	(29)	-1.23
Years 6 to 15			
	Employment Impact	0	0.00
	Income Impact	(29)	-1.23

Appendix A: County Listing for the Region

Clark, OH

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Ohio	Clark	144,742	8,121	2,771	10,893
Total State		144,742	8,121	2,771	10,893
Total Region		144,742	8,121	2,771	10,893

APPENDIX

A – 7 2006 Approved Plan

Plan was prepared by EMH&T, Inc. and was adopted on March 13, 2006

Plan is on file at the office of the Clark County Emergency Management Agency,
3130 E. Main Street, Suite 1E, Springfield, Ohio 45505