

2.1 IDENTIFY HAZARDS

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

Several methods of research were utilized to identify the hazards to which Clinton County and its municipalities are susceptible. Reviews of related plans/studies, reviews of local media archives, and interviews with local officials were used to ensure accurate data and events were identified. The documents used as part of the research on this project are listed below.

The following chart (Figure 2.1.1) illustrates the hazards to which the county and its municipalities are susceptible. The intent of this chart is to justify the inclusion of these hazards in the plan; more detailed information about how they affect the areas within the county can be found in the hazard profiles in Appendix 1.

Figure 2.1.1

Hazard	How Identified	Why Identified
Avalanche	<ul style="list-style-type: none"> • USGS Topographic Maps • NOAA 	<ul style="list-style-type: none"> • The general contour of the land in the county is mountainous, but they are not steep enough to cause avalanche activity. • Further, the amount of snowfall the county receives is insufficient for any kind of avalanche.
Coastal Erosion	<ul style="list-style-type: none"> • MapQuest 	<ul style="list-style-type: none"> • Coastal erosion is not a significant risk as the county is more than 450 miles from the Atlantic Ocean.
Coastal Storm	<ul style="list-style-type: none"> • See also “Thunderstorm” 	<ul style="list-style-type: none"> • Coastal storms are not a threat to the county as the county is more than 450 miles from the Atlantic Ocean.
Dam Failure	<ul style="list-style-type: none"> • Local media search • ODNR, Division of Soil and Water Resources – Dam Safety • National Dam Inventory • Association of State Dam Safety • Internet research 	<ul style="list-style-type: none"> • 9 Class I, 13 Class II and III within Clinton County • According to the ODNR, Division of Soil and Water – Dam Safety, the potential downstream hazard associated with Class I-III can be loss of life, structures, and agricultural products
Debris Flow	<ul style="list-style-type: none"> • See also “Land Subsidence” 	<ul style="list-style-type: none"> • See “Land Subsidence”
Drought	<ul style="list-style-type: none"> • Local media research • State of Ohio Hazard Mitigation Plan 2014 • ODNR Division of Soil and Water Resources • Palmer Drought Severity Index (PDSI) • National Climatic Data Center (NCDC) Event Record Database • USGS website 	<ul style="list-style-type: none"> • 2 events in 1999 • Agricultural economy • Reservoir system for water
Dust/Sand Storms	<ul style="list-style-type: none"> • ODNR – Division of Soil and Water Resources • Internet research 	<ul style="list-style-type: none"> • The topography is extensive grass and forest
Earthquake	<ul style="list-style-type: none"> • Ohio Seismic Network • ODNR – Division of Geology • ESRI GIS Information for Ohio • State of Ohio Hazard Mitigation Plan 2014 • USGS National Seismic Hazard Mapping Project • FEMA website 	<ul style="list-style-type: none"> • Significant seismic activity in counties surrounding Clinton County • Rests on the Grenville Front tectonic zone •
Expansive Soils	<ul style="list-style-type: none"> • See also “Land Subsidence” 	<ul style="list-style-type: none"> • See “Land Subsidence”
Extreme Cold	<ul style="list-style-type: none"> • NCDC Event Records 	<ul style="list-style-type: none"> • See “Winter Storm”

Extreme Heat	<ul style="list-style-type: none"> • NCDC Event Records 	<ul style="list-style-type: none"> • Temperatures in the county seldom exceed 100 degrees. • 1 event in which temperatures meet or exceed 100 degrees, denoting “excessive heat”.
Flooding	<ul style="list-style-type: none"> • Public Input • Local media search • Ohio State Hazard Mitigation Plan 2014 • NCDC Event Record Database • Past disaster declarations • FIRMs • FEMA Repetitive Loss List 	<ul style="list-style-type: none"> • 22 flooding events since 2002 • 15 flash flood events since 1996 • Death as a result of flooding • Large economic loss
Glaciers	<ul style="list-style-type: none"> • NCDC Event Records 	<ul style="list-style-type: none"> • Temperatures to not reach the levels to sustain glaciers
Hailstorm	<ul style="list-style-type: none"> • See also “Thunderstorm” 	<ul style="list-style-type: none"> • See “Thunderstorm”
Hazardous Materials Incident	<ul style="list-style-type: none"> • Public input • Local media research • US DOT – Hazardous Materials Safety • US EPA – Envirofacts Warehouse 	<ul style="list-style-type: none"> • Hazardous materials in various forms have the potential to result in death, serious injury, produce long-lasting health effects, and damage to property. • 122 Hazardous material reporting facilities. • Increased transportation presence in county
Hurricane	<ul style="list-style-type: none"> • See also “Thunderstorm” 	<ul style="list-style-type: none"> • The county does not experience the hurricane conditions of extremely high winds, rains, and hail. In some instances, the county may be affected by rainfall brought about by the remnants of a hurricane, which are addressed elsewhere.
Insect Infestation – Emerald Ash Borer	<ul style="list-style-type: none"> • Ohio State University • ODNR – Division of Wildlife • ODNR – Division of Forestry • US Forest Service • USDA/APHIS • Public Comment • Internet Search 	<ul style="list-style-type: none"> • Clinton County is classified as a quarantined area for Emerald Ash Borers • High Economic losses possible • Increased populations of insects
Land Subsidence	<ul style="list-style-type: none"> • Local media research • Public Input • Ohio State Hazard Mitigation Plan 2014 • Ohio Department of Transportation (ODOT) – Division of Engineering Policy • ODNR – Division of Geology • USGS Soil Survey 	<ul style="list-style-type: none"> • State Mitigation plan rates Clinton County as a “Moderate” risk • Increased Oil and Gas Industry presence
Landslide	<ul style="list-style-type: none"> • See “Land Subsidence” 	<ul style="list-style-type: none"> • See “Land Subsidence”

Oil and Gas Industry	<ul style="list-style-type: none"> • US Environmental Protection Agency (EPA) – Envirofacts Warehouse • US Department of Transportation (DOT) – Hazardous Materials Safety • ODNR – Division of Geology • ODNR – Division of Geological Survey • Local media research • Internet research • Public Input 	<ul style="list-style-type: none"> • Increased industry presence • Economic dependence
Terrorism	<ul style="list-style-type: none"> • USAMRIID Handbooks • USAMRICD Handbooks • National Fire Academy • Ohio State Hazard Mitigation Plan 2014 • FEMA Website • Internet research 	<ul style="list-style-type: none"> • Large metropolitan areas in vicinity • Low population density allowing for decreased chance of detection
Thunderstorm	<ul style="list-style-type: none"> • NCDC Event Record Database • State of Ohio Hazard Mitigation Plan 2014 • Tornado History Project • National Weather Service • Public Input • Internet research 	<ul style="list-style-type: none"> • 76 Hail storms with property damage • 2 Lightning events with property damage • 169 Thunderstorm events with significant property damage • 83 Heavy rain events
Tsunami	<ul style="list-style-type: none"> • MapQuest 	<ul style="list-style-type: none"> • The Atlantic Ocean is approximately 450 miles from the county.
Urban Fire	<ul style="list-style-type: none"> • See also “Wildfire” 	<ul style="list-style-type: none"> • See “Wildfire”
Volcano	<ul style="list-style-type: none"> • USGS 	<ul style="list-style-type: none"> • No volcanoes exist on the east coast.
War	<ul style="list-style-type: none"> • Public Input • Internet research 	<ul style="list-style-type: none"> • Location significantly distant from foreign entities • Low density of strategic importance
Wildfire	<ul style="list-style-type: none"> • NCDC Event Record Database • State of Ohio Hazard Mitigation Plan 2014 • ODNR – Division of Forestry • WFAS-MAPS • National Interagency Fire Center • Internet research 	<ul style="list-style-type: none"> • No events recorded since 2002 • Agricultural economy
Wind	<ul style="list-style-type: none"> • See also “Thunderstorm” 	<ul style="list-style-type: none"> • 25 Tornado events since 1950 • F3 and F4 Tornado occurrence • 5 High wind events since 2000 with significant property damage
Winter Storm	<ul style="list-style-type: none"> • NCDC Event record Database • State of Ohio Hazard Mitigation Plan 2014 • Internet search • Public input 	<ul style="list-style-type: none"> • 5 Ice storms • 11 Heavy snow storms • 22 Winter Weather events • 24 Winter Storms • Property damage as a result

MULTI-JURISDICTIONAL REQUIREMENTS

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

While it is true that the municipalities can be said to be susceptible to the above hazards by virtue of their location in Clinton County, it is stressed that it may be more or less susceptible to these hazards than each other and the balance of Clinton County. The following chart (Figure 2.1.2) determines if they are equally (=), more (>), or less (<) susceptible to these hazards than the balance of the county. (Only those hazards affecting the county are listed below.)

Figure 2.1.2

Hazard	Dam Failure	Drought/ Extreme Heat	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm/ Thunderstorm	Severe Wind/ Tornado	Terrorism	Winter Storm/ Extreme Cold
Blanchester, Village of	>	=	=	>	=	=	>	=	>	>	=	=
Clarksville, Village of	>	=	=	>	<	=	>	<	>	>	=	=
Martinsville, Village of	=	>	=	=	=	=	=	=	>	>	=	=
Midland, Village of	=	>	=	=	=	=	=	=	>	>	=	=
New Vienna, Village of	=	>	=	>	=	=	<	=	>	>	=	=
Port William, Village of	=	=	=	>	=	=	<	>	>	>	=	=
Sabina, Village of	=	>	=	>	>	=	<	>	>	>	=	=
Wilmington, City of	>	=	=	>	>	=	=	>	>	>	>	=

2.2 PROFILE HAZARDS

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

2.2.a Section Overview

Several hazards affect Clinton County, as noted in the Section 2.1: Identify Hazards. Those hazards, however, may not affect the county in ways that residents and planners may typically think. This section references detailed descriptions of how the identified hazards affect Clinton County and the municipalities therein.

Refer to Appendix 1 of this plan for detailed hazard profiles (including scholarly discussions of the hazard and historical occurrences), extensive asset inventory and loss estimate data, and Geographic Information System (GIS)-based mapping that predicts low, moderate, and high susceptibility areas.

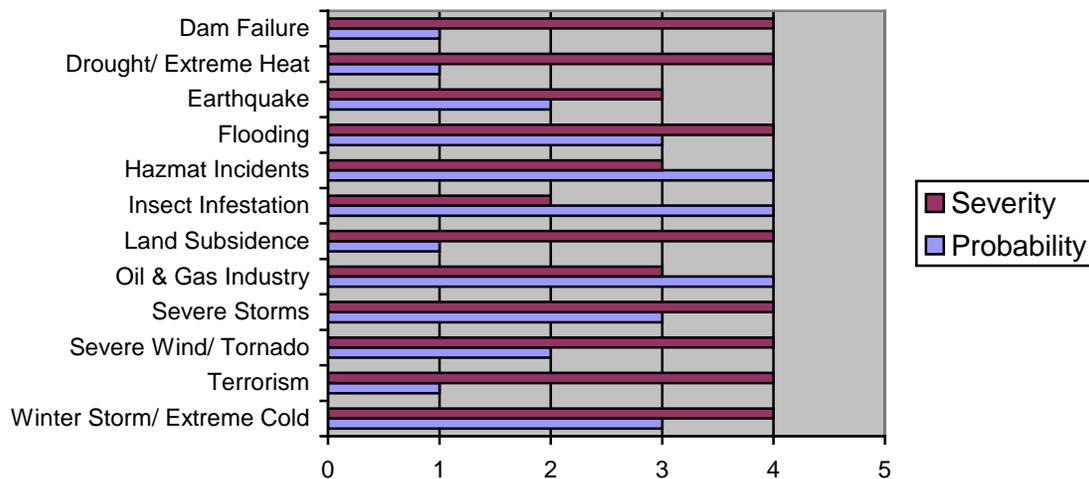


Figure 2.2.a.1

2.2.b Probability vs. Severity Explanation

In the case of many hazards, it is not possible to eliminate risks; they can only be reduced. When many risks exist at once, or when resources are limited, mitigation and preparedness require the setting of priorities. For example, local officials may want to invest mitigation and preparedness dollars in projects that lessen losses from higher probability hazards. The classification of “probability” and

“severity” for hazard risks in Clinton County is quantified by the following *Risk Assessment Decision Matrix*.

Figure 2.2.b.1 above was created to enhance the usability of the plan. It provides a more holistic snapshot of risk in terms of probability and severity in a format that is more familiar to most readers of this plan. To create the bar graph, the following approximations were used.

- Probability
 - Frequent = 4
 - Probable = 3
 - Occasional = 2
 - Remote = 1
 - Improbable = 0

- Severity
 - Catastrophic = 4
 - Critical = 3
 - Marginal = 2
 - Negligible = 1

2.2.c. Probability vs. Severity Methodology

The first task that was undertaken was to determine the frequency of hazard occurrences. For instance, how many floods occur in a year? How many winter storms has Clinton County experienced in the past ten (10) years? To answer these questions, the *NCDC Event Records* database was used. The National Climatic Data Center (NCDC) keeps records of significant storm events back to 1950. The number of hazard events (i.e., floods, hailstorms, thunderstorms, tornados, winter storms, etc.) was counted.

Based on records for only Clinton County, probability was determined. As such, probability for hazards in Clinton County is a comparison between the hazards that have actually occurred in Clinton County as opposed to a comparison with data from another location. For example, a total of ten (10) occurrences of Event X may be significant in Clinton County, but could be a very low number of occurrences in a neighboring or other county.

If the information contained in the NCDC database was insufficient, other historical data, such as local media archives and interviews with local officials, were gathered. If repeated coverage was given to a particular hazard event, that event was considered highly probable to occur. Also, local officials were able to verify or identify those hazards occurring frequently. Table 2.2.c.1 lists the classifications considered for hazard probability.

Table 2.2.c.1

Hazard Probability Classifications

<i>Label</i>	<i>Specific Hazard Event</i>	<i>Frequency</i>
Frequent	Likely to occur frequently	Continuously experienced
Probable	Will occur several times in the life of an item	Experienced several times
Occasional	Likely to occur sometime in the life of an item	Experienced
Remote	Unlikely but possible to occur in the life of an item	Unlikely that it has been experienced
Improbable	So unlikely that it can be assumed occurrence may not be experienced	Not experienced

The second and final task was to determine the severity of identified hazard events. Again, *NCDC Event Records* were used. These documents record the atmospheric conditions of the event and other details, such as wind speeds, damage incurred, and the number of deaths/injuries. If it appeared that thunderstorms frequently occurred but did not result in significant monetary losses or deaths, then thunderstorms were said to have a high probability and low severity. If winter storms, for example, appeared to occur frequently and also cause significant damage and deaths/injuries, winter storms were said to have a high probability *and* high severity. As with probability, if the NCDC database was insufficient, local media archives and interviews with local officials were used. Table 2.2.c.2 lists the severity classifications that were considered.

Table 2.2.c.2

Hazard Severity Classifications

<i>Description</i>	<i>Mishap Definition</i>
Catastrophic	Death or major structural loss
Critical	Severe injury, severe illness, or marginal structural damage
Marginal	Minor injury, minor illness, or structural damage
Negligible	Less than minor injury, illness, or structural damage

Figure 2.2.c.3 combines the probability and severity information into a “risk assessment matrix” that generalizes the potential impact of each hazard included in the plan. This is the figure that was re-formatted into a bar graph as described above.

Figure 2.2.c.3

Risk Assessment Matrix

<i>Hazard Severity</i>	<i>Hazard Probability</i>				
	Frequent	Probable	Occasional	Remote	Improbable
Catastrophic		4,9,12	10	1,2,7,11	
Critical	5,8		3		
Marginal	6				
Negligible					

- | | |
|--|-------------------------------|
| 1. Dam Failure | 7. Land Subsidence/Landslide |
| 2. Drought/Extreme Heat | 8. Oil & Gas Industry |
| 3. Earthquake | 9. Severe Storms |
| 4. Flooding | 10. Severe Wind/Tornado |
| 5. Hazmat Incident | 11. Terrorism |
| 6. Insect Infestation –
Emerald Ash Borer | 12. Winter Storm/Extreme Cold |

2.3 INVENTORY ASSETS

§201.6(c)(2)(ii)	[The risk assessment shall include a] description of the jurisdiction's vulnerability of the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
§201.6(c)(2)(ii)(A)	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

This risk assessment identifies “at-risk” community assets such as critical facilities, critical infrastructure, historical properties, commercial/industrial facilities, etc. “Assets” contribute directly to the quality of life in the community as well as ensure its continued operation. As such, government facilities are often listed, as are water/wastewater and transportation infrastructure. “Assets” can also be irreplaceable items within the community, such as historical structures or even vulnerable populations (including the elderly or youths).

METHODOLOGY

Inventorying assets first involves determining what in the community can be affected by a hazard event. The core planning committee maintains a specific list of community assets as part of this plan. These assets are grouped into the following categories.

- *Critical Facilities:* Governmental facilities, water/wastewater facilities, dams, emergency services facilities, medical facilities (hospitals/clinics), military facilities, and the transportation infrastructure.
- *Vulnerable Populations:* Schools, nursing homes, and senior centers.
- *Economic Assets:* Large commercial/industrial facilities or large employers (not covered in other categories).
- *Special Considerations:* Residences, community outreach facilities, post offices, and libraries.
- *Historical Considerations:* Areas/structures listed on the National Register of Historic Places.

While inventorying assets, much information can be gathered that will assist in the upcoming loss estimations. Each specific asset is listed with its size, replacement value (structure only), contents value, function use or value (annual operating budget), displacement cost (\$ per day), and occupancy. These values are utilized to compute loss estimates, which is why it is critical to carefully consider all the facilities that are listed in the asset inventory. Following is a brief description of how the above numbers are derived.

- *Size*: County assessor data or by directly contacting the facility.
- *Replacement Value*: County assessor data or by directly contacting the facility.
- *Contents Value*: Directly contacting the facility.
- *Function Use or Value*: Directly contacting the facility.
- *Displacement Cost*: Function Use or Value divided by 365.
- *Occupancy*: Directly contacting the facility.

ASSET INVENTORY

The above information for the complete asset inventory is listed on Table 2.3.1 below. Table 2.3.1 is a replica of Worksheet #3b from the *State and Local Mitigation Planning How-To Guide: Understanding Your Risks* (FEMA 386-2). Following is a key for the acronyms found on Table 2.3.1.

- *EMS*: Emergency Medical Services
- *ES*: Elementary School
- *FD*: Fire Department
- *HS*: High School
- *MS*: Middle School
- *PO*: Post Office
- *VFD*: Volunteer Fire Department

Table 2.3.2 lists the assets located within the Village of Blanchester.

Table 2.3.3 lists the assets located within the Village of Clarksville.

Table 2.3.4 lists the assets located within the Village of Martinsville.

Table 2.3.5 lists the assets located within the Village of Midland.

Table 2.3.6 lists assets located within the Village of New Vienna.

Table 2.3.7 lists assets located within the Village of Port William.

Table 2.3.8 lists assets located within the Village of Sabina.

Table 2.3.9 lists assets located within the City of Wilmington.

*NOTE: The assets listed on Tables 2.3.2-2.3.9 are *also* listed on the countywide asset inventory (Table 2.3.1).

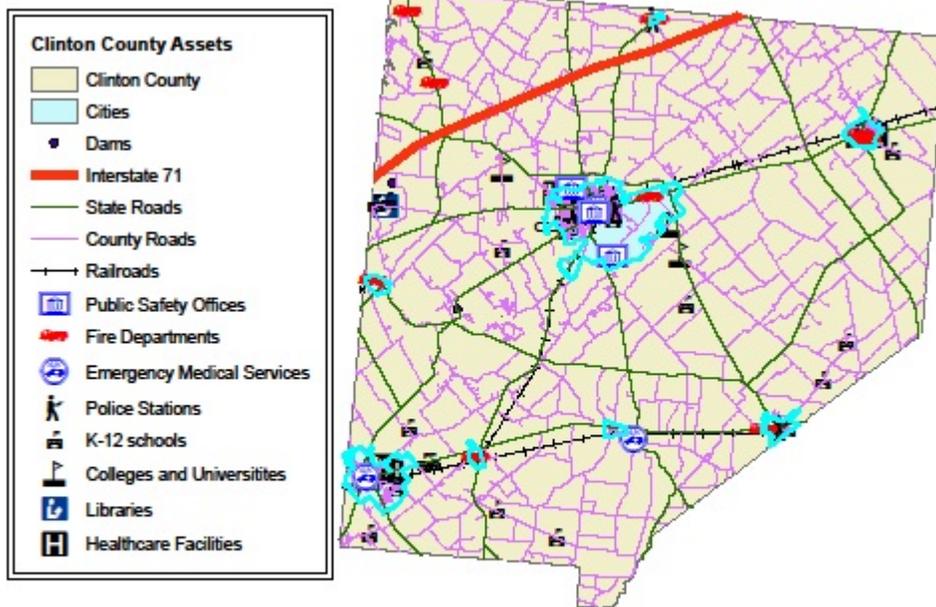


Figure 2.3.1

Table 2.3.9

City of Wilmington Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility X	Vulnerable Populations X	Economic Assets X	Special Considerations X	Historic/Other Considerations X	Replacement Value (\$)		Contents Value (\$)		Function Use or Value (\$)		Displacement Cost (\$)		Occupancy or Capacity (#)	
							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
GOVERNMENT FACILITIES																
Adams Township Trustees	389 S. Beechgrove Rd	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Alternatives to Violence	94 N. South St.	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
American Red Cross	50 S. Mulberry St.	FEMA	X			X										
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
CCCAP, Inc. Food Pantry	789 N. Nelson Ave.	FEMA	X			X										
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Chester Township Trustees	5606 SR 380	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
City Government	205 W. Main St.	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Clinton Agricultural	24 Randolph St.	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H

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			X	X	X	X	X												
HAZARDS								Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism	Winter Storm
Clinton Auto Title Office	180 E. Sugartree St.	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton Board of Elections	46 S. South St.	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton County Board of Commissioners	46 S. South St.	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton County Board of Dev Disabilities	4425 SR 730	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton County Chamber of Commerce	100 W. Main St	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton County Community Action Program	789 N. Nelson Ave.	FEMA	X				X												
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton County Community Services Center	1025 S. South St.	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M
Clinton County Court of Common Pleas	46 S. South St.	FEMA	X																
	Wilmington, OH	Haz						H	M	M	H	H	M	M	H	H	H	H	M

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Clinton County Education Service	3321 Airborne Rd. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County EMA	1645 Davids Dr. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Fair Housing Authority	172 S. South St Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Farm Bureau	1425 Rombach Ave. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Habitat for Humanity	478 Thorne Ave. Wilmington, OH	FEMA	X			X										
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Health Department	111 S. Nelson Ave. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Ho Ho Shop	2483 W. US 22 Wilmington, OH	FEMA	X			X										
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Homeless Shelter	36 Gallop St. Wilmington, OH	FEMA	X	X		X										
		Haz					H	M	M	H	H	M	M	H	H	H

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism
HAZARDS																	
Clinton County Jail	1645 Davids Dr.	FEMA	X	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Juvenile Court Services	46 S. South St.	FEMA	X			X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Metropolitan Housing Authority	5333 Kernan Rd	FEMA	X														
	Lynchburg, OH	Haz					M	M	M	H	M	M	M	M	H	H	M
Clinton County Offices	69 N. South St	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Offices	111 S. Nelson Ave.	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Prosecuting Attorney	111 S. Nelson Ave.	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Port Authority	113 Airport Rd.	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Public Defender	103 E. Main St.	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Clinton County Toys for Tots	69 N. South St Wilmington, OH	FEMA	X			X										
		Haz						H	M	M	H	H	M	M	H	H
Clinton Dog Warden	1330 Fife Ave. Wilmington, OH	FEMA	X			X										
		Haz						H	M	M	H	H	M	M	H	H
County of Clinton	180 E. Sugartree St. Wilmington, OH	FEMA	X													
		Haz						H	M	M	H	H	M	M	H	H
Department of Motor Vehicles	950 Rombach Ave. Wilmington, OH	FEMA	X													
		Haz						H	M	M	H	H	M	M	H	H
Legal Aid	117 N. South St. Wilmington, OH	FEMA	X													
		Haz						H	M	M	H	H	M	M	H	H
Liberty Township Trustees	7277 N. SR 134 Wilmington, OH	FEMA	X													
		Haz						H	M	M	H	H	M	M	H	H
Marion Township Trustees	416 School Rd Wilmington, OH	FEMA	X													
		Haz						H	M	M	H	H	M	M	H	H
Martinsville, Village of	416 School Rd Wilmington, OH	FEMA	X													
		Haz						H	M	M	H	H	M	M	H	H

Table 2.3.9

City of Wilmington Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility X	Vulnerable Populations X	Economic Assets X	Special Considerations X	Historic/Other Considerations X	Replacement Value (\$)		Contents Value (\$)		Function Use or Value (\$)		Displacement Cost (\$)		Occupancy or Capacity (#)	
							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Natural Resources Conservation	48 Randolph St. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Residential Advisory Council	4425 SR 730 Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
State Auditors Office	43 Walnut St. Wilmington, OH	FEMA	X			X										
		Haz					H	M	M	H	H	M	M	H	H	H
Union Township Trustees	179 Orchard Rd. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
US Agricultural Department	1435 Rombach Ave. Wilmington, OH	FEMA	X			X										
		Haz					H	M	M	H	H	M	M	H	H	H
Veterans' Services Commission	43 S. Walnut St. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Wilmington City Offices	472 S. Walnut St. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H

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		X	X	X	X	X	Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism
HAZARDS																	
TRANSPORTATION INFRASTRUCTURE																	
Cars Program	789 N. Nelson Ave.	FEMA		X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Bridges	Wilmington, OH	FEMA	X		X												
		Haz					H	M	M	H	M	M	L	M	M	M	M
Railroads	Wilmington, OH	FEMA	X		X												
		Haz					H	L	M	H	H	L	M	M	M	M	M
Roads	Wilmington, OH	FEMA	X		X												
		Haz					H	M	M	H	H	L	M	M	M	M	M
Wilmington Transit System	260 Charles St.	FEMA	X		X												
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
DAMS																	
Wilmington Upground Reservoir No. 1	Wilmington, OH	FEMA	X		X	X											
		Haz					H	M	M	H	H	M	M	H	H	H	M
Wilmington Upground Reservoir No. 2	Wilmington, OH	FEMA	X		X	X											
		Haz					H	M	M	H	H	M	M	H	H	H	M

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Clinton County Solid Waste	180 E. Sugartree St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
County Electrical Inspection	111 S. Nelson Ave.	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Clinton Highway Superintendent	1326 Fife Ave.	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Utility Department	69 N. South St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington Water Treatment	1142 Praire Rd.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington Wastewater Treatment Plant	1142 Praire Rd.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
EMERGENCY SERVICES																
Chester Township-New Burlington VFD - station 1	51 Mound Rd	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Chester Township-New Burlington VFD - station 2	5606 SR 380 Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Clinton Medical Transport	100 N. Lincoln St. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	H	H	H	M
Clinton County Sheriff's Office	1645 Davids Dr Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	H	H	H	M
Ohio State Highway Patrol	950 Rombach Ave. Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Wilmington FD - Station 1	46 E. Sugartree St Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Wilmington FD - Station 2	2415 Rombach Ave Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H
Wilmington PD	69 N. South St Wilmington, OH	FEMA	X													
		Haz					H	M	M	H	H	M	M	H	H	H

Table 2.3.9

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Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Replacement Value (\$)		Contents Value (\$)		Function Use or Value (\$)		Displacement Cost (\$)		Occupancy or Capacity (#)		
		X	X	X	X	X	Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism
HAZARDS																	
MEDICAL FACILITIES																	
Cape May Retirement Village	150 Cape May Dr.	FEMA		X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Center - Alcoholism & Drug Abuse	953 S. South St.	FEMA		X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton County Adult Daycare Center	66 N. Mulberry St.	FEMA		X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton Memorial Hospital	610 W. Main St.	FEMA	X	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton Memorial Hospital Family Health Center	825 W. Locust St.	FEMA	X	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton Memorial Hospital Outpatient Rehab Services	2241 Rombach Ave.	FEMA	X	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Clinton Memorial Hospital Regional Health Center	610 W. Main St.	FEMA	X	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Community Care Hospice	200 R. Gordon Dr.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Elderly Services Program	43 S. Walnut St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Free Clinic of Clinton County	62 E. Sugartree St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Friendly Center	290 Prairie Ave.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Pri Med Wilmington Medical	1184 W. Locust St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Solutions Comm Cseling & Recovery Cters	953 S. South St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Talbert House	930 Prairie Ave	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
VA Medical Center	448 W. Main St.	FEMA	X	X	X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Wilmington Nursing/Rehab Center	75 Hale St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
SCHOOLS AND EDUCATIONAL FACILITIES																
Champions in the Making	160 Park Dr.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Champions in the Making	464 W. Vine St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Clinton County Headstart	789 N. Nelson Ave.	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Clinton County YMCA SAC-Holmes	1350 W. Truesdell St	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Clinton County YMCA SAC-Main	700 Elm St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Denver Place ES	291 Lorish Ave	FEMA	X													595
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism
HAZARDS																	
East Clinton HS/MS	174 Larrick Rd	FEMA	X													820	
	Lees Creek, OH	Haz					M	M	M	H	H	M	L	H	H	H	M
East End ES	569 Rombach Ave	FEMA	X													300	
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H
East End ES Preschool	769 Rombach Ave	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H
Jefferson ES	12572 US Rte 68 S	FEMA	X													315	
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H
Laurel Oaks Cdc HS	300 Oak Dr	FEMA	X														
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H
Roy E. Holmes ES	1350 W. Truesdell St	FEMA	X													583	
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H
Southern State Community College - North	2698 Old SR 73	FEMA	X		X												
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H
SSCC Patri-Tots Learning Center	1850 Davids Dr.	FEMA	X		X												
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H

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							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado
HAZARDS																
Sunshine Christian Preschool and Kindergarten	909 W. Locust St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Timber Faith Preschool	840 Timber Glen Dr.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington Child Care & Learning	1600 Alex Dr.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington City District Office	341 S. Nelson Ave	FEMA	X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington College	251 Ludovic Street	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington Cooperative Preschool	74 E. Locust St.	FEMA	X		X											
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington HS	300 Richardson Pl	FEMA	X													995
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H
Wilmington MS	275 Thorne Ave	FEMA	X													792
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H

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		X	X	X	X	X	Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism
HAZARDS																	
COMMERCIAL AND INDUSTRIAL																	
Ahresty Wilmington Corp	2627 S. South St.	FEMA		X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Alkermes Inc.	265 Olinger Circle	FEMA		X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
ATSG/ABX Air	145 Hunter Drive	FEMA		X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
Ferno-Washington Inc.	70 Weil Way	FEMA		X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
R & L Carriers	600 Gillam Rd.	FEMA		X													
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M
POST OFFICES																	
Wilmington PO	1515 Alex Dr	FEMA			X												
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	M

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		X	X	X	X	X	Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism
HAZARDS																	
LIBRARIES																	
Clinton County Law Library	46 S. South St. Wilmington, OH	FEMA				X											
		Haz					H	M	M	H	H	M	M	H	H	H	M
Wilmington Public Library Of Clinton County	268 N. South St Wilmington, OH	FEMA				X											
		Haz					H	M	M	H	H	M	M	H	H	H	M
HISTORICAL FACILITIES																	
College Hall	Wilmington College Wilmington, OH	FEMA		X		X	X										
		Haz					H	M	M	H	H	M	M	H	H	H	M
Cowan Creek Circular Enclosure	Wilmington, OH	FEMA					X										
		Haz					H	M	M	H	H	M	M	H	H	H	M
Doan House	822 Fife Ave. Wilmington, OH	FEMA					X										
		Haz					H	M	M	H	H	M	M	H	H	H	M
Keiter Mound	Wilmington, OH	FEMA					X										
		Haz					H	M	M	H	H	M	M	H	H	H	M
Main Building School	Sugartree St. Wilmington, OH	FEMA					X										
		Haz					H	M	M	H	H	M	M	H	H	H	M

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		X	X	X	X	X												
HAZARDS							Dam	Drought	Earthquake	Flooding	Hazmat Incident	Insect Infestation	Land Subsidence	Oil & Gas Industry	Severe Storm	Severe Wind/Tornado	Terrorism	Winter Storm
Rombach Place	149 E. Locust St.	FEMA				X												
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H	M
South South Street Historic District	151-515 S. South St.	FEMA				X												
	Wilmington, OH	Haz					H	M	M	H	H	M	M	H	H	H	H	M
Wilmington Commercial Historic District	Wilmington, OH	FEMA				X												
		Haz					H	M	M	H	H	M	M	H	H	H	H	M

2.4 ESTIMATE LOSSES

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

Estimating the losses that may arise from a hazard event both educates local officials as to how to prioritize mitigation projects and speeds up the recovery process. Those community assets at risk of sustaining significant hazard-related losses will likely be higher priorities to protect with mitigation projects. Also, when disaster strikes, loss estimation data can be provided to recovery and damage assessment teams to help in categorizing the losses sustained and assistance needed.

The following figures are *loss estimates* and are only intended to guide the development and prioritization of mitigation strategies. These figures should not replace official damage assessments. Further, the figures are subject to change based on inflation, facility upgrades/additions, staff increases/reductions, etc.

METHODOLOGY

The loss estimates are derived from historical information contained in Storm Event Records maintained by the National Climatic Data Center (NCDC), estimate searches based on research, prediction systems such as Hazards U.S.-Multi Hazard (HAZUS-MH), and information contained in the State of Ohio Hazard Mitigation Plan.

ESTIMATED LOSSES

Estimated losses for each hazard have been described below with available information and a description of where and how these numbers were obtained.

2.4.1 Dam Failure

The United States Bureau of Reclamation (USBR) Construction Cost indexing (www.usbr.gov/pmts/estimate/cost_trend.html) is able to supply the 2014 cost indexes of 341 (October 2014) for earthen dams and 363 (October 2014) for concrete dams to determine dam replacement costs. These values are used in conjunction with the original cost for dam construction with a base index of 1977=100. USBR recommends creating updated designs for older structures increasing the cost by an average of \$20,000 - \$40,000. So, for example, a \$10,000,000 earthen dam built in 1977 would estimate cost \$34,100,000 in 2014 to replace while a concrete dam constructed in the same year would cost approximately \$36,300,000. This does not include the benefit losses from irrigation supplies, municipal and industrial (M & I) water supply, power generation, recreation, fish and wildlife, or water navigation as described in the Department of Homeland Security's (DHS's *Dam Sector: Estimating Economic Consequences for Dam Failure Scenarios* (September 2011), which will vary from dam to dam.

Dam Failure at Cowan Lake Dam in Clinton County		
Building Type	Number of Buildings	Exposure for this Scenario
Residential	128	\$17,497,303
Non-Residential	31	\$6,194,822
Critical Facilities	2	\$402,237
Totals	161	\$24,094,362

2.4.2 Drought

National Oceanic and Atmospheric Administration's (NOAA's) National Climatic Data Center (NCDC) lists 2 events to include excessive heat for Clinton County between 1996 and 2013. No events had reported damages associated with them. As for the *2014 State of Ohio Enhanced Hazard Mitigation Plan*, describes losses associated nationally and regionally with values ranging from \$200,000,000 to \$1,240,000,000 within the Great Plains. Being that structures are rarely affected by droughts, to accurately estimate a loss from a drought an economic analysis of market fluctuations should occur resulting from destroyed crops or increased livestock feed and watering costs as seen in Table 2.2.2.4. This look will show a systematic breakdown on the affects for people, animals, and crops alike. Being

that Clinton County has a predominantly agricultural economy at this time (71% of the land use is crop land per the Ohio County Profile [Office of Policy, Research, and Strategic Planning, 2014]), it is most likely more susceptible to the effects of a drought and will suffer more economically than other portions of Ohio.

2.4.3 Earthquake

There are no reportable events between 1994 and 2013. By applying HAZUS-MH, using a probabilistic annualized loss was created using HAZUS-MH creating an estimated loss value of \$40,000 for Clinton County but the exposure s significantly higher.

Earthquake, Wilmington OH Epicenter		
Building Type	Number of Buildings	Exposure for this Scenario
Residential	1,685	\$290,393,909
Non-Residential	1,166	\$160,433,338
Critical Facilities	40	\$5,503,716
Totals	2,891	\$456,330,964

2.4.4 Flooding

Within NCDC, a total of 34 events as either flooding or flash flooding occurred between January 1996 and December 2013 totaling \$111,000 in property and crop damage. By using HAZUS-MH, an estimated \$58,000,000 in total property loss occurred from a 100-year event in Clinton County. See Figure 2.4.4.1 for the Quick Assessment Report obtained on February 19, 2015. In comparison, the 2014 State of Ohio Enhanced Hazard Mitigation Plan estimates by averaging the 100-year and 25-year flooding event (tables 2.2.c and 2.2.f respectively) at \$47,495,000.

100-Year Flood for Clinton County		
Building Type	Number of Buildings	Exposure for this Scenario
Residential	2,926	\$469,815,000
Non-Residential	678	\$108,748,000
Critical Facilities	131	\$20,909,000
Totals	3,735	\$599,472,000

Quick Assessment Report

February 19, 2015

Study Region : Clinton County OH
 Scenario : flooding in Clinton
 Return Period: 100
 Analysis Option: 0

Regional Statistics

Area (Square Miles)	411
Number of Census Blocks	1,537
Number of Buildings	
Residential	16,845
Total	18,571
Number of People in the Region (x 1000)	41
Building Exposure (\$ Millions)	
Residential	2,111
Total	2,982

Scenario Results

Shelter Requirements

Displaced Population (# Households)	657
Short Term Shelter (# People)	590

Economic Loss

Residential Property (Capital Stock) Losses (\$ Millions)	27
Total Property (Capital Stock) Losses (\$ Millions)	58
Business Interruptions (Income) Losses (\$ Millions)	0

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

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 flood. These results can be improved by using enhanced inventory data and flood hazard information.

Figure 2.4.4.1

2.4.5 Hazardous Materials Incidents

The *2014 State of Ohio Enhanced Hazard Mitigation Plan* does not rank or provide an analysis for the economic impact associated with the release of hazardous materials. To guide where there are large clusters of possible hazardous material incidents and thereby most likely larger medical costs and business disruptions, the United States Environmental Protection Agency's (USEPA's) Toxic Release Inventory (TRI) can be used. Within Clinton County, there are 21 facilities listed. For these 21 facilities, a total of 499 toxic releases have been submitted. Because of the large quantity of submissions for each facility, all 21 facilities have subsequently had Risk-Screening Environmental Indicator (RSEI) reports created so as to compare each site's risk release against industry, county, state, and national medians. As stated, this will guide planners to areas of high concentration of possible indirect medical cost increases and business disruptions which can then be evaluated.

2.4.6 Insect Infestation

Clinton County only reviewed possible damages from the Emerald Ash Borer which can be fiscally damaging. While structures are rarely affected by Emerald Ash Borers, the amount can be catastrophic, substantially damaging the \$15.1 billion annual value within Ohio's forest product industry (ODNR-Division of Forestry, 2014) which employs 119,000 Ohioans. If taken proportionately, Clinton County has 0.3% of Ohio's population for employment of 431 people would be affected and as one of 88 counties in Ohio could suffer \$171,590,909 within the forest product industry.

2.4.7 Land Subsidence

NCDC contained no events involving landslides so therefore no property damage and no crop damage. As for the *2014 State of Ohio Enhanced Hazard Mitigation Plan*, Clinton County has a medium risk of events happening with an estimated loss value of \$105,185

Land Subsidence for Clinton County		
Building Type	Number of Buildings	Exposure for this Scenario
Residential	5	\$347,410
Non-Residential	5	\$915,644
Critical Facilities	2	\$1,159,614
Totals	12	\$2,422,668

2.4.8 Oil & Gas Industry

To determine the economic loss aspects expected from the oil and gas industry, a look at the related possible hazards should be reviewed. Do to abandoned wells and the type of land in which Clinton County has, the losses would be from land subsidence. Being that Clinton County is on a fault line, earthquakes are possible from the oil and gas removal, and hazardous materials incidents from spillage or during transportation would be categorized under that hazard. Therefore the possible losses for the oil and gas industry should be determined by the resulting method associated with another corresponding hazard with structures rarely directly affected by the Oil & Gas Industry.

2.4.9 Severe Storm/Thunderstorms

Severe Storms is an umbrella title for many different storm types to include, thunderstorms, lightning, and heavy rain. NOAA's NCDC listed 193 events for a total of \$2,909,000. Of these 193 events from 1955 to 2013 (58 years), 127 of them were thunderstorms accounting for \$2,759,000 in damages. While one event on April 9, 1999 caused \$1,000,000 in property damages, the other 126 events accounted for \$1,759,000 or \$13,960 per event. With an average of 2.19 damaging thunderstorm events per year, Clinton County can estimate \$30,572 annual losses from thunderstorms. In comparison, the *2014 State of Ohio Enhanced Hazard Mitigation Plan* lists the 10-year Cumulative Summer Storm losses (table 2.12.a) at \$1,614,000 or an average of \$161,400 annually. While the total loss is consistent, it is unknown how many events were accounted for in the Ohio State plan which could account for the drastic difference for the annual loss amounts.

Thunderstorms for Clinton County		
Building Type	Number of Buildings	Exposure for this Scenario
Residential	4	\$576,745
Non-Residential	1	\$185,720
Critical Facilities	0	\$37,503
Totals	5	\$799,968

2.4.10 Severe Wind/Tornado

NOAA's NCDC reports 29 events that were either high wind or tornados between 1968 and 2013 (45 years) totaling \$13,432,000 in damages. One high wind event (9/14/2008) sustained \$5,100,000 of the damages and one tornado (04/23/1968) resulted in \$2,500,000 leaving a total of \$5,832,000 for remaining 27 events. These results on average \$216,000 per event and 0.6 events annually; therefore Clinton County is likely to see \$129,600 annually from tornadoes or high wind events.

EF-5 Tornado Scenario for Clinton County		
Building Type	Number of Buildings	Exposure for this Scenario
Residential	1,807	\$113,554,748
Non-Residential	628	\$39,468,592
Critical Facilities	117	\$7,354,509
Totals	2,552	\$160,377,848

2.4.11 Terrorism

Economic loss determination from terrorism is dependent on the type of attack, the dispersal method, and where the attack occurs. The General Accounting Office (GAO) developed in *Terrorism Insurance: Status Coverage Availability for Attacks Involving Nuclear, Biological, Chemical, or Radiological Weapons* (2008) estimates for New York City. To create comparative values for Clinton County, relationship factors for population and total surface area should be developed. To compare death counts, a population factor of 0.005 can be created by dividing the 2013 estimated US Census population for Clinton County by that of New York City. For area of affect, thereby estimated losses, New York City covers 468.9 sq. miles to

Clinton County at 410.9 sq. miles. Clinton County is comparable to New York City and a factor of 0.876 can be used along with the population factor to compensate for the lower population density. These values are also listed in Figure 2.4.12.1 for each of the weapons types.

Attack type	Agent		Estimated losses (\$)		
			NYC	Clinton County	
Chemical	Sarin		34,000,000,000	148,920,000	
Radiological	Dirty Bomb		43,000,000,000	188,340,000	
Biological	Anthrax	1kg	118,000,000,000	516,840,000	
		10kg	254,000,000,000	1,112,520,000	
		75kg	501,000,000,000	2,194,380,000	
Nuclear	Powerplant Sabotage		217,000,000,000	950,460,000	
	Bomb	1kton	205,000,000,000	897,900,000	
		5kton	584,000,000,000	2,557,920,000	
Attack type		Agent		Estimated fatalities	
				NYC	Clinton County
Chemical	Sarin		6,000	30	
Radiological	Dirty Bomb		A few	negligible	
Biological	Anthrax	1kg	34,000	170	
		10kg	80,000	400	
		75kg	207,000	1,035	
Nuclear	Powerplant Sabotage		A few	negligible	
	Bomb	1kton	1,300,000	6,500	
		5kton	3,000,000	15,000	

Figure 2.4.11.1

2.4.12 Winter Storm

NOAA's NCDC lists 62 winter weather related events in Clinton County between 1996 and 2013 (17 years) for a total of \$525,000 in property damages but \$500,000 occurred in a single event in 1996 leaving only \$25,000 over the remainder of the 61 events or \$410 per event or \$1,471 annually. This does not account for road maintenance, cancelled flights, and auto repairs. New York City's Comptroller stated that \$130,700,000 was spent to clear New York City in 2014 as reported by www.Accuweather.com in their article "Winter Storms Cost US Economy Billions Annually" (February 6, 2015). Using the same comparison factors as used within the terrorism section above between New York City and Clinton County, Clinton County can estimate \$114,493,200 in road maintenance costs annually. Additionally, masFlight, in the same article, estimates an average of \$6,000 in economic losses per flight cancelled. It is difficult to estimate the amount of losses associated with vehicle repairs due to the ability to determine the true cause of any damage.

2.5 ANALYZE DEVELOPMENT TRENDS

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

Clinton County is located in Southwestern portion of Ohio near the metropolitan City of Cincinnati. Clinton County is rural in nature with much of the county, in the past and still, being used for farming. Defense industries rose in the latter part of the 20th century but in recent years, Clinton County has been in flux adjusting to a sudden rapid decrease in the transportation industry and the slow rise of the manufacturing industry.

Clinton County has a large population density in the City of Wilmington with smaller incorporated villages (i.e., Blanchester, Clarksville, Martinsville, Midland, New Vienna, Port William, and Sabina) that encircle Wilmington throughout the county. While some have grown more, such as Sabina with an increase in manufacturing, or due to major transportation routes such as State Route 50 and Interstate 71, most have remained residential communities for larger population centers. Other land uses in Clinton County generally conform to the following:

- **Agricultural:** According to the 2012 Census of Agriculture, Clinton County contains 759 farms for a total of 208,142 acres in land use. The average size is 274 acres. In review of the 2002, 2007, and the 2012 Censuses, land use has remained fairly constant with only a slight decline but the total number of farms has declined from 811 in the 2002 Census of Agriculture. Crop production has been and is still the predominant asset for farms with nearly 10 times the cash receipt from crops at \$148,248,000 to livestock at \$15,596,000. Following this trend though there will be a continued decrease in the number of farms.
- **Commercial:** Commercial growth is centralized around the denser populations. Wilmington, Blanchester, and Sabina have higher populations and therefore more extensive commercial offerings.
- **Industrial:** The principal industrial activities are in manufacturing and agricultural processing. Most of these locations focus of where the railroads are and the population densities. As a result, Wilmington and Sabina are more robust in the number of industrial locations.

- **Residential:** Residential development is occurring around the hubs of commercial and industrial development. Larger populations are where there are more robust offerings of commercial services and job opportunities such as Sabina, Blanchester, and Wilmington.
- **Specialized Land Use Designation(s):**
 - Historical Landmarks
 - Wilmington College
 - Southern State Community College
 - Cowan Lake State Park

Wilmington Industrial Air Park and the Loss of DHL

Decommissioned in 1972, Clinton County Air Force Base became the Wilmington Industrial Air Park (WIAP). Initially, it housed a joint vocational school using converted military barracks. In 1980, Airborne Freight Corporation acquired Midwest Air Charter and became the largest tenant of the airport. In 2003, DHL Worldwide Express merged with Airborne and added ground delivery operations ABX Air. WIAP now became a major sorting and air cargo center.

The air park experienced aircraft activity at 71,000 per year, averaging 194 aircraft per day and was a major employer in the county. When Deutsche-Post took over DHL in July 2009 and ceased all U.S. domestic deliveries, DHL closed its operations at the Wilmington Industrial Air Park. This closure resulted in the abrupt loss of 7,000 jobs at DHL and another 13,000 in related support and services sectors. This was a devastating economic blow to the county and its communities, especially after one year after the nation's financial crisis.

Since 2008 and the loss of DHL, there has been significant awareness and scrutiny about public funding, cost share and public spending. The general public has seen many political figures visit the area and make promises to replace a major tenant. Despite efforts by the County Port Authority, Economic Development, the Regional Planning Commission and others, there is no interest by major companies like DHL to lease the same size of the airport. Other commercial and industrial enterprises have been slow to come and establish operations in the area. County and local leaders are very cautious about funding and public spending. Therefore, accomplishing the mitigation goals, objectives and actions from the previously FEMA-approved plan in

2007 have suffered due to financial crisis and the loss of a major industrial partner in the area.

Currently, the population has shown a decrease with more people migrating out that coming in as described in the Ohio County Profiles that were prepared by the Office of Policy, Research and Strategic Planning. With a positive spike in immigration in 2006, the highest since the late 1990's, there has been a steady decline in the number of immigrants. During the same time period, the number of people migrating out stayed steady resulting in a negative migration after 2008.

Wilmington still remains an economic hub for Clinton County. As industry left resulting in a restructuring of the county's economic dependence, the use of existing facilities as taken hold. With the departure of a major air transportation corporation, the facilities are remarketed to smaller businesses to create an airpark with industrial and commercial opportunities. Agriculture maintains a strong portion of the economy and will most likely continue as a dominant portion of Clinton County in the near future, but with an increase in the oil and gas industry, land could shift to pumping fields.

Development will most likely continue to focus on population hubs such as Wilmington, Sabina, and Blanchester, of which, all are near major transportation routes to include railroads. As a result, flooding is a major concern in conjunction to possible dam failures. Hazardous materials and incidents from the oil and gas industry increase with the level of development and insect infestations (i.e., the Emerald Ash Borer), droughts, and winter storms are still threats to the agriculturally based businesses.