



LAKE COUNTY

2016 Multi-Jurisdictional
Hazard Mitigation Plan

**LAKE COUNTY
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN**

RELEASED 2016

TABLE OF CONTENTS

1.0 INTRODUCTORY MATERIALS.....	1
Introduction.....	1
1.1 Documentation of the Planning Process.....	2
1.2 Description of the Planning Area.....	10
1.3 Record of Changes.....	23
 2.0 RISK ASSESSMENT.....	 25
2.1 Identify Hazards.....	25
2.2 Profile Hazards.....	28
Coastal Erosion.....	29
Dam/Levee Failure.....	36
Drought.....	44
Earthquake.....	49
Fire.....	61
Flooding.....	67
Hazmat Incident.....	89
Infectious Disease.....	95
Infestation.....	99
Land Subsidence.....	103
Severe Weather.....	111
Terrorism.....	124
Winter Storm.....	129
2.3 Inventory Assets.....	142
2.4 Analyze Development Trends.....	177
 3.0 LOCAL HAZARD MITIGATION GOALS.....	 181
 4.0 PROJECT IMPLEMENTATION.....	 192
 5.0 PLAN MAINTENANCE PROCESS.....	 215
 6.0 APPENDICES	
Appendix 1: Evidence of Public Involvement	
Appendix 2: Glossary	
Appendix 3: Adopting Resolutions	

INTRODUCTION

This multi-jurisdictional hazard mitigation plan has been completed in accordance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000. The guidelines for the completion of this plan appear in the Code of Federal Regulations under Title 44: Emergency Services, Part 201.6. Specific reference is made to the *Local Mitigation Planning Handbook* (USDHS/FEMA, 2013). The Ohio Emergency Management Agency further monitored the original planning as well as subsequent updating processes. The Lake County Emergency Management Agency acted as the coordinating agency for the completion of this plan at the local level.

The *Lake County Multi-Jurisdictional Hazard Mitigation Plan* is considered “multijurisdictional” for several reasons. In addition to the county governing body of Lake County, all 18 municipal jurisdictions participated in the updating of the plan. The municipal jurisdictions provided representatives on the hazard mitigation core planning committee and contributed at least one project to the action plan. Further, all 18 governmental entities in Lake County formally adopted the plan by resolution. Additionally, various other stakeholders, such as the Lake County Port and Economic Development Authority, First Energy, etc. participated in the update. The goal of the plan is to describe risk and consider mitigation in a holistic manner, rather than simply segregating efforts by political subdivision.

1.1 DOCUMENTATION OF THE PLANNING PROCESS

§201.6(b) and 201.6(c)(1)	An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
	(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
	(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
	(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
	[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

This plan was developed in accordance with Part 201.6 of Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000. Several resources were used during the development of the plan, including the United States Department of Homeland Security / Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook* (USDHS/FEMA, 2013), the governing regulations in the Code of Federal Regulations, and documents provided by the Ohio Emergency Management Agency.

To guide the completion of the plan at the local level, a multi-jurisdictional core planning team was established. The final core planning committee that guided the 2015 update process included the following.

ORGANIZATION	REPRESENTATIVE
Cleveland Electric Illuminating	Wendy Zele
Concord Township	Matt Sabo, Fire Chief
Eastlake, City of	Ted Whittington, Fire Chief
Fairport Harbor, Village of	Rebecca Corrigan, Village Administrator
First Energy	Dave Dillon
Grand River, Village of	Bob Lloyd, Fire Chief
Kirtland, City of	Tony Hutton, Fire Chief
Kirtland Hills, Village of	Steven Payne
Lake County Commissioners	Jason Boyd, County Administrator
Lake County Engineer	Jim Gills
Lake County GIS	David Phares
Lake County GIS	Jim Branch

ORGANIZATION	REPRESENTATIVE
Lake County Emergency Management Agency	Larry Greene, Director
Lake County Emergency Management Agency	John Church, Deputy Director
Lake County Ohio Port & Economic Development Authority	Patty Fulop, Manager (Lost Nation Airport)
Lake County Planning & Community Development	David Radachy, Director
Lake County Stormwater Management	George Hadden
Lake County Utilities	Randy Rothlisberger
Lake Erie College	Billie Dunn
Lakeland Community College	Steve Gagliardi, Police Chief
Lakeline, Village of	Deborah Neale, Mayor
Leroy Township	Larry Greene, LCEMA Director
Madison, Village of	Ken Gauntner
Madison Township	Ken Gauntner
Mentor, City of	Jim Decker, Plans Examiner
Mentor, City of	Bob Searles, Fire Chief
Mentor-on-the-Lake, City of	John Gielink, Police Chief
North Perry, Village of	James McDonald, Fire Chief (Perry Joint Fire District)
Painesville, City of	Leanne Exum, City Engineer
Painesville Township	Mike Manary
Painesville Township	Frank Whittaker, Fire Chief
Perry, Village of	James McDonald, Fire Chief (Perry Joint Fire District)
Perry Township	Walter Siebel
Ricera	Bruce Van Scoy
Timberlake, Village of	Ritu Sharma
Waite Hill, Village of	Keith DeWitt, Police Chief
Wickliffe, City of	Jim Powers, Fire Chief
Willoughby, City of	Al Zwegat, Fire Chief
Willoughby Hills, City of	Robert Weger, Mayor
Willowick, City of	Bob Posipanka, Fire Chief
Windsor Laurelwood	Bob Gaglione
Windsor Laurelwood	Laura Blackson

1.1.1. Current Update Process

As noted in the introduction, the Lake County Emergency Management Agency (LCEMA) served as the coordinating agency for this update. To that end, the LCEMA sought support for the planning effort, identifying the resources needed to update the plan (including serving as the primary point of contact interfacing with the county's consultant working on the project), and re-engaging governmental organizations and other technical expertise available in the county. The county as well as all cities, villages, and townships are considered "plan participants". Other partners, such as Lake Erie College, Lakeland Community College, First Energy, Windsor Laurelwood,

etc., participated in the update as a *stakeholder*, but will not officially adopt the document.

To update the plan, the LCEMA Director assembled the planning committee cited above. (A sample invitation letter is included in Appendix 1.) Membership in this committee was largely comprised of those that had participated in previous versions of this plan (2005 and 2010). The LCEMA sought to make the committee as broadly-experienced and representative as possible, and ensured opportunities for the following types of organizations to participate: emergency management, the fire service, parks and recreation officials, planning districts of various types, transportation organizations, schools, public works, and law enforcement. Ultimately, the following agencies/organizations were invited to send representatives to planning committee meetings. Those that attended are documented on sign-in sheets in Appendix 1.

County Organizations

Lake County Commissioners
Lake County Emergency Management Agency
Lake County Engineer
Lake County General Health District
Lake County GIS
Lake County MetroParks
Lake County Planning and Community Development
Lake County Ohio Port and Economic Development Authority
Lake County Storm Water Management
Lake County Utilities

Governmental Jurisdictions

Concord Township
Eastlake, City of
Fairport Harbor, Village of
Grand River, Village of
Kirtland, City of
Kirtland Hills, Village of
Lakeline, Village of

Leroy Township
Madison Township
Madison, Village of
Mentor, City of
Mentor-on-the-Lake, City of
North Perry, Village of
Painesville, City of
Painesville Township
Perry Township
Perry, Village of
Timberlake, Village of
Waite Hill, Village of
Wickliffe, City of
Willoughby, City of
Willoughby Hills, City of
Willowick, City of

Non-Profit Organizations

Lake Health
University Hospitals
Windsor Laurelwood Center for Behavioral Medicine

Other

Cleveland Electric Illuminating
First Energy
First Energy Nuclear (FENOC)
JH Consulting, LLC of West Virginia
Lake Erie College
Lakeland Community College
Lost Nation Airport
Ricera

Additionally, the LCEMA invited external stakeholders to review the plan and provide comments, thus participating in the process. These stakeholders included

Lakeland Community College and Lake Erie College (from higher education) and the following neighboring counties:

- Ashtabula,
- Cuyahoga, and
- Geauga.

Both Lakeland Community College and Lake Erie College did participate in the process (both sent representatives to planning committee meetings). The requests of neighboring counties included any information they wanted to share about hazards that could potentially affect both jurisdictions as well as any risks originating in Lake County that may concern them. No comments were received from neighboring counties.

All municipal jurisdictions in the county participated in the update. As noted in the sign-in sheets in Appendix 1, many of them did participate through committee meetings. Others, though, were unable to be as active in meetings. The LCEMA Director maintained email contact with these municipalities to ensure the inclusion in the plan. Via telephone and email, these individuals provided updates to asset inventory lists and mitigation projects for their jurisdiction; confirm the availability of (and share) comprehensive plans, zoning information, etc.; and so on. Further, all jurisdictions were provided with a draft of the full plan and asked for comment (prior to submitting the plan to the state for review).

Following federal approval pending adoption, the county and participating municipalities intend to formally adopt this plan by resolution or ordinance.

1.1.2. Committee Involvement

The core planning met on four occasions during the update of the plan. Meeting dates included the following:

- July 14, 2015,
- September 15, 2015,
- November 3, 2015, and
- December 15, 2015.

The agenda for the first meeting included an introduction to the mitigation planning process. Committee members also reviewed the existing mitigation project list and

noted those projects that were completed or in-progress. The primary focus of the second meeting was to review hazards and risks impacting the jurisdictions of Lake County. Committee members worked to connect the content of the first two sessions during the third meeting. Based on new insights gleaned from risk data, committee members added new projects and prioritized the projects of the overall list. The fourth meeting served as an opportunity to review and comment on the complete draft from cover-to-cover and to provide the committee's approval for LCEMA to submit the plan for state and federal approval. Sign-in sheets for the meetings are included in Appendix 1.

Committee membership involved more than just meeting attendance. Members were given tasks at the conclusion of the each meeting, which were predominantly comprised of requests to collect jurisdiction-specific data. For instance, the consultant provided members with copies of the asset inventory sheets for the jurisdiction that had been included in the 2005 version of the plan and asked them to collaborate with respective personnel for the jurisdictions, update the list, and bring it with them to the next meeting. As such, committee member tasks not only improved the accuracy of the information in the plan, they served to educate a greater number of personnel within the jurisdictional structure than had been done in the past.

1.1.3. Engaging the Public

The LCEMA also coordinated opportunities for the public to participate in the planning process. The September and November core planning committee meetings were open to the public. Notification occurred via publication on the main Lake County website (www.lakecountyohio.gov/), the LCEMA's website (www.lakecountyohio.gov/ema/Home.aspx) as well as advertisements in *The News-Herald* newspaper (confirmation of web placement and copies of advertisements are included in Appendix 1).

One resident attended the first committee meeting to which the public was invited. This gentleman asked questions relative to the presence of dams in the county and was also given a tour of the county's emergency operations center.

1.1.4. Research Conducted

There were no changes in priorities that were necessary. Where no changes were made, the updates in this revision validate the information in the previously-approved plan.

Assessing Risk

The research conducted for the risk assessment phase of this update included data from federal, state, higher education, and mass media sources. The research aim was primarily to validate and describe the hazards included for consideration in this plan. Specific sources relative to individual hazards are listed in the appropriate hazard profile contained in Section 2.2.

It is significant to note the planning committee's involvement in the risk assessment process. Committee members guided the inclusion of hazards in the plan. For instance, rather than separate such hazards as severe wind, thunderstorms, and hail, the group opted to consolidate those risks into a "severe weather" hazard. Committee members provided insight as to historical occurrences in their jurisdictions of the included risks. Finally, committee members helped to significantly revise the asset inventory listings for each jurisdiction (as discussed in 1.1.2 above).

Mitigation Plan Development and Update

As noted in 1.1.2 above, the planning committee was intimately involved in updating the mitigation plan. The primary purpose of the first committee meeting was to review the existing project list; the third meeting was used to compare the applicability of the project list with updated risk data and to change the project list accordingly. (The project list under consideration was the list from the previous federally-approved version of this plan [2010].) Committee members commented on the appropriateness of the goals and objectives as well as shared thoughts on new goals and objectives related to risk data. Significantly, committee members shared information on on-going infrastructure projects in their jurisdictions that would be compatible with mitigation efforts (e.g., storm water improvement projects). In some instances (noted in Section 4.0 below), committee members provided the LCEMA with supporting documentation (e.g., property information, mapping, loss data based on previous hazard occurrences, etc.) for inclusion in

future mitigation project development. Though specifically noted for use in future project applications, the LCEMA ensured incorporation of this information into the updated plan.

The county's consultant guided committee members through the process of re-prioritizing mitigation projects. The prioritized list was then presented as an overall mitigation strategy for Lake County (i.e., each project is listed with a timeframe, potential cost and funding source, and coordinating agency).

1.1.5. Implementing the Plan and Monitoring Progress

Lake County's stakeholders realized that the plan must remain viable in order to appropriately guide mitigation in the county. To that end, plan implementation (i.e., the mitigation strategy and project prioritization) are presented in Section 4.0: Project Implementation. The monitoring process is presented in Section 5.0: Plan Maintenance Process.

1.1.6 Plan Maintenance

See Section 5.0 Plan Maintenance Process for a detailed discussion of monitoring and evaluative efforts.

1.2 DESCRIPTION OF THE PLANNING AREA

1.2.1. Lake County



Lake County is located in the northeastern portion of Ohio. It was established in March of 1840 and was named for Lake Erie. The county is bordered to the north by Lake Erie, Ashtabula County to the east, Geauga and Cuyahoga Counties to the south, and Cuyahoga County to the west. Unincorporated areas include Concord Township, Leroy Township, Madison Township, Painesville Township, and Perry Township. The county contains 18 municipalities, including the following villages:

- Fairport Harbor,
- Grand River,
- Kirtland Hills,
- Lakeline,
- Madison,
- North Perry,
- Perry,
- Timberlake, and
- Waite Hill.

Lake County also contains the following cities:

- Eastlake,
- Kirtland,
- Mentor,
- Mentor-on-the-Lake,
- Painesville,
- Wickliffe,
- Willoughby,
- Willoughby Hills, and
- Willowick.

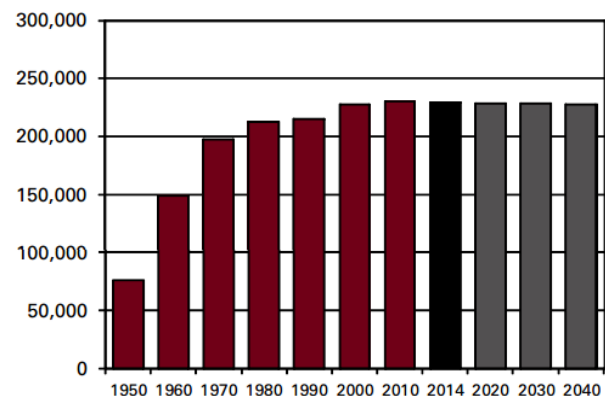
Lake County contains approximately 30.96 miles of interstate highway. Other components of Lake County's transportation infrastructure include 40.64 miles of US highway and 134.72 miles of state highway (ODOT, 2014). Interstate 90, US Routes 6 and 20, and State Routes 2 and 84 cross the county east west. Interstate 271 and State Routes 44, 86, 174, 306, 528, and 608 run north south. Two commercial airports and three functioning railroads as well as the harbors and marinas of Lake County are also vital to the transportation infrastructure. The county encompasses approximately 228 square miles of land area (Ohio Department of Development, Office of Research, 2015) and is geographically the smallest of Ohio's 88 counties (Lake County, Ohio, 2015 – www.lakecountyohio.gov).

The Chagrin and Grand Rivers flow through Lake County. The Chagrin River flows through the western portion of the county, passing near the City of Willoughby Hills, Waite Hill Village, Timberlake Village, and Lakeline Village before flowing into Lake Erie at Chagrin Harbor in the City of Eastlake. The Grand River flows through the eastern and central portions of the county, passing near the City of Painesville and Lake Erie College before flowing into Lake Erie at Fairport Harbor.

Lake County is the 11th most populated county in Ohio (Lake County, Ohio, 2015 – www.lakecountyohio.gov). Despite having the smallest land area, Lake County's estimated 2014 population is 229,230 (US Census Bureau, 2015), which is comparable to the population of the last ten to fifteen years (Ohio Department of Development, Office of Research, 2015 – see Figure 2). Lake County's population distribution continues to be much denser on its western side. US Census Bureau figures also indicate that there are 101,712 housing units in Lake County, with an average of 2.41 persons per household (2015). Further, the county's median household income is listed at \$56,018 (Ohio Department of Development, Office of Research, 2015).

The majority of Lake County's land cover is wooded or forested; nearly 49% of the total land cover is forested, followed by 32% listed as urban (i.e., residential, commercial, industrial, transportation, and/or urban grasses) and 14% as cropland (Ohio Department of Development, Office of Research, 2015). Approximately 214 individual farms operate in Lake County with an average size of 80 acres per farm (a significant decrease of 106 farms from 2010 version of this

Figure 2



plan) (USDA, National Agricultural Statistics Service, 2012). Lake County's topography is flat and open to gently sloping (Lake County GIS, 2015; ODNR, Division of Geological Survey, n.d.). Significantly, Lake County contains a large horticultural presence with hundreds of acres of plant nursery stock. Nursery employment is estimated at 1,327 jobs and a payroll of over \$30 million. Estimated sales are \$87.5 million (Lake SWCD, 2014).

Lake County has a diverse employment background. According to estimates provided by the Ohio Department of Development (2015), the largest areas of employment are trade, transportation, and utilities; professional and business services; education and health services; manufacturing; and construction. Total employment is currently 116,300 persons. The county's unemployment rate (in 2014) stood at approximately 5.6%, a substantial decrease from a high of 7.9% in 2010 (Ohio Department of Development, Office of Research, 2015). During the period 2010-2014, Lake County saw an average of 344 businesses start. At year end 2014, the total number of active businesses was 4,876 (Ohio Department of Development, Office of Research, 2015).

Lake County is the home of several tourist attractions, including one of the county's greatest assets, its location along the Lake Erie shoreline. Many cultural, environmental, and recreational attractions also exist in the county, including Headlands Beach State Park, Fairport Harbor Beach, Chagrin River Harbor, Hach-Otis State Nature Preserve, the Mentor Marsh, Lake Erie College Equestrian Center and Morley Farm, North Chagrin Reservation and Squire's Castle, Holden Arboretum, the Indian Museum of Lake County, Marine Museum and Lighthouse, Classic Park (home of the Lake County Captains), and President James A. Garfield's Home, "Lawnfield".

The education system in Lake County consists of 59 public schools at which 31,305 students attend and 1,925 teachers instruct, as well as 14 private schools at which another 4,100 students attend. The graduation rate stands at 90% (Ohio Department of Education, n.d.). There is also one two-year public college (Lakeland Community College) near Mentor and Kirtland, and one private college (Lake Erie College) in Painesville (Ohio Higher Ed, University of Ohio, 2014; National Center for Education Statistics, 2013).

Several health care facilities are located in Lake County. Lake Health operates two registered hospitals (Tri Point Medical Center and Lake West Medical Center) with approximately 400 beds. Additionally, there are 12 licensed nursing homes with over 1,500 beds and 11 licensed residential care facilities with nearly 1,000 available beds (Ohio Department of Health, 2015).

The communications network in Lake County consists of one radio station and one daily newspaper that is circulated to 34,000 residents (Ohio Department of Development, Office of Research, 2015).

1.2.2. Eastlake City

The City of Eastlake is located in the western portion of Lake County. The major highways accessing the city include State Routes 2, 91, 283, and 640. The city can also be accessed by boat via the Chagrin Harbor of Lake Erie. The Chagrin River flows through the east-central portion of the city. The Conrail railroad also traverses the city to the harbor. Lake Erie borders Eastlake to the north, and has prompted lake effect snow and coastal storms in the city.

There are four public schools in the City of Eastlake: North High School, East Kae Middle, Jefferson Elementary, and Longfellow Elementary. The Kennedy Academy is also located in the city. Eastlake contains a portion of Chagrin River Metropark, located in the southeastern corner of the city, and the Vineyards Shopping Center.

As indicated by the US Census Bureau (2015), the City of Eastlake has a total estimated population of 18,321 (2014). The city contains 8,280 housing units with an average of 2.33 persons per household. The median household income is listed at \$52,441.

1.2.3. Fairport Harbor Village

The Village of Fairport Harbor is positioned in north central Lake County in Painesville Township. Lake Erie borders the entire northern portion of the village and the Grand River makes up the entire western border. The major thoroughfare that can be used to access the village is State Routes 535, which is the only major north south roadway in the corporate limits. The village can also be accessed by boat via the Fairport Harbor of Lake Erie. The city is positioned just north of Painesville.

There are two schools in the Village of Fairport Harbor, including Fairport Harding High and McKinley Elementary. The village also contains the Fairport Harbor Lakefront Park and Fairport Harbor Marine Museum.

According to the US Census Bureau (2015), the Village of Fairport Harbor has a total estimated population of 3,094 (2014). Fairport Harbor contains 1,430 housing units (2013) with an average of 2.16 persons per household. The current median household income is \$40,146 (fairportharbor.org, 2015).

1.2.4. Grand River Village

The Village of Grand River is located in north central Lake County in Painesville Township. The corporate limits are approximately one mile inland of Lake Erie. The Grand River borders the village to the east. The only major highways accessing the village are State Routes 44 and 283

and County Route 518. The village can also be accessed by boat via the Grand River. The village contains a portion of the Mentor Marsh Nature Preserve.

According to the US Census Bureau, the Village of Grand River has a total estimated population of 396 (2014). The village contains 140 housing units (2013) with an average of 2.83 persons per household.

1.2.5. Kirtland City

The City of Kirtland is located in the southwestern portion of Lake County. The transportation infrastructure in the city includes U.S. Route 6, which runs east west through the southern portion, State Route 306 that runs north south through the center of the city, and State Route 615 in the northern most part of the city.

There are three schools in the City of Kirtland, including Kirtland Elementary, Kirtland Middle, and Kirtland High. Kirtland also contains the Chapin Forest Reservation, portions of the Holden Arboretum, Lake Farmpark, and the Penitentiary Park Glen. Kirtland Temple, Corning Lake, and Blueberry Pond are also located in Kirtland.

According to the US Census Bureau (2015), the City of Kirtland has a total estimated population of 6,819 (2014). The city contains 2,719 housing units with an average of 2.65 persons per household. The current median household income is reported to be \$83,281.

1.2.6. Kirtland Hills Village

The Village of Kirtland Hills is positioned in southwestern Lake County just north of the City of Kirtland. The major roadways that pass through the village include Interstate 90, which runs east west through the northern portion of the village, and State Route 615 running north south through the western portion of the village. The East Branch of the Chagrin River flows through the southern portion of the village. The village contains a portion of the Holden Arboretum and the Children's Schoolhouse Nature Park.

As indicated by the US Census Bureau (2015), the Village of Kirtland Hills has a total estimated population of 643 (2014) and contains 241 households (2013) with an average of 2.67 persons per household.

1.2.7. Lakeline Village

The Village of Lakeline is positioned in western Lake County south of Timberlake Village and along Lake Erie. The village is accessible using State Route 283, which is the only north south roadway through the village.

The US Census Bureau (2015) indicates that Lakeline is the least populated municipality in Lake County with an estimated population of 224 (2014). There are 92 housing units (2013) in the village with an average of 2.43 persons per household.

1.2.8. Madison Village

Madison Village is located in the eastern portion of Lake County in Madison Township, approximately four miles east of Perry. Madison is the last municipality in eastern Lake County before crossing into Ashtabula County. There are three major roadways into and out of the village, including Interstate 90 and State Route 84, the major east west highways, and State Route 528, which travels north south through the center of the village. The Norfolk Southern railroad also traverses the village.

There are two schools in the village: Homer N. Kimball Elementary and the Madison Educational Campus. According to the US Census Bureau (2015), the Village of Madison has a total estimated population of 3,176 (2014). The village contains 1,279 housing units (2013) with an average of 2.48 persons per household.

1.2.9. Mentor City

The City of Mentor is located in west central Lake County, just west of Painesville. The transportation infrastructure into and out of the city is vast and includes State Routes 44, 306, and 615, all running north south, and Interstate 90, US Route 20, and State Routes 2, 84, and 283, all running east west. There are several miles of the Norfolk Southern and CSX railroad that traverse the city.

There are 13 public schools in the City of Mentor, as well as one private school (Lake Catholic High School) and portions of Lakeland Community College. The city also contains the Bellflower Park, Garfield Park, Headlands Beach State Park, Hodgson Park, Donald E. Krueger Park, Mentor Lagoons Nature Preserve and Marina, Mentor Marsh Nature Preserve, Morton Community Park, Presidents Park, Veterans Park, Wildwood Park, the Erie Commons, the Blackbrook Golf Course, Spring Valley Park, and the Great Lakes Mall. The city has significant industrial development between SR 2 and US 20.

As indicated by 2014 US Census Bureau estimates (2015), the City of Mentor has a population of 46,870 and is the most heavily populated municipality in Lake County. There are 20,218 housing units in the city with an average of 2.45 persons per household. The reported median household income is \$65,888.

1.2.10. Mentor-on-the-Lake City

The City of Mentor-on-the-Lake is located in northwestern Lake County, just to the north and west of Mentor City. The only major highway that can be used to access the city is State Route 283. There is one school in the city: Lake Elementary. The city also contains Mentor Beach Park, John R. McMinn Memorial Park, and Overlook Beach Park.

According to the US Census Bureau (2015), Mentor-on-the-Lake has a total estimated population of 7,412 (2014). The city contains 3,461 housing units with an average of 2.21 persons per household, and currently reports a median household income of \$46,721.

1.2.11. North Perry Village

The Village of North Perry is positioned in the northeastern portion of Lake County in Perry Township. Lake Erie borders the entire northern portion of the village. There is limited access into the village; US Route 20 is the only major highway that can be used to access the village. The village contains the Lakeshore Reservation and portions of the Perry Nuclear Power Plant.

As indicated by the US Census Bureau (2015), the Village of North Perry has a total estimated population of 891 (2014) and contains 315 housing units (2013) with an average of 2.83 persons per household.

1.2.12. Painesville City

The City of Painesville is located in central Lake County and is the county seat. The major thoroughfares in the village include US Route 20 and State Routes 44 and 86 running north south, and State Routes 2, 84, and 283 running east west.

There are eight schools in Painesville City, including one private school. The city also contains the Painesville Recreation Park. The Grand River flows through the eastern portion of the city. As indicated by the US Census Bureau (2015), the City of Painesville has a population of 19,840 (2014). Painesville contains 7,867 housing units with an average of 2.65 persons per household. The city currently boasts a median household income of \$35,536.

1.2.13. Perry Village

The Village of Perry is located in northeastern Lake County in Perry Township, approximately four miles east of Painesville. The major thoroughfares in the village include US Route 20 traveling through the northern portion and State Route 84 traveling through the southern portion; several county routes also access the village.

There are four schools that operate in Perry Village, including Perry High, Perry Middle, Perry Elementary, and Center Road Elementary. According to US Census Bureau statistics (2015), Perry Village has an estimated population of 1,625 (2014). The village contains 589 housing units (2013) with an average of 2.76 persons per household.

1.2.14. Timberlake Village

Timberlake Village is located in western Lake County. The village is positioned between Eastlake City, Lakeline Village, and Lake Erie. The village can be accessed using State Routes 91 and 283. The Chagrin River flows just east of the village. According to US Census Bureau statistics (2015), the Village of Timberlake has an estimated population of 663 (2014) and contains 309 housing units (2013), with an average of 2.15 persons per household.

1.2.15. Waite Hill Village

The Village of Waite Hill is located in the southwestern portion of Lake County. The major highways that can be used to access the village include Interstate 90, passing through the northern-most tip of the village, and State Routes 174 and 306. The Chagrin River flows through the western edge of the village and branches in the northern portion of the village.

According to US Census Bureau statistics (2015), the Village of Waite Hill has a total population of 467 (2014). The village contains 213 total housing units (2013), creating an average of 2.19 persons per household.

1.2.16. Wickliffe City

Wickliffe City is located in the southwestern-most portion of Lake County. There are several thoroughfares that can be used to access the city, Interstate 90 passes through the southern portion of the city, State Routes 2, 84 and 633 can also be used, as well as US Route 20. There are two railroads that pass through the city: Conrail and Norfolk & Southern.

Three public schools and two private schools are located in the city. Wickliffe is also home to the Center for Pastoral Leadership. The city contains the Green Ridge Golf Course, the Pine Ridge Country Club, and Coulby Park.

According to US Census Bureau statistics (2015), the City of Wickliffe has a total estimated population of 12,584 (2014). The village contains 5,780 housing units with an average of 2.25 persons per household. The current median household income for Wickliffe is \$47,155.

1.2.17. Willoughby City

Willoughby City is located in the southwestern portion of Lake County. Major highways that access the city include Interstate 90, US Route 20, and State Routes 2, 84, 91, 174, and 640. The Chagrin River flows through the center of the city. There are eight schools that operate in the City of Willoughby, including three private schools.

Several recreational opportunities also exist in Willoughby City, including the Lost Nation Municipal Golf Course, Chagrin River Park, Daniels Park, Willo Center Shopping Center, Willoughby Commons Shopping Center, Parsons Gardens, Todd Field, and the Johnnycake Ridge Golf Course. Willoughby City is home to Lake West Hospital.

According to the US Census Bureau (2015), the City of Willoughby has an inhabitation of an estimated 22,453 people (2014). There are 11,387 housing units in the city with an average of 2.15 persons per household. The city boasts a median household income of \$51,245.

1.2.18. Willoughby Hills City

The City of Willoughby Hills is located in the southwestern portion of Lake County near the Cuyahoga County line, east of Kirtland. The major roadways that access the city include Interstate 271, State Routes 84, 91, and 174 (all running north south), and Interstate 90 and US Route 6 running east west.

The Chagrin River flows through the eastern portion of the city. The city also contains the Airport Greens Golf Course, Manikiki Golf Course, the North Chagrin Reservation, Squire's Castle, and the Shops at Willoughby Hills Shopping Center.

According to the US Census Bureau (2015), the City of Willoughby Hills has an estimated inhabitation of 9,405 people (2014). There are 4,929 housing units in the city with an average of 2.16 persons per household. The city boasts a median household income of \$56,593.

1.2.19. Willowick City

The City of Willowick is located in the western portion of Lake County along the Cuyahoga County line. The major roadways that can be used to access the city include US Route 20 and State Routes 2, 283, and 640. The city's entire northern border is that of Lake Erie.

There are three schools that operate in Willowick City, including St. Mary Magdalene Elementary, Willowick Middle, and Royalview Elementary. The city also contains Dudley Park, Lakefront Lodge, Manry Park, the North Shore Mall, and the Shoregate Town Center Shopping Center.

According to the US Census Bureau (2015), the City of Willowick has a total estimated population of 14,009 people (2014). There are 6,476 housing units in the city with an average of 2.27 persons per household. The city boasts a median household income of \$47,071.

1.2.20. Concord Township

Concord Township is located in the central portion of Lake County along the Geauga County border. It is adjacent to Kirtland Hills Village, Mentor and Painesville Cities and Leroy and Painesville Townships. The major highways accessing the Township include State Routes 44, 84, 86 and 608 along with Interstate 90. Concord Township is south of the old beach ridges and is the beginning of the Appalachian Plateau. Little Mountain located is in Concord Township. Little Mountain is the highest point above sea level in the County. The terrain in Concord Township has prompted lake effect snow averaging 69 inches of snow per year.

There are three (3) public schools in Concord Township: LaMuth Middle School, Melridge Elementary of the Riverside School District and Auburn Career Center, the local vocational education high school for Lake and Geauga Counties. Concord Township also has St. Gabriel School, a Catholic elementary school, located in it.

Concord Township contains Girdled Road Lake Metropark, the Environmental Learning Center and a portion of Helen Hazen Wyman Metropark. It is also home to the Lake Erie College Equestrian Center and LakeHealth's Tri-Pointe Medical Center.

As indicated by the 2010 Census, Concord Township has a total population of 18,577 residents and is the fifth most populated community in Lake County and the largest township. The Township contains 7,453 housing units with an average of 2.56 persons per household. Concord Township has been experiencing development pressure since 1990. 1,557 units were added to the Township since 2000. The median household income is listed at \$81,508.00.

1.2.21. Leroy Township

Leroy Township is located in the central portion of Lake County along the Geauga County border. It is adjacent to Concord, Perry and Painesville Townships. The major highways accessing the Township include State Route 86 and Interstate 90. Leroy Township is south of the old beach ridges and is the beginning of Appalachian Plateau. The terrain in Leroy Township has prompted lake effect snow and averages 69 inches of snow per year.

There is only one public school in Leroy Township: Leroy Elementary of the Riverside School District. Leroy Township contains a portion of Girdled Road Lake Metropark, Hell Hollow Metropark, Indian Pointe Metropark, Paine Falls Metropark and Hidden Lake Metropark.

According to the 2010 Census, the Leroy Township has a total population of 3,253 residents and it contains 1,263 housing units with an average of 2.56 persons per household. The median household income is listed at \$73,776.

1.2.22. Madison Township

Madison Township is located in the eastern portion of Lake County. It is bordered by Ashtabula County to the east, Geauga County to south, and Perry Township and Leroy Township to the west. Interstate 90 runs through the southern portion of the Township, but there is no direct access to it. The only exit in the Madison area is located in Madison Village. The Township is also served by US 20, SR 84, SR 307 and SR 528.

There are four public schools in Madison Township, including Madison High School, Madison Middle School, North Elementary and the Pre-K School. Lake Metroparks has a large presence in Madison Township. There are four parks along the Grand River: River Road Park, Hidden Valley Park, Hogback Ridge Park and Riverview Park. They also are responsible for the Arcola Creek Park at the mouth of Arcola Creek at Lake Erie and Erie Shores Golf Course. Agriculture is also very common land use in Madison Township. The Township is dotted with nurseries and wineries and the Madison Country Club is located in the northern half of the Township.

There are two population figures from the 2010 Census that are associated with the Township. One includes the populations of Madison Township and Madison Village (18,823 people) and one that does not include the incorporated area (15,639 people). The Madison Township Board of Trustees only provide services for 15,639 people in the unincorporated areas of the Township. Madison Village provides services for the residents in their communities and all three communities are served by the Madison Fire District. With a population of 15,639 people, Madison Township ranks 7th amongst the Lake County communities. There are 6,754 housing units in Madison Township and there are an average of 2.54 people living in each unit. The median household income in Madison Township is \$52,789.

1.2.23. Painesville Township

Painesville Township is located in north central Lake County, along Lake Erie. It surrounds Painesville City. There are also two villages, Fairport Harbor and Grand River, which are considered part of the Township. The Grand River is also a major feature in Painesville Township. It forms part of the border between Painesville Township and Painesville City and part of the boundary between Concord Township and Painesville Township. Painesville Township has two

limited access highways, State Routes 44 and 2. State Routes 84, 86, 283 and 535 also run through the Township.

Riverside Local School District serves Concord Township, Painesville Township, Leroy Township, Grand River Village, a portion of Chardon Township and a portion of Painesville City. The School District has six elementary schools, two middle schools and a high school, but the majority of the facilities are located in Painesville Township. Painesville Township has four elementary schools, one junior high and a high school located within its boundaries. Clyde C. Hadden and Buckeye Elementary are located in the western portion of the Township, while Hale Road and Madison Avenue Elementary, John R. Williams Junior High and Riverside High School are located in eastern part of the Township.

The Township contains a portion of the Mentor Marsh Nature Preserve and Helen Hazen Wyman Metropark and a majority of Headlands State Park (a portion of the state park is located in Mentor). Painesville Township also owns their own park on Lake Erie. The park is managed by Lake Metroparks.

There are two population figures from the 2010 Census that are associated with the Township. One includes the populations of Painesville Township, Grand River Village and Fairport Harbor Village (20,399 people) and one that does not include the incorporated areas (16,681 people). The Painesville Township Board of Trustees only provide services for 16,681 people in the unincorporated areas of the Township. Grand River and Fairport Harbor provide services for the residents in their communities. Painesville Township is the sixth largest community in Lake County and second largest township by population. There are 6,466 households in Painesville Township and there are an average of 2.88 people living in each unit. The median household income in Painesville Township is \$50,962.00.

1.2.24. Perry Township

Perry Township is located in north central Lake County, along Lake Erie. The Grand River is also a major feature in Perry Township. It forms the border between Perry Township and Leroy Township. There are also two villages, Perry Village and North Perry Village, that are consider a part of the Township. The Township is served by US 20 and SR 84.

There are no schools in Perry Township. Perry Township is served by the Perry Local School District and the Perry Educational Village is located in Perry Village. Lake Metropark's newest park, Lake Erie Bluffs is located in Perry Township, along with Mason Landing. Perry Township also owns a park along the Lake Erie shoreline.

There are two population figures from the 2010 Census that are associated with the Township. One includes the populations of Perry Township, Perry Village and North Perry Village (8,999 people) and one that does not include the incorporated areas (6,449 people). The Perry Township Board of Trustees only provide services for 6,449 people in the unincorporated areas of the Township. Perry Village and North Perry Village provide services for the residents in their communities and all three communities are served by the Perry Fire District. There are 2,469 housing units in Perry Township and there are an average of 2.71 people living in each unit. The median household income in Perry Township is \$68,281.00.

1.3 RECORD OF CHANGES

To determine which sections would be updated, the planning committee reviewed and analyzed each section of the plan. These changes are reflected in the following “Record of Changes”.

Section	Description of Change
INTRODUCTION	
1.1 Documentation of the Planning Process	- Removed notes on previous planning processes. - Added a narrative describing the methodology used to complete this update.
1.2 Description of the Planning Area	Verify and update demographic data.
1.3 Record of Changes	Updated as per 2015 revisions.
RISK ASSESSMENT	
2.1 Identify Hazards	Removed list of hazards <i>that are considered by the plan</i> since those are detailed by hazard profiles.
2.2 Profile Hazards	- Consolidated hazard profile information from appendices into the section. - Updated profiles based on additional events to occur as well as per guidance from the Ohio EMA.
2.3 Inventory Assets	- Removed structural, contents, and function/use as well as occupancy values for each structure since they are no longer needed for loss estimates. - Added new assets; removed closed/incorrect assets. - Verified names, addresses, and hazard vulnerability classifications.
2.X Estimate Losses	Consolidated into hazard profiles.
2.4 Analyze Development Trends	- Updated lists of known development projects as well as demographics. - Re-numbered.
ACTION PLAN	
3.0 Local Hazard Mitigation Goals	- Consolidated hail, severe thunderstorm, and severe wind & tornado projects under a “severe weather” category. - Changed the hazard from “epidemic” to “infectious disease”. - Changed the hazard from “wildfire” to “fire”. - Eliminated all references to strategies (and moved them to Section 4.0).
4.0 Project Implementation	- Created section based on recommendations from Ohio EMA. - Created a table listing all mitigation projects for Lake County and participating jurisdictions. - Integrated appropriate information from former Sections 4.1 and 4.2 into the table.
4.1 Identification and Analysis of Mitigation Measures	Consolidated into a new section – Section 4.0: Project Implementation.

Section	Description of Change
4.2 Implementation of Mitigation Actions	Consolidated into a new section – Section 4.0: Project Implementation.
5.0 Plan Maintenance Process	- Updated the list of plans referenced in the mitigation planning process. - Included a table to better depict local capabilities supporting hazard mitigation.
General	APPENDICES - Removed former Appendix 1; inserted profile data into Section 2.2. - Removed former Appendix 2. - Re-numbered the glossary appendix. - Removed former Appendix 4. - Re-numbered the public involvement appendix; updated the information per 2015 outreach efforts. - Re-numbered the adopting resolutions appendix.

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.

The section notes the hazards that are included in Lake County's hazard mitigation plan. Several methods of research were utilized to identify the hazards to which Lake County and its local governments are susceptible. Said research has led to the inclusion of the following hazards:

- Coastal erosion,
- Dam/levee failure,
- Drought,
- Earthquake,
- Fire (structure and wildfire),
- Flooding,
- Hazmat incident,
- Infectious disease,
- Infestation,
- Land subsidence,
- Severe weather,
- Terrorism, and
- Winter storm.

For these hazards, the sources of data are noted with the hazard profiles contained in Section 2.2.

The following chart illustrates the hazards to which the county and its local governments were determined to not be susceptible. The intent of this chart is to justify the exclusion of these hazards from the plan.

<i>Hazard</i>	<i>Research Sources</i>	<i>Rationale</i>
Avalanche	• United States Geological Survey (USGS) Topographic Maps • NOAA	• Although Lake County contains very limited elevated terrain and receives significant amounts of snowfall annually, the general elevation is not high enough to cause snow to cap hills year-round. • Further, the general topography of the county is not suitable for avalanches.

<i>Hazard</i>	<i>Research Sources</i>	<i>Rationale</i>
Hurricane	• See also "Severe Weather"	• While Lake County sometimes receives precipitation as hurricanes hit eastern and southern coastal states, the county does not experience intense hurricane conditions.
Seiche	• NOAA	• NOAA's NCDC does not list any seiche waves that have significantly impacted Lake County. • Since such an event is plausible, brief discussions of seiches are included in the earthquake profile (resulting from seismic activity) and the severe weather profile (because research notes Lake Erie as particularly prone to wind-related seiches).
Tsunami	• NOAA • Ohio Seismic Network • USGS	• Though there is evidence of seismic activity under Lake Erie, such activity is not considered substantial enough to result in tsunami waves.
Volcano	• USGS	• No volcanoes exist on the east coast.

2.1.1 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 local governments can be said to be susceptible to the above hazards by virtue of their location in Lake County, it is stressed that it may be more or less susceptible to these hazards than each other and the balance of Lake County. The following chart determines if they are equally (=), more (>), or less (<) susceptible to these hazards than the balance of the county.

Hazard	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Eastlake	>	=	=	=	=	>	>	=	=	=	=	>	=
Fairport Harbor	>	=	=	=	=	>	=	=	=	>	=	=	=
Grand River	<	=	=	=	>	>	=	=	=	>	=	=	=
Kirtland	<	>	=	=	>	=	=	=	=	=	=	=	=
Kirtland Hills	<	>	=	=	>	=	>	=	=	=	=	=	=
Lakeline	>	=	=	=	=	=	<	=	=	=	=	=	=
Madison	<	=	=	=	=	=	>	=	=	=	=	=	=
Mentor	>	>	=	=	>	=	>	=	=	=	=	>	=
Mentor-on-the-Lake	>	=	=	=	=	=	=	=	=	=	=	=	=
North Perry	>	=	=	=	=	=	>	=	=	=	=	>	=
Painesville	<	>	=	=	=	>	>	=	=	>	=	>	=
Perry	<	=	=	=	=	=	>	=	=	=	=	=	=
Timberlake	>	=	=	=	=	=	<	=	=	=	=	=	=
Waite Hill	<	=	=	=	>	>	>	=	=	=	=	=	=
Wickliffe	<	=	=	=	=	=	>	=	=	=	=	>	=
Willoughby	>	=	=	=	=	>	>	=	=	=	=	>	=
Willoughby Hills	<	=	=	=	>	>	>	=	=	=	=	=	=
Willowick	>	=	=	=	=	=	=	=	=	=	=	>	=

KEY

= : Municipality affected by hazard same as county.
>: Municipality affected by hazard more than county.
<: Municipality affected by hazard less than county.

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.
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2.2.1 Section Overview

Several hazards affect Lake County, as noted in the Section 2.1 above. Those hazards, however, may not affect the county in ways that residents and planners may typically think. Additionally, while hazard may occur frequently, it may cause little damage or disruption; conversely, a hazard that rarely occurs may cause significant damage and disruption. As such, this section contains a profile of each hazard considered by this plan, which provides details on how the hazard impacts the area. Additionally, this section discusses a number of complicating variables that could either result in emergencies on their own or add to the complexity of the profiled hazards. Finally, this section includes a comparison of hazard severity and hazard vulnerability.

2.2.2 Coastal Erosion

Coastal erosion is the gradual wearing and carrying away of land or beach materials by wave action, water, wind, general weather conditions, and tidal currents.

RESEARCH

- ODNR, Office of Coastal Management (<http://coastal.ohiodnr.gov/>)
- Ohio Division of Geological Survey (<http://geosurvey.ohiodnr.gov/lake-erie-geology/erosion-and-research/erosion-problems>)
- FEMA Risk Map (<http://fema.maps.arcgis.com/home/webmap>)
- NOAA, National Climatic Data Center Storm Events Database (<http://www.ncdc.noaa.gov/stormevents/>) – Search terms included:
 - o Coastal flood,
 - o High surf,
 - o Lakeshore flood,
 - o Marine hail,
 - o Marine high wind,
 - o Marine strong wind,
 - o Marine thunderstorm wind,
 - o Rip current,
 - o Seiche,
 - o Sneakerwave, and
 - o Storm surge/tide

Coastal hazards are a constant threat to the 95,000 miles of U.S. coastline, Ohio contains 262 miles of Lake Erie's coastline. Lake County contains 31 miles of Ohio's Lake Erie coastline. In the Great Lakes region, flooding and rising lake levels cause serious property damage, endanger public safety, and degrade environmental quality. Economic losses exceed tens of millions of dollars per year. The Lake Erie shoreline of Ohio is undergoing widespread recession. According to the Ohio Coastal Management Program (OCMP), approximately 95% of Ohio's Lake Erie shore is eroding with 43% of the shore now beachless. Nearly 2,500 structures are within 50 feet of the destruction. Portions of Lake County's transportation infrastructure may also become victim to the erosion of shoreline land including portions of State Route 283 and Mentor Harbor Boulevard, which traverse the county east west along the shore.

Coastal erosion results from beach-lake interaction coupled with human activity. The beach system is one that is considered to be in dynamic equilibrium, which means that sand is moved from one location to another, but does not leave the

system. For example, winter storms and other storm surges may remove significant amounts of sand, creating steep, narrow beaches. In the summer, gentle waves return the sand, widening beaches and creating gentle slopes. Sand movement will not be consistent year after year in the same location because there are so many factors involved in coastal erosion, including human activity, sea or lake level rise, seasonal fluctuations, and climate change.

Wind, waves, and longshore currents are the driving forces behind coastal erosion. This removal and deposition of sand permanently changes beach shape and structure. Sand may be transported to landside dunes, deep ocean trenches, other beaches, and deep ocean bottoms. Coastal erosion poses many problems to coastal communities in that valuable property is frequently lost to this dynamic beach-ocean system. Additionally, human activity may accelerate the process of coastal erosion through poor land use methods. Thus, issues of beach restoration and erosion control are at the forefront in coastal communities. Factors that can cause shoreline erosion include the following.

- **Bluff Recession:** An eroded beach leaves the base of the bluff vulnerable to wave attack. As waves break farther inshore, they weaken and erode the base of the bluff, which is known as undercutting. Once the base area is eroded, upper bluff soils and vegetation lose their support and slide to the base of the bluff.
- **High Lake Levels:** High levels cause waves to break farther inshore, eroding the beach and lower bluff areas. High lake levels are primarily the result of increased precipitation in the upper Great Lakes Watershed.
- **High Winds:** High winds during storms also cause water levels to reach above-normal levels. During storms, high winds force the water surface higher at the downwind end of the lake. As the storm passes, this pent-up water is released and moves toward the opposite end of the lake. The wind-driven wave buildup, known as a seiche, can cause severe flooding along the shoreline.
- **Human Activities:** Activities such as construction of marinas and groins block the natural movement of beach sediment by wave action. While some human activities can lessen coastal erosion, larger structures may cause currents to carry sediment offshore to deeper water, rather than transport it farther down the beach.

Lake Erie's shoreline can be protected in a number of ways. Structures, when properly placed, can protect the shoreline in two ways. In the water, they help trap and retain sediment. On land, they protect the shoreline against constant wave attack. Breakwaters are usually composed of stone or rocks and are placed a short distance offshore. By breaking the full force of incoming waves, they promote the accumulation of sediment between the structure and the eroding beach. In order to avoid erosion to down-drift beaches, the area behind the breakwater should be partially filled with sand after construction.

Groins are structures that extend perpendicular from the shore. Groins interrupt the natural movement of beach sediment by trapping and retaining sand on the up-drift side of the groin. The area on the up-drift side should be filled after construction to avoid erosion to down-drift beaches. Revetments are structures placed in the beach profile or along the base of bluffs to absorb the energy of incoming waves. These structures protect only the land immediately behind them and not adjacent areas. If placed in the water, revetments do not encourage sediment buildup and little, if any, beach will develop.

The following table is the Saffir-Simpson Scale, which illustrates the correlation between wind speed, storm surge, and the expected damage from coastal storms.

Category	Wind Speed	Storm Surge (ft. above normal sea level)	Expected Damage
1	74-95 mph	4-5 ft.	Minimal: Damage is done primarily to shrubbery and trees, unanchored mobile homes, and some signs. No real damage is done to structures.
2	96-110 mph	6-8 ft.	Moderate: Some trees are toppled, some roof coverings are damaged, and major damage is done to mobile homes.
3	111-130 mph	9-12 ft.	Extensive: Large trees are toppled, some structural damage is done to roofs, mobile homes are destroyed, and structural damage is done to small homes and utility buildings.
4	131-155 mph	13-18 ft.	Extreme: Extensive damage is done to roofs, windows, and doors; roof systems on small buildings completely fail; some curtain walls fail.
5	> 155 mph	>18 ft.	Catastrophic: Roof damage is considerable and widespread, window and door damage is severe; there are extensive glass failures and entire buildings could fail.

LOCATION

Many stretches of Lake County's shoreline are cliff-like bluffs. These areas were once the site of vacation homes and other retreats; however, recently these areas have been developed residentially. Extensive residential development along the lakefront could be costly.

Period of Occurrence:	Gradual
Number of Events to Date (1950 – 2015):	0
Probability Estimation (Events per Year):	0.00
Probability of Event:	Likely
Warning Time:	Days to Years
Potential Impacts:	Shoreline property can be severely damaged. Development in coastal areas can be significantly hampered.
Cause Injury or Death:	None
Potential Facility Shutdown:	Minimal

EXTENT

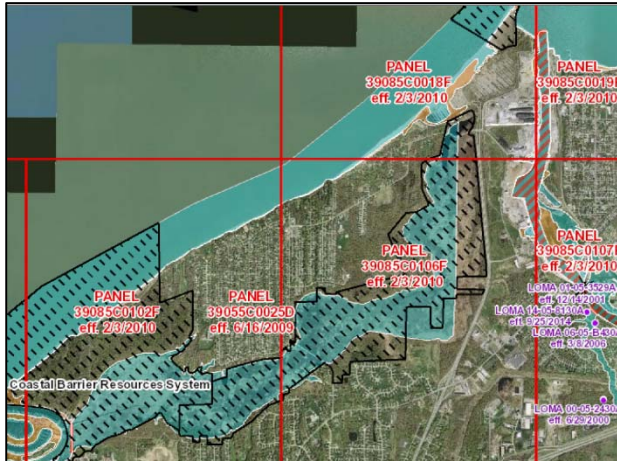
A number of projects have been completed or are underway in Lake County with respect to coastal erosion. The Lake County Ohio Port and Economic Development Authority is working with the United States Army Corps of Engineers to strengthen areas of the coast line in Fairport Harbor (east of the village proper). Studies have been completed to support basic commercial development. Lake Metroparks has also done projects in Perry and Madison Townships to protect the coast line.

As part of the Lake County Planning Commission's coastal management plan, breakwalls have been constructed in Mentor and North Perry. Further, individual jurisdictions have been compiling agreements with appropriate contractors, state agencies, and local partners to ensure that response measures (such as shoring up structures and filling in eroded areas) can be implemented quickly. These jurisdictions include Fairport Harbor, Painesville Township, and North Perry. While coastal erosion is likely to remain a hazard for the foreseeable future (due to the county's proximity to Lake Erie), potential losses have been lessened since previous adoptions of this plan.

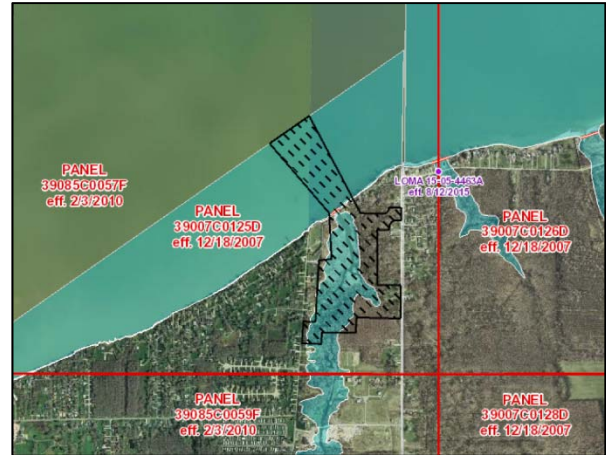
Generally, communities throughout Lake County comply with applicable regulations that have been put in place to combat coastal erosion. In order to build in coastal erosion areas (CEAs), as designated by the Ohio Department of Natural Resources, Office of Coastal Management, permits are necessary. Additionally, communities are aware of and support the designation of FEMA's coastal

management buffer zones. The following images depict coastal protection areas in Lake County (FEMA Risk Map).

Mentor/MOTL Area



Northeast Corner of County



HISTORICAL OCCURRENCES

Painesville Township, Ohio

Lake Road in Painesville Township has been impacted, such that response times have been adversely affected toward the Lake Erie shore (and communities such as The Pines subdivision).

Mentor, Ohio

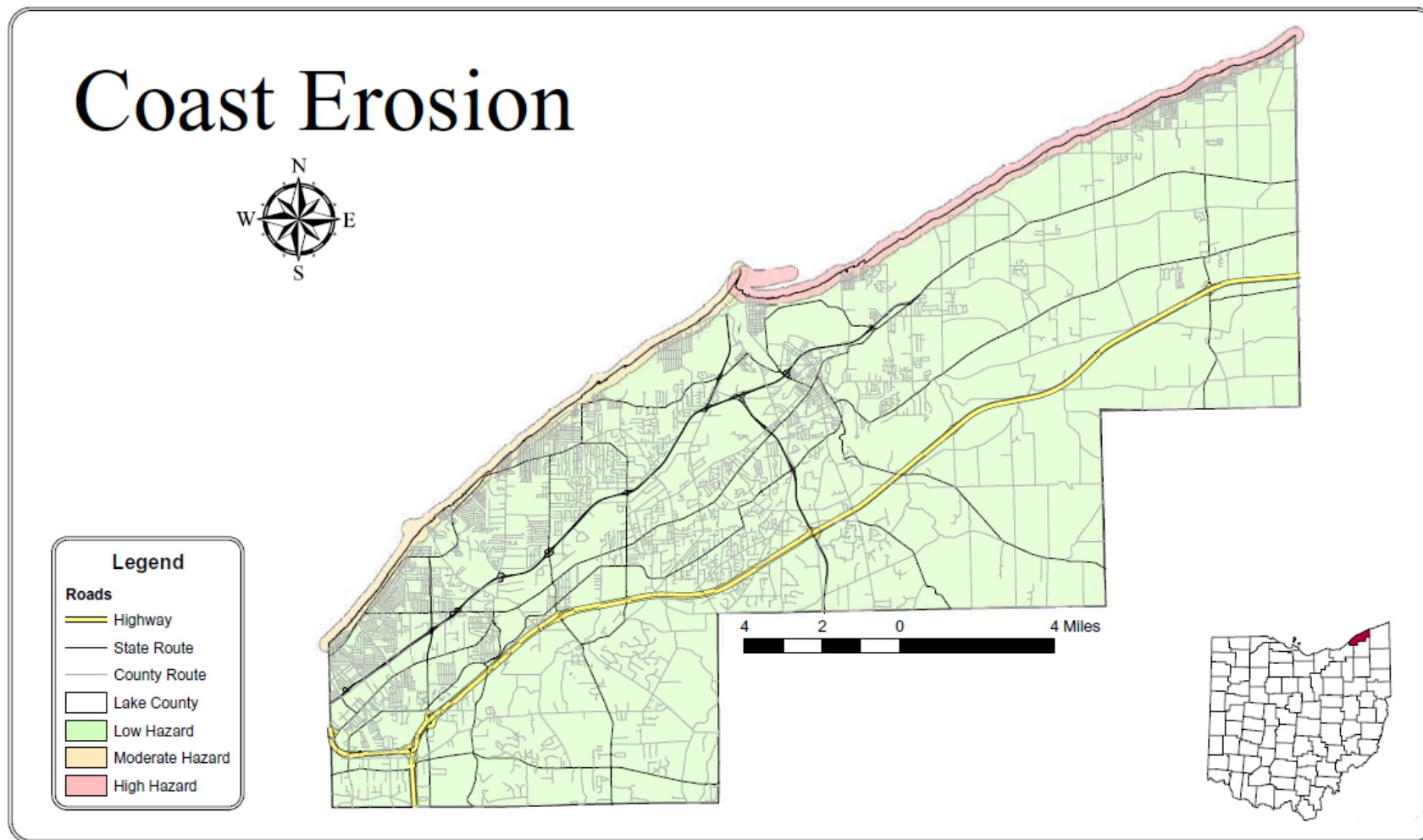
The City of Mentor has experienced erosion issues near its marina, which could impact nearby wetlands. The wetland areas act as a buffer for storm surges, meaning the erosion could indirectly lead to exacerbated flooding issues in the northern parts of the city.

VULNERABILITY OF STRUCTURES

The following table estimates potential structural losses due to coastal erosion. Based on a review of the Lake County Planning Commission's coastal management plan (LCPC, 2005) and the FEMA Risk Map site, there are very few structures that could be impacted by erosion (which is not to say that there are not environmental or economic assets that could be substantially impacted). To estimate coastal flooding losses, a HAZUS-MH report for a 12' coastal flood was utilized.

Structure Type	Number	Loss Estimate
Residential	1,172	\$177,323,600
Non-Residential	7	\$66,060,000
Critical Facilities	0	\$0
TOTALS	1,179	\$243,383,600

COASTAL EROSION HAZARD MAP



2.2.3 Dam/Levee Failure

A dam failure is when downstream flooding occurs as the result of the complete or partial inundation of an impoundment.

RESEARCH

- Public input
- Butz, M. C. (2009). Corps does not approve of Eastlake flood project. *The News-Herald*. Online. (<http://www.news-herald.com/article/HR/20090414/NEWS/304149964>)
- Chagrin River Watershed Partners, Inc. (2011). *Chagrin River Watershed Action Plan*. Online. (<http://water.ohiodnr.gov/portals/soilwater/downloads/wap/ChagrinR.pdf>)
- Ohio Dam Safety Program (<http://soilandwater.ohiodnr.gov/safety/dam-safety>)
- USACE National Inventory of Dams (http://nid.usace.army.mil/cm_apex/f?p=838:12)
- USACE National Levee Database (http://nid.usace.army.mil/egis/f?p=471:69:0::NO::P69_SUBMITTED:1)
- Stanford University – National Performance of Dams Program (NPDP) (<http://npdp.stanford.edu/>)

There are about 80,000 dams in the United States, the majority of which are privately owned. State and local authorities, public utilities, and federal agencies own others. The benefits of dams are numerous: they provide water for drinking, navigation, and agricultural irrigation, and save lives by preventing or reducing floods. These structures are generally made with concrete or earthen materials. The failure of these dams, although a man-made structure, will result in the natural event of flooding.

HEIGHT OF DAM	
Class I	Greater than 60 ft.
Class II	Greater than 40 ft.
Class III	Greater than 25 ft.
Class IV	Less than/equal to 24 ft.

STORAGE VOLUME	
Class I	Greater than 5,000 ac-ft.
Class II	Greater than 500 ac-ft.
Class III	Greater than 50 ac-ft.
Class IV	Less than/equal to 50 ac-ft.

Dams are classified under two conditions: height and storage volume (as illustrated in the charts above). The height of a dam is defined as the vertical dimension measured from the natural streambed at the downstream toe of a dam to the low point along the top of the dam. The storage volume is defined as the total volume impounded when the pool level is at the top of the dam immediately before it is overtopped. According to the Ohio Department of Natural Resources, the damage predicted by a dam failure coincides with the class of the dam. Potential downstream hazards are defined as the resultant downstream damage should the dam fail, including probable future development. The potential downstream hazards are broken into four classes.

POTENTIAL DOWNSTREAM HAZARDS	
Class I	Probable loss of life, structural damage to high value property (i.e., homes, industries, major public utilities).
Class II	Flood water damage to structures (no loss of life envisioned), damage to state and interstate highways, and railroads.
Class III	Damage to low value, non-residential structures, blocked roads, damage to crops, and injuries to livestock.
Class IV	Losses restricted mainly to the dam.

Uncontrolled floodwaters are one of the most powerful and destructive forces in nature. Dams that are not designed to withstand major storms may be destroyed, increasing flood damage downstream. The potential for damage due to dam failure is increasing along with the number of residential and commercial development downstream of dams. In many cases, existing dams will need to be modified to keep downstream areas safe from catastrophic flooding.

There are three types of failures of earthen dams: overtopping, seepage, and structural failure. Overtopping failures result from the erosive action of water on the embankment. Erosion is due to uncontrolled flow of water over, around, and adjacent to the dam. Earthen embankments are not designed to be overtopped and therefore are particularly susceptible to erosion. Once erosion has begun during overtopping, it is almost impossible to stop.

All earthen dams have seepage resulting from water percolating slowly through the dam and its foundation. However, seepage must be controlled in both velocity and quantity. If uncontrolled, it can progressively erode soil from the embankment or its foundation resulting in rapid failure of the dam. Erosion of the soil begins at the downstream side of the embankment either in the dam proper or the foundation, progressively works toward the reservoir, and eventually develops a “pipe” or direct

conduit into the reservoir. Seepage can cause slope failure by creating high pressures in the soil pores or by saturating the slope.

Structural failures can occur in either the embankment or the appurtenances. Structural failure of a spillway, lake drain, or other appurtenance may lead to failure of the embankment. Cracking, settlement, and slides are the more common signs of structural failure of embankments. Large cracks in either an appurtenance or the embankment, major settlement, and major slides will require emergency measures to ensure safety, especially if the problems occur suddenly.

The three types of failures are often interrelated in a complex manner. For example, uncontrolled seepage may weaken the soil and lead to a structural failure. A structural failure may shorten the seepage path and lead to a piping failure. Surface erosion may result in structural failure, and the cycle continues. Minor defects such as cracks in the embankment may be the first visual sign of a major problem which could lead to failure of the structure. Someone experienced in dam design and construction should evaluate the seriousness of all deficiencies as soon as they are detected.

Also important to recognize in this section are levees. A levee is an embankment for preventing flooding or, in some cases, a continuous dike or ridge (as of earth) for refining the irrigation areas of land to be flooded (www.merriam-webster.com/dictionary/levee). A levee failure is similar to a dam failure in that the failure results in water that is intentionally held back or kept out is allowed to flow through the breach in the levee. Like dams, levees can fail due to erosion and/or damage, overtopping, or as a result of instability in a foundation.

Perhaps the most well-known levee failures in recent memory occurred in New Orleans, Louisiana following Hurricane Katrina's landfall in 2005. In that instance, numerous failures were reported (perhaps as many as 50), resulting in water flooding lower (in elevation) areas of the city. Adding to the challenge of repairing the failed levees was getting the water out of flooded areas.

LOCATION

Dam listings for Lake County are somewhat inconsistent. There are currently 14 dams in the county, according to the Ohio Department of Natural Resources, Division of Water. Of those dams, two are Class I and two are Class II. The Stanford University National Performance of Dams Program (NPDP) lists ten impoundments in Lake County. The US Army Corps of Engineers reports nine dams. The following table

Period of Occurrence:	At any time
Number of Events to Date (1999 – 2015):	1 (failures), 1 (incidents)
Probability Estimation (Events per Year):	0.0625 (failures), 0.0625 (incidents)
Probability of Event:	Infrequent – Dams that fail typically have some deficiency that causes the failure that should be detected by regular inspections and subsequently repaired. Heavy rains or moderate earthquakes may trigger a dam failure.
Warning Time:	Minimal – Depends on frequency of inspection
Potential Impacts:	Potential loss of human life, economic loss, environmental damage, disruption of lifeline facilities
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	30 days or more

lists the dams in Lake County along with names, classifications, and owners (and includes the source from which the data are taken).

Dam Name	Hazard Class	Owner	Data Source
Hoose Road Retention Dam	I, High	City of Mentor	ODNR, NPDP, USACE
Brightwood Lake Dam	I, High	Grant Garner & Mr. & Mrs. Kenneth	ODNR, NPDP, USACE
Cloverdale Lake Dam	II, Significant	Lake County Farmers Conservation Club	ODNR, NPDP, USACE
Little Mountain Dam "A"	II, Significant	Hermitage Builders, Inc.	ODNR, NPDP, USACE
Girl Scouts Lake Dam	III, Low	N/A	ODNR, NPDP, USACE
Quail Hollow Lake Dam	III, Low	Quail Hollow Country Club	ODNR, NPDP, USACE
Camp Lejnar Lake Dam	III, Low	N/A	ODNR, NPDP
Long Pond Dam	III, Low	Lake County Rod & Gun Club	ODNR, NPDP, USACE
Lake Erie College Lake Dam	III, Low	Lake Erie College	ODNR, NPDP, USACE
Lower Woods Pond Dam	III, Low	Lake County Rod & Gun Club	ODNR, NPDP, USACE

Dam Name	Hazard Class	Owner	Data Source
Lake Indian	III	Northeast Ohio Council, Boy Scouts of America	ODNR
Slagle Pond Dam	III	Fore D's Golf, LLC	ODNR
Canoe Lake Dam	III	Northeast Ohio Council, Boy Scouts of America	ODNR
Bass Lake Dam	III	Northeast Ohio Council, Boy Scouts of America	ODNR

Additionally, there are a number of exempt structures in Lake County. These include the following (the location is listed in parentheses).

- Amla Recreation Park Lake Dam (Leroy Twp.)
- Blueberry Pond Dam (Kirtland)
- Clear Lake Dam (Concord Twp.)
- Diamond Alkali Pond Dam (Concord Twp.)
- Erie Shores Gold Club Lake Dam (Madison Twp.)
- Hole No. 9 Dam (Madison Twp.)
- Ledge Road Pond No. 1 Dam (Madison Twp.)
- Ledge Road Pond No. 2 Dam (Madison Twp.)
- Ledge Road Pond No. 3 Dam (Madison Twp.)
- Mentor Recreation Park Lake Dam (Mentor)
- Oakridge Dry Dam (Concord Twp.)
- Richard Bates Pond (Madison Twp.)
- Slagle Lake No. 1 Dam (Madison Twp.)
- Slagle Lake No. 2 Dam (Madison Twp.)
- Snyder Pond Dam (Kirtland)
- Storer Lake Dam (Perry Twp.)
- Strawberry Lane Lake Dam (Willoughby)

According to the US Army Corps of Engineers, there is one levee in Lake County, located along the Chagrin River in Eastlake. This structure levees an urban area of 21.74 acres (nid.usace.army.mil). The hazard area is listed as Zone AE and A1-A30. The graphic at right shows the likely impact area should the levee fail.



The Chagrin River Watershed Partners note that a number of projects have recently removed levees along the Chagrin River. In 2012, Lake Metroparks removed

650 linear feet of earthen levee along the Chagrin to enable the river to access its historical floodplain as part of a floodplain restoration project. A 385 linear feet section of level was removed along the East Branch of the Chagrin by the Holden Arboretum.

EXTENT

The Brightwood Lake Dam in Lake County is a Class I Dam located on a tributary to Mudbrook Creek. Since the adoption of the original hazard mitigation plan, six families in four structures were bought out. These families formerly lived just below the dam on Prouty Road; as a result, these structures are no longer in the hazard area. The remaining Class I dam is located near the City of Mentor on Kellogg Creek. Two dams, including the L'Allouette Plume Lake dam (<http://www.lakecountyohio.gov/commissioners/PUBLICNOTICES.aspx>), have been removed in Lake County according to the county's storm water management department. The Corning Lake restoration at the Holden Arboretum is also on-going. The project included knocking open a portion of the dam, draining the lake, and then repairing the dam (http://www.cleveland.com/metro/index.ssf/2015/08/holden_arboretums_once-beautif.html).

The planning committee noted a particular challenge associated with the Lakeshore Farms facility in Madison Township. Specifically, there is a 36" gas line running through the embankment. Committee members also noted that the Ohio Department of Natural Resources (ODNR) regularly inspects dam facilities throughout the county; however, those inspections are not annual (as per assumptions in previous versions of this plan).

HISTORICAL OCCURRENCES

Leroy Township, Ohio

According to the Stanford NPDP (<http://npdp.stanford.edu/>, accessed September 7, 2015), there has been one historical incident related to the failure of a dam in Lake County. The Girl Scouts Lake Dam (OH00348) was constructed in 1968. In 1999, concrete deterioration was noted; specifically, the principal spillway system was on the verge of failing due to rust, etc. It is significant to note that the Girl Scouts no longer own the property (Core Planning Committee, personal communications).

Willoughby, Ohio

The planning committee noted the Daniels Park failure in early 2005, which was the failure of a concrete low head dam. Though the dam failed, no downstream flooding occurred (<http://www.news-herald.com/general-news/20050103/dam-breaks>).

Eastlake, Ohio

According to the US Army Corps of Engineers National Levee Database, a July 2008 routine inspection of the levee in Eastlake returned an unacceptable inspector rating. The News Herald noted that a portion of the southern end of the Chagrin River dike had been taken down by two homeowners and there are a number of unauthorized encroachments around the dikes, particularly along the river (e.g., docks, stairs, and patios) (Butz, 2009). No failure has occurred to date.

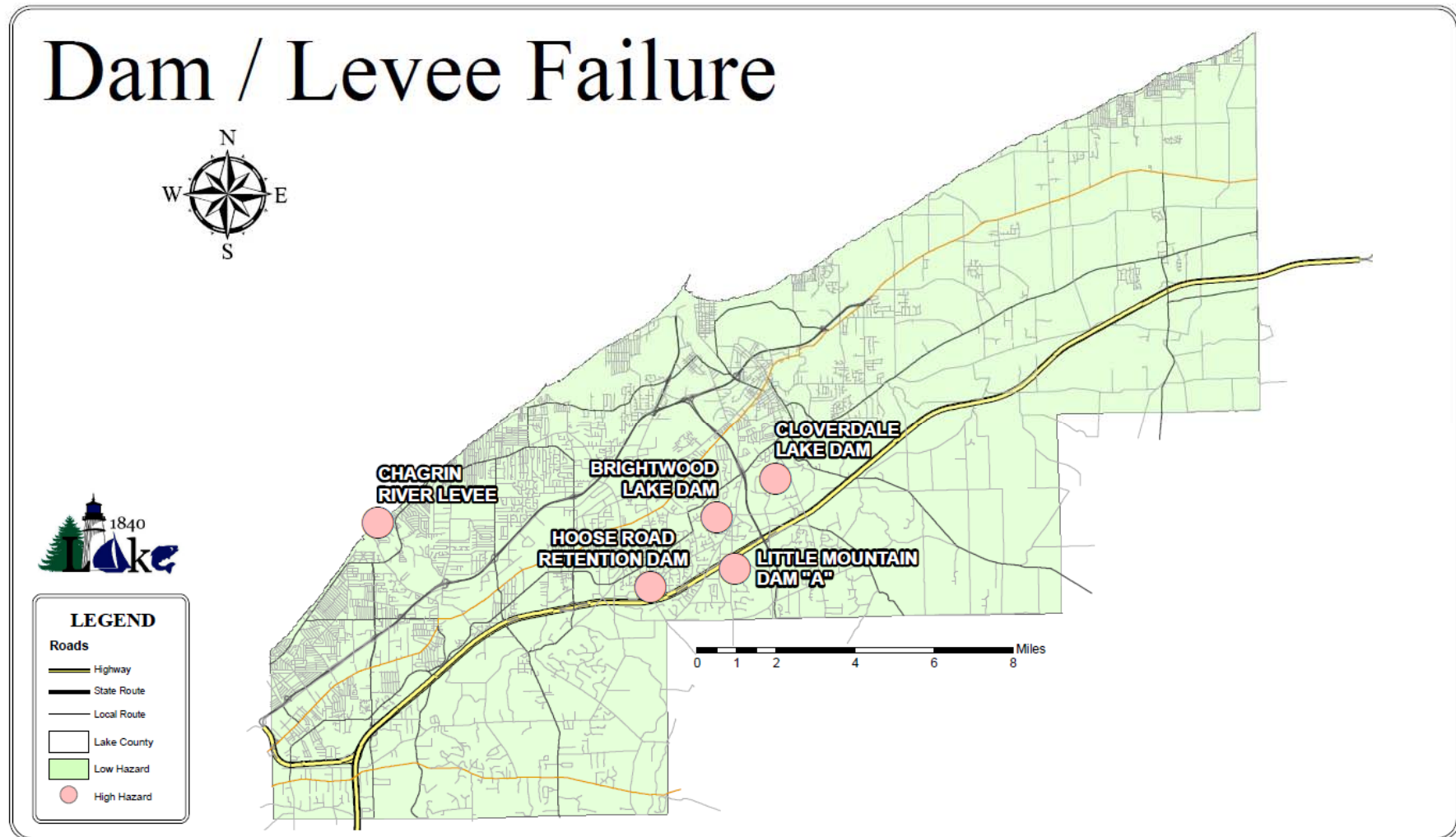
VULNERABILITY OF STRUCTURES

The Ohio Department of Natural Resources provides geographic information system (GIS) data downloads; one of the downloadable layers is structures located in the 100-year floodplain. This layer was compared to areas downstream of the dams in Lake County. Since the layer is simply labeled “Structures” (i.e., no breakdown as to residential, non-residential, or critical facility), the number yielded by the GIS analysis was compared to the number of structures estimated by HAZUS-MH as moderately damaged by the 100-year flood. The number of total structures identified in this manner was then divided by the number of dams (14) to estimate the vulnerable structures for any one failure. Since the levee failure impact area was small, planners manually counted structures via an aerial photograph.

To generate loss estimates for residential structures the number of vulnerable structure was multiplied by the mean housing unit value reported by the Ohio Development Services Agency. Non-residential and critical facility values were found using the Ohio EMA’s loss estimate workbook for HAZUS results.

Structure Type	Number		Loss Estimate	
	Dam	Levee	Dam	Levee
Residential	4	47	\$605,200.00	\$7,111,100.00
Non-Residential	2	3	\$438,290.16	\$657,435.24
Critical Facilities	1	0	\$219,401.00	\$0.00
TOTALS	7		\$1,262,891.16	\$7,768,535.24

DAM/LEVEE FAILURE HAZARD MAP



2.2.4 Drought

Drought is an extended period of deficient rainfall relative to the statistical mean for a region.

RESEARCH

- Local media research
- USDA Census of Agriculture (2012)
(http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/)
- USDA National Agricultural Statistics Service (<http://www.nass.usda.gov/>)
- NOAA, National Climatic Data Center Storm Events Database
(<http://www.ncdc.noaa.gov/stormevents/>) – Search terms included:
 - o Drought

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 into three 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. The 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 ground water table. Consequently, there is a decrease in groundwater discharge to streams and lakes. A prolonged hydrological drought will affect the water supply.
- **Mathematical Drought:** Computation in which rainfall deficiencies are expressed. Extended, widespread droughts are fairly infrequent; however, brief local droughts are common and can be severe. The drought of 1930-36 was the most severe that has been recorded in Ohio. Precipitation totals for 1930 and 1934 were the smallest since the earliest statewide records began in 1883.

LOCATION

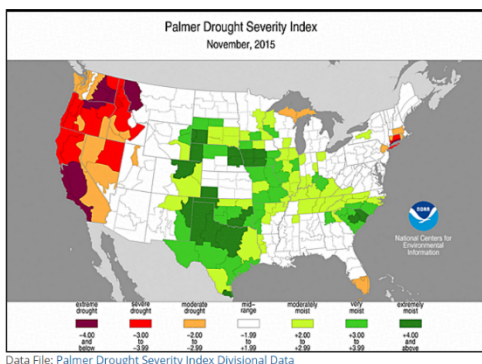
This hazard is a countywide hazard that can affect all areas and jurisdictions in the county.

EXTENT

Lake County is susceptible to drought conditions during the summer and autumn months due to a significant lack of rainfall and/or other precipitation. These drought conditions often affect local farmers (both commercial farmers and personal farmers) and the local water supply (wells often run dry and rivers run low forcing public water supplies to decrease).

Lake County's agricultural sector, which makes up approximately 23% of the total land cover, is extremely susceptible to drought and could potentially suffer significant economic

Period of Occurrence:	Summer months or extended periods with no precipitation
Number of Events to Date (1950 – 2015):	3
Probability Estimation (Events per Year):	0.04615
Probability of Event:	Infrequent – Small scale droughts occur frequently, but events causing major disruption and economic loss are infrequent
Warning Time:	Weeks
Potential Impacts:	Activities that rely heavily on high water usage may be impacted significantly, including agriculture, tourism, wildlife protection, municipal water usage, commerce, recreation, electric power generation, and water quality deterioration. Droughts can lead to economic losses such as unemployment, decreased land values, and agrobusiness losses. Minimal risk of damage or cracking to structural foundations, due to soils.
Cause Injury or Death:	None
Potential Facility Shutdown:	None



losses. According to the *Palmer Drought Severity Index* for a period between 1985 and 1995, Ohio counties spend 0-5% of the summer and autumn months under drought conditions. As of November 2015, Lake County's precipitation levels were near normal (i.e., mid-range) according to the map on the right.

HISTORICAL OCCURRENCES

Lake County, Ohio

According to an August 1, 1999 NOAA Event Record, drought conditions persisted across northern Ohio as rainfall totals for the month were below normal at most locations, including Lake County. For some locations, it was the sixth driest August on record. Water use restrictions were instituted in many areas. The drought also greatly impacted agricultural interests. Crop yields in northern Ohio were reduced by an average of 30 percent. NOAA Event Records indicate that there have been three drought events in Lake County between 1950 and 2015.

Another NOAA Event Record, dated August, 1996, recorded drought conditions for Lake County. According to that record, dry weather persisted throughout the month of August across northern Ohio. Rainfall averaged from a few tenths of an inch in north central and northwest Ohio to one to two inches in extreme northeast Ohio. August rainfall normally averaged between three and four inches. Crops that normally matured during August were affected by the dry weather during this period; crop losses were predicted at ten to thirty percent (though the actual dollar amount was unknown).

As stated in an article taken from *The News-Herald* dated September 11, 1995, major drought-related problems started to become apparent in northeastern Ohio. This was according to a commercial horticultural agent for the Ohio State University Extension Office located in Lake County. A hydrologist with the Ohio Department of Natural Resources, Division of Water stated that the Palmer Drought Severity Index for northeastern Ohio was at minus 2.9, classifying the area as suffering from moderate drought. A minus three (-3) would have placed the county into the severe classification.

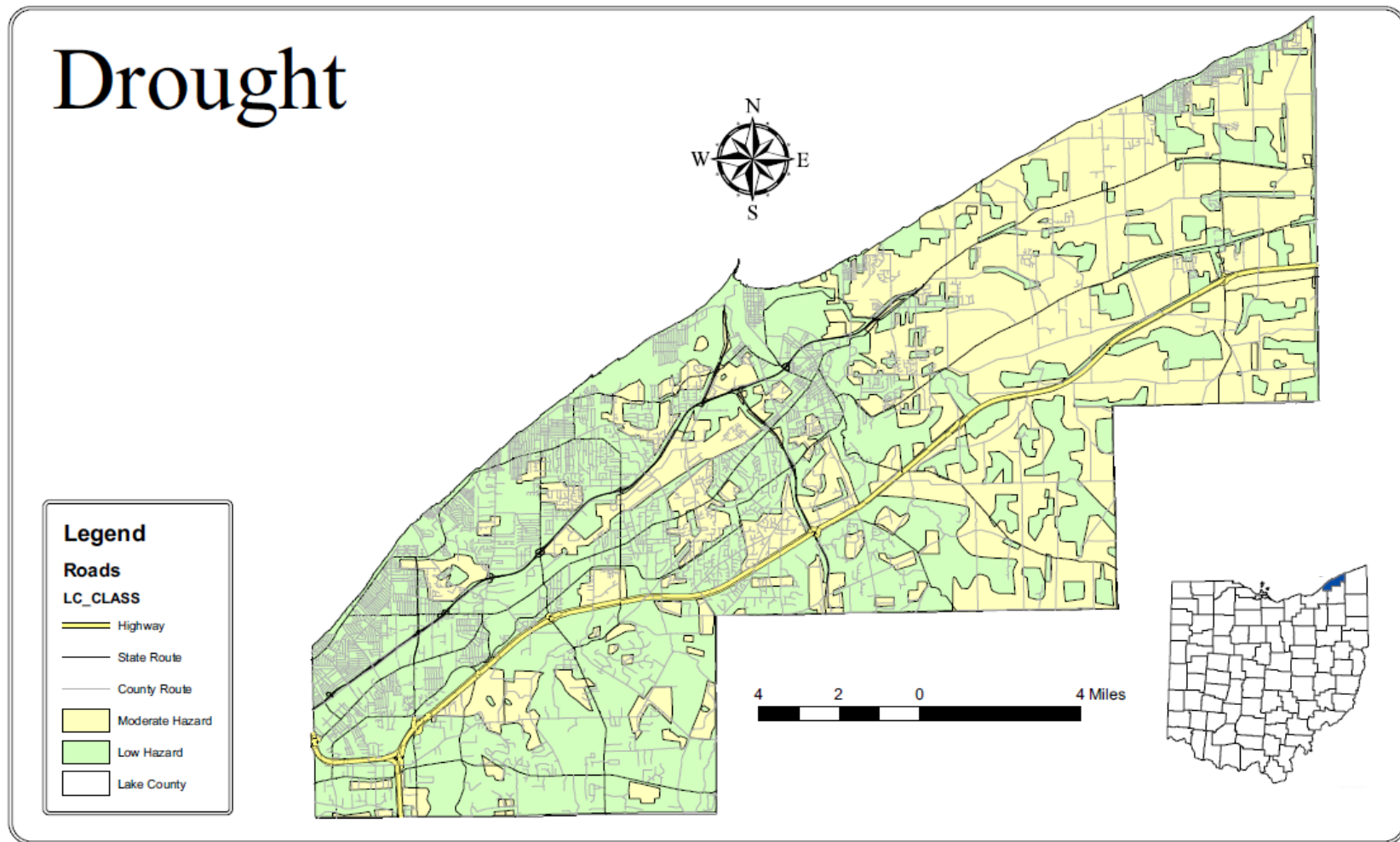
Commodity Statistics – Drought Conditions Lake County, Ohio					
Commodity	Non-Drought Year, 2011	Drought Year, 2012	Units	Change	Amount
Hay (other) harvested	1,800	1,900	Acres	(+)	100
Hay (other) yield	2.15	1.65	Tons/ Acre	(-)	0.5
Hay (other) production	3,900	3,100	Tons	(-)	800

Quantitatively showing the vulnerability of Lake County to drought has proven difficult. For instance, given data from the USDA, National Agricultural Statistics Service (shown in the table above), one could compare crop yields and production during drought and non-drought years. In Lake County, though, data could only be obtained for a single crop. The hay yield appears to have been impacted by the 2012 drought. Production dropped by 800 tons. USDA statistics show that farm sales in Lake County in 2012 totaled \$81.7 million. The drop in production from 2011 to 2012 was just over 20% of the total. A similar drop across all farming commodities could cause an estimated economic loss of \$16,341,800.

VULNERABILITY OF STRUCTURES

Structures are rarely affected by this type of hazard. Drought usually affects people, animals, and crops.

DROUGHT HAZARD MAP



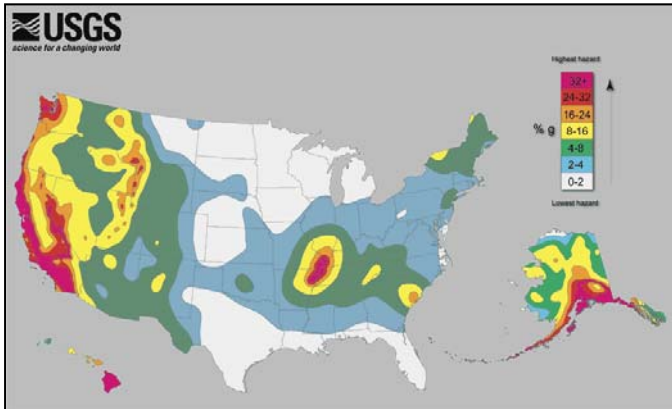
2.2.5 Earthquake

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulation within or along the edge of the Earth's tectonic plates.

RESEARCH SOURCES

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- ODNR, Division of Geological Survey, Ohio Seismic Network (<http://geosurvey.ohiodnr.gov/earthquakes-ohioseis/ohioseis-home>)
- ODNR, Division of Oil & Gas Resources (<http://oilandgas.ohiodnr.gov/industry/underground-injection-control>)
- USGS National Seismic Hazard Mapping Project (<http://earthquake.usgs.gov/hazards/>)
- Wald, D. J. & Kanamori, H. (1999). Relationship between peak ground acceleration, peak ground velocity, and modified Mercalli intensity in California. *Earthquake Spectra*, 15(3), 557-564.

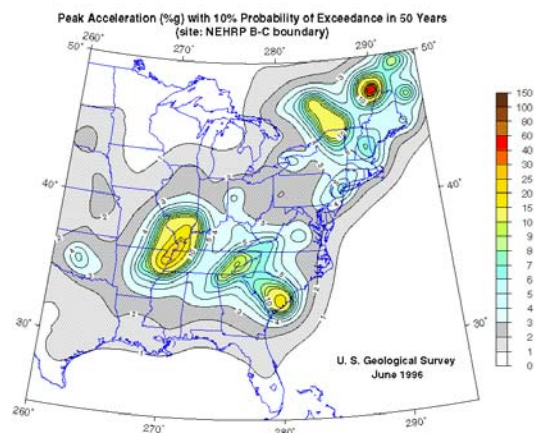
Earthquakes are one of nature's most damaging hazards and are more widespread than is often realized. The area of greatest seismic activity in the United



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 170 earthquakes with epicenters in Ohio have been felt

since 1776. An earthquake's sudden release of stored energy may manifest itself by shaking or displacing the ground. The severity of these effects is dependent on the amount of energy released from the fault (or epicenter) of the quake. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes 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. Peak ground acceleration (PGA) is a measure of strength of ground movements. The PGA measures the rate in change of motion relative to the established rate of acceleration due to gravity.

The map provided by the USGS (shown below) depicts the PGA values for areas with a 10% chance of being exceeded over the next 50 years. Ohio does have an earthquake risk as it is located in the 2 and 5%g area (Lake County's PGA is 2.0 – 3.0). FEMA states that areas with these PGAs are considered to have a low to moderate earthquake risk. As such, earthquake vulnerability is rated "low".



The Modified Mercalli Intensity (MMI) scale is used throughout the United States to measure the effect of an earthquake on the Earth's surface – i.e., its *intensity* (<http://earthquake.usgs.gov/learn/topics/mercalli.php>).

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions.
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly-designed structures; some chimneys broken.
VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	Extreme	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.

The MMI value is typically assigned to a specific site after an earthquake has occurred; however, it can be loosely compared to the PGA values for an area to estimate the intensity of earthquakes that an area could experience. According to Wald and Kanamori (1999), areas with a 2 to 5%g would fall in the MMI IV and V ranges. In other words, at most, earthquake intensity would be felt by nearly everyone and could awaken people at night; some physical damage could occur. It is significant to note that earthquakes noted on the MMI scale as moderate may also occur in Lake County.

LOCATION

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

EXTENT

According to an *Earthquake Epicenters in Ohio Map* prepared by the Ohio Department of Natural Resources, there have been approximately 21 earthquakes in Lake County dating back to 1858.

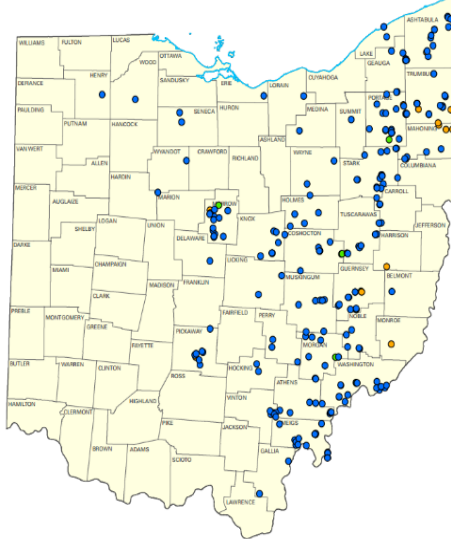
Several efforts have been undertaken to address earthquakes in Lake County. For example, the Lake County Emergency Management Agency hosted

a town hall meeting to discuss injection well issues with residents. Core planning committee members stressed that the injection well issue should be documented by this plan. According to the Ohio Department of Natural Resources, there are two

Period of Occurrence:	At any time
Number of Events to Date (1858 – 2015):	21
Probability Estimation (Events per Year):	0.13376
Probability of Event:	Frequent
Warning Time:	None
Potential Impacts:	According to FEMA, areas with a PGA of 3 to 5 (0.03 to 0.05) will incur little to no damage with no function loss.
Cause Injury or Death:	Minor risk of injury
Potential Facility Shutdown:	None

injection wells in Lake County. One of those is near I-90 and Vrooman, which is within ten miles of the Perry Nuclear Power Plant. Significantly, there is one injection well located in Geauga County near the southern border of Lake County as well as two others in Geauga County and numerous injection wells in Ashtabula County to the east.

CLASS II BRINE INJECTION WELLS OF OHIO



coastal erosion, flooding, and structural damage. As justification, this plan notes that of the earthquakes that have occurred and been centered in Lake County, many have been off-shore or on the shoreline. Significantly, though, the most likely actual wave-related incident would be a seiche wave. Seiches are standing waves in enclosed or partially enclosed bodies of water. The National Weather Service issues low water

advisories for portions of the Great Lakes when seiches of two feet or greater are likely to occur (National Weather Service Instruction, 2008). There is evidence of seiches impacting water levels in the Great Lakes by three to ten feet (NOAA; Illinois State Geological Survey; Korgan, 2000). Significantly, the National Oceanic and Atmospheric Administration reports no instances of seiches impacting Lake County in a major way.

HISTORICALLY-SIGNIFICANT EARTHQUAKES

3.5 Miles Northeast of Kirtland Hills, April 10, 1858

Magnitude: 3.3

Depth: 0 kilometers

Mercalli Intensity Scale: IV – Light

Felt Area: (None reported)

Source: National Center for Earthquake Engineering Research

A 3.3 magnitude wave earthquake (0 kilometers depth) occurred with an epicenter approximately 3.5 miles northeast of Kirtland Hills. This quake occurred at 11:30 a.m. and may have been felt indoors by many, outdoors by few during the day. Dishes, windows and doors may have been disturbed. Walls probably made a cracking sound. There is no further information regarding this event.

3 Miles East Northeast of Kirtland, March 9, 1943

Magnitude: 4.4

Depth: 0 kilometers

Mercalli Intensity Scale: V - Light

Felt Area: 85,000 square miles

Source: National Center for Earthquake Engineering Research

A 4.4 magnitude wave earthquake (0 kilometers depth) occurred with an epicenter approximately 3 miles east northeast of Kirtland, Ohio. This quake occurred at 3:35 in the morning. No significant damages were reported from this quake, which had a felt area of 85,000 square miles. This event was originally assigned a location beneath Lake Erie, offshore from Ashtabula County; however, recent reevaluation of the seismic records of this event by seismologists from the U.S. Geological Survey placed the epicenter on the Lake-Geauga County line, near the epicenter of the 1986 event.

Leroy Township

1 Mile North Northeast of Proctor Road and Painesville-Warren Road

January 31, 1986

Magnitude: 5.0

Depth: 5 kilometers

Mercalli Intensity Scale: VI - Strong

Felt Area: 322,000 square kilometers

Source: U.S. Geological Survey

The January 31st earthquake struck just before 11:47 a.m. Eastern Standard Time. Although early media speculation had the epicenter located from Columbus to southern Canada, the U.S. Geological Survey quickly determined that the epicenter was east of Cleveland, and within a few hours the epicenter had been accurately located in southern Lake County just north of the Geauga-Lake County line. This 5.0 magnitude event was felt in parts of 11 states, the District of Columbia, and southern Ontario. Most of Ohio and western Pennsylvania experienced particularly strong vibrations that were noted by numerous individuals. The Ohio DNR Division of Geological Survey received hundreds of telephone calls in the hours after the earthquake as did numerous federal, state, and local agencies.

Early rumors of mass destruction, injury, and death turned out to be false. Although newspapers reported 17 people being treated for injuries in the epicentral area, only two injuries were a direct result of the earthquake. A woman received minor cuts from falling ceiling tile in a Mentor shopping mall and a child received a minor cut from broken window glass at Lake Erie College in Painesville. The remainder of the reported injuries turned out to be people treated for anxiety and effects of cold weather after they were evacuated from buildings suspected of being damaged by the quake.

Destruction in the epicentral area was mostly minor. Merchandise fell from store shelves in Mentor, Painesville, and Chardon and buildings in these communities experienced varying degrees of cracked plaster and cracked or broken windows. Chimneys are particularly susceptible to damage or destruction from ground motion associated with moderate to strong earthquakes. There was, however, only one confirmed report of a chimney being toppled. Local newspapers reported several other chimneys that sustained cracks or that were pulled away from a home or building in the epicentral area. Many schools in Lake and Geauga Counties were evacuated after

the earthquake and inspected for structural damage. None were reported to have sustained significant structural damage, although cracks in walls were reported at several schools.

There were numerous reports from Lake and Geauga Counties of changes in water wells. The most common effect was a change in color or taste of the well water. There were several reports of wells going dry and a few even increased their flow by a considerable rate.

Many people in northeastern Ohio initially interpreted the earthquake as an exploding furnace or a truck striking the building. Less mundane interpretations included a nuclear attack on New York City or the aftershock of the explosion of the space shuttle Challenger on January 28, 1986.

Perhaps the greatest concern – and controversy – was directed toward the Perry Nuclear Power Plant in northern Lake County. The plant was not operating at the time of the earthquake, but was scheduled to load fuel rods on the next day. Officials at the Perry plant, which is located about 11 miles north of the epicenter, declared a precautionary Site Area Emergency immediately after the earthquake, but downgraded this to alert status within a short time. Accelerometers on site at the Perry plant recorded accelerations as high as 0.19 to 0.23 g; the plant is designed to withstand 0.15 g. These higher values, however, were at high frequencies and represented only momentary peak accelerations not capable of causing significant damages. Inspections of the Perry plant after the earthquake disclosed only minor cracks in concrete and small leaks in noncritical water pipes. Both conditions may have existed before the earthquake, according to newspaper reports.

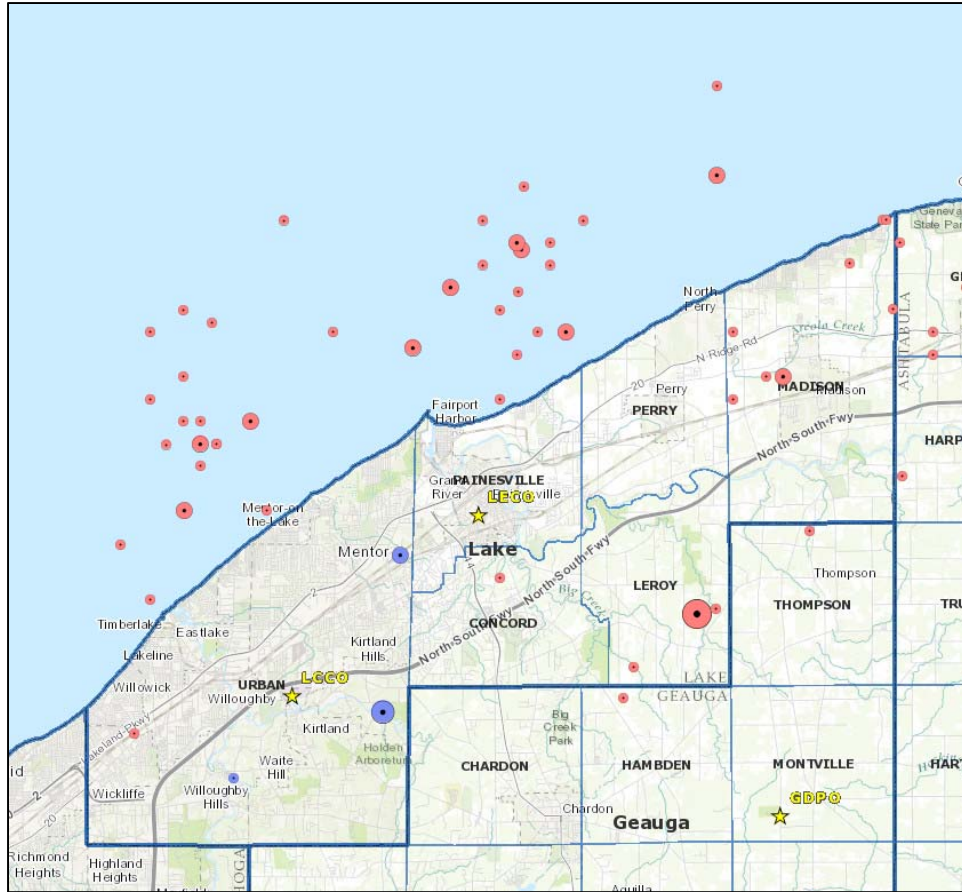
Because of an increased interest in earthquakes in the eastern United States, the comparatively large magnitude of the event, the potential for aftershock activity, and the proximity of the epicenter to a nuclear power plant, approximately 30 seismologists representing Lamont-Doherty Geological Observatory (Palisades, New York), University of Michigan, St. Louis University, Tennessee Earthquake Information Center, U.S. Geological Survey (Reston, Virginia; Denver, Colorado; Menlo Park, California), Weston Geophysical (Westboro, Massachusetts), University of Wisconsin, and Woodward-Clyde Consultants arrived at the epicentral area on the day after the earthquake. The primary objective of these seismologists was to place portable seismographs in the epicentral area in order to record aftershocks.

Although aftershocks are commonly considerably smaller in magnitude than the main event, the proximity of portable instruments deployed around the perimeter of an epicenter permits precise locations of focal depths for the aftershocks. Such numerous detailed seismic records can then be used to locate the zone of rupture and define the direction of movement along the fault plane.

Lake County experienced four earthquakes in 2010 alone. One of these earthquakes occurred in June, 2010, offshore from Mentor. It registered a 2.5; reports from Mentor included a brief jolt and a booming sound. Since the previous adoption of the plan (in 2010), six additional earthquakes have occurred (Ohio SEIS). Those earthquakes were as follows.

- **March 8, 2013:** Offshore Lake Erie (Lake County) – 2.7 magnitude
- **July 1, 2013:** Offshore Lake Erie (Lake County) – 3.2 magnitude
- **October 6, 2013:** Shoreline Lake Erie (Lake County) – 2.4 magnitude
- **November 16, 2013:** US/Canada Border (Lake County) – 2.5 magnitude
- **April 8, 2014:** Madison – 2.2 magnitude
- **July 9, 2014:** Painesville – 2.1 magnitude

The image below, taken from the Ohio Department of Natural Resources Earthquake Epicenters dynamic online mapping tool, shows earthquakes in and near Lake County. The magnitude of the earthquake corresponds to the size of the red dot (larger dots equal larger earthquakes).



RECENT EARTHQUAKES

50 Yards Offshore of Madison-On-The-Lake, Ohio

August 14, 2008

Magnitude: 2.3

Depth: 5 kilometers

Mercalli Intensity Scale: (Felt)

Felt Area: (None reported)

Source: Ohio Seismic Network

A small earthquake occurred along the Lake Erie shoreline on August 14, 2008, at 6:32 p.m. The epicenter is in the northeastern corner of Lake County, about three miles northeast of North Madison. No felt reports were received.

Wickliffe, Ohio

February 4, 2010

Magnitude: 2.1

Depth: 5 kilometers

Mercalli Intensity Scale: II - Weak

Felt Area: (None reported)

Source: Ohio Seismic Network

A small earthquake occurred beneath Wickliffe on February 4, 2010, at 5:44 p.m. Eastern Standard Time. The Ohio Seismic Network calculated the magnitude at 2.1 which is near the lower threshold of being felt. Two residents of Wickliffe reported a booming sound and shaking of the house and indicated that several neighbors experienced similar phenomena. These residents were within the error ellipse of the computed epicenter. No damages were reported.

2 Miles Northwest of Madison, Ohio

April 25, 2010

Magnitude: 2.9

Depth: 5 kilometers

Mercalli Intensity Scale: III - Weak

Felt Area: (None reported)

Source: Ohio Seismic Network

A small earthquake occurred in eastern Lake County between Perry and Madison on April 24, 2010, at 2:00 a.m. Many residents of both communities reported feeling the event. A 2.3 magnitude earthquake occurred very near this location on February 1, 2005, and a 3.3 earthquake occurred here on June 30, 2004. No damages were reported.

3 Miles West of Madison, Ohio

June 7, 2010

Magnitude: 2.3

Depth: 0 kilometers

Mercalli Intensity Scale: (Felt)

Felt Area: (None reported)

Source: Ohio Seismic Network

A small earthquake occurred in eastern Lake County between Perry and Madison on April 24, 2010, at 10:00 p.m. EDT. Many residents of both communities reported feeling the event. A 2.3 magnitude earthquake occurred very near this location on February 1, 2005 and a 3.3 earthquake occurred here on June 30, 2004. No damages were reported.

Madison Township

Dock Road near the Arcola Creek Sanctuary

October 6, 2013

Magnitude: 2.4

Depth: 5 kilometers

Mercalli Intensity Scale: (Felt)

Felt Area: (None reported)

Source: Ohio Seismic Network

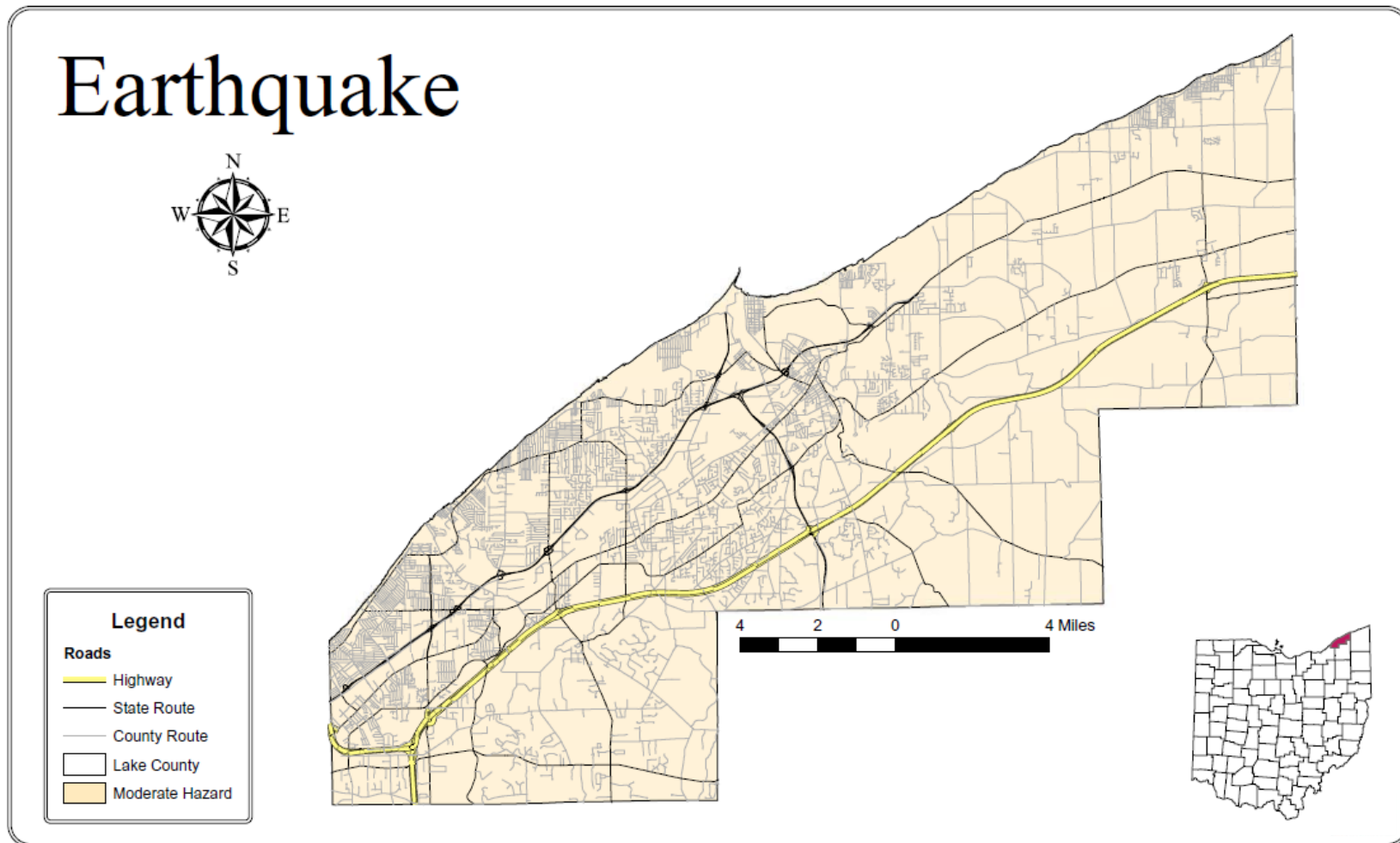
A small earthquake occurred on Sunday, October 6, at 3:37 pm approximately 4.4 miles northwest of Geneva. Two individuals in the 44041 zip code reported feeling the event. There were no damages. There have been a number of small earthquakes in this general area in past years, including a 2.3-magnitude event in 2008 and a 2.6-magnitude event in 2009 in almost this same location.

VULNERABILITY OF STRUCTURES

The following table represents the potential vulnerability of structures in Lake County to the earthquake hazard. Given that the hazard can affect the entire county, all structures are potentially vulnerable. This chart was derived using the HAZUS-MH report and a spreadsheet provided by the Ohio Emergency Management Agency. The scenario used by HAZUS-MH for this analysis was a 5.0 magnitude earthquake located 10km underground and centered just off of Mentor Road, between Mentor High School and the Lakeland Freeway.

Structure Type	Number	Loss Estimate
Residential	18,273	\$3,575,913,620
Non-Residential	8,679	\$3,615,000,471
Critical Facilities	203	\$84,554,107
TOTALS	27,155	\$7,275,468,199

EARTHQUAKE HAZARD MAP



2.2.6 Fire

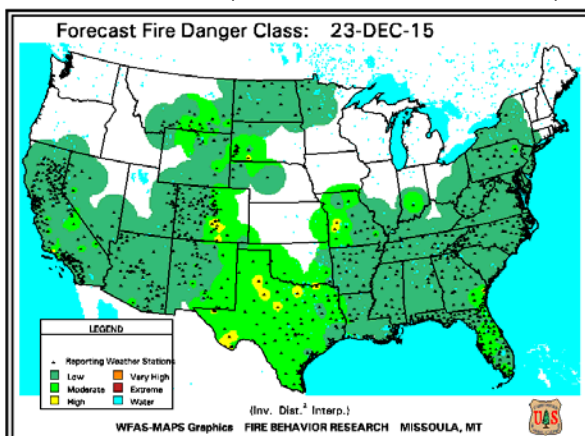
A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures.

A structure fire involves the structural components of various types of residential, commercial, or industrial buildings.

RESEARCH

- Local media research
- Lake County Sheriff's Office, Central Communications Division
(<http://www.lakecountyohio.gov/sheriffoffice/CentralCommunicationsDivision.asp>
[x](#))
- ODNR Division of Forestry
- United States Forest Service (www.wfas.net)
- National Fire Protection Association (www.nfpa.org)
- NOAA, National Climatic Data Center Storm Events Database
(<http://www.ncdc.noaa.gov/stormevents/>) – Search terms included:
 - o Dense smoke
 - o Wildfire

Wildfires often begin unnoticed and spread quickly. They are usually signaled by dense smoke that fills the area for miles around. Grasses, bushes, trees, and other vegetation supply fuel for the wildfire. The size of a wildfire is dependent on the amount of fuel available, weather conditions, and wind speed and direction. In a map from WFAS-MAPS, Fire Behavior Research, the majority of Ohio was labeled as being at a



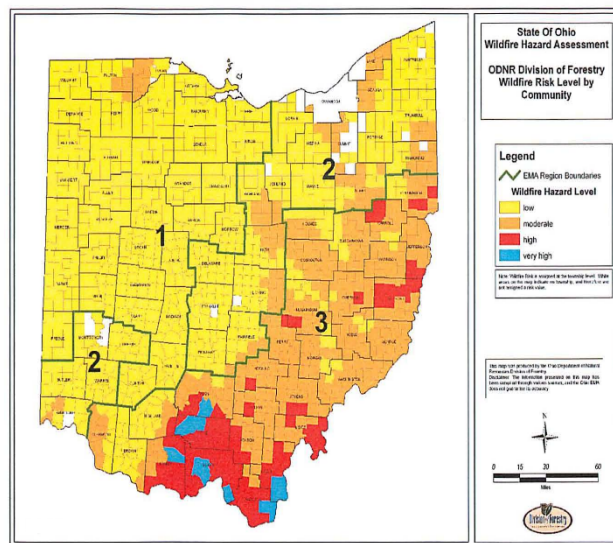
low risk for wildfires. The National Interagency Fire Center also indicates that Lake County is at a low risk of wildfires. In general, Lake County is not located in the Ohio Department of Natural Resources (ODNR) Division of Forestry “wildfire protection area”.

In addition to wildfires, structure fires could present a significant problem in Lake County's communities. Structures fires range from small incidents, such as single house fires, to larger scenarios, such as fires at large commercial/industrial facilities or fires consuming entire commercial districts. The National Fire Protection Association maintains statistics on structure fires in the United States. In 2013, 487,500 fires resulted in 2,855 deaths, 14,075 injuries, and in excess of \$9.5 billion in losses. Over the past five years, the statistics produce the following averages:

- **Fires:** 483,000;
- **Deaths:** 2,681;
- **Injuries:** 14,914; and
- **Losses:** \$10.24 billion (2012 dollars).

LOCATION

According to the State of Ohio's hazard mitigation plan (see right), no Lake County communities are at a particular risk of wildfire, though the eastern end of the county may be slightly more vulnerable.



EXTENT

Structure fires are a more common occurrence. According to data provided by the Lake County Sheriff's Central Communications Division, the agency (which does not dispatch all fire agencies in the county) dispatched 14,442 fire calls in 2014. (Significantly, not all of these calls are structure fires.)

Fire agencies throughout Lake County are actively involved in fire mitigation. Efforts include extensive outreach and education as well as code enforcement. Fire departments have coordinated a robust network of mutual aid to ensure adequate response resources are available. Additionally, a number of mitigation strategies noted in this plan support general fire mitigation (see Section 4.0 below).

Period of Occurrence:	At any time – Primarily summer
Number of Events to Date (2003 – 2015):	15,000+
Probability Estimation (Events per Year):	Multiple fires per year
Probability of Event:	Infrequent
Warning Time:	Minimal
Potential Impacts:	Impacts human life, health, and public safety. Loss of wildlife habitat, increased soil erosion, and degraded water quality. Utility damage and outages, infrastructure damage (transportation and communication systems), and damaged or destroyed critical facilities.
Cause Injury or Death:	Injury and risk death
Potential Facility Shutdown:	Days to weeks or more

HISTORICAL OCCURRENCES

Data from the NOAA Event Record database notes no incidents of dense smoke or wildfire from 1950 to the present.

Mentor Marsh, Ohio

The most recent, recorded large wildland fire occurred in 2003, when a marsh fire ripped through northern Mentor. News of the story made newspapers miles and hours away. Through the efforts of first responders from all over northeast Ohio, no houses or other structures were lost. Melted siding was the only structural loss incurred according to the county emergency management agency director. Additional fires have occurred in the marsh, including a small five-acre incident in November, 2015 (as per *The News Herald*).

There have been a number of significant structure fire incidents within Lake County over the last five years.

Fairport Harbor, Ohio

The Fairport Harbor gas fire incident, which took place on January 24th, 2011, caused \$1.3 million in damage to residential, multi-residential and commercial structures. Two gas line pressure regulators failed, sending natural gas from delivery lines directly into homes at high pressure, leading to appliance explosions (The News-Herald). The incident was reported nationally via an Associated Press article.

Two more significant fires to occur in Lake County since the Fairport Harbor incident involve commercial/industrial sites.

Painesville Township, Ohio

The first, at Hardy Industrial Technologies in Painesville Township, occurred on October 11th, 2012. The fire was allowed to burn itself out due to rail cars parallel to the building being impinged by fire (The News-Herald).

Mentor, Ohio

The Metal Seal Precision fire, which occurred on July 25th, 2014 in Mentor, caused up to \$30 million in damages. The fire was sustained by hydraulic oil, which is a major environmental concern. It was reported that some of this oil entered a nearby pond and creek, but crews contained the spill before it spread further (The News-Herald).

VULNERABILITY OF STRUCTURES

The following table estimates potential structural losses due to fire. The actual loss associated with a structure can vary widely dependent on the situation. A one-story residential fire will cause significantly less damage than a large industrial fire like those that have occurred within the last few years. Additionally, an incident like the Fairport Harbor fire where a number of different buildings and types of buildings are involved further increases the damage.

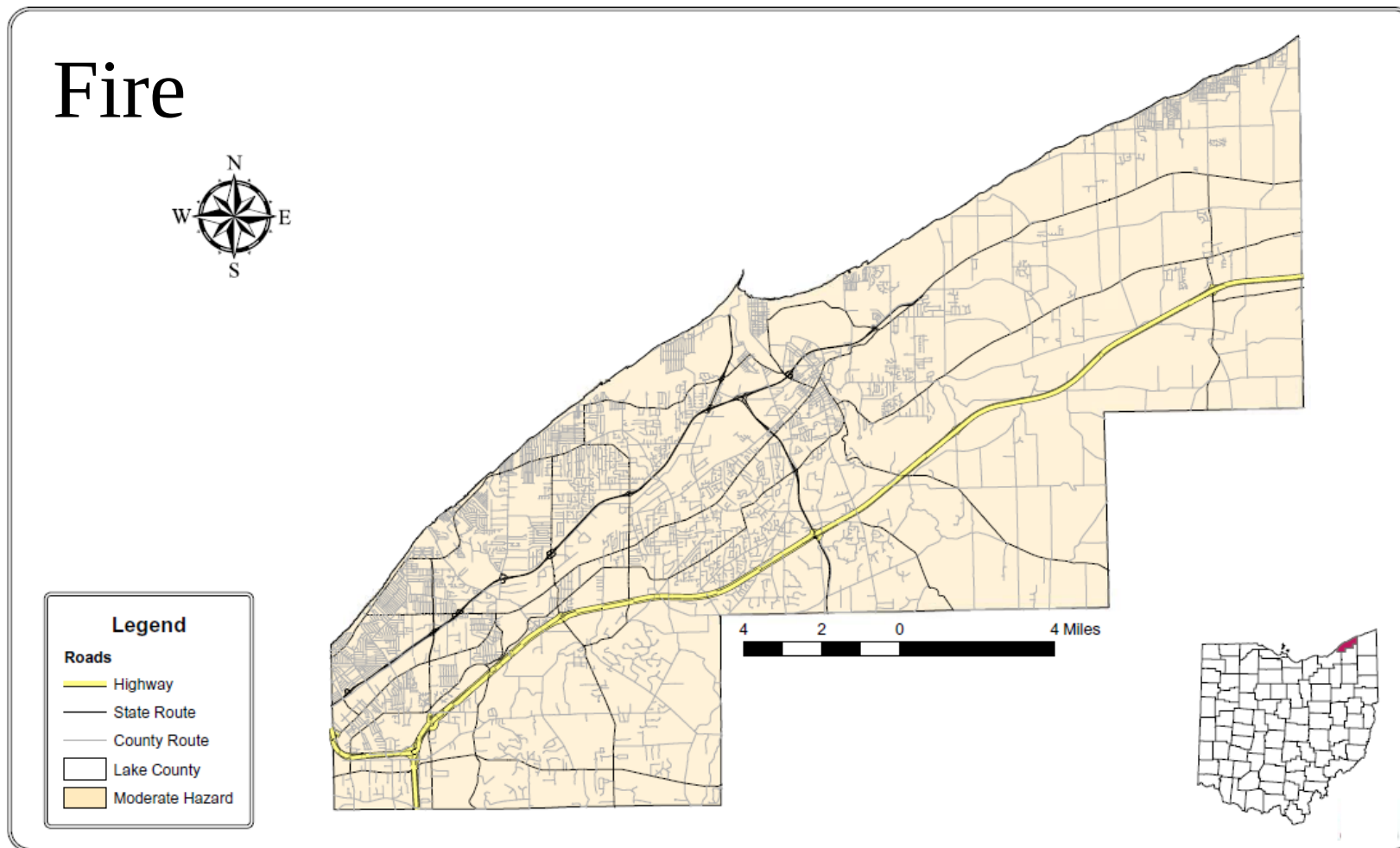
The hazard is countywide and affects all areas and jurisdictions of the county. The loss estimates below were calculated in a number of steps. First, the number of “working fires” was calculated by taking the number of dispatched fire calls in the

county (14,442) and multiplying by the percentage of fire department calls that were classified by the NFPA as working fire in 2013 (4%). This results in a total of 578 working fires in the county each year. Per the HAZUS-MH workbook provided by the Ohio EMA, 73% of structures in Lake County are residential, 24% are non-residential and 3% are critical facilities. Multiplying the number of working fires by these percentages results in the estimated number of vulnerable structures for each category.

To determine the monetary loss estimate, the number of vulnerable structures was multiplied by the average structural value which was also calculated from the HAZUS-MH workbook. It is important to note that this represents the total destruction of the structure, which is not always the case. Structural fires can range from small fires that do limited damage to small sections of a structure to fires that destroy numerous homes, as evidenced in the Fairport Harbor incident.

Structure Type	Number	Loss Estimate
Residential	422	\$92,485,783
Non-Residential	139	\$30,382,975
Critical Facilities	17	\$3,802,305
TOTALS	578	\$126,671,063

FIRE HAZARD MAP



2.2.7 Flooding

Flooding is defined as a general temporary condition of partial or complete inundation of normally dry land areas from: overflow of inland or tidal waters; unusual and rapid accumulation of runoff of surface water from any source; mudflows; or the sudden collapse of shoreline land. A flash flood is a rapid flooding of low-lying areas, rivers, and streams that is caused by intense rainfall and is often associated with thunderstorms.

RESEARCH

- FEMA. (2010). *Flood Insurance Study: Lake County, Ohio (and Incorporated Areas)*. Online. (<http://map1.msc.fema.gov/data/39/S/PDF/39085CV001A.pdf?LOC=4483f0b34774e0d78ccf77f8de16f892>).
- FEMA Risk Map (<http://fema.maps.arcgis.com/home/webmap>)
- FEMA. (2012). *What is Risk MAP?* Online. (https://www.fema.gov/media-library-data/20130726-1731-25045-8364/what_is_risk_map_factsheet_07_19_12.pdf)
- FIRM information
- Local media research
- ODNR, Division of Soil and Water Resources (<http://soilandwater.ohiodnr.gov/water-use-planning/floodplain-management>)
- NOAA, National Climatic Data Center Storm Events Database (<http://www.ncdc.noaa.gov/stormevents/>) – Search terms included:
 - o Coastal flood
 - o Flash flood
 - o Flood

Lake County is susceptible to flooding largely due to the physical geography of the county, which includes several rivers and creeks as well as a relatively varied topography. The worst floods usually occur when a river overflows its banks. Periodic floods occur naturally on most rivers, forming an area known as a “floodplain”. With enough rainfall, the rivers and creeks will rise up to and over the floodplain, thus causing a flood.

Identification of floodplain areas within the county and its municipalities is based on Flood Insurance Rate Map (FIRM) data produced by the National Flood

Insurance Program (NFIP). Floodplain areas were also identified by the recent RiskMAP project.

The principal flooding problems in Lake County are generally related to rainfall accompanied by a melting of snow cover in early spring or during a mid-winter thaw. Summer storms may cause isolated instances of flooding, but rarely result in major flood incidents (FEMA FIS, 2010). Other problems surround high Lake Erie stages accompanied by storm-induced wave action and erosion and from the overflow of the Chagrin and Grand Rivers, compounded by ice jamming (FEMA FIS, 2010). The 2010 flood insurance study also looked at areas of the Marsh Creek Basin in Mentor. Flooding in this area “occurs as a result of restrictive bridges and culverts and discharges in excess of channel capacities” (p. 16). High Lake Erie stages and storm-induced water surface rises may contribute to flooding in the low-lying areas near the Mentor Marsh and Lake Erie. In other areas, such as Madison Village and North Perry, flooding is attributable to undersized culverts and a lack of drainage facilities in undeveloped areas (FEMA FIS, 2010).

LOCATION

Flooding is a county wide hazard that can affect all areas and jurisdictions in the county. Flooding is mainly associated with creeks, streams, and rivers as well as along the coast of Lake Erie. In Eastlake, the primary areas vulnerable to flooding are in the “downstream reaches of the Chagrin River near Lake Erie where past development in floodplain areas was unregulated” (FEMA FIS, 2010, p. 15). Communities in the Grand River watershed (e.g., Fairport Harbor, Grand River, Painesville, etc.) may also be impacted by flooding. Both areas may be aggravated by ice jams.

EXTENT

There have been 35 flood events recorded in Lake County between 1995 and 2015. Of these events, 19 have been flash floods, causing an estimated \$347,517,000 in property damages and \$15,000 in crop damages (NOAA NCDC). Sixteen events have been river floods, totaling approximately \$1,237,000 in property damage and \$ 2,000,000 in crop damage (NOAA NCDC). NOAA reported zero coastal floods in the period. Flooding continues to be a relatively frequent and damaging natural disaster as a result of the Chagrin and Grand Rivers, their many tributaries flowing through the

west and east-central portions of the county near several communities, as well as coastal storms and storm surge from Lake Erie.

Riverine flooding is very likely to continue striking these same areas. Some areas near the paths of the Chagrin and Grand Rivers are particularly low-lying areas. Local officials could consider strengthening and/or developing building and/or development regulations in these areas.

Because the majority of Lake County is of relatively flat or gently rolling topography, flooding is usually a widespread event as small creeks and streams overflow their banks and flood large areas of agricultural fields and several rural roads. Flooding that occurs in or near the urban areas is often attributed to failing storm sewers and poor drainage systems. Local representatives indicated that several roads become blocked during heavy and constant rains, and that officials have been considering a bridge and other elevation projects to combat localized flooding.

Core planning committee members spent a great deal of time discussing flooding as a hazard in the county. Representatives from Timberlake noted that basements often flood in the east shore areas of the village approximately one block away from the beach; further, such flooding often goes unreported by residents. The Bellflower areas of Mentor and various of Fairport Harbor are impacted by flood waters in more average storms. Eastlake, Willoughby, and Willowick represents, in particular, discussed storm water backup issues. In Eastlake, the Surfside and Glen Drive areas are particularly impacted. As noted in Section 4.0, numerous communities (particularly in the western portions of the county) are undertaking storm drainage improvements. Throughout Lake County, committee members reported a regular coming-together of resource deployment for storm water back-up issues. These issues have been addressed via zoning in some areas. Additionally, several areas have seen installation of backflow valves (which were supported by grant-funded subsidies to home owners).

The committee as a whole noted the significance of 2013 flooding in the western portions of the county. In this event, storm and sanitary sewers mixed to flood basements. An outwall was damaged in Willowick. Mentor and Timberlake noted a number of homes that were destroyed.

From a purely preparedness perspective, Lake County is participating in and/or monitoring a number of issues. For example, FEMA is adding coastal flooding zones to flood mapping (similar to ocean maps). As another example, the Perry Nuclear Power Plant has recently been researching and working with the United States

Environmental Protection Agency to increase piping sizes and such to mitigate flooding concerns following the Fukushima disaster.

HISTORICAL OCCURRENCES

Willoughby and Eastlake, Ohio

According to a NOAA Event Record dated February 27, 1997, the Chagrin River at Willoughby exceeded its flood stage of 11 feet and crested at 14 feet. Flooding occurred along the northern section of Trailard, Milan, and Chagrin Drives, and Daniels Park was closed due to high water. Several basements were flooded in Eastlake. A February 28, 1997 article taken from *The News-Herald* indicated that 15 hours of soaking rain resulted in widespread flooding and property damage as the Chagrin River spilled over its banks.

Painesville, Ohio

Another NOAA Event Record, dated February 28, 2011, described heavy rain and rapid snow melt that led to a rise in the Grand River at Painesville, which reached moderate flood stage with a crest of 13.29 feet. Over 100 homes in and around Painesville had to be evacuated because of the rising waters. In Fairport Harbor, several homes near the Grand River reported flooded basements. This event resulted in an estimated \$200,000 in property damage.

Willoughby Hills and Eastlake, Ohio

A March 12, 2015 NOAA Event Record noted flooding following an ice jam on the Chagrin River. According to the narrative, an ice jam developed during the overnight hours of March 12th near Willoughby Hills. The ice backed up in the southern loop of the Chagrin, just west of the Trailard Drive community; streets were first overtopped in the southwest corner and north east of the Horseshoe Glen subdivision. About 20 people were voluntarily evacuated after the water levels rose to approximately 15 feet. This incident resulted in an estimated \$100,000 in property damage. This same ice jam broke on the morning of the 14th (according to a separate NOAA Event Record). As a result, the water and ice came up fast in the West Island Drive community in Eastlake at around 6 a.m. Approximately 12 homes were evacuated. Fortunately, damages were limited to docks and some low-lying basements and garages.

According to the NOAA Event Records, there have been 19 total flash flood events in Lake County between 1995 and 2015. Flash flooding is difficult to mitigate against, as many structures in slightly higher elevated areas are not subject to floodplain ordinances. Also, areas that may fall victim to flooding from overflowing storm drains may not be in

Period of Occurrence:	Primarily January through May (history shows incidents occurring year-round) Flash Flood – At any time depending on recent weather conditions Result of Dam Failure – At any time
Number of Events to Date (1996 – 2015):	38
Probability Estimation (Events per Year):	2.0
Probability of Event:	Frequent
Warning Time:	River Flood – 3 to 5 days Flash Flood – Minutes to hours Dam Failure – None
Potential Impacts:	Impacts to human life, health, and public safety. Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, fire, damaged or destroyed critical facilities, and hazardous material releases. Can lead to economic losses such as unemployment, decreased land values, and agrobusiness losses. Floodwaters are a public safety issue due to contaminants and pollutants.
Cause Injury or Death:	Injury and moderate risk of death
Potential Facility Shutdown:	Days to Weeks

floodplains and thus exempt from regulations. Residents and business owners in these areas should be warned of the potential for flash flooding.

Lake County, Ohio

According to a NOAA Event Record dated April 21, 1995, heavy rains of about one to two inches fell during the morning on top of saturated grounds. Flooding of poor drainage areas, basements, and small streams occurred. High water persisted well into the afternoon. Volunteer observers in Kirtland reported 2.2 inches of rain.

Concord and Madison Townships, Ohio

NOAA reported flash flooding conditions in May of 2011. Rainfall from severe thunderstorms brought upwards of three inches of water to Lake County within approximately 90 minutes. Flash flooding was reported in Concord Township where Big Creek and Gardon Creek came out of their banks. Several roads were flooded and some homes were threatened along Jason and Christian Avenues. Madison Township was also impacted, where River Road, Ford Road, Madison Road, and Union Streets flooded with over a foot of water. Some depths were reportedly over the hoods of cars.

Madison Village, Ohio

A NOAA Event Record dated May 22, 2014, reported flash flood losses of an estimated \$250,000. According to the narrative, heavy rain on the event of May 21 measured 2.5 inches between 9:30 p.m. and 11 p.m. and caused widespread flash flooding in Madison Village. A tributary to Arcola Creek, which runs through downtown Madison, came out of its banks and flooded Main and Safford Streets. In some places, flood waters were estimated at four feet deep. The hardest hit areas were in the east of the village where numerous basements flooded.

Concord Townships, Eastlake, Fairport Harbor, and Madison, Ohio

The flood of 2006 was the largest flood since the early 1990s in Lake County. It appeared to be a combination of riverine and flash flooding, and resulted in excess of \$320 million in property damage and one fatality. Portions of the Chagrin River were reported to have risen nearly ten feet in approximately 24 hours. According to NOAA, approximately 100 homes were destroyed and another 800 significantly damaged. Most of these structures were in Painesville, Eastlake, Madison, Fairport Harbor, and

Concord Township. Following this project, county officials undertook the Millstone and Grist Mill acquisition and relocation projects.

REPETITIVE LOSS PROPERTIES AND NFIP COMPLIANCE

In terms of repeated flooding problems, Lake County and its municipalities have the following numbers of properties listed by the Federal Emergency Management Agency (FEMA) as *repetitive loss properties*. The following table shows the number of properties, number of losses and payments by jurisdiction.

Community	Number	Type	# of Losses	Building Payments (\$)	Contents Payments (\$)	Total Payments (\$)
Lake County	8	Residential	19	\$516,930.02	\$28,783.81	\$545,713.83
	1	Non-Residential	3	\$101,111.95	-	\$101,111.95
City of Eastlake	40	Residential	107	\$876,351.91	\$171,790.16	\$1,048,142.07
	1	Non-Residential	3	\$7,671.48	\$3,115.49	\$10,786.97
City of Mentor	2	Residential	4	\$55,603.57	\$18,095.63	\$73,699.20
	0	Non-Residential	0	-	-	-
City of Painesville	3	Residential	6	\$55,361.65	\$12,658.62	\$68,020.27
	0	Non-Residential	0	-	-	-
City of Willoughby Hills	10	Residential	30	\$373,164.84	\$254,572.01	\$627,736.85
	0	Non-Residential	0	-	-	-
City of Willoughby	4	Residential	10	\$87,920.79	\$47,807.34	\$135,728.13
	0	Non-Residential	0	-	-	-
City of Willowick	1	Residential	2	\$8,937.00	\$221.47	\$9,158.47
	1	Non-Residential	3	\$129,432.73	-	\$129,432.73
Village of Fairport Harbor	0	Residential	0	-	-	-
	1	Non-Residential	17	\$161,697.26	\$15,284.01	\$176,981.27
Village of Grand River	0	Residential	0	-	-	-
	2	Non-Residential	8	\$163,819.17	\$22,730.61	\$186,549.78
Village of Madison	1	Residential	3	\$70,896.12	\$969.80	\$71,865.92
	1	Non-Residential	2	\$40,783.53	\$8,971.70	\$49,755.23
Village of Perry	1	Residential	2	\$3,939.63	\$2,794.64	\$6,734.27
	0	Non-Residential	0	-	-	-
Totals	70	Residential	183	\$2,049,105.53	\$537,693.49	\$2,586,799.02
	7	Non-Residential	36	\$608,455.75	\$50,101.81	\$658,557.56

Lake County and four of its municipalities also have Severe Repetitive Loss Properties, as defined by FEMA. These properties, the number of losses and payments are found below.

Community	Number	Type	# of Losses	Building Payments (\$)	Contents Payments (\$)	Total Payments (\$)
Lake County	1	Residential	2	\$346,991.10	-	\$346,991.10
	0	Non-Residential	0	-	-	-
City of Eastlake	1	Residential	4	\$46,213.23	\$7,816.93	\$54,030.16
	0	Non-Residential	0	-	-	-
City of Willoughby Hills	3	Residential	13	\$144,489.83	\$105,882.67	\$250,372.50
	0	Non-Residential	0	-	-	-
City of Willoughby	1	Residential	4	\$27,170.25	\$31,751.91	\$58,922.16
	0	Non-Residential	0	-	-	-
Village of Fairport Harbor	0	Residential	0	-	-	-
	1	Non-Residential	17	\$161,697.26	\$15,284.01	\$176,981.27
Totals	6	Residential	23	\$564,864.41	\$145,451.51	\$710,315.92
	1	Non-Residential	17	\$161,697.26	\$15,284.01	\$176,981.27

All 19 local governments in Lake County are participants in the National Flood Insurance Program (NFIP). Each community has a designated local floodplain administrator (DFPA) that was established by local ordinance or resolution. These local contacts (LC) (by title) are as follows:

- **Lake County:** County Drainage Engineer
- **Eastlake City:** Chief Building Official
- Fairport Harbor Village
 - o DFPA – Village Engineer
 - o LC – Mayor
- Grand River Village
 - o DFPA – Village Engineer
 - o LC – Mayor
- **Kirtland City:** City Engineer
- **Kirtland Hills Village:** Chief Zoning Inspector
- **Lakeline Village:** Mayor

- Madison Village
 - o DFPA – Village Administrator
 - o LC – Mayor
- Mentor City
 - o DFPA – City Engineer
 - o LC – Plans Examiner / Floodplain Administrator
- Mentor-on-the-Lake City
 - o DFPA – Zoning Inspector
 - o LC – Administrator
- North Perry Village
 - o DFPA – Zoning Inspector
 - o LC – Mayor
- **Painesville City:** City Engineer
- Perry Village
 - o DFPA – Village Engineer
 - o LC – Floodplain Administrator
- **Timberlake Village:** Mayor
- Waite Hill Village
 - o DFPA – Village Engineer
 - o LC – Mayor
- **Wickliffe City:** Building Commissioner
- **Willoughby City:** Chief Building Official / Zoning Inspector
- **Willoughby Hills City:** Chief Building Official & Zoning Administrator
- **Willowick City:** Building Official

Since all governmental jurisdictions have incorporated floodplain management into their everyday operations, this plan assumes that all jurisdictions have prioritized compliance with the NFIP as high. As part of the requirements for participating in the

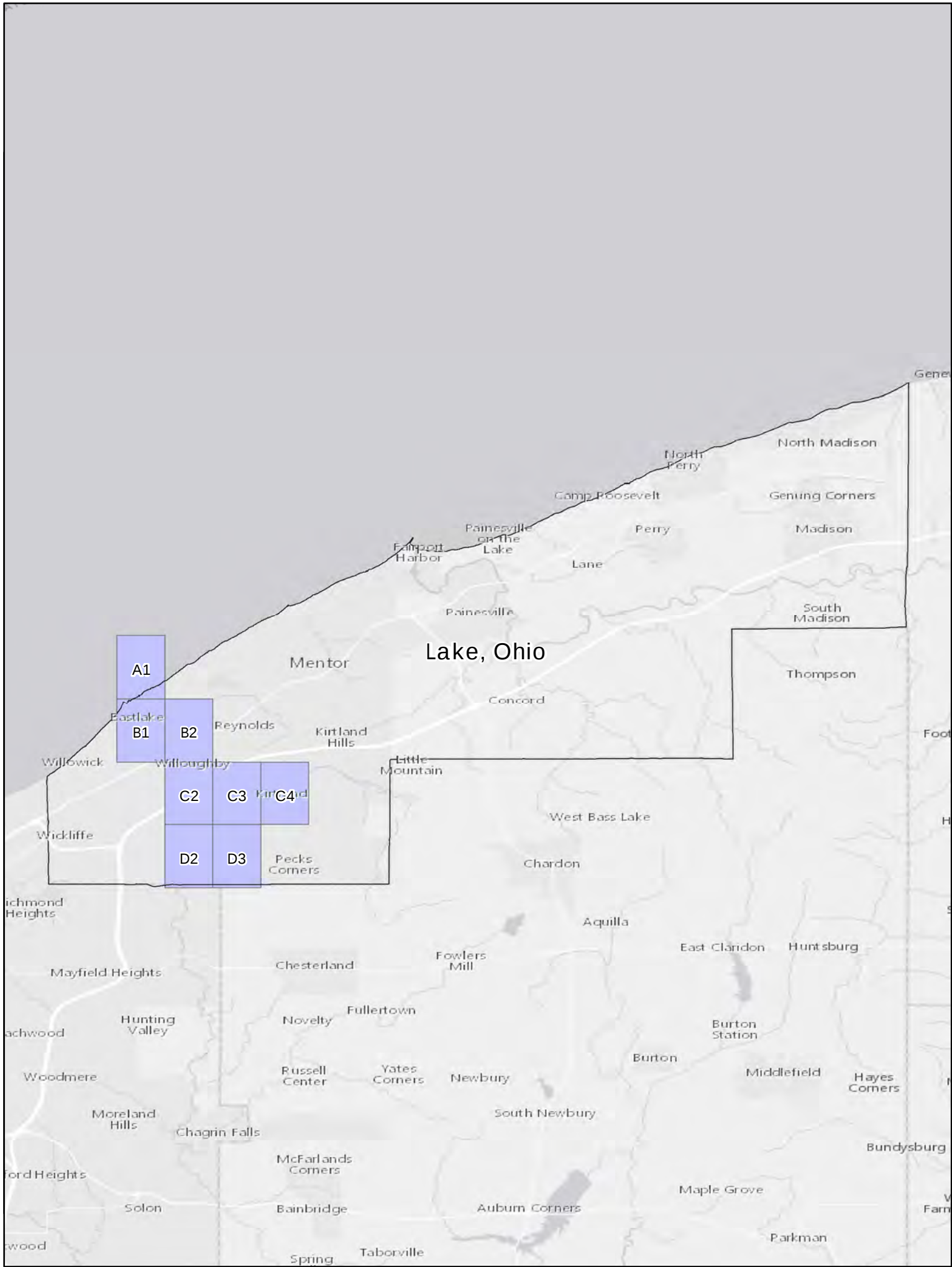
program, each jurisdiction has adopted floodplain management regulations. These regulations determine what type of development can occur in floodplains as well as provide residents and prospective developers with information on the actual floodplain boundaries. General NFIP responsibilities – performed by DFPAs – are as follows. *NOTE: Activities are in compliance with the *Ohio Floodplain Management Handbook* (ODNR, 2005).

- Floodplain Identification and Mapping
 - o Maintains a current copy of the D-FIRM mapping for his/her community. Lake County's most current mapping became effective in February, 2010.
 - o Maintains copies of "Letters of Map Amendment and/or Change".
 - o Provides assistance with local floodplain determinations, including requests to have properties removed from the hazard list.
 - o Monitor construction (including new construction, significant renovations, and fill placement) on properties in the flood hazard area.
 - o Coordinate with lenders, insurance agencies, residents, businesses, developers, etc. in determining if locations are in the flood hazard area.
- Floodplain Management
 - o Maintain informational materials on responsible floodplain development and flood insurance.
 - o Works with the governing body to amend, as necessary, its floodplain ordinance (i.e., floodplain management regulations).
 - o Issue permits for development in the floodplain.
 - o Document and maintain records of appropriate elevation data.
- Flood Insurance
 - o Educate community members about the availability and value of flood insurance.
 - o Inform community property owners about changes to mapping, etc. that would impact their flood insurance rates.
 - o Provide general assistance to the community relating to flood insurance issues.

Lake County began the process of modernizing its floodplain mapping in 2005 with a scoping meeting held July 26th. Preliminary maps were created on September 29, 2006 and an open house was conducted on November 9, 2006. The appeal and comment period lasted from September 9th through December 8, 2007. Finally, the letter of final determination was issued on August 3, 2009 and the modernized mapping became effective on February 3, 2010. The following table shows those communities participating in the National Flood Insurance Program.

Community Name	Init FHBM Identified	Init FIRM Identified	Curr Eff Map Date	Reg-Emer Date
Lake County				
Eastlake, City of	11/30/73	2/18/81	2/03/10	2/18/81
Fairport Harbor, Village of	7/23/76	5/15/80	2/03/10	9/13/06
Grand River, Village of	2/08/74	7/16/79	2/03/10	7/16/79
Kirtland, City of	8/08/75	2/01/80	2/03/10	2/01/80
Kirtland Hills, City of	7/29/77	10/05/84	2/03/10	10/05/84
Lakeline, Village of	N/A	2/03/10	2/03/10	8/04/88
Madison, Village of	5/10/74	12/04/79	2/03/10	12/04/79
Mentor, City of	6/14/74	12/01/77	2/03/10	12/01/77
Mentor-on-the-Lake, City of	7/11/75	8/01/79	2/03/10	8/01/79
North Perry, Village of	4/18/75	7/16/79	2/03/10	7/16/79
Painesville, City of	11/02/73	2/02/77	2/03/10	2/02/77
Perry, Village of	3/22/74	12/15/78	2/03/10	12/15/78
Timberlake, Village of	N/A	2/03/10	2/03/10	8/04/88
Waite Hill, Village of	12/17/73	8/01/79	2/03/10	8/01/79
Wickliffe, City of	7/25/75	1/02/80	2/03/10	1/02/80
Willoughby, City of	11/30/73	1/16/81	2/03/10	1/16/81
Willoughby Hills, City of	12/21/73	1/16/80	2/03/10	1/16/80
Willowick, City of	8/15/75	12/04/79	2/03/10	12/04/79

In 2013, Lake County went through FEMA's RiskMAP process as part of a study along Lake Erie (i.e., the Great Lakes Coastal Flood Study). The purpose of the RiskMAP process is to provide communities with "more precise flood mapping products, risk assessment tools, and planning and outreach support" (FEMA, 2012). The resultant data for Lake County included depth grid maps for the Eastlake and Willoughby areas (primarily along the Chagrin River). The maps highlight the depth of flooding for the 1% flood event (i.e., the "100-year flood") and show depths ranging from zero to approximately 20 feet.





Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio



Buildings

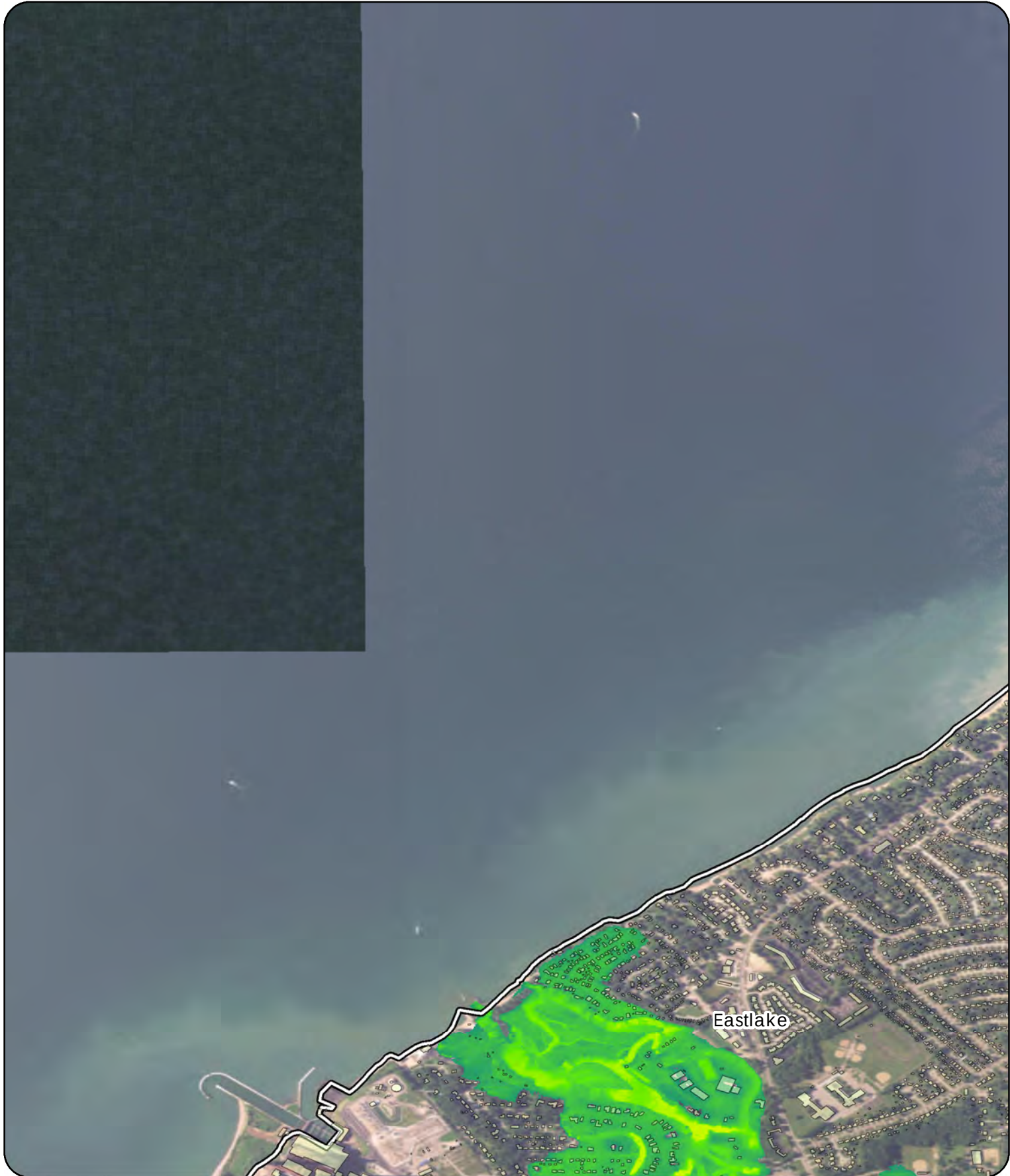
Jurisdictions

Depth 1% SFHA

0 Feet 3 5 8



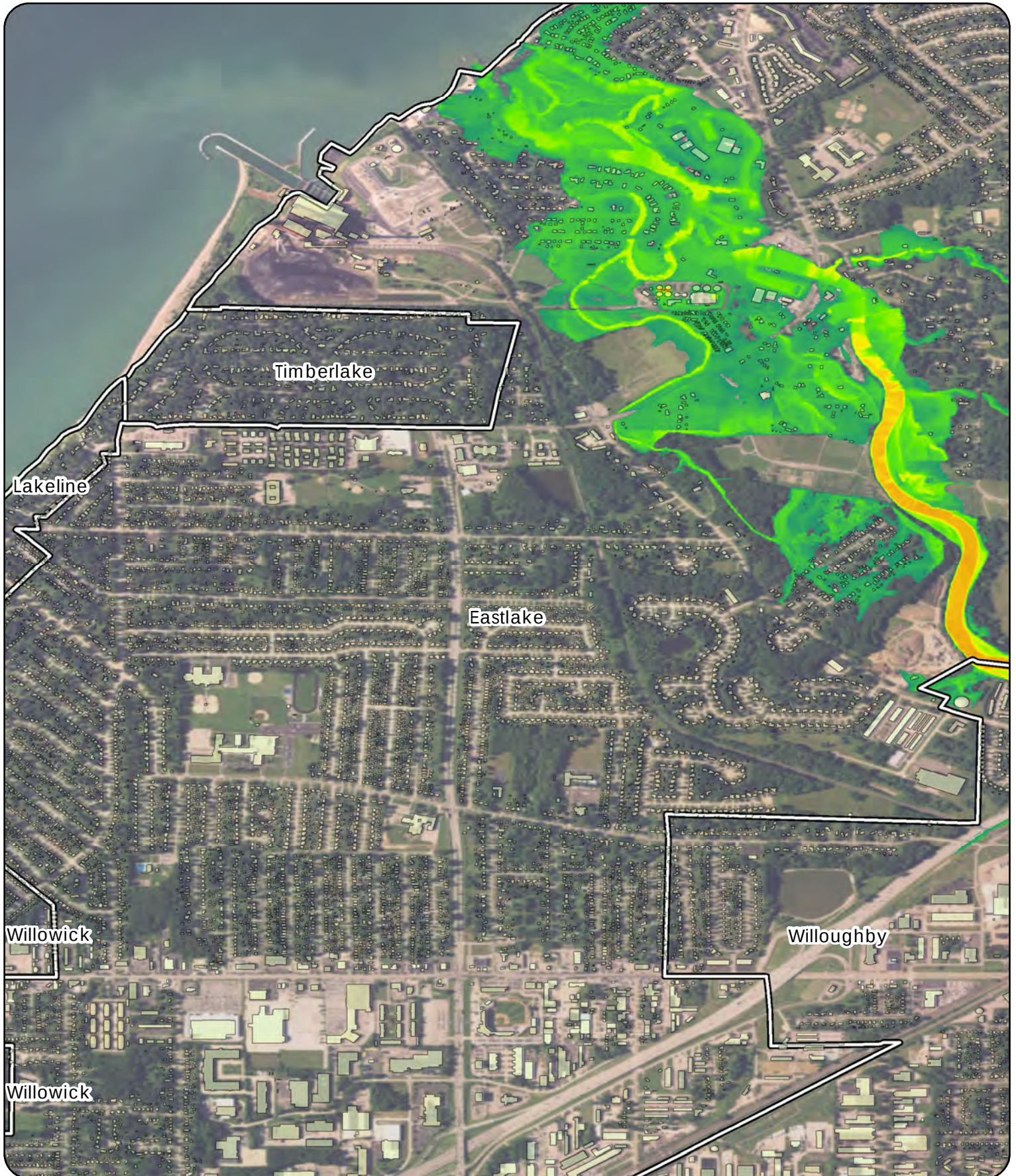
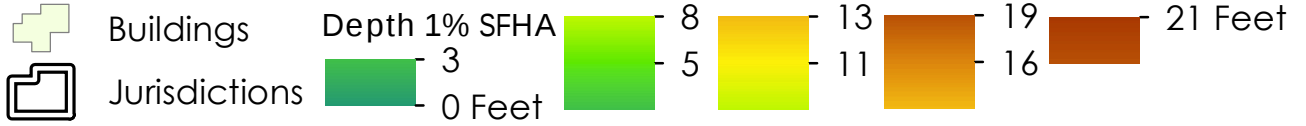
21 Feet



Disclaimer – The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.

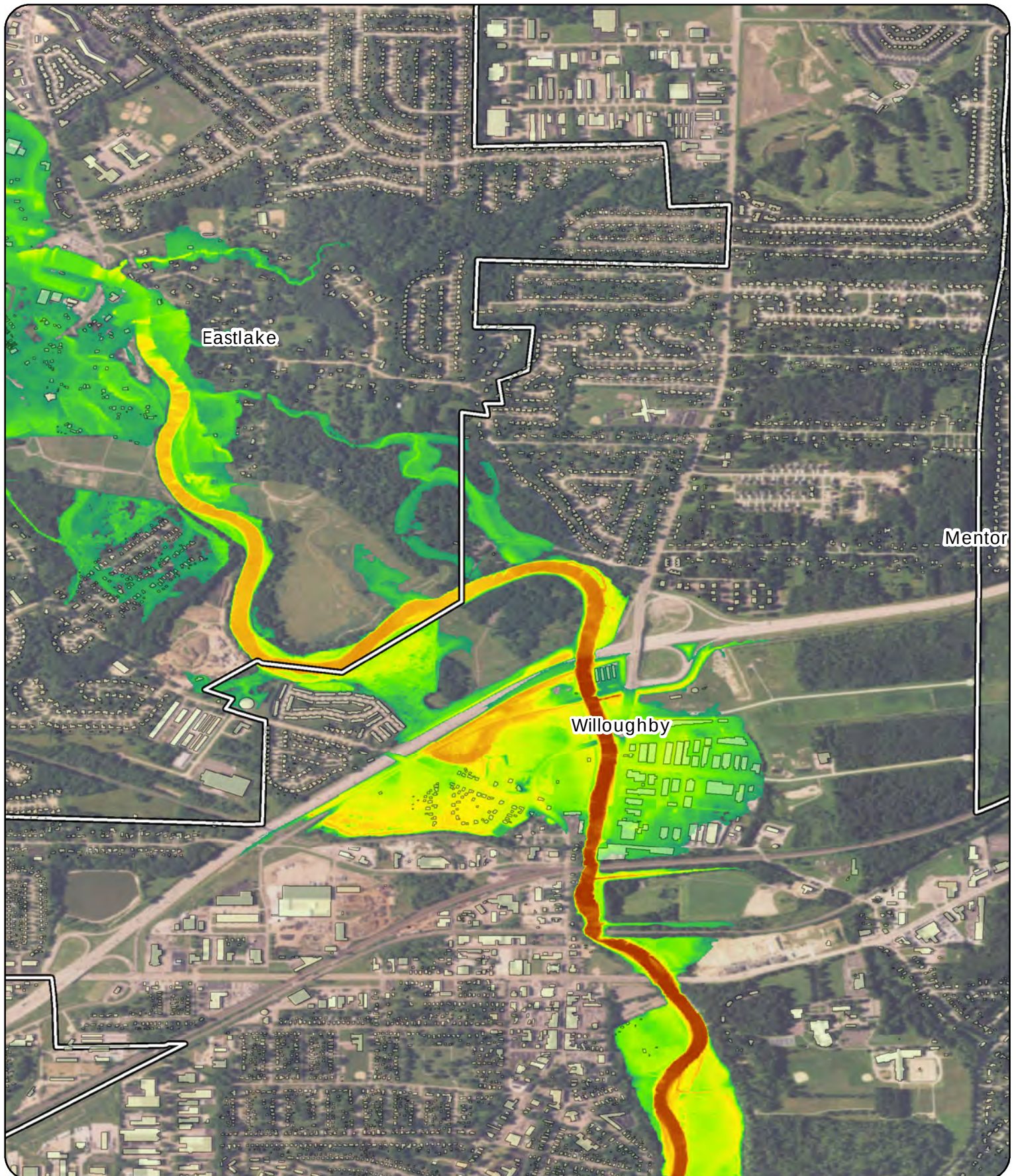
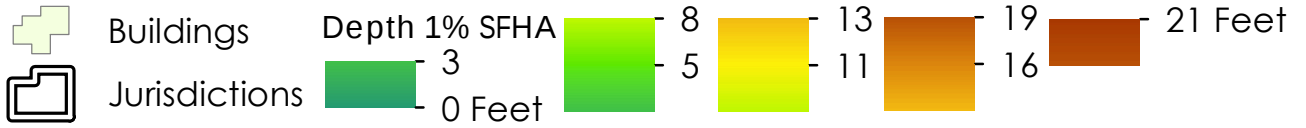
0 0.25 0.5 Miles

Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio



↑
N
B2

Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio

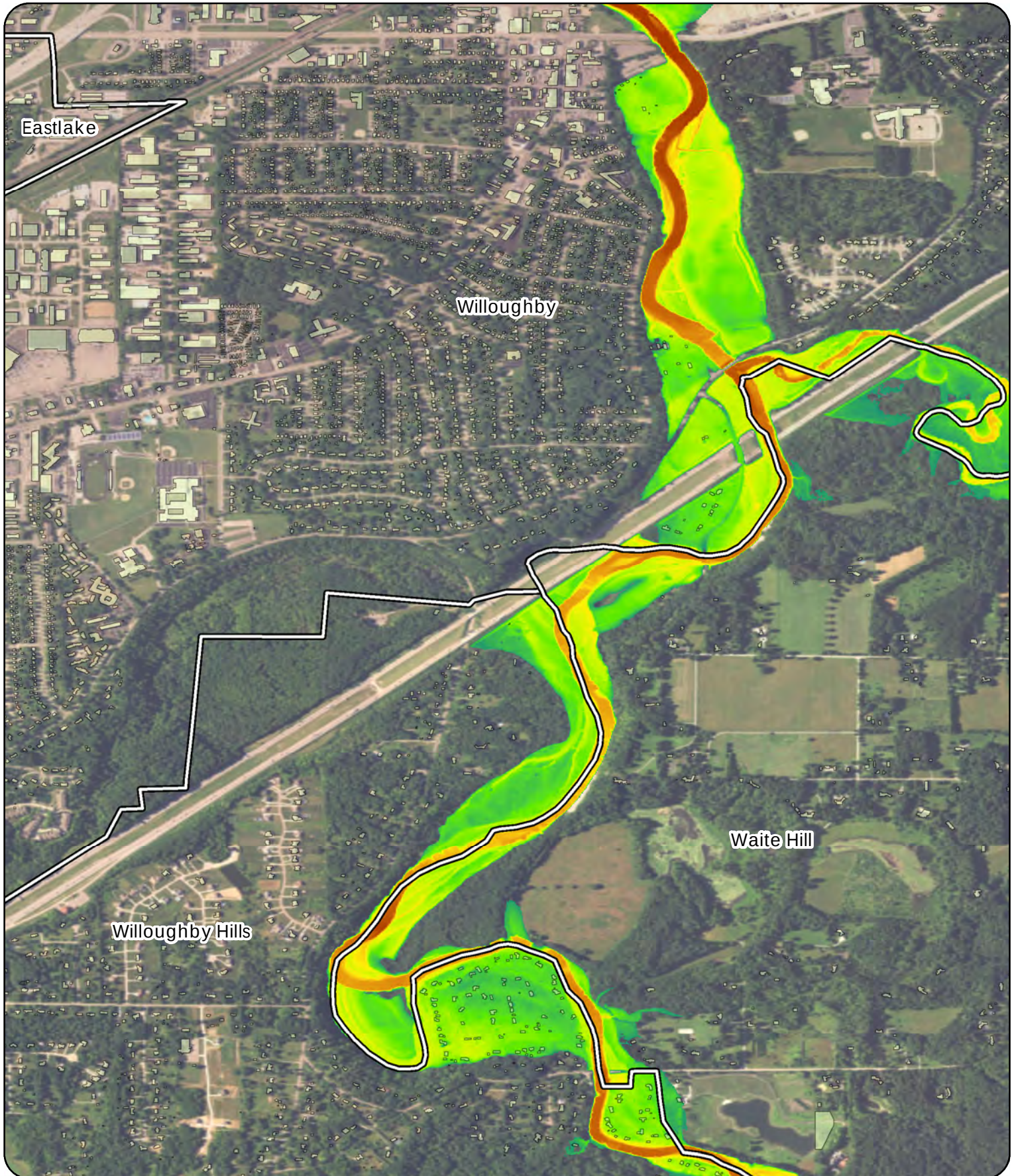
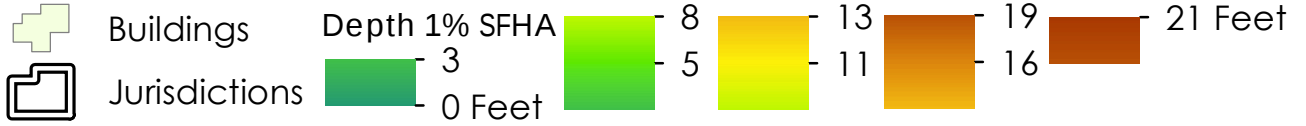


Disclaimer – The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.

0 0.25 0.5 Miles

↑
N
C2

Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio

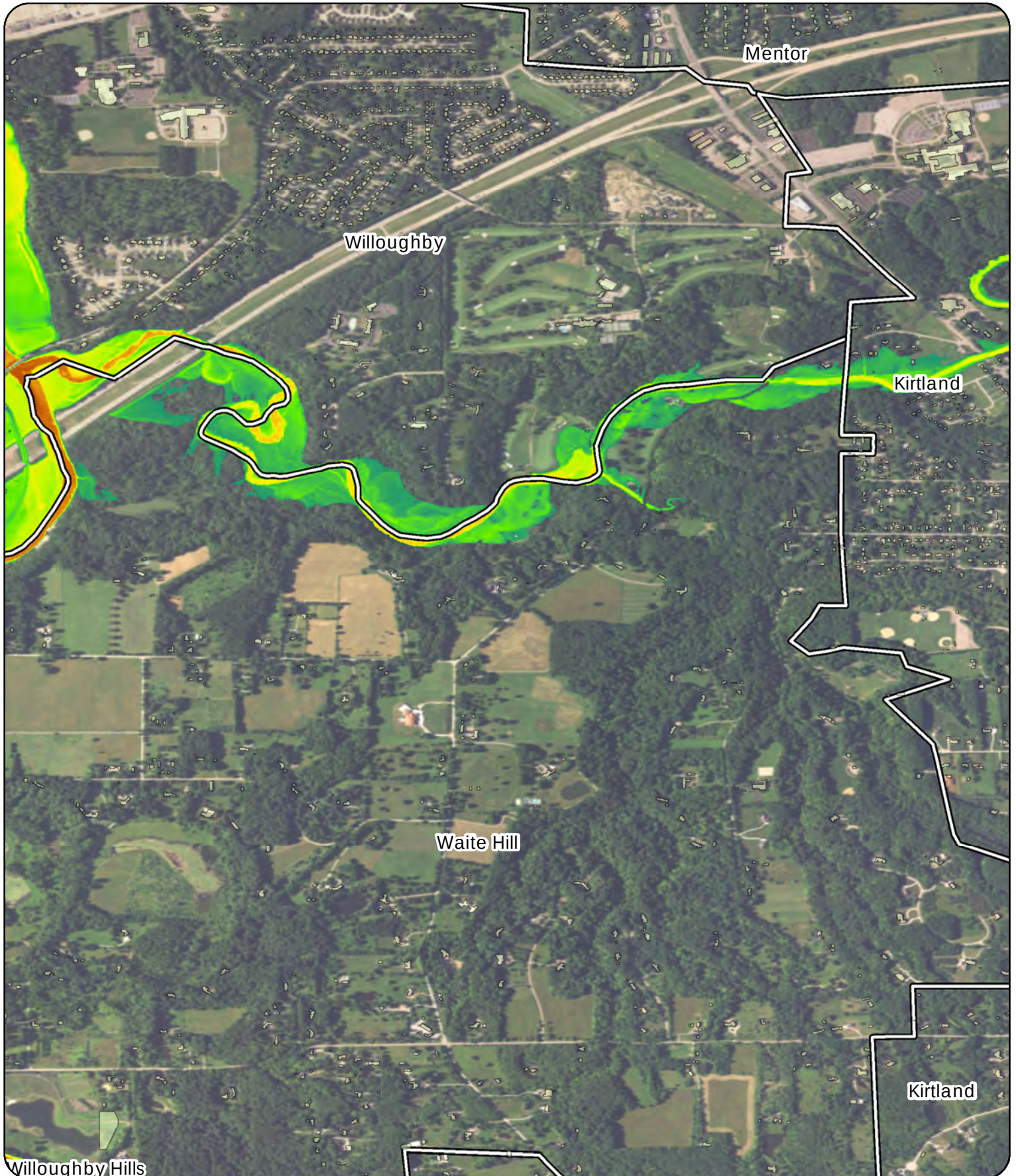
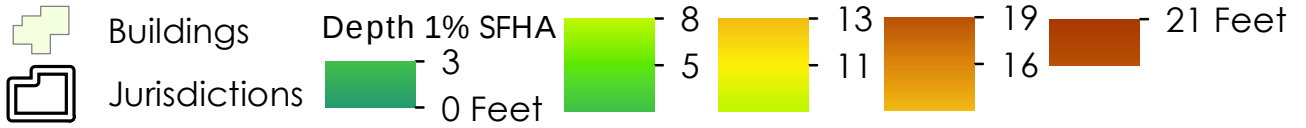


Disclaimer – The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.

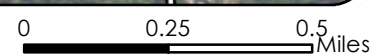
0 0.25 0.5 Miles

↑
N
C3

Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio



Disclaimer - The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.



↑
N
C4

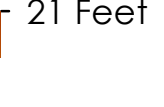
Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio



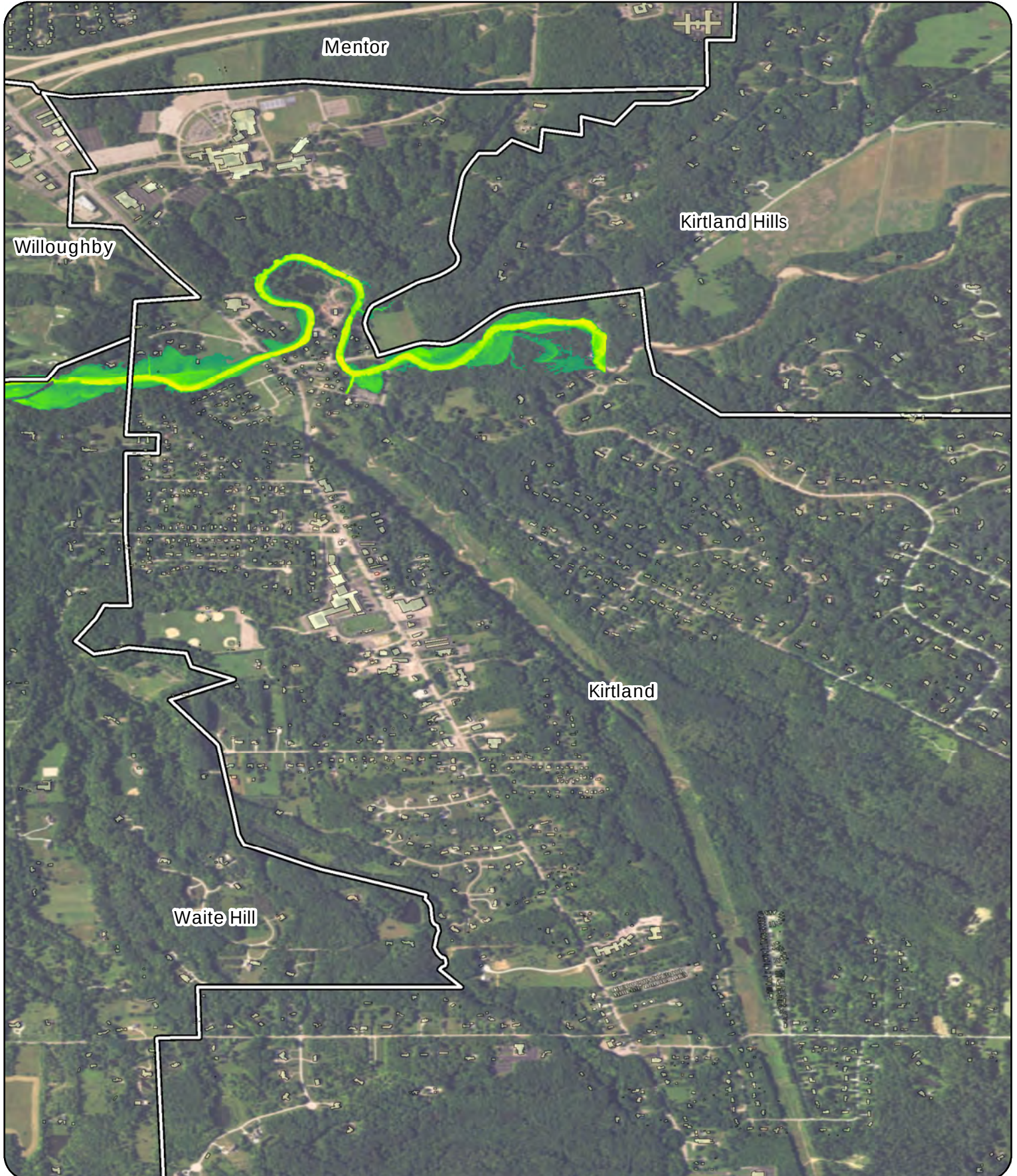
Buildings

Depth 1% SFHA

3 0 Feet



Jurisdictions



Disclaimer – The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.

0 0.25 0.5 Miles



Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio



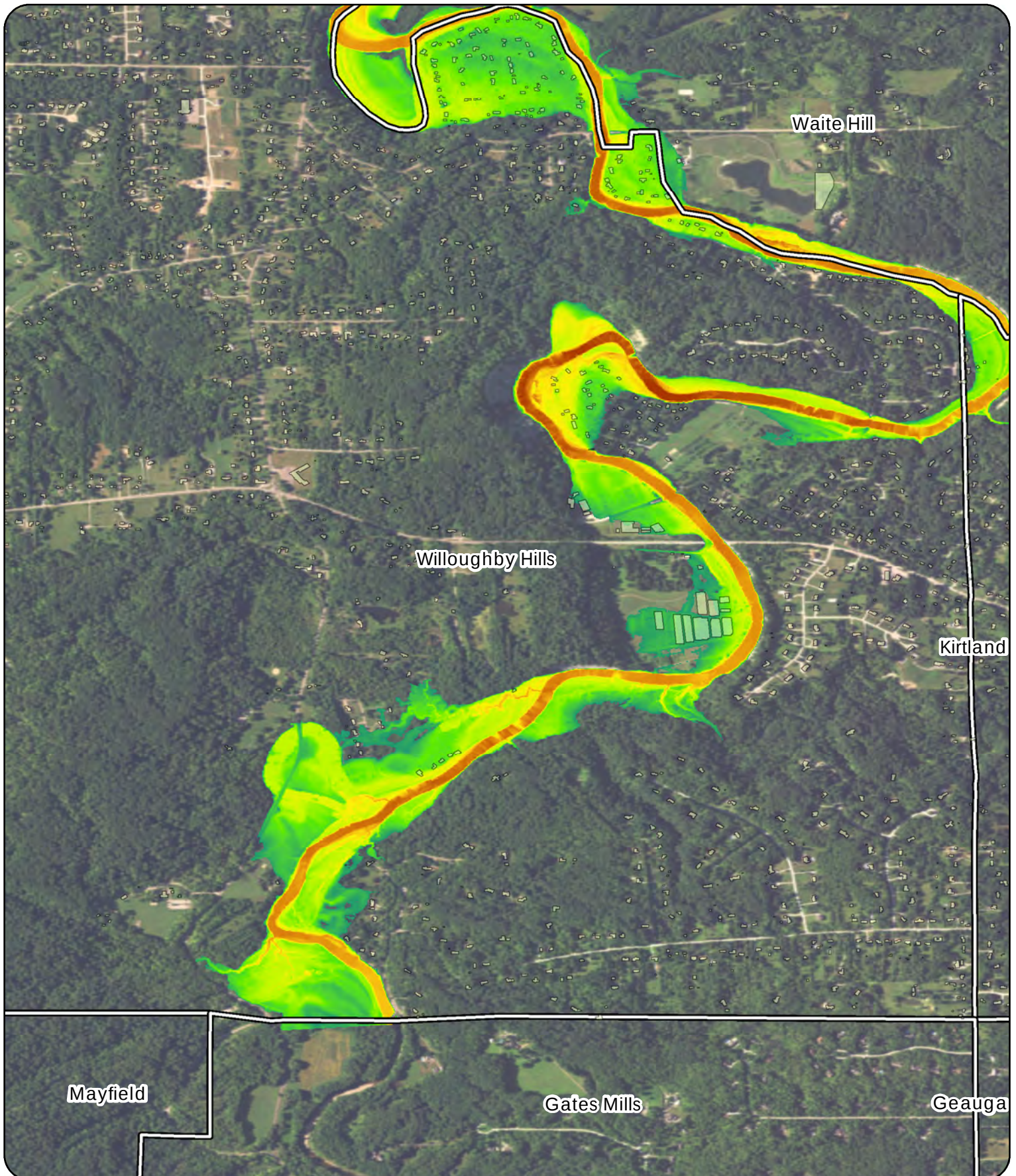
Buildings

Jurisdictions

Depth 1% SFHA
3
0 Feet



21 Feet



Disclaimer – The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.

0 0.25 0.5 Miles



Depth of Flooding for the 1% Flood Event: RiskMAP Project Lake County, Ohio



Buildings

Jurisdictions

Depth 1% SFHA

0 Feet



3

5

8

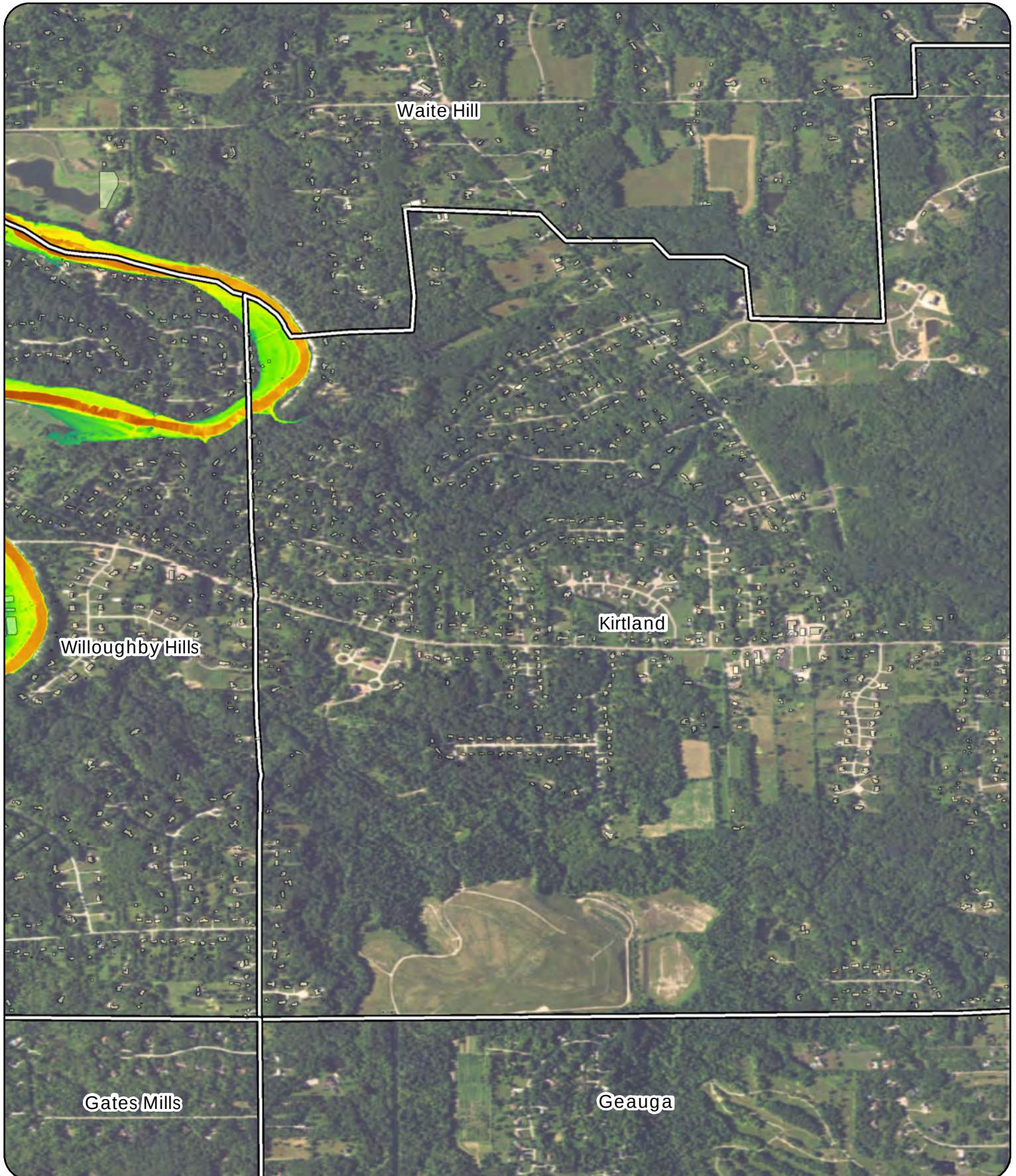
11

13

16

19

21 Feet



Disclaimer – The 1% annual chance flood depth grid data is best available and may differ from revised preliminary or effective Special Flood Hazard Area. The data is for planning purposes only and not to be used for regulatory purposes.

0 0.25 0.5 Miles

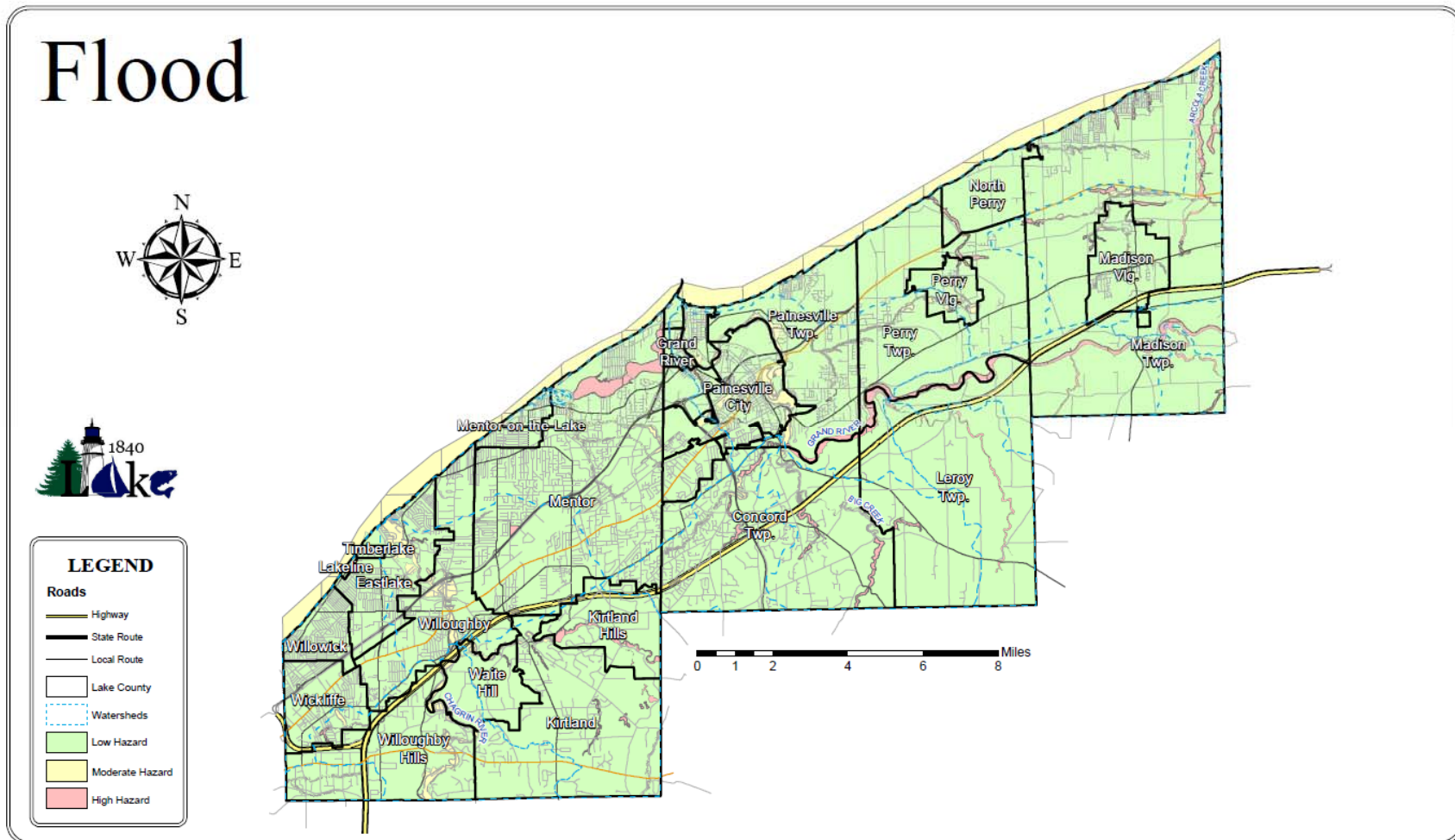
VULNERABILITY TO STRUCTURES

The following table was created using building exposure data from the HAZUS-MH report based on a 100-year flood event (specifically Tables 1 and 2). HAZUS data was converted to the figures in the table via a spreadsheet provided by the Ohio Emergency Management Agency.

Structure Type	Number	Loss Estimate
Residential	1,724	\$5,216,106,000
Non-Residential	823	\$2,486,180,000
Critical Facilities	104	\$315,315,000
TOTALS	2,652	\$8,017,601,000

It is possible to form loss estimate from historical data as well, based on property and crop losses found in the NCDC. These records show that in the prior 19 years (since 1996) there have been 38 flooding events reported to the NCDC, which average to 2 events per year. Flooding has caused nearly \$349 million in property damage during that time frame, with an average of \$9,177,736.84 per each event. Flooding has also caused just over \$2 million in crop damage during the same time frame, which averages to \$53,026.13 per event. Based on a historical average of 2 events per a year it is estimated that flooding in Lake County will cause \$18,355,473.68 in property damage and \$106,052.63 in crop damage yearly.

FLOODING HAZARD MAP



**NOTE: High hazard areas correspond to the 100-year floodplain.*

2.2.8 Hazmat Incident

A technological hazard refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials.

RESEARCH

- Local media research
- United States Environmental Protection Agency (USEPA) National Priorities List (NPL)
- USEPA EnviroFacts Data Warehouse (<http://www.epa.gov/enviro/tri-search>)
- The Right-to-Know Network (<http://www.rtknet.org/>)
- Battelle. (2001). *Comparative Risks of Hazardous Materials and Non-Hazardous Materials Truck Shipment Accidents/Incidents*. Prepared for Federal Motor Carrier Administration. Columbus, OH.

Hazardous substances fall under two definitions of hazard:

- **Health Hazard:** A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur if exposed. Hazardous materials can enter the body in one of four ways. The four routes of entry include inhalation, ingestion, injection, and skin absorption.
- **Physical Hazard:** A chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed liquid, a compressed gas, explosive, flammable, an organic oxide, an oxidizer, pyrophoric (ignites spontaneously), unstable (reactive), or water reactive substance.

Hazardous materials incidents are significant man-made hazards in Lake County. Hazardous materials in various forms have the potential to result in death, serious injury, produce long-lasting health effects, and damage buildings, homes, and other property. These events can occur rapidly over a large area. However, the hauling, storage, and use of hazardous materials play a vital role in the economy of our nation. These materials are stored and handled at fixed facilities and are transported over highways, railways, and water transportation systems. It is estimated

that over four billion tons of hazardous materials are transported annually and that 100,000 trucks haul hazardous materials on the country's highways each day. Almost half of all freight trains carry hazardous materials. Ohio is a crossroads state into, through, or out of which travels virtually every one of the 50,000 chemicals known to be manufactured in the United States. There are 2,500 hazardous materials shipments per day on the highways across the state.

LOCATION

On a local level, an industrial site in the City of Painesville has been placed on the United States Environmental Protection Agency's (USEPA's) National Priorities List (NPL). Diamond Shamrock Corporation (Painesville Works) covers about 500 acres between Lake Erie and the Grand River in Painesville. The site is bordered on the east by a large tire manufacturing company and the west by an industrial area in the Village of Fairport Harbor. Eight sources are associated with the site, including 75 million tons of chromate waste materials, three waste lakes, a waste retention basin, a hazardous waste landfill, chromate effluent treatment lagoons, and contaminated soils in the main production area.

Other hazardous materials incidents can occur at any number of industrial locations located within Lake County or along the main roads and rails that run through the county.

EXTENT

The City of Painesville site poses a threat to the drinking water intakes along Lake Erie and to the fisheries, wetlands, and sensitive environments in the Grand River and Lake Erie. Several substances were found in the surface water and sediment sampling conducted in 1981 by the USEPA, including hexavalent chromium, mercury, cyanide, ethylbenzene, xylene, and

Period of Occurrence:	At any time
Number of Events to Date (2004-2015):	397
Probability Estimation (Events per Year):	36.0909
Probability of Event:	Infrequent
Warning Time:	None
Potential Impacts:	Potential loss of human life, economic loss, environmental damage
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	Days to weeks

naphthalene. Headlands Beach State Park, located approximately a quarter mile west of the Grand River's entry into Lake Erie, is a significant recreation area near this site. Further, local officials planning a residential development in Mentor discovered leaking drums near the project site along Route 535. Several efforts are underway to contain the materials.

The most probable site for a hazmat incident in Lake County would be in the cities and villages where industries that use hazardous materials are located and areas where transportation routes cross. According to the USEPA's EnviroFacts data warehouse, there are approximately 709 facilities in Lake County (per searches of zip codes in Lake County) with permitted release points. Hazmat incidents do not follow any seasonal pattern and could occur at any time of the year. An incident causing the accidental release of a hazardous material is spontaneous with little time of warning. For this reason, evacuation procedures at large industrial/commercial sites and evacuation routes should be identified and made known to employees and the public as a mitigative action. Further, the recovery and clean-up activities involved in a hazmat incident may require several hours or even days.

Transportation-based hazardous materials incidents are also known high risks for Lake County. Rail lines operated by CSX Transportation and Norfolk Southern Railroad run east-west through the central portion of the county. This Class I railroad carries some of the highest tonnage of hazmat between Chicago and Buffalo of any shipping lines between these cities (Core Planning Committee, personal communications). Additionally, committee members noted an increase in the shipment of Bakken crude oil along these railways.

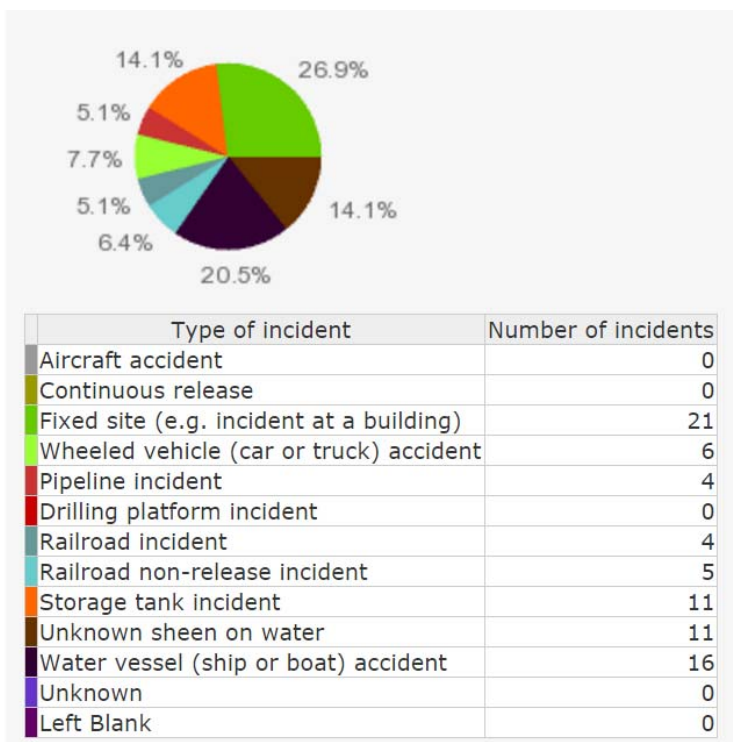
The rail lines and Interstate 90 serve as northern and southern boundaries to numerous industrial developments, in particular the cities on the western end of the county through Painesville. Interstate 90 itself serves as a primary transportation corridor between Chicago and New York City. Additionally, Lake County lies under several flight paths associated with Cleveland Hopkins International Airport.

HISTORICAL OCCURRENCES

A number of historical incidents involving hazardous materials have occurred. Within the transportation sector, numerous roadway accidents, many of which were relatively small releases have occurred. According to the National Response Center Right-to-Know network, a total of 78 incidents occurred between 2010 and 2014.

Seventeen incidents occurred in 2010; 19 in 2011; 18 in 2012; 19 in 2013; and five in 2014. These incidents resulted in three fatalities, two hospitalizations, and two injuries. Incident types are depicted in the figure at right. The top five cities for incidents were:

- **Painesville:** 16,
- **Mentor:** 15,
- **Grand River:** 7,
- **Eastlake:** 7, and
- **Fairport Harbor:** 6.



The top substances involved in the instances unknown oil, gasoline, diesel fuel, and unknown material (or no code).

Painesville, Ohio

In 2007, a CSX train with 112 cars derailed and exploded near Painesville (http://blog.cleveland.com/metro/2007/10/train_wrecks_in_painesville.html). Of the 13 cars that derailed, one was carrying ethanol and another was carrying corn. The other 11 were noted as empty. An estimated 1,000 residents were evacuated and both State Route 2 and 44 were temporarily closed. Lathrop Elementary School was also evacuated.

VULNERABILITY OF STRUCTURES

For a general, per-incident loss estimate, a static figure can be utilized. Battelle (2001) noted the average non-explosion loading/unloading hazmat incident results in losses of \$5,000. This figure is corroborated by a five-year average using data from the Pipeline Hazardous Materials Safety Administration (PHMSA). According to

PHMSA data, the average incident between 2010-2015 resulted in approximately \$5,700 in losses.

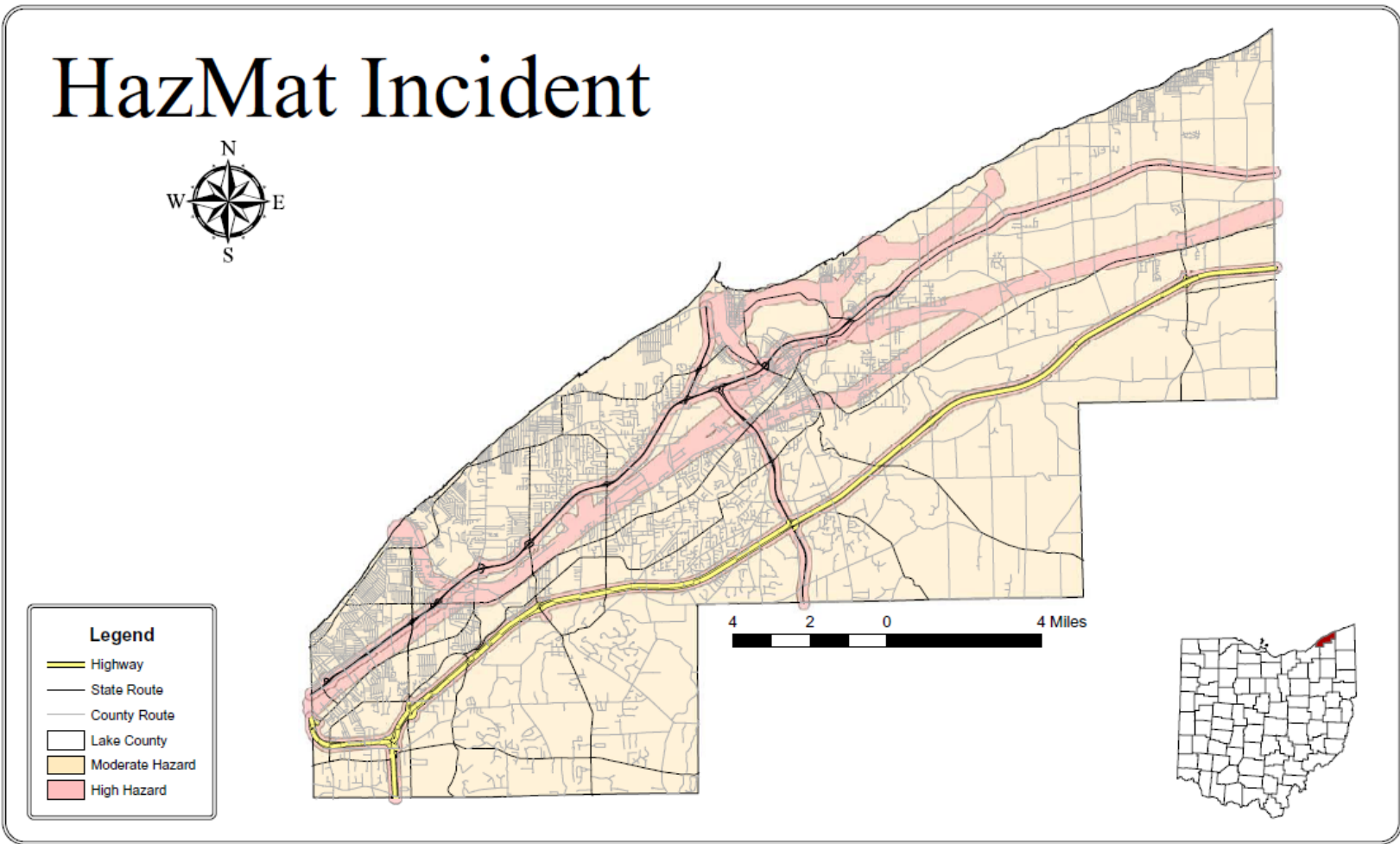
For structures, an historical incident was utilized to compile a loss estimate. One of the many corporations in Lake County that have extremely hazardous substances is a technology-driven global company that combines complex, specialty chemicals to optimize the quality, performance and value of customers' products while reducing their environmental impact. It produces and supplies technologies to customers in the global transportation, industrial and consumer markets. These technologies include lubricant additives for engine oils, driveline and other transportation-related fluids, industrial lubricants, as well as additives for gasoline and diesel fuel. In addition, it makes ingredients and additives for home care and personal care products and pharmaceuticals, and specialty materials. These include plastics technology and performance coatings in the form of specialty resins and additives. Products for the oilfield market include technologies for exploration, production and transportation.

On November 17, 2015, a fire occurred at a similar plant Pennsylvania owned by the same company. The fire started in a manufacturing facility during the process of adding chemicals to a production tank that blends products used in oilfield applications, such as hydraulic fracturing. Chemicals housed in the facility included ammonium persulfate and sodium chlorite. During the fire, local authorities directed nearby businesses and residents on safety procedures, including evacuations and/or sheltering in place. Eight people reported injuries due to the fire. All were treated and released. As of December 2015, the cause of the fire was still not known.

Extremely Hazardous Substance Facility, 1-mile vulnerability zone

Structure Type	Number	Loss Estimate
Residential	5,118	\$981,866,548.50
Non-Residential	1,869	\$648,122,848.80
Critical Facilities	76	\$26,354,915.20
TOTALS	7,063	\$1,656,344,915.50

HAZMAT INCIDENT HAZARD MAP



2.2.9 Infectious Disease

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 forced closure of businesses and industrial operations.

RESEARCH

- Local media research
- LCGHD Data from H1N1 Response (www.lcghd.org/)
- Ohio Department of Health (ODH) (www.odh.ohio.gov/)

An infectious disease (sometimes referred to, in extreme instances, as *epidemic* or *pandemic*) can affect all parts of Lake County, but is more probable to occur in densely populated areas, particularly large, multi-unit residential developments associated the population.

Infectious diseases can develop with little or no warning and quickly erode the capacity of local medical care providers. A fast developing infectious disease can last several days and extend into several weeks. In some extreme cases, they can last for several months. An outbreak 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. Seasonal outbreaks, of such diseases as flu, typically occur in the winter months.

LOCATION

This hazard is a countywide hazard that can affect all areas and jurisdictions of the county.

EXTENT

The Lake County General Health District has taken many steps to ensure a base level of preparedness for epidemic and pandemic conditions. Initiatives

surrounding general preparedness for Avian flu (beginning in 2006) and most recently for H1N1 (swine flu) have led other local governments to create and adopt business continuity plans. Since various residents in Lake County travel and because groups/individuals from out of county (or state) frequently

Period of Occurrence:	At any time
Number of Events to Date (2004 – 2015):	2
Probability Estimation (Events per Year):	0.181818
Probability of Event:	Likely
Warning Time:	Days to Months
Potential Impacts:	Widespread illness can force the closure of business/government operations; emergency services could be strained through inoculation efforts.
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Moderate

travel to Lake County destinations, the possibility does exist for novel strains to be introduced to the local population, thus validating epidemic/pandemic planning efforts. Additionally, Lake County is located in close proximity to high-density populations in Cuyahoga County, which may lead to outbreaks near and, ultimately, in the county. Further, densely populated areas in the western portions of Lake County could lead to a faster-spreading disease. The health district also monitors rabies outbreaks throughout Lake County. According to the health district, 600 to 700 animal bites are reported in Lake County per year; 25% of all bites occur among elementary-aged children. To monitor and address the rabies hazard, the health district maintains a rabies task force and a field monitoring team.

Local officials have worked extensively with regional partners in preparation for large-scale infectious disease events. A task force, on which the Lake County General Health District and Lake County Emergency Management Agency participate, has been formed with Lake Health, University Hospitals, and the Cleveland Clinic to share information and jointly plan for a response.

HISTORICAL HAZARD OCCURRENCES AND OTHER LOCAL CONSIDERATIONS

Lake County, Ohio

As noted, Lake County was impacted by the H1N1 pandemic between 2009 and June, 2010. In Ohio, 227 cases were confirmed, as were 52 deaths (ODH). The Lake County General Health District (LCGHD) distributed H1N1 vaccinations which, as reported by *The News Herald* (<http://www.news-herald.com/general-news/20091024/h1n1-vaccinations-begin-in-lake-county>), began in October, 2009. In 2011, the LCGHD reported on a study conducted by the Ohio Department of Health, which suggested that between 675 and 1,237 cases of H1N1 may have been avoided in Lake County as a result of vaccination efforts (<https://www.lcghd.org/documents/May%202011%20Long.pdf>).

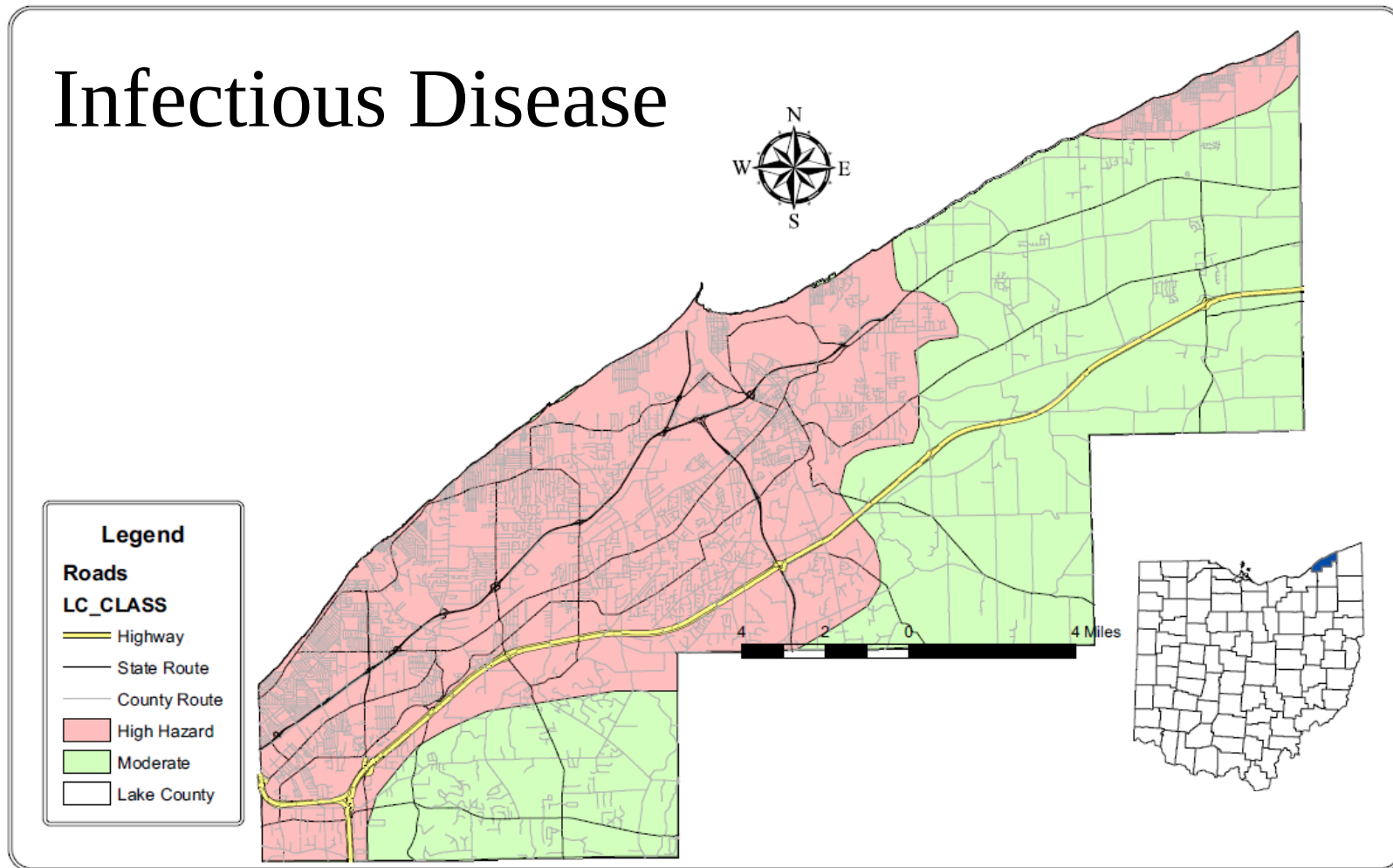
Lake County, Ohio

In 2014, northeast Ohio was heavily involved with the Ebola outbreak response. A confirmed case (that was highly covered by the national media) was located in Summit County. Regional media outlets reported, in October, that at least eight people were quarantined in northeast Ohio. Three schools were also closed as a precaution (<http://www.wlwt.com/news/health-official-on-ebola-7-quarantined-in-ohio/29163216>). One of the exposed individuals was a First Energy employee; in response, the company enacted its internal crisis response and crisis communications plans (Core Planning Committee, personal communications).

VULNERABILITY OF STRUCTURES

Structures are rarely affected by this type of hazard. Infectious diseases usually affect people and, at times, operations at critical facilities, local businesses, etc.

INFECTIOUS DISEASE HAZARD MAP



2.2.10 Infestation

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

RESEARCH

- Local media research
- Ohio Department of Health (www.odh.ohio.gov/)
- Ohio Department of Agriculture (<http://www.agri.ohio.gov/>)
- ODNR Division of Forestry (<http://forestry.ohiodnr.gov/>)

According to searches of online information provided by the Ohio Division of Forestry, Lake County is subject to an infestation primarily of a European strain of gypsy moth, which is one of the most destructive defoliating insect pests to attack the trees and forests of the northeastern United States. 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. A state gypsy moth quarantine was established in 1987. The quarantine is an effort to minimize the movement of egg masses into non-infested areas of Ohio. Lake County is among several counties in northeastern Ohio that have been quarantined due to gypsy moth infestation.

LOCATION

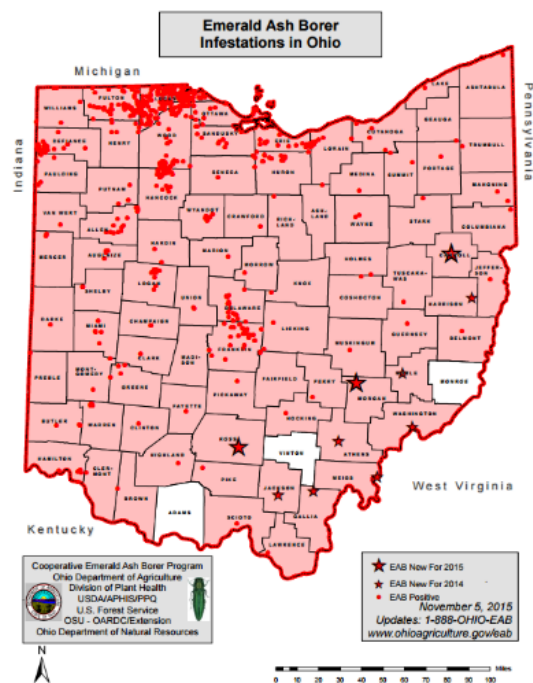
This hazard is a countywide hazard that can affect all areas and jurisdictions of the county.

Period of Occurrence:	At any time
Number of Events to Date (2000 – 2015):	2
Probability Estimation (Events per Year):	0.13333
Probability of Event:	Likely
Warning Time:	Months to Years
Potential Impacts:	Can be particularly damaging to crops
Cause Injury or Death:	N/A
Potential Facility Shutdown:	N/A

EXTENT

Local officials are concerned about green algae infestations following an incident that occurred in Toledo, Ohio in 2014 (<http://www.toledoblade.com/local/2015/08/02/Toxic-algae-struggles-leave-city-s-reputation-hanging-in-the-balance.html>). That incident was attributed to fertilizer run-off in the water basin. Planning committee members also noted the presence of the emerald ash borer (as shown in the image at right). Wickliffe and Timberlake, specifically, reported issues with the pest. Timberlake is working with the Holden Arboretum on the issue. First Energy representatives also pointed to an aggressive trimming program.

Other infestations that could possibly occur in Lake County include Asian long horned beetles, mosquitoes known to be infected with the West Nile Virus, and spider mites. The probability of an infestation actually occurring in Lake County is relatively low with only moderate associated risk. Infestation is most likely to occur in the 84,822 acres of forest or the 33,855 acres of farmland and will likely cause no damage to structural assets.



HISTORICAL OCCURRENCES

Lake County, Ohio

According to searches of online information provided by the Ohio Division of Forestry, Lake County is subject to an infestation primarily of a European strain of gypsy moth, which is one of the most destructive defoliating insect pests to attack the trees and forests of the northeastern United States. 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. A state gypsy moth quarantine was established in 1987. The quarantine is an effort to minimize the movement of egg masses into non-infested areas of Ohio. Lake County

is among several counties in northeastern Ohio that have been quarantined due to gypsy moth infestation.

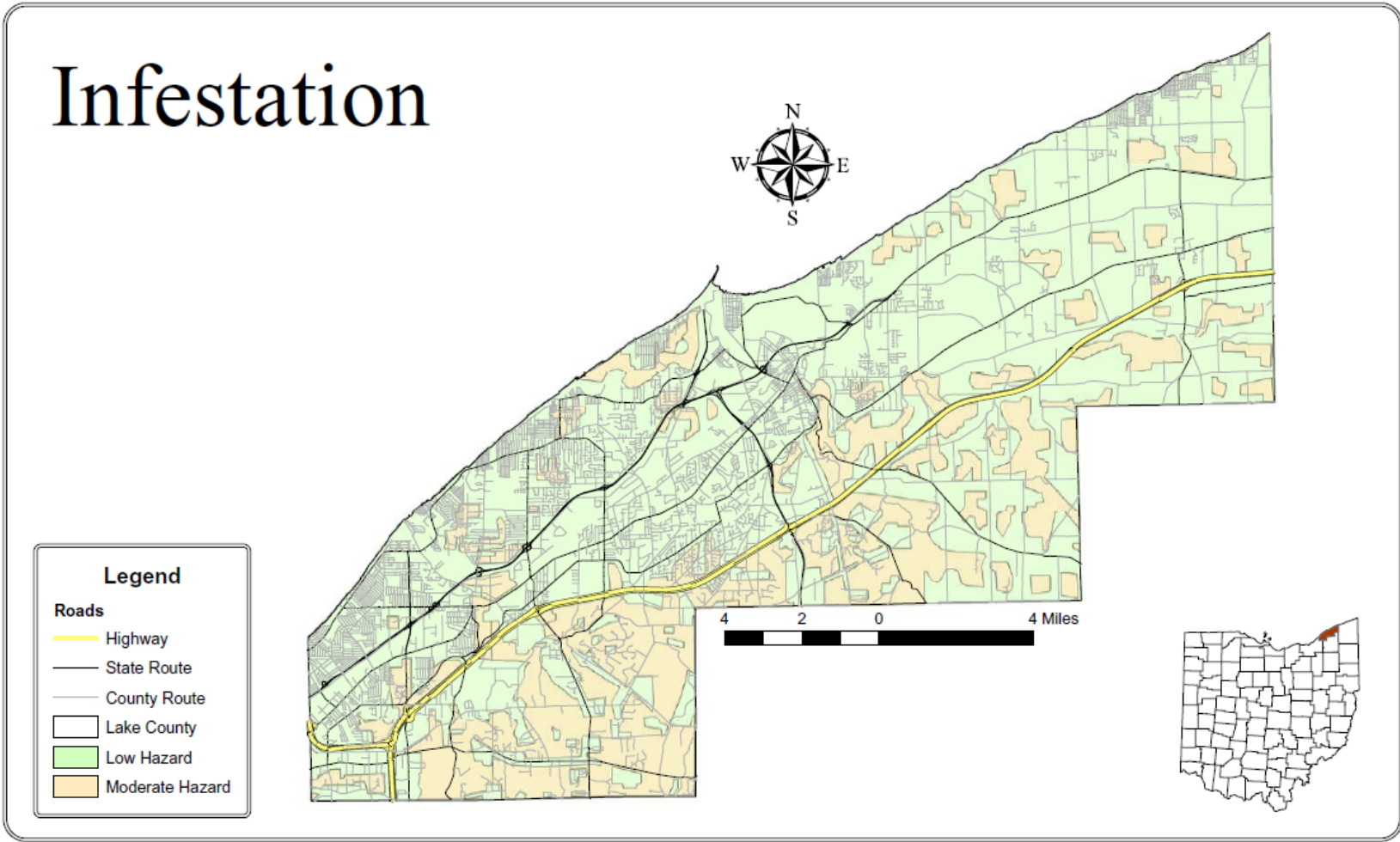
Lake Erie, Ohio

Another highly probable infestation that is being monitored in Lake County is the zebra mussel. The Ohio Department of Natural Resources and Aqua Ohio are monitoring the build-up of the mussels on intakes throughout the county. Intakes are particularly vulnerable due to the possibility of microscopic, free-swimming larvae making their way into such facilities as water treatment plants.

VULNERABILITY OF STRUCTURES

Structures are rarely affected by this type of hazard. Infestation usually affects foliage and, at times, crops.

INFESTATION HAZARD MAP



2.2.11 Land Subsidence

Land subsidence refers to any failures in the ground that cause collapses in the earth's surface.

RESEARCH SOURCES

- ODNR Division of Geological Survey (<http://geosurvey.ohiodnr.gov/geologic-hazards/abandoned-underground-mines/aum-home>)
- United States Geological Survey Landslide Hazards Program (<http://landslides.usgs.gov/hazards/nationalmap/>)
- United States Department of Transportation, Federal Highway Administration

Land subsidence hazards include: landslides (a wide range of earth movement such as rock falls), debris flow (e.g. mudslides and avalanches), and expansive soils (which is the swelling and sinking of soil). Each of these hazards involves ground movement in or on the earth's surface. These hazards can be caused by natural processes such as the dissolving of limestone underground, earthquakes, or volcanic activity. Land subsidence hazards can also occur as a result of human actions such as the withdrawal of subsurface fluids or underground mining; unplanned commercial, residential or industrial developments; roadway construction; etc.

According to the United States Geological Survey (USGS), Ohio is listed as having low, moderate, and high percentages of landslide incidents. Specifically, Lake County is listed as having a low percentage of landslide incidences. This ranking means that Lake County has a moderate susceptibility/low incidence to landslides. Susceptibility to landslides is defined as the probable degree of response of the areal rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. This information is taken from the *Landslide Overview Map of the Conterminous United States*.

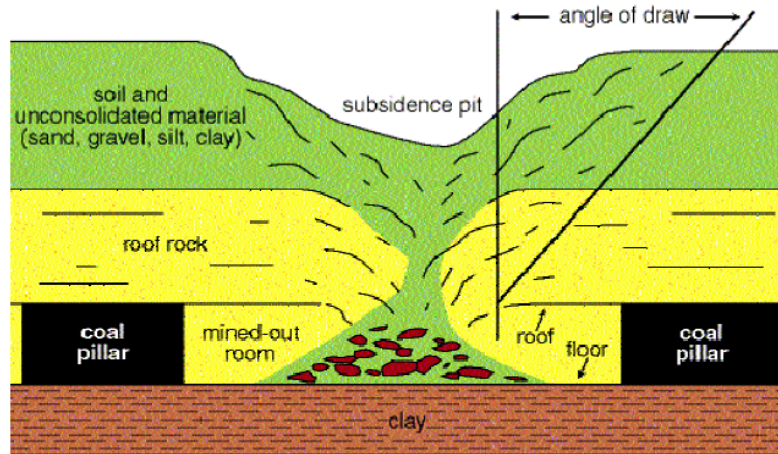
Mine subsidence, like an earthquake, is a geologic hazard that can strike with little or no warning and can result in catastrophic and costly damages. Unlike an earthquake, mine subsidence normally only affects few people. However, if a mine collapses under an interstate highway, several lives and industries are subjected to

potential damage. Mine subsidence can also cause foundation damage to buildings, disrupt underground utilities, and be a potential risk to human life.

There are two types of subsidence: (a) pit, also called sinkhole or pothole, and (b) sag or through. (The term “sinkhole” more properly refers to solution collapse features in limestone). Pit subsidence is characterized by an abrupt sinking of the surface resulting in a circular, steep-sided, craterlike feature that has an inward drainage pattern, which is illustrated at right. It is often associated with the roof collapse of mines that have total overburden (overlying unconsolidated material and rock) of less than 165

feet, weak roof rock of shale or mudstone, and a ratio of unconsolidated-material thickness to rock thickness of less than 1:2. Sag subsidence is a gentle, gradual settling of the surface. It is

associated with pillar crushing or pillar punching in deeper mines (overburden of more than 75 feet). Sag subsidence features may fill with water if the surface of the subsidence intersects the water table.



LOCATION

Much of Lake County does not appear to be particularly susceptible to traditional forms of land subsidence. However, some areas in the southeastern portions of the county, where topography is more variable, show evidence of land subsidence.

EXTENT

Most of Lake County lies on a geological formation containing evaporate rock such as salt and gypsum (The map below demonstrates the presence of “evaporite rocks”

in Ohio and roughly throughout the Lake County area.) According to nationalatlas.gov, sink holes and other subsidence are not predicted to be extensive in the areas of Ohio containing these formations.

Period of Occurrence:	At any time – Chance of occurrence increases following long periods of heavy rain, snowmelt, or near construction activity
Number of Events to Date (2004-2015):	3
Probability Estimation (Events per Year):	0.272727
Probability of Event:	Infrequent
Warning Time:	Weeks to months – Some instances of land subsidence can occur quickly without warning, but often in the context of other storm events.
Potential Impacts:	Economic losses such as decreased land values, agrobusiness losses, disruption of utility and transportation systems, and costs for any litigation. May cause geological movement, causing infrastructure damages ranging from minimal to severe.
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Days to weeks



Figure 9. Salt and gypsum underlie about 40 percent of the contiguous United States. Carbonate karst landscapes constitute about 40 percent of the United States east of Tulsa, Oklahoma (White and others, 1995).

 Evaporite rocks—salt and gypsum
 Karst from evaporite rock
 Karst from carbonate rock
 (modified from Davies and Legrand, 1972)

According to the Ohio Department of Natural Resources, Division of Geological Survey (Mineral Resources Management), there is one abandoned underground mine in Lake County, located near the Villages of Fairport Harbor and Grand River, which extends under Lake Erie. (There are approximately 1,700 housing units in the Villages of Fairport Harbor and Grand River that could be susceptible to foundation damage.) No specific, significant instances of subsidence as a result of this mine have been reported.

Safety problems for travelers caused by sinkholes and slides initiated by abandoned underground mines are a growing concern. The Ohio Department of Transportation

(<https://www.fhwa.dot.gov/engineering/geotech/hazards/mine/workshops/odot/mine97.cfm>) developed an abandoned Underground Mine Inventory and Risk Assessment process as a proactive method of locating and assessing the safety of mine sites underlying highways throughout Ohio. There are at least three highways that could become damaged as a result of mine subsidence in Lake County if subsidence were to occur: State Routes 44, 283, and 535. All are located near the abandoned mine under Fairport Harbor and Grand River.

ODOT representatives also provided input for this profile, citing a number of areas where slope repair projects were needed as a result of land subsidence. Those projects included the following.

- Lak-90-4.28: Future repair project
- Lak-90-3.67: Landslide repair near Maple Grove
- Lak-283-5.10: Culvert/slope repair 0.37 miles east of Chagrin River bridge
- Lak-Casement Ave.: Case just south of Woodworth Avenue
- Lak-91-4.00: Slope repair just south of N&S and CSX railroad bridge
- Lak-90-4.10: Landslide repair

Local officials also noted another type of land subsidence: abandoned pipelines and orphaned gas wells. For example, the City of Eastlake, in partnership with the Ohio Department of Natural Resources, mitigated (i.e., capped) two orphaned wells and are preparing to address three more (Core Planning Committee, personal communications). These wells create problems when they start leaching, which is identifiable via an odor of natural gas. The planning committee noted that there could

potentially be hundreds of these types of wells in Lake County. Painesville Township representatives confirmed at least one in their jurisdiction.

HISTORICAL OCCURRENCES

Lake County, Ohio

Slope Repairs to Roadways

The Twelfth District of the Ohio Department of Transportation covers Lake County and has repaired damage to a number of roadways due to landslides. The district has also repaired slopes to prevent future landslides. These projects include landslide repair near Maple Grove, culvert and slope repair just east of the Chagrin River Bridge, a casement repair just south of Woodworth Ave, and slope repair just south of the N&S and CSX Railroad Bridge.

Painesville Township

Sinkholes Caused by Aging Drainage Systems

On September 6, 2012, the Township Storm Water Department Director appeared before the County Commissioners to request an award for a bid contract for road improvement project. The project also included storm sewer removal and replacement. The director stated that cameras were used to inspect the storm sewer system and found broken pipes, offset joints, and root infestation. He also stated that the township had experienced at least four sink holes in the pavement. He continued to explain that the sewer system is 10 feet deep, so the sinkholes are very significant. The comment was added that this project is a very high priority with the township. As a result, the Commissioners approved this project with two votes “Ayes,” and one vote “nay.”

City of Painesville

Sinkhole Caused by Heavy Rain

As part of a downtown revitalization project, a hotel and two residences were in the process for demolition and site reconstruction. For an eight-hour period overnight (July 19-20, 2013), 6.02 inches fell in the region. At a construction site, part of the project was to renovate the parking lot of a former old hotel. While rain continued to pour, a portion of the curbing on a hill eventually gave way. This hillside failure caused the collapse of the curb and another support structure and made a very large

sink hole. As the heavy rain continued and the runoff water flowed, a gully formed providing an access for massive amounts of water to flow.

Concord Township

Morley Road Dam Project

Sinkhole Discovered Near the Dam

The Morley Road dam just north of Ridgewater Drive in Concord Township was built around 1938 as part of a Works Progress Administration project to construct a reservoir (known as L'Alouette Plume Lake), presumably to support local nursery industry. In 1960, the Ohio Department of Transportation constructed State Route (SR) 44 and an access slip ramp immediately east of Morley Road and the dam. The SR 44/SR 84 interchange construction resulted in the filling and raising of Morley Road in the section over the dam, and placed the structure under the jurisdiction of the Ohio Department of Natural Resources (ODNR) - Ohio Dam Safety Program as a Class III dam. (ODNR's dam and levee inspection program did not begin until the 1970s.)

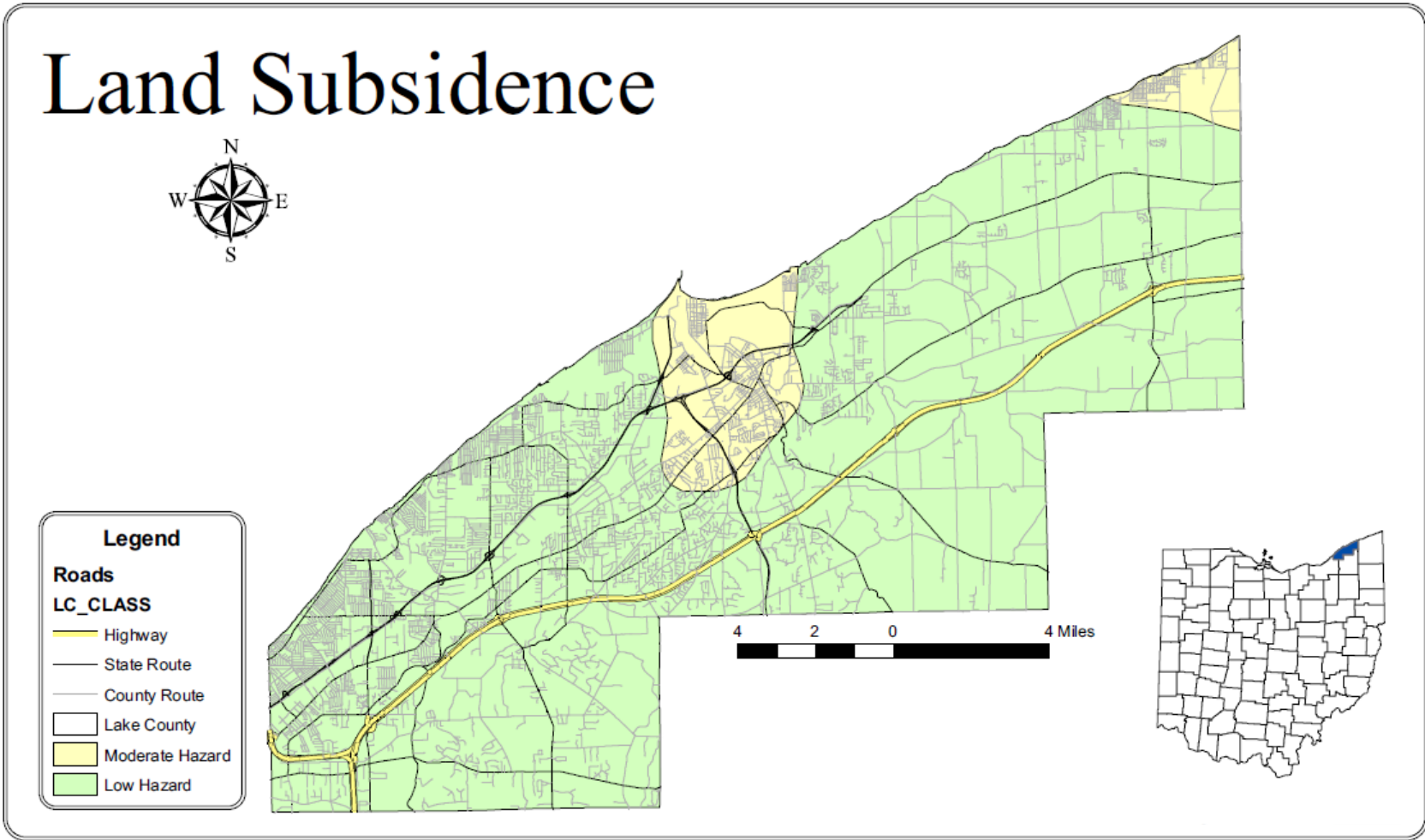
In the fall of 2013, Lake County Engineers discovered an active sinkhole and a collapse in the spillway culvert and contacted the ODNR Division of Soil and Water Resources. ODNR determined that the sinkhole threatened the safety of Morley Road and the dam, and requested that the dam owners either bring the dam into full compliance with ODNR's dam safety laws, drain the lake and remove the dam, or lower the dam embankment to become exempt from ODNR regulations. The dam and lake owners, as well as Lake County and ODOT, expressed their support for draining the lake, removing the dam and restoring natural stream flow. In 2015, Lake County secured an Ohio Environmental Protection Agency grant to restore the dewatered lake back to a natural stream. Matching funds for the project were provided by ODOT through their system preservation funds to modify the dam structure and install a new culvert.

VULNERABILITY OF STRUCTURES

The following table estimates potential structural losses due to land subsidence. Given the presence of an abandoned mine underlying Fairport Harbor and Grand River, structure totals and associated values for only those structures in those villages were used to populate the table.

Structure Type	Number	Loss Estimate
Residential	1,570	\$224,703,500
Non-Residential	189	\$78,685,105
Critical Facilities	8	\$3,526,894
TOTALS	1,767	\$306,915,500

LAND SUBSIDENCE HAZARD MAP



2.2.12 Severe Weather

The severe weather profile addresses a number of weather events, including hailstorms, temperature extremes, thunderstorms, tornadoes, and wind storms.

Hail is a form of precipitation which occurs when freezing water in thunderstorm type clouds accumulates in layers around an icy core. When this event takes place, balls or irregular lumps of ice are created. On average, hail can be from 5mm to 50mm in diameter.

Extreme heat is defined as three 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. Extreme cold is characterized by temperatures at or below freezing for an extended period of time and, in some cases, at or below zero degrees for an extended period of time.

A thunderstorm is considered severe when that storm produces a tornado, winds of at least 58 mph (50 knots), and/or hail at least $\frac{3}{4}$ " in diameter. Structural wind damage may imply the occurrence of a severe thunderstorm. A thunderstorm wind equal to or greater than 40 mph (35 knots) and/or hail of at least $\frac{1}{2}$ " is defined as "approaching severe".

A tornado is a violently rotating column of air extending from a thunderstorm to the ground.

Wind storms are destructive wind events that occur with or without the presence of other storm events, such as tornados or severe thunderstorms.

RESEARCH

- Local media research
- NOAA, National Climatic Data Center Storm Events Database
(<http://www.ncdc.noaa.gov/stormevents/>) – Search terms included:
 - o Cold/wind chill,
 - o Excessive heat,
 - o Extreme cold/wind chill,
 - o Funnel cloud,
 - o Hail,
 - o Heat,
 - o Heavy rain,
 - o High wind,
 - o Lightning,
 - o Strong wind,
 - o Thunderstorm wind,
 - o Tornado, and
 - o Waterspout

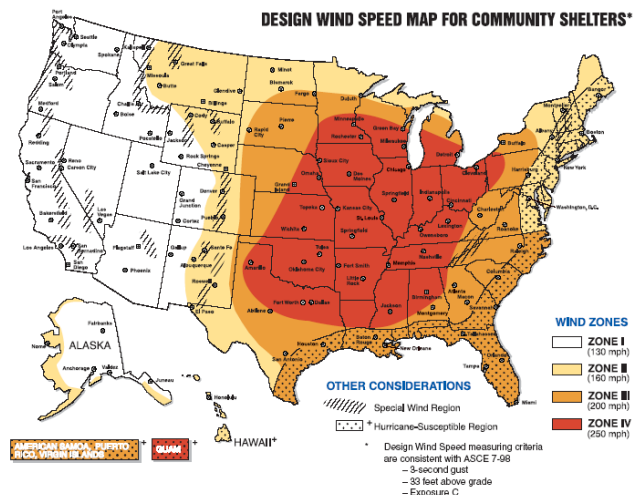
In previous versions of Lake County's hazard mitigation plan, the various types of weather events comprising this profile were discussed separately. The county's planning committee, however, felt the effects of all of these situations are similar enough to warrant consolidation of the discussion. All of these situations can involve temperature fluctuations, precipitation, and damaging winds. (Winter weather was felt to be a frequent-enough hazard to remain individualized.)

The wind gusts associated with thunderstorms pose a threat to life and/or property. Severe thunderstorms also have the potential of producing a tornado with little or no advanced tornado warning. These storms may contain frequent cloud-to-ground lightning and heavy downpours which can lead to localized flooding. Generally, a weak thunderstorm which produces a wind gust of the required strength would be defined as "severe" whereas a very violent thunderstorm with continuous lightning and very heavy rain (but without the required wind gusts, hail, or tornado/funnel cloud) would not. For the purposes of this plan, though, these violent thunderstorms are also considered severe because they are more frequent and cause a significant amount of damage annually throughout the county.

A hot summer afternoon thunderstorm is capable of transforming the landscape from verdant green to icy white with the onset of a hailstorm. The first sign that hail may be arriving is growing whitening among the shafts of rain. Soon, a rattling sound is heard as hailstones strike roofs and pavements and the ground whitens, becoming slippery as hailstones cover grass and roadways. A hailstorm can be the most damaging part of a thunderstorm, inflicting injury to man and beast and destroying crops, gardens, and property.

Hailstone damage is often confined to automobiles and crops; however, structural damage is a possibility in the form of broken windows and damaged gutters or HVAC systems (depending on the size of the structure).

A wind storm is a severe weather condition indicated by high winds and with little or no



rain. Localized geographical conditions can exacerbate the damages from high winds and cause increases in wind intensity. The “Design Wind Speed Map for Community Shelters” is one way of graphically analyzing wind risks. As can be seen, Lake County is in a “Zone IV” with respect to design wind speeds, which means that shelters constructed for protective purposes (from wind hazards) should be designed to withstand up to 250 mph winds.

Severe wind events can cause a variety of secondary, or cascading, hazard events. For instance, wind may blow limbs from trees down knocking out electric power or blocking roadways. Wind often results in damages to roofs and other home finishings (such as siding, etc.). The most extreme example of a severe wind event is a tornado. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of one mile wide and 50 miles long. Tornadoes are among the most unpredictable of weather phenomena. Tornadoes can occur in any state in the U.S. but are more frequent in the Midwest, Southeast, and Southwest.

The nature of tornadoes is that they strike at random. While it is known that some areas of the country experience tornadoes more than others, predicting exactly what parts of Lake County have a greater chance of being struck by a tornado is difficult. For planning purposes, it is less important to map the tornado risk than it is to identify it. This is because it is so difficult to predict the path of future tornadoes. The Enhanced Fujita scale

	Description	Wind Speeds (mph)
EF0	Minor or no damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.	65-85
EF1	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.	86-110
EF2	Considerable damage. Roofs torn off well-constructed houses; foundations of frame houses shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.	111-135
EF3	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations badly damaged.	136-165
EF4	Extreme damage. Well-constructed and whole frame houses completely leveled; cars and other large objects thrown and small missiles generated.	166-200
EF5	Total destruction of buildings. Strong framed, well-built houses leveled off foundations and swept away; steel-reinforced concrete structures are critically damaged; tall buildings collapse or have severe structural deformations; some cars, trucks, and train cars can be thrown approximately one mile.	>200

(<http://www.spc.noaa.gov/efscale/ef-scale.html>) provides us with an idea with the scope of damage that could result from tornado events.

A cascading hazard associated with severe wind could be seiche waves. Lake Erie is particularly prone to wind-caused seiches because of its shallowness and its elongation on a northeast-southwest axis (which frequently matches the direction of prevailing winds). Significantly, the National Oceanic and Atmospheric Administration reports no instances of seiches impacting Lake County in a major way.

Extreme heat is a hazard usually found in more desert regions than Lake 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 2000 was 113 degrees Fahrenheit. Health hazards related to extreme heat include sunburns, heat cramps, heat exhaustion, and heat stroke. In a normal year, approximately 175 Americans die from extreme heat. Young children, the elderly, and those who are sick or overweight are more likely to become victims.

Extreme heat is not the only temperature extreme hazard for northeastern Ohio. Extreme cold events can be equally problematic. In the winters of 2014 and 2015, “polar vortex” incidents resulted in temperatures at or below zero degrees for an extended period. Cold weather can result in damage via frozen/busted piping, frozen engine elements on vehicles, etc. Additionally, public health can become a concern for residences with little or no heat.

LOCATION

This hazard is a countywide hazard that can affect all areas and jurisdictions within the county.

EXTENT

Core planning committee members noted a variety of recurrent weather issues. The hazard is a countywide hazard and affects all areas and jurisdictions of the county. Severe weather is generally a problem at the Lost Nation Airport, impacting schedule flights. The airport maintains an automated weather observation station (AWOS) III weather station to monitor conditions. Additionally, Lake County is home to a wine-making industry. Extreme cold and wet seasons can significant impact that industry (as can drought conditions). Finally, in a general sense, there are power quality issues

associated with severe weather. Severe winds and thunderstorms frequently interrupt electric power.

According to the NOAA Event Record database, there have been 122 severe thunderstorm events in Lake County between 1960 and 2015. These storms have resulted in over \$8 million in property damage. Historical records would indicate that predicting the location of damage from thunderstorms (as well as the frequency of storms) to be very difficult – they strike seemingly at random. Additionally, 15 heavy rain events have occurred since 1996 (NOAA Event Record database), which resulted in approximately \$35,000 of crop damage. There have been 53 hail events reported in Lake County between 1975 and 2015, according to the National Oceanic Atmospheric Administration. Intense winds have been known to blow off of Lake Erie. According to NOAA Event Records, there have been 64 severe wind events in Lake County between 1960 and 2015.

Regarding tornadoes, the best predictor of future occurrences is the occurrence of previous tornadoes. According to NCDC records, there have been two tornadoes recorded in Lake County (since 1969).

Temperature extremes tend to impact the youth and elderly ends of the population spectrum. According to the Ohio Department of Development, approximately 16.5% of the total population in Lake County is over the age of 65. Approximately 5.3% of the county's population is aged five or younger. Because men perspire more than women, men are more susceptible to heat related illnesses as they become quickly dehydrated. It is also significant to note that temperature extreme events are not always easily defined; they can be relative to the seasons as demonstrated in the historical occurrences below.

Severe Weather Characteristics		Number of Events / Probability Estimations (Events per Year)	
Period of Occurrence:	At any time	Hailstorm Events (1975-2015):	53
Warning Time:	Minutes to hours	Probability Estimation:	1.325
Potential Impacts: Utility damage and outages, infrastructure damage (transportation and communications systems), structural damage, and damaged or destroyed critical facilities. Impacts human life, health, and public safety.		Temp. Extreme (1996-2015):	11
		Probability Estimation:	0.5789
		Thunderstorm (1960-2015):	138
		Probability Estimation:	2.5091
Cause Injury or Death:	Injury and risk of multiple deaths	Severe Wind (1960-2015):	64
		Probability Estimation:	1.1636
Potential Facility Shutdown:	Days to weeks or more	Tornado (1969-2015):	2
		Probability Estimation:	0.04348

HISTORICAL OCCURRENCES

Lake County, Ohio

In June, 2013, according to a NOAA Event Record, a strong frontal system remained nearly stationary across the upper Ohio Valley during the evening hours of the 12th. Scattered showers and thunderstorms developed across northern Ohio; the storms became more numerous as the evening progressed and many of them became severe. Thunderstorm winds in excess of 60 mph throughout Lake County downed dozens of trees and caused widespread power outages. Approximately 3,000 utility customers in Lake County lost power during this event.

Eastlake and Madison, Ohio

A severe thunderstorm on May 25, 2011, near Eastlake resulted in approximately \$100,000 of property damage. Heavy rainfall and strong winds downed numerous large trees onto power lines. Winds during this storm were measured at 50 knots. Police reported a transformer on fire and widespread power outages (NOAA Event Record database). Later, on July 11, 2011, another thunderstorm event resulted in approximately \$100,000 in property damage near Madison. During this storm, with winds again measuring 50 knots, numerous homes in the area were damaged as a result of downed trees (NOAA Event Record database).

Eastlake, Ohio

According to a NOAA Event Record on April 20, 2000, lightning struck an apartment building near Eastlake and caused a fire. The fire did extensive damage to several apartments in the building.

Mentor, Kirkland, Willoughby, Wickliffe, Willowick, and Willoughby Hills, Ohio

As indicated by an August 29, 1994 article from *The News-Herald*, a thunderstorm rumbled through Lake County, toppling trees and limbs onto power lines, homes, and cars. One Mentor resident had to be taken to the hospital by life flight helicopter when a tree fell on the car in which she was riding. The Lake County Emergency Operations Center also took a temporary hit after lightning damaged the county's west-end radio tower. Audio signals between police, fire services, and the dispatch center were interrupted as a result. Cities affected by the thunderstorm included Mentor, Kirtland, Willoughby, Wickliffe, Willowick, and Willoughby Hills. The Lost Nation Airport in Willoughby reported a 68-mile per hour wind gust.

Madison, Mentor, Painesville, Perry, and Willoughby, Ohio

A NOAA Event Record dated October 4, 2000, indicated that a 77 mph thunderstorm wind gust was measured at the Fairport Harbor Lighthouse. Dozens of trees were downed across the county by thunderstorm winds. Areas near Lake Erie were especially hard hit with considerable damage in Mentor and Madison. Several homes were damaged and trees crushed two cars in Mentor. Also hard hit was Painesville, where a fallen tree destroyed a car. Trees were also downed in Willoughby and Perry.

Lake Erie, Ohio

According to a July 13, 1995, NOAA Event Record, a line of severe thunderstorms roared south from Ontario and Michigan across Lake Erie at 50 mph. The strong winds rushed out ahead of the thunderstorms and despite the issuance of a special marine warning, many boaters were caught by surprise. The Coast Guard received 152 calls for assistance and had to rescue many people in the lake.

Lake County, Ohio

As indicated by a NOAA Event Record dated October 4, 1991, hail approximately 1.75 inches in diameter was reported throughout Lake County.

Mentor and Concord Township, Ohio

Hailstones up to 1" in size were reported in May of 2007 throughout Mentor and Concord Township (NOAA Event Record database).

Eastlake, Ohio

A May 10, 2013, storm impacting Eastlake resulted in golf-ball sized hail (approximately 1.75" in diameter). This storm resulted in approximately \$25,000 in property damage, primarily to vehicles.

Willoughby, Ohio

In June of 2013 (the 12th), ping-pong ball-sized hail resulted in significant damage in the Willoughby area (NOAA Event Record database). Many vehicles were impacted, with reports of approximately \$250,000 in property damage.

Lake County, Ohio

According to a March 10, 2002, article from *The News-Herald*, heavy sustained winds tore through the area during the afternoon hours downing several trees and power lines in four counties in northeastern Ohio including Lake, leaving thousands of households in darkness. Gusts in excess of 75 miles per hour were reported, shearing off trees and snapping power lines.

Lake Erie, Ohio

A NOAA Event Record dated October 5, 1995, indicated that the remnants of Hurricane Opal passed over the eastern end of Lake Erie. Sustained northeast winds ahead of the storm reached 45 knots all across the lake with gusts to 60 knots, producing waves of 10 to 14 feet. Water levels on the western basin rose three to four feet above average. Minor to moderate beach and shore erosion occurred in many areas.

Lake County, Ohio

A September, 2008 storm resulted in approximately \$5 million in property damage, while a December, 2009 storm caused over \$750,000 in property damage. In October of 2012, Hurricane Sandy tracked up the east coast of the United States and merged with an upper level trough. Winds in Lake County gusted over 60 mph for a few hours. A peak gust of 67 mph was measured by the Fairport Harbor Lighthouse. Hundreds of trees and utility poles were downed by high winds. At least 31,500 electric customers lost power during the storms. There were reports of trees and limbs on houses and vehicles. Many homes also lost sections of roofing and siding. Some streets and roads had to be closed because of downed trees and utility lines (NOAA Event Record database).

Lake County, Ohio

In 2014, according to a NOAA Event Record, an area of very strong low pressure moved northeast across the central Great Lakes on November 24th. A cold front trailing this low swept across Ohio during the morning and early afternoon hours. Scattered power outages were reported, as were hundreds of downed trees and some utility poles. High winds of at least 60 mph were measured in Lake County.

Lake County, Ohio

During the afternoon of Friday, July 4, 1969, thunderstorms formed over southeastern Michigan, several of which produced tornadoes, large hail, and high winds west and south of Detroit. As these storms moved southeastward during the early evening, they evolved into a strong derecho over extreme southeastern Michigan and Lake Erie. The derecho then roared southeast across northern and eastern Ohio and western Pennsylvania during the next few hours. Winds gusted to 104 mph in Toledo, and reached 100 mph in the Cleveland area. In towns and cities near Lake Erie, many people were outside, preparing to watch Independence Day fireworks. Also for the occasion, many small boat owners had anchored their craft just off the Lake Erie shore to watch the displays. As the derecho passed, untold thousands of trees were blown down, including 5,000 trees in Toledo alone. Along the shore of Lake Erie, eight people were killed by falling trees and over 100 boats were overturned, drowning at least three people. A total of eighteen people were killed as a result of the derecho winds in Ohio. Some of the worst damage occurred in Lakewood, a

suburb of Cleveland. The storm system continued to uproot trees, damage roofs, and produce power outages as it moved into Pennsylvania, where five people were injured by high winds in Meadville.

Mentor, Ohio

The other occurrence happened on August 9, 2000, and yielded a F0 tornado 50 yards wide and one mile long. There were no injuries reported in this second event. Property damages in 2000 totaled approximately \$25,000 (NOAA Event Record database).

Lake County, Ohio

According to an article taken from *The News-Herald* dated June 14, 1995, the scorching high temperature of 94 degrees was not a record-breaker, but those trying to beat the heat did not seem to know the difference. The number of people at the municipal pool in Willoughby doubled as a result of the heat.

Lake County, Ohio

According to a NOAA Event Record dated June 13, 1994, an extended period of hot weather, along with dry conditions that had been developing since May, damaged many farm crops across the state. Many areas went the first three weeks of June with virtually no rain. Temperatures exceeded 90 degrees statewide during this period. As much as 30 percent of corn and June hay cuttings were lost. A number of deaths occurred during the heat wave, but it was uncertain if any could be directly attributed to the heat.

Lake County, Ohio

Regarding extreme cold, the polar vortex events of 2014 and 2015 provide examples. In January, 2014, temperatures were reported with lows of -10° F or colder on the 6th and 7th. Wind chills dipped below -25° F during the mid-day hours. The event resulted in school closures (NOAA Event Record database). Temperatures in February, 2015 were even colder, with wind chills sometimes reading -30° F (NOAA Event Record database).

Lake County, Ohio

In April of 2012, unseasonably low temperatures resulted in significant losses in Lake County. A NOAA Event Record reported an area of strong high pressure being centered over the upper Ohio Valley. Clear skies and calm winds allowed for very cold low temperatures. Readings in some areas dipped into the lower 20s and were below freezing for several hours. While such temperatures would not always be cause for concern, the timing in April significantly impacted crops. As much as 80 percent of the grape crop was destroyed and fruit trees throughout northern Ohio were also hard hit. NOAA reported approximately \$10 million in damages in the Lake County zone.

Lake Erie, Ohio

Unique to Lake County and other jurisdictions bordering the Great Lakes are waterspouts. According to the NOAA Event Record Database, ten waterspouts have occurred between 1996 and 2015 (with the most recent being reported in 2001). These events have not resulted in injuries or damage, but they do occur with some frequency (approximately 0.5263 events can be expected per year).

VULNERABILITY OF STRUCTURES

The estimation of vulnerable structures, and the damages they will sustain, can be calculated through the use of historical data found in the NCDC event records. The following table was populated through a multi-step statistical process using this data. First, the probability for each type of severe weather listed at the beginning of this profile were found using the number of events divided by the year range these events occurred in. Per event property loss estimates were then calculated by dividing the total property damage for each event type by the number of events that have occurred. Yearly property loss estimates were found by multiplying the per event property loss by the number of events per a year.

Using the data in the Ohio EMA's HAZUS-MH workbook, the value of structures in Lake County was identified and used to determine how many of each type of structure is vulnerable to severe weather. In three of the severe weather hazard types that have occurred (Heat, Heavy Rain and Waterspouts), no property damage has been reported to the NCDC.

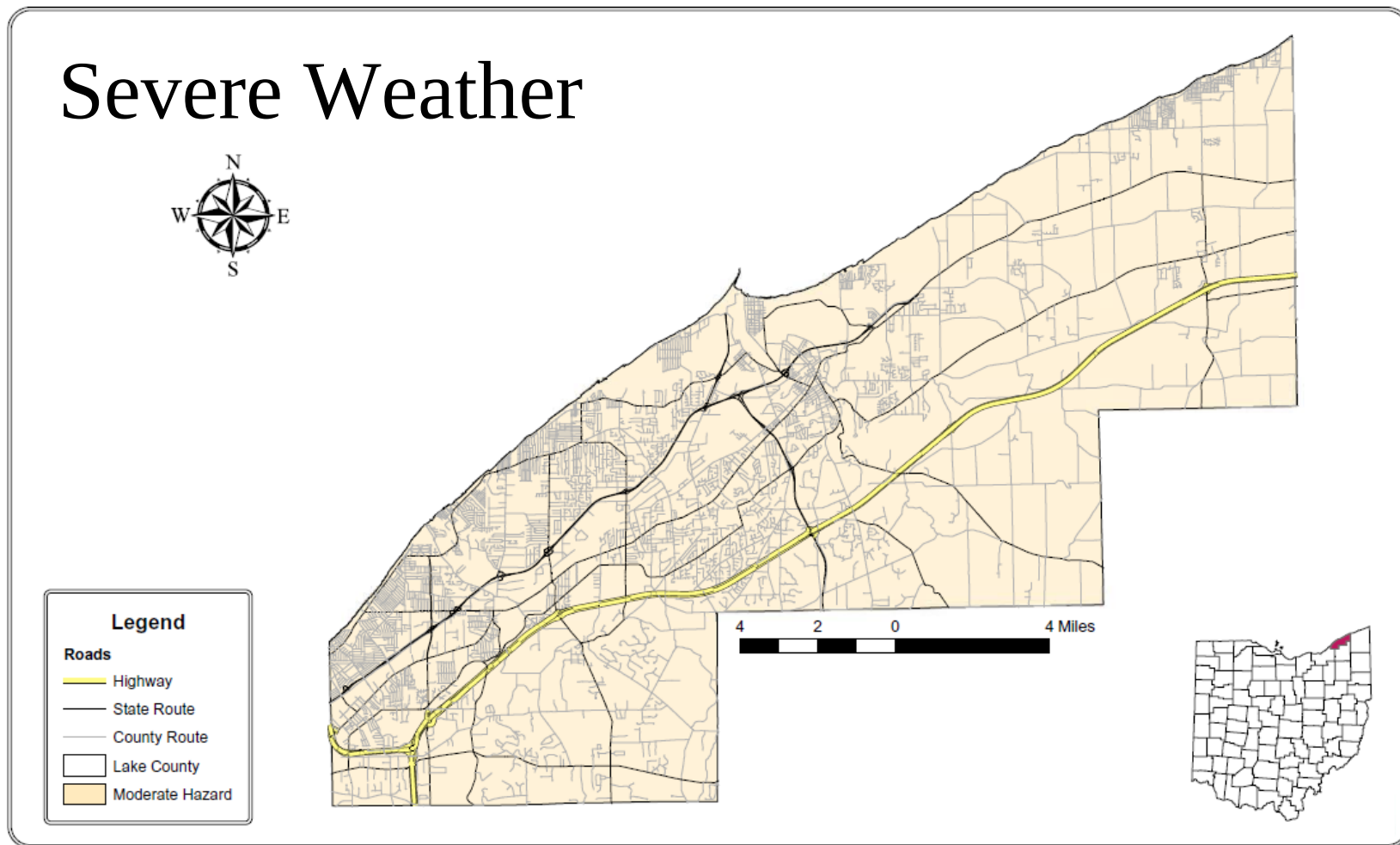
Structure Type	Number	Loss Estimate
Residential	5	\$1,151,939.12
Non-Residential	2	\$378,719.71
Critical Facilities	1	\$47,339.96
TOTALS	8	\$1,577,998.79

The vulnerability assessment below is based on this historic event commonly known to some Ohioans as “The Ohio Fireworks Derecho.” This type of an event is similar to an EF-2 tornado. Using HAZUS-MH data, the structure loss is estimated at \$1,889,860.66 (adjusted for inflation and other factors).

EF-2 Tornado

Structure Type	Number	Loss Estimate
Residential	9	\$1,362,515.19
Non-Residential	3	\$438,748.62
Critical Facilities	1	\$88,596.85
TOTALS	13	\$1,889,860.66

SEVERE WEATHER HAZARD MAP



2.2.13 Terrorism

Terrorism is the use of force or violence, including threats of force or violence, against persons or property in violation of the criminal laws of the United States for the purposes of intimidate, coercion, or ransom.

RESEARCH

- USDHS FEMA (<http://www.fema.gov/hazard/terrorism/info.shtm>)
- USAMRIID Handbooks
- USAMRICD Handbooks
- General internet research

This profile is intentionally generalized. Lake County's Homeland Security Committee has identified a number of potential terrorist-related hazards throughout the county and maintain files of such information separately from this document.

"Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons. High-risk targets for acts of terrorism include military and civilian government facilities, international airports, large cities, and high-profile landmarks. Terrorists might also target large public gatherings, water and food supplies, utilities, and corporate centers. Further, terrorists are capable of spreading fear by sending explosives or chemical and biological agents through the mail" (FEMA). Terrorist incidents are at the forefront of everyone's consciousness following the war on terror in the early 2000s, the attacks on the Boston Marathon, and concerns of domestic radicalization and ISIS. We, as a society, have realized how vulnerable we are to such actions.

Terrorist attacks can be focused on government or the civilian population and is not always accomplished on a "grand scale", as is the case with international terrorists who are attempting to coerce the federal government. Such terrorism, while a hazard in Lake County, is more unlikely than what is known as *domestic terrorism*. Domestic terrorism can involve disgruntled employees (in the case of large industrial plants), angry parents (at schools), upset citizens (at government facilities), etc. Domestic terrorists may often only intend to harm a single individual or a small group of individuals, but the threat of their actions can be highly disruptive. Organized

criminal groups do operate within Ohio, according to the Buckeye Sheriff's Association and the President's Commission on Crime. Without a doubt, such criminal organizations intimidate and threaten the freedom of many Ohio residents, including those in Lake County.

Biological terrorism is the use of living organisms to attack a population. With the use of biological agents the demographic effect is aimed to be higher than fiscal effects even though structures must be decontaminated before being reused. Events of this nature have a low probability of occurring within Harrison County, but events similar to the release of salmonella in Dalles, Oregon by the Rajneeshees in 1984 to gain political power is possible (<http://www.examiner.com/article/25-years-ago-bioterrorism-at-the-salad-bar>). These events could have long durations both in response and recovery because biological terrorism could overwhelm the healthcare system. A long time is often needed to incubate the illness and then a long time to recover from it. There is often no warning time as biological terrorism is considered "detect to treat" (USAMRIID's Medical Management of Biological Casualties, 2011) which means that a biological agent already affecting an area and the only response can be to treat the physical symptoms.

Radiological events are the releases of radioactive material into a susceptible population or structure. These are often done in conjunction with explosives to create a "dirty bomb" allowing for a wider distribution of radioactive material. The probability is low since most radioactive sources are heavily regulated and secured, but sources can be found in medical facilities (i.e., x-ray machines, imaging serums, etc.), construction sites (i.e., depth gauges, structural integrity gauges, etc.), and mining locations (i.e., depth gauges, structural integrity gauges, etc.). The duration can be extremely long depending on the level of exposure and distribution within an area. If a dirty bomb has been detonated, a structure could become structurally unsound as a result of the explosives as well as unusable due to the radiation levels within the structure thereby increasing the fiscal effects, disrupting economic flow, or government activities. The radiological source can also cause demographic effects dependent on the time of exposure, distance from the radiation source, and shielding levels (i.e., lead, dirt, wood, etc. between the source and the individual) resulting in radiation sickness or even death (Radiological Emergency Management, 2013).

Nuclear terrorism involves the use of a nuclear bomb or device. Because nuclear bombs and devices are heavily regulated and controlled, the probability of one

being used is extremely low, but if one did get used, the effects would be catastrophic. The duration of the incident would most likely be all within the recovery phase since recovery would take years to overcome (while the event duration is relatively short lasting seconds to minutes). The demographic effects could be significant; depending on the size of the device, a village or the whole county could be destroyed, killing or severely injuring all within the area. Fiscal effects could be extensive with buildings, infrastructure, and government systems all destroyed.

LOCATION

Most of the iterations of terrorism described above have a relatively low probability of occurring in Lake County. It should be noted, though, that the county does contain facilities from which hazardous materials used for terrorist purposes could be procured. Some instances, such as biological terrorism, would likely present as other types of hazards.

Railroad facilities are another example of potential terrorist targets. Dams and water and sewer treatment facilities, as well as the Perry Nuclear Power Plant are likewise potentially susceptible. Facilities in neighboring counties may also be susceptible to WMD-type attacks and may affect Lake County indirectly. The Department of Defense estimates that as many as 26 nations may possess chemical agents and/or weapons and an additional 12 may be seeking to develop them.

Period of Occurrence:	At any time
Number of Events to Date (2004-2015):	0 major (numerous "white powder" incidents)
Probability Estimation (Events per Year):	0.01
Probability of Event:	Infrequent
Warning Time:	Minimal – Depends on the presence of a threat
Potential Impacts:	Potential loss of human life, economic loss, environmental damage, disruption of lifeline facilities
Cause Injury or Death:	Injury and risk of multiple deaths
Potential Facility Shutdown:	Days to weeks or more

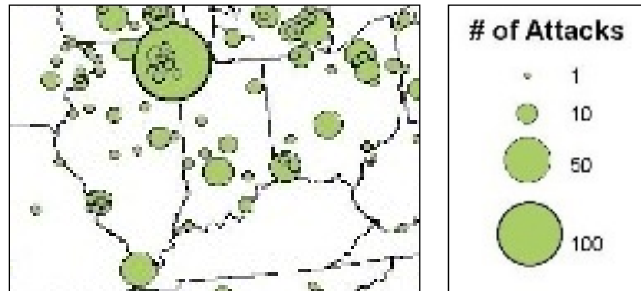
EXTENT

Officials throughout Lake County have taken a number of proactive steps with the aim of mitigating terrorism in the area. For instance, local emergency services providers have formed regional partnerships with utilities, neighboring counties, etc. to provide an enhanced response should something occur. Additionally, the Lake County

Ohio Port and Economic Development Authority, with support from the Transportation Security Administration, as upgraded security measures at the Lost Nation Airport. First Energy also noted the presence of an extensive terrorism policy of its own. First Energy's policies have included undertaking hostile action scenarios as part of nuclear exercises and drills.

HISTORICAL OCCURRENCES

Terrorist incidents have occurred near to Lake County. The graphic at right depicts such terrorism "hot spots".

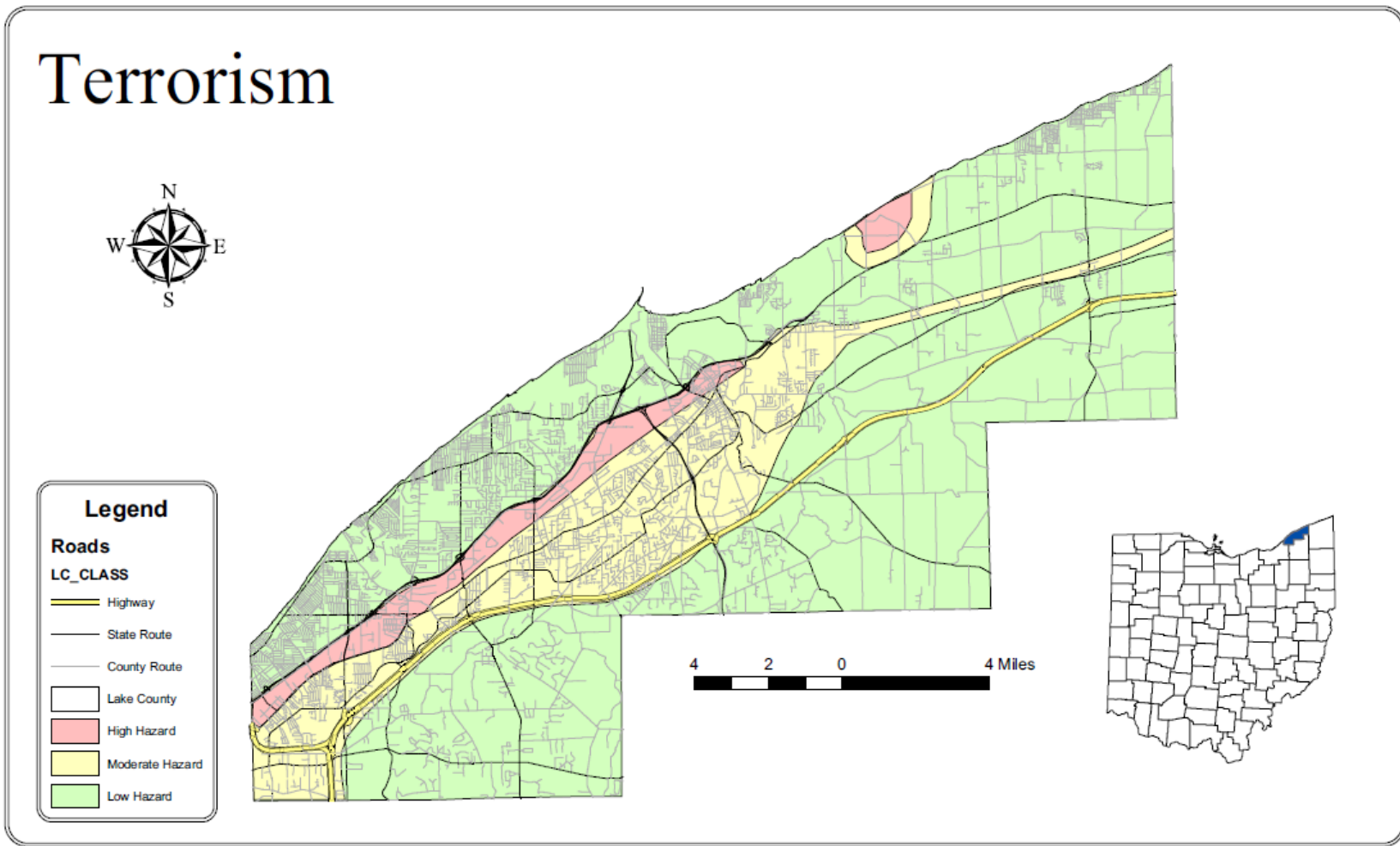


VULNERABILITY OF STRUCTURES

The following table estimates potential structural losses due to terrorism. All critical facilities in the county were considered exposed, as were all industrial facilities. The total values for the residential, non-residential, and critical facility categories (as per HAZUS-MH data) were divided by the numbers of exposed facilities (e.g., the total value of non-residential structures was divided by the number of industrial structures) to arrive at a loss estimate.

Structure Type	Number	Loss Estimate
Residential	0	\$0
Non-Residential	1,675	\$3,030,721
Critical Facilities	546	\$227,541,600
TOTALS	2,221	\$230,572,321

TERRORISM HAZARD MAP



2.2.14 Winter Storm

A winter storm is a type of storm in which the dominant varieties of precipitation are forms that only occur at cold temperatures such as snow or sleet, or a rainstorm where ground temperatures are cold enough to allow ice to form.

RESEARCH

- Local media research
- NOAA, National Climatic Data Center Storm Events Database
(<http://www.ncdc.noaa.gov/stormevents/>) – Search terms included:
 - o Avalanche,
 - o Blizzard,
 - o Frost/freeze,
 - o Heavy snow,
 - o Ice storm,
 - o Lake-effect snow,
 - o Sleet,
 - o Winter storm, and
 - o Winter weather.

Lake County is highly vulnerable to the wide-ranging effects of snowstorms, blizzards, lake-effect snow, ice storms, and severe cold snaps. A severe winter storm could affect the entire county at the same time, virtually bringing all county operations to a standstill. This type of hazard creates a difficult emergency response effort due to adverse road conditions that impede or prohibit vehicle movement. Roads are sometimes blocked, stranding rural residents from the incorporated areas where medical and other emergency services are centered.

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 or other transportation accidents. 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 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 and statewide response and recovery efforts. A total of 269 winter storms from 1923 to 1994 (statewide) have been classified as severe.

LOCATION

This hazard is a countywide hazard that can affect all areas and jurisdictions of the county.

EXTENT

There have been 99 recorded severe winter storms in Lake County between 1996 and 2015 according to the NOAA Event Record database, most of which were heavy snow events. The breakdown of events is as follows.

- **Ice Storm:** 1 (\$500,000 estimated property damages)
- **Heavy Snow:** 49 (\$8,513,000 estimated property damages)
- **Lake-Effect Snow:** 12 (\$2,200,000 estimated property damages)
- **Winter Storm:** 36 (\$16,574,000 estimated property damages)

Period of Occurrence:	Winter
Number of Events to Date (1996 – 2015):	99
Probability Estimation (Events per Year):	5.2105
Probability of Event:	Likely
Warning Time:	Snow – Days Ice – Minutes to hours
Potential Impacts:	Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, damaged critical facilities. Can cause severe transportation problems and make travel extremely dangerous. Power outages, which result in loss of electrical power and potentially loss of heat. Extreme cold temperatures may lead to frozen water mains and pipes, damaged car engines, and prolonged exposure to cold resulting in frostbite.
Cause Injury or Death:	Injury
Potential Facility Shutdown:	Days

- **Winter Weather:** 1 (no losses reported)

Winter storms are one of the most frequent occurrences in Lake County. As a result, residents have learned numerous coping strategies and complain little of damage incurred. Historical data has shown that predicting the number of winter storms to strike in a year would be difficult, as would be predicting the severity of these storms. As such, the entire county is said to have the same vulnerability to winter storms.

HISTORICAL OCCURRENCES

Lake County, Ohio

According to a NOAA Event Record dated November 9, 1996, heavy lake effect snow occurred over a seven-day period. Total storm accumulations reached 28 inches in Kirtland. The storm wreaked havoc on power and telephone lines. Cleveland Electric Illuminating estimated 185,000 customers were without power, some for several days. Dozens of emergency shelters were opened for people who were without electricity. In Wickliffe and Willoughby, motels and hotels that still had power were sold out. Schools throughout northeast Ohio were closed. Most cities used 15 percent of their snow removal budgets on that one storm and the National Guard was called to help clear snow from roads and the roofs of buildings. Hundreds of homes, garages, carports, barns and commercial buildings had roofs that collapsed or were severely damaged. A plastics manufacturing plant in Mentor had a major roof collapse.

Lake County, Ohio

Another event record, dated December 22, 2004, reported on a potent winter storm that affected northern Ohio. Low pressure developed over eastern Texas and then moved quickly northeast, eventually tracking across eastern Ohio during the morning hours of December 23rd. The storm dumped nearly two feet of snow on portions of Ohio. Snowfall accumulations ranged from 12 to 16 inches over Lake, Geauga, and northern Ashtabula Counties. In addition, most of the area saw at least a quarter inch of ice accumulation. Scattered power outages resulted from the ice accumulation. It took several days for road and power company crews to completely clean up. Ultimately, this single event resulted in excess of \$750,000 in property damage.

Lake County, Ohio

Lake-effect snow showers developed during the afternoon of December 21, 2008 and continued into the evening hours of December 22, 2008, according to a NOAA Event Record. Bands of snow affected the immediate lake shore area with the heaviest snow reported during the evening hours of the 21st and the afternoon of the 22nd. Southwest to west winds gusting to as much as 35 mph accompanied the snow and caused near white-out conditions at times. Significant drifting was also reported. Six to nine inches of snow was reported over portions of Lake County, with a maximum of ten inches reported at Madison. Travel was severely hampered in this event and many accidents were reported. Ultimately, approximately \$400,000 in property damage was reported.

Concord Township, Ohio

Numerous transportation situations have been reported resulting from winter weather. A January, 2013 story from Fox 8 Cleveland read: "Crashes on I-90 a 'Complete Disaster'" (<http://fox8.com/2013/01/23/crashes-on-i-90-described-as-complete-disaster/>). That story described a multi-vehicle accident near Concord Township. The accident was caused by the speed of onset of snow conditions. Fox 8 also reported on a semi-truck accident in February, 2013 along I-90 near State Route 44 in Mentor (<http://fox8.com/2013/02/20/semi-crash-slows-traffic-in-lake-county/>). Both of these accidents resulted in temporary road closures.

Concord Township, Ohio

Heavy snowfall on Christmas Eve in 2013 caused a significant accident in I-90 according to the Ohio State Highway Patrol, as reported by the NY Daily News. The chain reaction incident occurred just before 11 a.m. in Concord Township and involved twenty-eight cars. The roadway was shut down for 6 hours in order to clear the debris and disabled vehicles (<http://www.nydailynews.com/news/national/ohio-snow-storm-blamed-28-car-pileup-christmas-eve-article-1.1558125>).



Leroy Township, Ohio

A similar incident occurred in early February of 2016, when forty vehicles were involved in a crash on I-90 in Leroy Township. Seventeen victims were transported to area hospitals with injuries ranging from minimal to serious. The Fox 8 report notes that this is the third such accident in three years in the area and the Lake County Sherriff estimated that the crash would surpass \$1 million in vehicle damage, injuries and response costs (<http://fox8.com/2016/02/11/new-details-40-vehicles-involved-in-i-90-crash-in-lake-county/>). The image to the above, from Fox 8, shows the scene on I-90 during this incident.

Lake County, Ohio

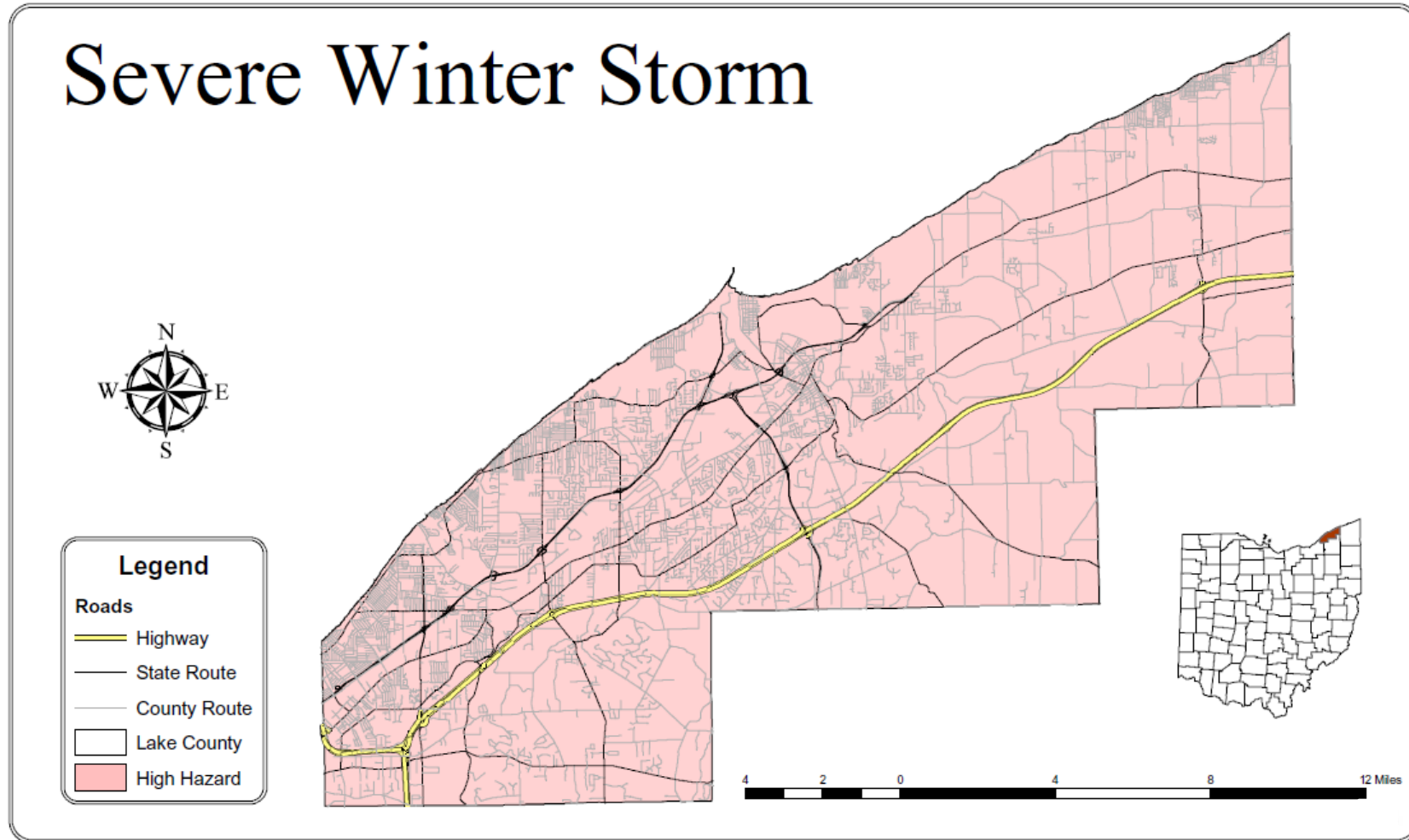
According to a January, 2005 NOAA Event Record, a historic winter storm with significant ice accumulations affected northern Ohio. The storm resulted in the downing of thousands of trees, causing widespread power outages. The ice accumulations were heavier in western Ohio, but counties closer to Lake Erie saw a mix of snow and freezing rain.

VULNERABILITY OF STRUCTURES

This hazard is considered a countywide hazard and affects all areas and jurisdictions in the county. Vulnerable structures and loss estimates for winter storm hazards are calculated using historical property damage data from the NCDRC records. The number of occurrences for each hazard type was calculated and divided by the year range of occurrence to find the average number of events per a year. The total property damage for each hazard type was divided by the number of events to find the property loss estimate per an event. This figure was multiplied by the average events per year to find the loss estimate for each hazard. The summation of these figures gives the total loss estimate for winter storms. The breakdown by type of structure was found using the total loss estimate and figures from the Ohio EMA's HAZUS MH loss estimation workbook. The number of structures for each type was determined by dividing the loss estimate for each by the estimated structural value from the loss estimation workbook.

Structure Type	Number	Loss Estimate
Residential	6	\$1,324,135.03
Non-Residential	2	\$426,906.92
Critical Facilities	1	\$57,885.68
TOTALS	9	\$1,808,927.63

WINTER STORM HAZARD MAP



2.2.15 Systems Disruption and Complicating Variables

A number of situations could occur that would result in a disruption to a number of critical systems throughout Lake County. For example, workplace violence and violent intruders (or “active shooters”) would have a significant impact on operations at the location where they occur; however, these incidents are better classified as crimes as opposed to jurisdiction-wide or more global hazards such as terrorism. It should be noted, though, that even though such situations are not typically thought of as having countywide effects, they most likely would. For instance, the initial act of subduing a shooter would be a predominantly law enforcement task. The treatment of casualties, though, could overwhelm local fire and emergency medical and require widespread activation of mutual aid. Additionally, if an active shooter incident were to occur at a public or private school, the psychological impacts could be crippling. Significantly, Lakeland Community College and Lake Erie College are also concerned about the active shooter threat. In both cases, training and equipment needs are paramount.

Emergency situations in one area of the county could also result in disruptions in other areas of the county. For example, a large-scale vehicle accident along Interstate 90, resulting in several injuries, could impact Concord Township. The TriPointe Medical Center is located along Auburn Road; increased traffic (such as ambulance traffic and loved ones arriving en masse) in this area may occur. Any type of mass casualty incident could result in a similar situation at TriPointe as well as:

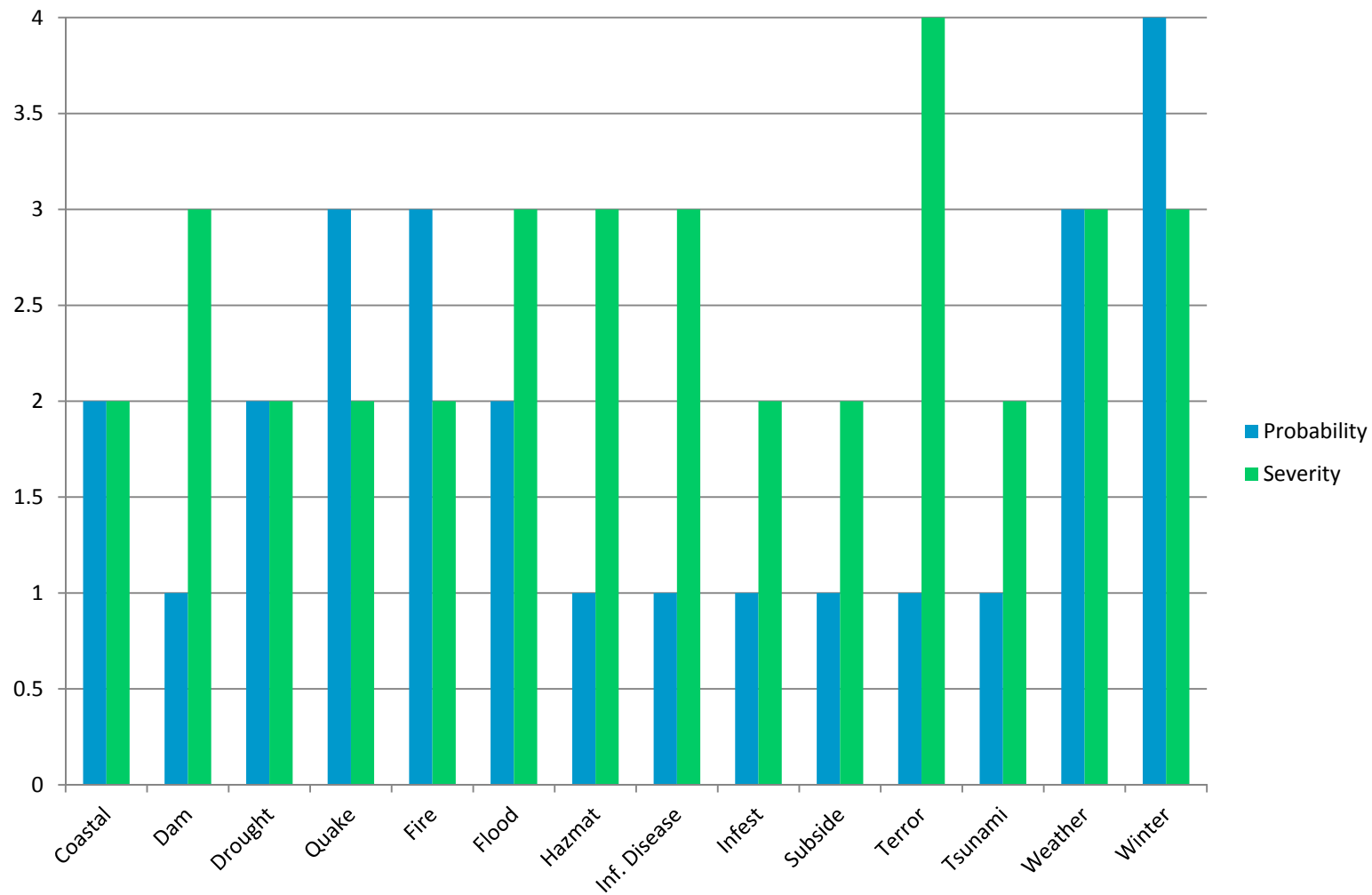
- Lake West Medical Center (36000 Euclid Avenue, Willoughby);
- Lake Health’s Mentor (9485 Mentor Avenue) and Willowick (29804 Lake Shore Boulevard) campuses; and
- Madison campus and emergency room (6270 North Ridge Road).

As eluded to in the severe weather profile above, some hazards are complicated by a series of loosely-related variables. In the severe weather profile, power reliability is mentioned and numerous historical occurrences noting power outage occurrences are presented. Such variables are often considered *cascading hazards*. A particularly poignant, nationwide example is that of Hurricane Katrina in New Orleans in 2005. The direct impacts of the storm missed the city; however, increased rainfall and storm surge ultimately resulted in a failure of the levee system that protected the city, causing widespread and major flooding in many areas (Drabek,

2010). For example, high winds may cause sporadic damage throughout the county, but often do not become a significant countywide concern until a large number of residents are without power. In addition to weather-related power outages, cascading hazards in Lake County could include (but not be limited to) the following.

- Structural damage following coastal erosion
- Flooding of downstream areas in the event of a dam failure
- Drinking water supply shortages following severe and prolonged drought conditions
- Power outages, ruptured gas lines, etc. following earthquakes
- Public health concerns following flooding conditions
- Road closures resulting from land subsidence
- Prolonged flooding following a seiche wave

In many cases, effects that are considered “cascading hazards” can cause disruptions as stand-alone hazards. Lake County was impacted by the Northeast Blackout of 2003. A report by the U.S.-Canada Power System Outage Task Force (2004) noted that a generating plant in Eastlake went offline amid high electrical demand, putting a strain on high-voltage power lines (located in a distant rural setting) which later went out of service when they came in contact with overgrown trees. The follow-on effects resulted in the shutdown of more than 100 power plants. Some hazards, primarily seiche waves, are *most likely* caused by another hazard and could, in some contexts, be considered a cascading hazard. The most likely scenario resulting in a seiche would be an off-shore earthquake under Lake Erie which creates a large wave that comes ashore.



2.2.16 Probability vs. Severity

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 Lake County is quantified by the following risk assessment decision matrix.

The table above was created to enhance the usability of the plan. It provides a user-friendly 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
 - o Frequent = 4
 - o Probable = 3
 - o Occasional = 2
 - o Remote = 1
 - o Improbable = 0
- Severity
 - o Catastrophic = 4
 - o Critical = 3
 - o Marginal = 2
 - o Negligible = 1

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 Lake County experienced in the past ten years? To answer these questions, the *NCDC Event Records* database (<http://www.ncdc.noaa.gov/stormevents/>) 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 Lake County, probability was determined. As such, probability for hazards in Lake County is a comparison between the hazards that have actually occurred in Lake County as opposed to a comparison with data from another

location. For example, a total of ten occurrences of Event X may be significant in Lake 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. In such cases, the core planning committee was utilized as a resource. 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. The following table lists the classifications considered for hazard probability.

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, the expertise of the core planning committee was again used. The table below lists the severity classifications that were considered.

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

The following graphic 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.

Risk Assessment Matrix

<i>Hazard Severity</i>	<i>Hazard Probability</i>				
	Frequent	Probable	Occasional	Remote	Improbable
Catastrophic				11	
Critical	13	12	6	2, 7, 8	
Marginal		4, 5	1, 3	9, 10	
Negligible					

- | | |
|--------------------|-----------------------|
| 1. Coastal Erosion | 8. Infectious Disease |
| 2. Dam Failure | 9. Infestation |
| 3. Drought | 10. Land Subsidence |
| 4. Earthquake | 11. Terrorism |
| 5. Fire | 12. Severe Weather |
| 6. Flooding | 13. Winter Storm |
| 7. Hazmat Incident | |

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 potentially-vulnerable 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).

2.3.1 Methodology

Inventorying assets first involves determining what in the community can be affected by a hazard event. The hazard profiles contained in Section 2.2 above contain generalized loss estimates that, in some cases identify the types of facilities that could be impacted by the hazards considered in this plan.

The core planning committee used its meetings during the update process to significantly revise the original asset list that was included in this plan. Importantly, since the asset inventory is a recommended planning element, each participating municipality was wholly responsible for identifying the assets in its jurisdiction (and thus given flexibility to determine what it considered an “asset”). Some municipalities, such as Kirtland Hills, elected to very generally list assets (i.e., bridges, residential, roads) rather than specifically name assets. Others, such as Lakeline, recognized the bulk of their assets as residential along with those related to the transportation infrastructure. In the following lists, assets are grouped into the following categories.

- **Critical Facilities:** Governmental facilities, water/wastewater facilities, emergency services facilities, medical facilities (hospitals/clinics), and 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.

2.3.2 Asset Inventory

The following tables list assets on a community-by-community basis. The following acronyms are used throughout.

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

Each asset table denotes the name, address, and type of asset for each facility listed as well as a determination of vulnerability for each asset. Vulnerability is listed as either low (L), moderate/medium (M), and high (H). The planning committee, upon reviewing data, made determinations of the geographical areas with low, moderate, and high vulnerability. The determinations were noted on mapping (see Section 2.2). The L, M, and H references in asset tables correspond to the mapping. The following definitions were used (and based on risk matrix definitions in Section 2.2.16).

- **Low:** Those areas where the hazard would not result in damage and would unlikely be experienced.
- **Moderate/Medium:** Areas where the hazard may result in minor illness or other injury and would typically be experienced on a few occasions.
- **High:** Those areas where the hazard may result in death, severe illness, minor injury, marginal structural loss, or the hazard could reasonably be expected to be continuously experienced.

Eastlake Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Eastlake FD	35150 Lake Shore Blvd, EASTLAKE	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Eastlake MS	35972 Lake Shore Blvd, EASTLAKE		X				L	L	L	M	L	H	L	L	L	L	H	L	M
Eastlake Municipal Offices	35150 Lake Shore Blvd, EASTLAKE	X					L	L	L	M	L	L	L	L	L	L	H	M	M
Eastlake PD	35150 Lake Shore Blvd, EASTLAKE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Eastlake Public Library	36706 Lake Shore Blvd, EASTLAKE				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Jefferson ES	35980 Lake Shore Blvd, EASTLAKE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Kennedy	34050 Glen Dr, EASTLAKE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Longfellow ES	35200 Stevens Blvd, EASTLAKE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
North HS	34041 Stevens Blvd, EASTLAKE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

Fairport Harbor Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Connecticut Land Co. Office	129 2nd St, FAIRPORT HARBOR					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Fairport Harbor FD	FAIRPORT HARBOR	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Fairport Harbor PO	FAIRPORT HARBOR				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Fairport Harbor Public Library	335 Vine St, FAIRPORT HARBOR				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Fairport Harbor West Breakwater	FAIRPORT HARBOR					X	H	L	L	M	L	L	L	L	L	L	H	L	M
Fairport Harding HS	329 Vine St, FAIRPORT HARBOR		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Fairport Marine Museum	129 2nd St, FAIRPORT HARBOR					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Village of Fairport Harbor	FAIRPORT HARBOR	X					L	L	L	M	L	L	L	L	L	L	H	M	M

Grand River Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Grand River FD	205 Singer Ave, GRAND RIVER	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Grand River Municipal Bldg.	205 Singer Ave, GRAND RIVER	X					L	L	L	M	L	L	L	L	L	L	H	M	M
Grand River PO	205 Singer Ave, GRAND RIVER				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

Kirtland Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Edward W. & Louise C. Moore Estate	7960 Garfield Rd, KIRTLAND					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Holden University Center	4242 SR 306, KIRTLAND				X		L	L	L	M	L	L	M	L	L	L	H	M	M
Kirtland City Hall	9301 Chillicothe Rd, KIRTLAND	X					L	L	L	M	L	L	L	L	L	L	H	M	M
Kirtland Community Center	7900 Euclid-Chardon Rd., KIRTLAND				X		L	L	L	M	M	L	L	L	L	L	H	L	M
Kirtland ES	9140 Chillicothe Rd, KIRTLAND		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Kirtland FD St. 1	8879 Kirtland Chardon Rd, KIRTLAND	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Kirtland FD St. 2	70282 Chillicothe Rd, KIRTLAND	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Kirtland HS	9150 Chillicothe Rd, KIRTLAND		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Kirtland MS	8225 Chardon Rd, KIRTLAND		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Kirtland Public Library	9267 Chillicothe Rd, KIRTLAND				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Kirtland Temple	8020 Chillicothe Rd, KIRTLAND					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Lake County EOC	8505 Garfield Rd, KIRTLAND	X					L	L	L	M	L	L	M	L	L	L	H	M	M
Lakeland Community College	7700 Clocktower Dr., KIRTLAND				X		L	L	L	M	L	L	M	L	L	L	H	M	M
Newel K. Whitney Store	8881 Chillicothe Rd, KIRTLAND					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Old South Church	9802 Chillicothe Rd, KIRTLAND					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

Kirtland Hills Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	M	L	L	L	M	M	L
Leonard C. Hanna, Jr. Estate	Little Mtn Rd, KIRTLAND HILLS					X	L	L	L	M	L	L	L	L	L	H	L	M
Residential	N/A				X		M	M	L	M	L	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	L	L	M	M	M	L

Lakeline Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

Madison Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Addison Kimball House	390 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Albert DeHeck House	431 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Alpha Charles Childs House	319 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Brick Vernacular House	7597 S Center St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Cheese-Vat Factory	7482 Center St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Cyrus J. Ingersoll House	249 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
David R. Paige House	21-29 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
David Smead House	269 E Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Dr. JC Winans House	143 River St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Edwin L. Ware House	293 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Frances Ensign Fuller House	790 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Francis Hendry House	239-243 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
George D. Wilson House	367 River St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
George Damon House	9862 Chillicothe Rd, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
George Pease House	553 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
H. Gill House	232 River St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M

Madison Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Homer Nash Kimble ES	94 River St, MADISON		X				L	L	L	M	L	L	M	L	L	L	H	L	M
James Dayton House	391 W Washington St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Jane Gilbert House	189-195 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
John J. Jones House	298 Lake St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
John Kellogg House & Barn	30 E Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Joseph Talcott House	354 River St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Lake County Sewer Plant	7815 Cashen Rd, MADISON	X					L	L	L	M	L	M	M	L	L	L	L	M	L
Lemuel Kimball, II House	467 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Madison FD St. 2	1743 Hubbard Rd, MADISON	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Madison FD St. 3	840 River St, MADISON	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Madison PO	375 N Lake St, MADISON				X		L	L	L	M	L	L	M	L	L	L	H	L	M
Madison Public Library	6111 Middle Ridge Rd, MADISON				X		L	L	L	M	L	L	M	L	L	L	H	L	M
Madison Village	126 W Main St, MADISON	X					L	L	L	M	L	L	M	L	L	L	H	M	M
Madison Village Manor	148 E Main St, MADISON		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Norfolk & Western Freight	MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Orland Selby House	564 E Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L

Madison Asset Inventory

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Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Rev. Harlan Metcalf House	275 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Robertus W. Childs House	9020 Chillicothe Rd, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
Solomon Kimball House	391 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M
South ES	92 E Main St, MADISON		X				L	L	L	M	L	L	L	L	L	L	L	L	M
William Lyman House	734 W Main St, MADISON					X	L	L	L	M	L	L	M	L	L	L	H	L	M

Mentor Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Avery Dennison	7100 Lindsay Dr, MENTOR			X			L	L	L	M	L	L	L	L	L	L	H	L	M
Bellflower ES	6655 Reynolds Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Benjamin & Mary Young House	7597 S Center St, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Black Brook Golf Course	8900 Lake Shore Blvd., MENTOR			X			L	L	M	L	L	M	L	L	M	L	L	L	L
Brentmoor ES	7671 Johnnycake Ridge, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Cardinal Autism	5028 Forest Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Corning-White House	8353 Mentor Ave, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Edward W. & Louise C. Moore Estate	7960 Garfield Rd, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Emeritus at Mentor	5700 Emerald Ct, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Fairfax ES	6465 Curtiss Ct, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Garfield ES	7090 Hopkins Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Garfield Historical Site	8095 Mentor Ave, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Garfield Library	7300 Center St, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Garfield Park	7967 Mentor Ave, MENTOR				X		L	L	L	M	L	L	L	L	L	L	L	L	M
Governor's Point	8506 Hendricks, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Governor's Port	8460 Westport, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Gray-Coulton House	8607-8617 Mentor Ave, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Haven Home	7395 Rockingham Rd, MENTOR		X				L	L	L	M	L	L	L	M	L	L	H	L	M

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Heartland of Mentor	8200 Mentor Hill, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Hopkins ES	7565 Hopkins Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
James Mason House	8125 Mentor Ave, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
John & Carrie Yager House	7612 S Center St, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
John G. Oliver House	7645 Little Mtn Rd, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Kemper House	8155 Mentor Hills, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Krueger Park	7572 Chillicothe, MENTOR				X		L	L	L	M	L	L	L	L	L	L	L	L	M
Lake County Humane Society	7564 Tyler Blvd, MENTOR				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Lake County Utilities - Gary Kron Sewer Plant	8471 Lake Shore Blvd, MENTOR	X					L	L	L	L	L	M	M	L	L	L	L	M	L
Lake ES	7625 Pinehurst Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Lake Health Mentor Campus	9485 Mentor Ave, MENTOR	X					L	L	L	M	L	L	L	L	L	L	L	L	M
Lake Shore MI Southern RR Depot	8445 Station St, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Memorial MS	8879 Mentor Ave, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor Beach Park	7779 Lake Shore Blvd, MENTOR					X	M	L	L	L	L	M	L	L	L	L	L	L	M
Mentor Cemetery	6881 Hopkins Rd., MENTOR				X		L	L	L	L	L	L	L	L	L	L	L	L	L
Mentor City Hall (Municipal Ctr.)	8500 Civic Ctr Dr, MENTOR	X					L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor City Public Works	6645 Hopkins Rd, MENTOR	X					L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor FD #1	6929 Heisley Rd., MENTOR	X					L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor FD #2	5025 Corduroy Rd., MENTOR	X					L	L	L	M	L	L	L	L	L	M	L	L	M

Mentor Asset Inventory

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Mentor FD #3	7957 Mentor Ave., MENTOR	X					L	L	L	M	L	H	L	L	L	L	L	L	M
Mentor FD #4	6900 Reynolds Rd., MENTOR	X					L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor FD #5	8467 Civic Ctr Dr, MENTOR	X					L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor Fire Museum	7262 Jackson St., MENTOR					X	L	L	L	M	L	L	L	L	L	L	L	L	L
Mentor HS	6477 Center St, MENTOR		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Mentor Ice Arena	8600 Munson Rd., MENTOR			X			L	L	L	M	L	L	L	L	L	L	L	L	L
Mentor Lagoons Marina	8365 Harbor Dr., MENTOR			X			L	L	M	M	L	M	L	L	L	L	L	L	L
Mentor PD/ Court	8500 Civic Ctr Dr, MENTOR	X					L	L	L	M	L	L	L	L	L	L	M	L	M
Mentor PO	8600 Tyler Blvd, MENTOR				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Mentor Public Library-Main	8215 Mentor Ave, MENTOR				X		L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor Public Library	4669 Corduroy Rd, MENTOR				X		L	L	L	M	L	L	L	L	L	M	L	L	M
Mentor Senior Citizens Center	8484 Munson Rd., MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
Mentor Senior Emeritus	7900 Center St, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Mentor Village Hall	8383 Mentor Ave, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Mentor Village School	7482 Center St, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Mentor Woods Nursing Home	8881 Schaefer St, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Morton Park	9325 Rosemary, MENTOR				X		L	L	L	M	L	L	L	L	L	L	L	L	M
Orchard Hollow ES	8700 Hendricks Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Parker Place	7960 Center St, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L

Mentor Asset Inventory

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Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Rice ES	7640 Lake Shore Blvd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Ridge MS	7860 Johnnycake Ridge Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	L
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Salida Woods	7685 Lake Shore Blvd, MENTOR		X				L	L	L	L	L	L	L	L	L	L	L	L	L
Sawyer-Wayside House	9470 Mentor Ave, MENTOR					X	L	L	L	L	L	L	L	L	L	L	L	L	L
Shore MS	5670 Hopkins Rd, MENTOR		X				L	L	L	M	L	L	L	L	L	L	L	L	M
STERIS Corp.	5960 Heisly Rd, MENTOR			X			L	L	L	M	L	L	H	L	L	L	H	L	M
Sterling Morton ES	9292 Jordan Dr, MENTOR		X				L	L	L	M	L	L	L	L	L	M	L	L	L
Tri-County Amb. Service	7000 Spinach Dr, MENTOR	X					L	L	L	M	L	L	L	L	L	L	H	L	M
University Hospitals Mentor Health Center	9000 Mentor Ave, MENTOR	X					L	L	L	M	L	L	H	L	L	L	L	L	M
Wildwood Cultural Center	7645 Little Mountain Rd., MENTOR			X		X	L	L	L	M	L	L	L	L	L	L	L	L	M

Mentor-on-the-Lake Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Aqua Ohio Water Plant	7748 Twilight Dr, MENTOR ON LAKE	X					M	L	L	M	L	M	M	L	L	M	M	M	M
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Lake ES	7625 Pinehurst Dr, MENTOR ON LAKE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Mentor-on-the-Lake FD	5860 Andrews Rd, MENTOR ON LAKE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Mentor-on-the-Lake PD	5860 Andrews Rd, MENTOR ON LAKE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Mentor-on-the-Lake Service Dept.	5860 Andrews Rd, MENTOR ON LAKE				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

North Perry Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Perry Nuclear Power Plant	NORTH PERRY	X					M	L	L	M	L	L	H	L	L	L	H	H	M
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

Painesville Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Chestnut ES	339 Chestnut St, PAINESVILLE		X				L	L	L	M	M	L	L	L	L	M	H	M	M
Elm Street ES	565 Elm St, PAINESVILLE		X				L	L	L	M	M	L	L	M	L	M	H	M	M
Harvey HS	200 W Walnut Ave, PAINESVILLE		X				L	L	L	M	M	L	L	L	L	M	H	M	M
Heritage MS	135 Cedarbrook Dr, PAINESVILLE		X				L	L	L	M	M	L	L	M	L	M	H	M	M
Homestead I Healthcare Center	164 Liberty St, PAINESVILLE		X				L	L	L	M	M	L	L	M	L	L	H	L	M
Homestead II Healthcare Center	60 Wood St, PAINESVILLE		X				L	L	L	M	M	L	L	M	L	L	H	L	M
Ivy House Care Center	308 S State St, PAINESVILLE		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Lake County Courthouse	105 Main St, PAINESVILLE	X					L	L	L	M	M	L	L	L	L	M	H	M	M
Lake County Jail	104 E Erie St, PAINESVILLE	X					L	L	L	M	M	L	L	L	L	M	H	M	M
Lake Erie College	391 W Washington St, PAINESVILLE				X	X	L	L	L	M	M	L	L	L	L	M	H	M	M
Lake Erie College Stadium	301 Latimore St, PAINESVILLE				X		L	L	L	H	L	L	L	L	L	L	H	L	M
Lake Medical Nursing & Rehab Center	70 Normandy Dr, PAINESVILLE	X					L	L	L	M	M	L	L	M	L	L	H	L	M
Lewis Morley House	231 N State St, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M
Lutz's Tavern	792 Mentor Ave, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M
Maple ES	560 W. Jackson St, PAINESVILLE		X				L	L	L	M	M	L	L	M	L	M	H	M	M
Matthews House	309 W Washington St, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M

Painesville Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Methodist Episcopal Church of Painesville	71 N Park Pl, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M
Painesville Cemetery Dept.	501 E. Main St, PAINESVILLE				X		L	L	M	M	L	L	L	L	M	M	M	L	M
Painesville City FD	28 Mentor Ave, PAINESVILLE	X					L	L	L	M	L	L	L	L	L	M	H	L	M
Painesville City Hall	7 Richmond St, PAINESVILLE	X				X	L	L	L	M	L	L	L	L	L	M	H	M	M
Painesville Electric Dept.	459 Storrs St, PAINESVILLE	X					L	L	L	L	L	L	L	L	L	M	H	L	M
Painesville Engineering/ Bldg. Dept.	66 Mentor Ave, PAINESVILLE	X					L	L	L	L	L	L	L	L	L	M	H	L	M
Painesville Municipal Court	7 Richmond St, PAINESVILLE	X					L	L	L	M	L	L	L	L	L	M	H	M	M
Painesville PD	28 Mentor Ave, PAINESVILLE	X					L	L	L	M	L	L	L	L	L	M	H	L	M
Painesville PO	215 E Jackson St, PAINESVILLE				X		L	L	L	M	L	L	L	L	L	M	H	L	M
Painesville Power Plant	325 Richmond St, PAINESVILLE	X					L	L	L	M	M	L	M	L	L	M	H	M	M
Painesville Public/ Morley Library	184 Phelps St, PAINESVILLE				X		L	L	L	M	L	L	L	L	L	M	H	L	M
Painesville Public Works Dept.	459 Storrs St, PAINESVILLE	X					L	L	L	L	L	L	L	L	L	M	H	L	M
Painesville Recreation Dept.	54 Mentor Ave, PAINESVILLE				X		L	L	L	L	L	L	L	L	L	M	H	L	M
Painesville Warehouse	459 Storrs St, PAINESVILLE				X		L	L	L	L	L	L	L	L	L	M	H	L	M
Painesville Water Dept.	459 Storrs St, PAINESVILLE	X					L	L	L	L	L	L	L	L	L	M	H	L	M
Painesville Water Plant	9565 Headlands Rd, PAINESVILLE	X					L	L	M	M	L	M	M	L	L	M	M	M	M
Painesville Water Pollution Control Plant	1170 N. State St, PAINESVILLE	X					L	L	M	M	L	M	M	L	L	M	M	L	M

Painesville Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Painesville Water Service	7 Richmond St, PAINESVILLE	X					L	L	L	M	L	L	M	L	L	M	H	M	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Red Raider Pre-School	350 Cedarbrook Dr, PAINESVILLE		X				L	L	L	M	M	L	L	L	L	M	H	L	M
Residential	N/A				X		M	M	L	M	M	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Smead House	187 Mentor Ave, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M
St. James Episcopal Church	141 N State St, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M
Starkey Place Assisted Living	270 Mentor Ave, PAINESVILLE		X				L	L	L	M	L	L	L	M	L	L	H	L	M
State Highway Patrol	2736 N Ridge Rd, PAINESVILLE	X					L	L	L	M	L	L	L	L	L	M	H	L	M
Uri Seeley House	969 Riverside Dr, PAINESVILLE					X	L	L	L	M	L	L	L	L	L	M	H	L	M
YMCA	933 Mentor Ave, PAINESVILLE				X		L	L	L	L	M	L	L	M	L	M	H	L	L

Perry Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Center Rd. WWTP	PERRY	X					L	L	L	M	L	L	M	L	L	L	H	M	M
Center Road ES	1 Learning Ln, PERRY		X				L	L	L	M	L	L	M	L	L	L	H	L	M
Lucius Green House	4160 Main St, PERRY					X	L	L	L	M	L	L	M	L	L	L	H	L	M
New Avenues to Independence	5051 S Ridge Rd, PERRY		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Perry ES	1 Learning Ln, PERRY		X				L	L	L	M	L	L	M	L	L	L	H	L	M
Perry FD St. 1	3870 S Ridge Rd, PERRY	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Perry HS	1 Success Blvd, PERRY		X				L	L	L	M	L	L	M	L	L	L	H	L	M
Perry MS	2 Learning Ln, PERRY		X				L	L	L	M	L	L	M	L	L	L	H	L	M
Perry PO	3754 Center Rd, PERRY				X		L	L	L	M	L	L	M	L	L	L	H	L	M
Perry Public Library	3753 Main St, PERRY				X		L	L	L	M	L	L	M	L	L	L	H	L	M
Perry Senior Center	3200 Narrows Rd, PERRY		X				H	L	L	M	L	L	M	L	L	L	H	L	M
Perry Town Hall	3759 Center Rd, PERRY	X					L	L	L	M	L	L	M	L	L	L	H	M	M
Perry Twp. Town Hall	3740 Center Rd, PERRY				X		L	L	L	M	L	L	M	L	L	L	H	L	M
Perry Village Road Garage	3850 Center Rd, PERRY				X		L	L	L	M	L	L	M	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M

Perry Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Tarback Education/Community Ctr.	4325 Manchester Ave, PERRY				X		L	L	L	M	L	L	M	L	L	L	H	L	M

Timberlake Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	H	M	M	L	L	M	M	M	L
Village of Timberlake	TIMBERLAKE	X					L	L	L	M	M	L	L	L	L	L	H	M	M

Waite Hill Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Village of Waite Hill	7215 Eagle Mills Rd, WAITE HILL	X					L	L	L	M	L	L	L	L	L	L	H	M	M
Waite Hill PD	7215 Eagle Mills Rd, WAITE HILL	X					L	L	L	M	L	L	L	L	L	L	H	L	M

Wickliffe Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
ABB, Inc.	29801 Euclid Ave, WICKLIFFE			X			L	L	L	M	L	L	H	L	L	L	H	L	M
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Harry Coulby Mansion	WICKLIFFE					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Lubrizol	29400 Lakeland Blvd, WICKLIFFE			X			L	L	L	M	L	L	H	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Wickliffe-Coulby Service Facility	28730 Ridge Rd, WICKLIFFE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe Country Place	1919 Bishop Rd, WICKLIFFE		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Wickliffe ES	1821 Lincoln Rd, WICKLIFFE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe FD	29885 Euclid Ave, WICKLIFFE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe HS	2221 Rockefeller Rd, WICKLIFFE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe- Lakeland Service Facility	30020 Lakeland Blvd, WICKLIFFE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe MS	28240 Euclid Ave, WICKLIFFE		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe PD	28730 Ridge Rd, WICKLIFFE	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe PO	1400 Lloyd Rd, WICKLIFFE				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe Public Library	1713 Lincoln Rd, WICKLIFFE				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Wickliffe Senior Center	900 Worden Rd, WICKLIFFE		X				L	L	L	M	L	L	L	L	L	L	H	L	M

Willoughby Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Abbots Manor	34251 Ridge Rd, WILLOUGHBY		X				L	L	L	M	M	L	L	M	L	L	M	L	M
Amerigas	37401 Stevens Blvd, WILLOUGHBY			X			L	L	L	M	L	L	M	L	L	L	M	L	M
Andrews Osborne Academy	38588 Mentor Ave, WILLOUGHBY		X				L	L	L	M	M	L	L	M	L	L	M	L	M
Breckenridge Village	36500 Euclid Ave, WILLOUGHBY		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Brookdale of Willoughby	35300 Kaiser Ct, WILLOUGHBY		X				L	L	L	M	M	L	L	M	L	L	M	L	M
City of Willoughby	1 Public Sq, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	H	L	M
DTW District	4012-4148 Erie St, WILLOUGHBY					X	L	L	L	M	M	L	L	L	L	L	M	L	M
Edison ES	5288 Karen Isle Dr, WILLOUGHBY		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Grant ES	38281 Hurricane Dr, WILLOUGHBY		X				L	L	L	M	L	L	L	L	L	L	H	L	M
HCR Manor Care of Willoughby	37603 Euclid Ave, WILLOUGHBY		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Industrial Training Center	34041 Stevens Blvd, WILLOUGHBY				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Kalcor	37721 Stevens, WILLOUGHBY			X			L	L	L	M	L	L	M	L	L	L	M	L	M
Lake County Utilities - Water	38270 Aquarius Pkwy, WILLOUGHBY	X					L	L	L	M	L	M	M	L	L	L	L	M	L
Lake County Water Plant	34770 Ridge Rd, WILLOUGHBY	X					L	L	L	M	L	L	M	L	L	L	M	M	M
Lake West Medical Center	36100 Euclid Ave, WILLOUGHBY	X					L	L	L	M	L	L	M	M	L	L	H	M	M
Lost Nation Airport	38550 Jet Center, WILLOUGHBY				X		L	L	L	H	L	L	M	L	L	L	M	M	L

Willoughby Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Smart Building	4143-4145 Erie St, WILLOUGHBY					X	L	L	L	M	L	L	L	L	L	L	H	L	M
South HS	5000 Shankland Rd, WILLOUGHBY		X				L	L	L	M	L	L	L	L	L	L	H	L	M
UHHS Laurelwood	35900 Euclid Ave, WILLOUGHBY	X					L	L	L	M	L	L	H	M	L	L	H	M	M
Van Gorder Manor	37819 Euclid Ave, WILLOUGHBY		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Willo Medical Building	36001 Euclid Ave, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	M	L	M
Willoughby FD	37000 Euclid Ave, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby Fire Station #2	2080 Lost Nation Rd, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	M	L	M
Willoughby Library	30 Public Sq, WILLOUGHBY				X		L	L	L	M	L	L	L	L	L	L	M	L	M
Willoughby MS	36901 Ridge Rd, WILLOUGHBY		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby Municipal Court	4000 Erie St, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	H	M	M
Willoughby PD	36700 Euclid Ave, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby PO	4040 Erie St, WILLOUGHBY				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby Iron & Waste	3884 Church St, WILLOUGHBY	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby-Eastlake Technical Center	25 Public Sq, WILLOUGHBY				X		L	L	L	M	L	L	L	L	L	L	H	L	M

Willoughby Hills Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Louis A. Penfield House	2203 River Rd, WILLOUGHBY HILLS					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Willoughby Hills City Hall	35405 Chardon Rd, WILLOUGHBY HILLS	X					L	L	L	M	L	L	L	L	L	L	H	M	M
Willoughby Hills Community Ctr.	35400 Chardon Rd, WILLOUGHBY HILLS				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby Hills FD	35405 Chardon Rd, WILLOUGHBY HILLS	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willoughby Hills PD	35405 Chardon Rd, WILLOUGHBY HILLS	X					L	L	L	M	L	L	L	L	L	L	H	L	M

Willowick Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Claud Foster House	30333 Lake Shore Blvd, WILLOWICK					X	H	L	L	M	L	L	L	L	L	L	H	L	M
Lake Health Medical Center	29804 Lake Shore Blvd, WILLOWICK	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Royalview ES	31500 Royalview Dr, WILLOWICK		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick City Hall/PD	30435 Lake Shore Blvd, WILLOWICK	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick Community Center (EOC)	321 East 314 St, WILLOWICK	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick FD	30435 Lake Shore Blvd, WILLOWICK	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick MS	31500 Royalview Dr, WILLOWICK		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick PO	260 E 312th St, WILLOWICK				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick Public Library	263 E 305th St, WILLOWICK				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick Service Department	31230 Vine St, WILLOWICK	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Willowick Service Dept. Garage	31230 Vine St, WILLOWICK	X					L	L	L	M	L	L	L	L	L	L	H	L	M

Concord Township Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Altercare of Mentor Center	9901 Johnnycake Ridge Rd, CONCORD TWP		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Auburn Vocational	8140 Auburn Rd, CONCORD TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Concord Air Park	12361 Concord Hambden Rd, CONCORD TWP				X		L	L	L	H	L	L	M	L	L	L	M	M	L
Concord Twp Service Dept.	7229 Ravenna Rd, CONCORD TWP				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Concord Twp. Community Ctr.	7671 Auburn Rd, CONCORD TWP				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Concord Twp. FD	10154 Prouty Rd, CONCORD TWP	X					L	L	L	M	L	L	M	L	L	L	H	L	M
Concord Twp. Town Hall	7229 Ravenna Rd, CONCORD TWP				X		L	L	L	M	L	L	L	L	L	L	H	L	M
Hartley Manor Assisted Living	10171 Johnnycake Ridge Rd, CONCORD TWP		X				L	L	L	M	L	L	L	M	L	L	H	L	M
Henry F. Lamuth MS	6700 Auburn Rd, CONCORD TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Melridge ES	6689 Melridge Dr, CONCORD TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Pine Hill Country Care	7301 Ravenna Rd, CONCORD TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Precious Care Assisted Living	8095 Auburn Rd, CONCORD TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L
Tri-Pointe Hospital	7590 Auburn Rd, CONCORD TWP	X					L	L	L	M	L	L	H	M	L	L	H	M	M

Leroy Township Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hail	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	L	M	L	L	L	M	M	L
Indian Point Fort	13165 Seeley Rd, LEROY TWP					X	L	L	L	M	L	L	L	L	L	L	L	H	L	M
Leroy ES	13613 Painesville Warren Rd, LEROY TWP		X				L	L	L	M	L	L	L	L	L	L	L	H	L	M
Leroy FD	13028 Leroy Ctr Rd, LEROY TWP	X					L	L	L	M	L	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	L	M	L	L	M	M	M	L
South Leroy Meetinghouse	SR 86 and Brakeman Rd, LEROY TWP					X	L	L	L	M	L	L	L	L	L	L	L	H	L	M

Madison Township Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hail	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	L	M	L	L	L	M	M	L
Brittany House	7367 Middle Ridge Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	M	L	L	H	L	M
Broadfield Manor Nursing & Convalescent Home	7927 Middle Ridge Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	M	L	L	H	L	M
Cozy Acres	2824 Haines Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	M	L	L	H	L	M
Hubbard Road Meadows	2358 Hubbard Rd, MADISON TWP				X		L	L	L	M	L	L	L	L	M	L	L	H	L	M
Inn-Madison Healthcare	7600 S Ridge Rd, MADISON TWP	X					L	L	L	M	L	L	L	L	M	L	L	H	L	M
Judge Abraham Tappan House	7855 S Ridge Rd, MADISON TWP					X	L	L	L	M	L	L	L	L	L	L	L	H	L	M
Madison Healthcare	7600 S Ridge Rd, MADISON TWP	X					L	L	L	M	L	L	L	L	M	L	L	H	L	M
Madison HS	3100 Burns Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	L	L	L	H	L	M
Madison MS	6079 Middle Ridge Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	L	L	L	H	L	M
Madison Pre-K	1956 Red Bird Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	L	L	L	H	L	M
Madison Seminary & Home	6769 Middle Ridge Rd, MADISON TWP					X	L	L	L	M	L	L	L	M	L	L	L	H	L	M
Madison Twp. Safety Ctr.	2065 Hubbard Rd, MADISON TWP	X					L	L	L	M	L	L	L	L	L	L	L	H	L	M
North ES	1941 Red Bird Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	L	L	L	H	L	M
Phoenix Residential Centers	1954 Hubbard Rd, MADISON TWP		X				L	L	L	M	L	L	L	L	M	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	L	M	L	L	M	M	M	L

Madison Township Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hail	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Stewart Lodge	7774 Warner Rd, MADISON TWP				X		L	L	L	M	L	L	L	L	L	L	L	H	L	M
Unionville District School	3480 West St, MADISON TWP					X	L	L	L	M	L	L	L	L	L	L	L	H	L	M
Unionville Tavern	SR 84 & Countyline Rd, MADISON TWP					X	L	L	L	M	L	L	L	L	L	L	L	H	L	M

Painesville Township Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Buckeye ES	175 Buckeye Rd, PAINESVILLE TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Clyde C. Hadden ES	1800 Mentor Ave, PAINESVILLE TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Hale Road ES	56 Hale Rd, PAINESVILLE TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Lake County Utilities - Water	1845 Lake Rd, PAINESVILLE TWP	X					L	L	L	L	L	M	M	L	L	L	L	M	L
Madison Ave ES	845 Madison Ave, PAINESVILLE TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Painesville Twp. FD St. 1	55 Nye Rd, PAINESVILLE TWP	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Painesville Twp. FD St. 2	141 Bowhall Rd, PAINESVILLE TWP	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Painesville Twp. FD St. 3	550 Hardy Rd, PAINESVILLE TWP	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Riverside Jr. Williams HS	585 Riverside Dr, PAINESVILLE TWP		X				L	L	L	M	L	L	L	L	L	L	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

Perry Township Asset Inventory

Name or Description of Asset	Address and Jurisdictional Location	Critical Facility	Vulnerable Populations	Economic Assets	Special Considerations	Historic/Other Considerations	Coastal Erosion	Dam Failure	Drought	Earthquake	Fire	Flooding	Hazmat Incident	Infectious Disease	Infestation	Land Subsidence	Severe Weather	Terrorism	Winter Storm
Bridges	N/A				X		L	L	L	H	L	H	M	L	L	L	M	M	L
Ladd's Tavern	5466 S Ridge Rd, PERRY TWP					X	L	L	L	M	L	L	L	L	L	L	H	L	M
Perry Twp. FD St. 1	3742 Center Rd, PERRY TWP	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Perry Twp. FD St. 2	3870 S Ridge Rd, PERRY TWP	X					L	L	L	M	L	L	L	L	L	L	H	L	M
Railroads	N/A				X		L	L	L	H	L	L	M	L	L	M	M	M	L
Residential	N/A				X		M	M	L	M	L	M	M	L	L	M	H	L	M
Roads	N/A				X		M	L	L	H	L	M	M	L	L	M	M	M	L

2.4 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.

Lake County is located in northeastern Ohio and is bordered by Lake Erie to the north, Ashtabula County to the east, Geauga and Cuyahoga Counties to the south, and Cuyahoga County to the west. Painesville, the county seat, is currently the fourth most-populated of the municipalities in Lake County following Mentor, Willoughby, and Eastlake.

In the past, Lake County has been the home of several small businesses and a mix of larger commercial operations and industry. During the recent history of the county, these businesses have changed. For example, companies are bought and sold; old companies close, leaving empty facilities behind that are filled by new companies; etc. Other land uses in Lake County generally conform to the following:

- **Agricultural:** Covers approximately 34,000 acres in the county. Agricultural areas are spread throughout the county; however, the majority are located in the southern and southeastern portions of the county. According to the 2012 Census of Agriculture, Lake County contains 214 farms.
- **Commercial:** The majority of the commercial areas can be found in and near the incorporated areas of the county, primarily on the western side of the county. Generally, commercial areas can be found along Interstate 90.
- **Industrial:** Located in the central and western portions of the county, primarily between Interstate 90 and the railroad tracks.
- **Residential:** Located primarily in the western portion of the county and elsewhere along major roadways. The Village of Madison is the “residential anchor” of eastern Lake County.
- **Specialized Land Use Designation(s):** The most unique feature in Lake County is its 31 miles of shoreline along Lake Erie. Other specialized land uses include the following:
 - Headlands State Park
 - Fairport Harbor Beach
 - Chagrin River Harbor
 - Hack-Otis State Nature Preserve

- Mentor Marsh
- Lake Erie College Equestrian Center and Morley Farm
- North Chagrin Reservation and Squire's Castle
- Holden Arboretum
- Indian Museum of Lake County
- Marine Museum and Lighthouse
- "Lawnfield", President James A. Garfield's home
- Classic Park, home of the Lake County Captains baseball team

Two major rivers flow through Lake County providing harbors and marinas for light shipping and recreational opportunities. A number of large national and regional companies call Lake County home and have their headquarters in the county. International business is also significant because of the access to the St. Lawrence Seaway and Hopkins International Airport. Lake County is located within 20 miles of the metro area of Cleveland.

The major employers in the county include ABB, Inc.; Avery Dennison Corporation; First Energy Corp; Lake County Government; Lake Hospital System; Lincoln Electric Holding, Inc.; Lubrizol Corporation; Mentor Exempted Village Schools; STERIS Corporation; and Willoughby-Eastlake City Board of Education.

Planned Developments in Lake County (2016 – 2020)	
<i>Jurisdiction</i>	<i>Description</i>
Concord Township	Planned growth of the grist mill
	New drug store (Discount Drug Mart)
	Commercial (with some residential) development near Tri Pointe
	Residential: 15 active subdivisions with 255 sub-plots
Madison Village / Township	Commercial development near Route 528 and I-90
	Planned new hotel near Route 528 and I-90
	Sidley Industrial Park
	Industrial plant along Route 528
Mentor	Newell Creek Project – 360 acres office/retail development near Route 615 and I-90 (acreage includes residential development referenced above)
	16-acre commercial development at SR 2 and SR 615
	47-house, 25-acre residential development on Maple Street
Mentor-on-the-Lake	Lakeside Plaza
Painesville	66-acre office/industrial development
	840,000 sq. ft. commercial development
	200,000 sq. ft. mixed use development
	100 condos near Route 303

Planned Developments in Lake County (2016 – 2020)	
<i>Jurisdiction</i>	<i>Description</i>
Perry Township	Lane Road Industrial Park (Lake Metroparks purchased 340 acres of the industrial park) 130-acre industrial development at CEI property
Willoughby	Andrews Development – 25 acres of mixed use development Osborne Park – 100 acres of commercial and 85 acres of industrial development New residential development off 91
Willowick	Larimar Lakeside – Gated community with 200 homes (some in multi-family units four to six stories tall) Shoreland Crossings residential development

Lake County Planning and Community Development is also extensively involved in comprehensive land use planning throughout Lake County. Lake County Planning and Community Development is helping Painesville Township and Leroy Township with their comprehensive plans. They are also currently working on a retail trade survey for Lake County. In general, the table below lists land uses in some of the municipal areas of the county.

Land Use in Lake County	
<i>Jurisdiction</i>	<i>Description of Land Use</i>
Eastlake	- Primary industrial sites are along Curtis Boulevard and Vine Street. - Industrial zones in southern portion of city. - Marine zones in northern portion of city near the confluence of the Chagrin River and Lake Erie. - Residential zones in the central and northern portions of the city.
Kirtland	- Limited industrial and institutional/office zones in the northern portions of city. - Retail zones primarily along SR 306. - The historic town center is located along SR 306 in northern portion of city (just below industrial/office zones).
Madison	- Industrial zones along SR 528, north of the railroad tracks and along the east side of SR 528, south of SR 307. - Commercial and business zones along Interstate 90. - Business zones in downtown. - Business zones along Middle Ridge in northern portions of the village.
Mentor	- Commercial development occurs primarily at the interchanges of SR 2 and along the Mentor Avenue (US 20) corridor. - Industrial development occurs between SR 2 and the railroad tracks. - Marine recreational development occurs in the northern portions of the city.

Land Use in Lake County	
<i>Jurisdiction</i>	<i>Description of Land Use</i>
Painesville	- Industrial zones in the central from the western corporation line to South State along the CSX railroad tracks. - Industrial zone located from Liberty Street to the eastern corporation line along the NS Railroad tracks and on the east side of SR 44 along Renaissance Parkway. - Business and commercial zones along Richmond Street, State Street, St. Clair Street, Erie Street in the central portion of the city. This includes Downtown Painesville. - There are small pockets of commercial through city, located on Mentor Avenue, Chestnut Street, Walnut Street and Chester Street to name a few.
Wickliffe	- Industrial uses are located between SR 2 and the CSX and NS Railroad tracks. - Commercial uses are located along Euclid Avenue (US 20). - Residential uses north SR 2 and south of US 20.
Willoughby	- Airport in the northern part of the city. - Light industrial zone near SR 91 and US 20, west of the downtown and west of the airport. - Residential zone near downtown. - Numerous residential zones on North End of city. - General business and retail zones along SR 283 in North End of city.
Willowick	Commercial development along northern side of US 20, along East 305th Street, along Lake Shore Boulevard. and along Vine Street.

Many communities are working on zoning issues that will both benefit development and serve a mitigative purpose. For example, Willoughby has developed a lakefront zoning district that would allow for new residential and commercial uses along Lake Shore Boulevard and Lost Nation Road. Willowick has also completed a lakefront overlay zone. Fairport Harbor has created mixed-use water front district of its own.

Projects along the county's lakefront are likely to continue. In 2009, the Lake County Planning Commission, Lake County Soil and Water Conservation District, and Lake County Storm Water Management Department were awarded a grant to examine land use, zoning, and development and conservation issues on a watershed basis as opposed to individual community borders. The study, which is referred to as the "Eastern Lake County Coastal Tributaries Watershed", was adopted in 2011. It covers approximately 19,000 acres within portions of Fairport Harbor, Painesville Township, Perry Township, Perry Village, North Perry, and Madison Township. The project identified conceptual priority development areas, conservation areas, and agricultural areas.

3.0 LOCAL HAZARD MITIGATION GOALS

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

The core planning committee determined several goals and objectives to mitigate the hazard risks identified in the hazard identification and risk assessment. These mitigation actions were developed based on projects thought to be most feasible and beneficial to hazard reduction.

Goals and objectives are only listed in this section as a “quick reference guide” for users of the plan. These goals and objectives generally guide the development of more specific strategies related to hazard mitigation. Strategies – which are specific mitigation projects – are organized both by hazard and jurisdiction and are listed in Section 4.0.

LAKE COUNTY

Goal 1: Eliminate or lessen significant coastal erosion in Lake County.

Objective 1.1: Reduce the probability of significant structural damage due to erosion and flooding as a direct result of coastal erosion.

Goal 2: Reduce the potential for dam failures in Lake County.

Objective 2.1: Reduce the probability of significant flood damage as a result of a dam failure.

Goal 3: Protect Lake County’s agricultural assets from the negative effects of drought.

Objective 3.1: Increase public awareness as to the agricultural effects of drought as well as the ramifications to the public water supply.

Objective 3.2: Develop methods for the procurement of an emergency water supply.

Goal 4: Reduce the potential effects of earthquakes in Lake County.

Objective: 4.1: Educate the public as to the potential for earthquakes in Ohio, specifically Lake County.

Objective: 4.2: Increase the public's knowledge of steps they can take to prepare for a potential earthquake.

Goal 5: Protect Lake County's population from an infectious disease.

Objective 5.1: Increase public awareness and knowledge after an epidemic or pandemic has been declared.

Objective 5.2: Work with the LCGHD to control infectious diseases.

Goal 6: Reduce the negative effects of flooding in Lake County.

Objective 6.1: Lessen flood damage by preserving the natural course of waterways.

Objective 6.2: Increase coordination among pertinent individuals/groups to mitigate flood hazards.

Objective 6.3: Develop, implement, or strengthen regulatory requirements to lessen flood damage.

Objective 6.4: Reduce flood damage by undertaking structural projects.

Goal 7: Protect Lake County's population and assets from an infestation.

Objective: 7.1: Increase public awareness and knowledge after an infestation has been discovered.

Goal 8: Lessen the effects of land subsidence in Lake County.

Objective 8.1: Assess the feasibility of undertaking reclamation projects.

Goal 9: Reduce damage from various weather events in Lake County.

Objective: 9.1: Increase public awareness that severe weather (e.g., hail, thunderstorms, high winds, and/or tornados) is imminent.

Objective 9.2: Minimize future damage from severe weather throughout Lake County by encouraging hazard-resistant construction practices.

Objective 9.3: Increase public knowledge of what steps to take after a severe weather has occurred.

Objective 9.4: Conduct an inventory of available shelters within Lake County.

Goal 10: Reduce the effects of severe winter storms in Lake County.

Objective 10.1: Minimize future damage from severe winter storms throughout Lake County by encouraging hazard-resistant construction practices.

Objective 10.2: Establish heating centers or shelters for vulnerable populations and stranded motorists.

Goal 11: Protect Lake County's population and forests/marshes from fires.

Objective 11.1: Educate the public on how to avoid starting fires.

Objective 11.2: Reduce the potential for wildfires by limiting the time periods during which burning is permitted to take place.

Goal 12: Protect the general public and the environment of Lake County from hazardous material incidents.

Objective 12.1: Study and evaluate transportation systems for problems that could lead to hazardous materials spills and other incidents.

Objective 12.2: Increase hazardous materials response capabilities throughout the county.

Goal 13: Protect the general public of Lake County from terrorist events.

Objective 13.1: Increase countywide preparedness for terrorist incidents.

Objective 13.2: Enact response programs to cope with terrorist incidents should they occur.

Goal 14: Reduce or eliminate the negative effects of various other hazards in Lake County.

Objective 14.1: Enhance or upgrade the existing communications system of Lake County.

Objective 14.2: Develop means to ensure safe traffic flow during emergency situations.

Objective 14.3: Determine the location and number of available facilities that could be used as shelter sites during emergency situations.

EASTLAKE CITY

Goal: Reduce the effects of secondary hazards stemming from primary events.

Objective 1: Provide for uninterrupted electrical power throughout the City of Eastlake.

FAIRPORT HARBOR VILLAGE

Goal (FH) 1: Reduce significant coastal erosion in the Village of Fairport Harbor.

Objective (FH) 1: Reduce the probability of significant structural damage due to erosion and flooding as a direct result of coastal erosion.

Goal (FH) 2: Protect critical facilities throughout the village.

Objective (FH) 2: Ensure the continuity of operations at critical facilities throughout the village.

GRAND RIVER VILLAGE

Goal: Reduce the negative effects of flooding in Grand River Village.

Objective 1: Encourage participation in the Community Rating System (CRS) to reduce flood insurance rates.

KIRTLAND CITY

Goal: Lessen the negative effects of the hazards that could impact Kirtland.

Objective 1: Install a countywide storm warning system and provide training to a group of individuals to operate the system.

Objective 2: Increase preparedness for a variety of hazards.

KIRTLAND HILLS VILLAGE

Goal: Reduce the negative effects of severe winter storms in the Village of Kirtland Hills.

Objective 1: Increase public awareness as to the types of hazards associated with severe winter weather.

LAKELINE VILLAGE

Goal: Reduce the negative effects of winter storms in the Village of Lakeline.

Objective 1: Reduce the impact of blowing and drifting snow in the Village of Lakeline.

MADISON VILLAGE

Goal: Reduce the negative effects of severe weather in Madison Village.

Objective 1: Increase public awareness of the types of hazards associated with severe thunderstorms and actions the public can take to safeguard against those hazards.

Objective 2: Ensure the continuity of operations at critical facilities throughout the village.

MENTOR CITY

Goal (M) 1: Reduce the potential for fires in Mentor City.

Objective (M) 1: Regulate open burning in or near the Mentor Marsh.

Objective (M) 2: Increase public awareness of fire safety.

Goal (M) 2: Strengthen the resilience of critical facilities to a variety of hazards in Mentor City.

Objective (M) 3: Ensure a business continuity capability for critical facilities.

Goal (M) 3: Participate in hazard mitigation and emergency preparedness with other jurisdictions in Lake County.

Objective (M) 4: Participate, as appropriate, with other jurisdictions in the county to enhance public outreach projects.

MENTOR-ON-THE-LAKE CITY

Goal: Protect the general public and the environment of Lake County from hazardous material incidents.

Objective 1: Increase preparedness for a variety of hazards.

NORTH PERRY VILLAGE

Goal: Reduce the negative effects of flooding in North Perry Village.

Objective 1: Increase public awareness of the flooding hazard throughout the village.

PAINESVILLE CITY

Goal: Reduce the negative effects of multiple hazards throughout Painesville.

Objective 1: Provide early warning to the public that a hazard is imminent.

Objective 2: Reduce flood damage by undertaking structural projects.

PERRY VILLAGE

Goal (P) 1: Reduce the negative effects of flooding in Perry Village.

Objective (P) 1: Lessen flood damage by preserving the natural course of waterways.

Objective (P) 2: Strengthen business continuity at critical facilities during all hazards, including flooding events.

Goal (P) 2: Enhance radio systems, both countywide and in Perry.

Objective (P) 3: Ensure interoperable communications for the fire and police departments of Perry Village.

TIMBERLAKE VILLAGE

Goal: Protect the general public from a variety of hazards in Timberlake.

Objective 1: Increase preparedness for a variety of hazards.

WAITE HILL VILLAGE

Goal: Ensure a capability to respond to natural disasters.

Objective 1: Ensure that first responders are prepared to respond to the types of disasters that Waite Hill may experience.

WICKLIFFE CITY

Goal: Reduce the negative effects of various natural hazards in the City of Wickliffe.

Objective 1: Reduce damage associated with flooding from the storm water system.

Objective 2: Mitigation infestation problems through the removal of affected trees and other foliage.

WILLOUGHBY CITY

Goal: Reduce the negative effects of the hazards that could impact the city.

Objective 1: Encourage participation in the CRS to reduce flood insurance rates.

Objective 2: Ensure the continuity of critical facilities throughout the city.

Objective 3: Reduce flood damage throughout the city.

Objective 4: Strengthen notification and warning capabilities through Willoughby.

WILLOUGHBY HILLS CITY

Goal (WH) 1: Reduce the negative effects of severe winter storms in Willoughby Hills.

Objective (WH) 1: Increase the public of Willoughby Hills' awareness of the hazards associated with severe winter weather.

Objective (WH) 2: Provide for uninterrupted electrical power throughout the Village of Willoughby Hills.

Goal (WH) 2: Protect Willoughby Hills' population and assets from flooding.

Objective (WH) 3: Provide, to the extent possible, early warning of flooding events.

WILLOWICK CITY

Goal: Protect Willowick's population and assets from flooding.

Objective 1: Ensure responsible development so that continued growth does not add to the flooding hazard.

CONCORD TOWNSHIP

Goal: Reduce the negative effects of hazards in Concord Township.

Objective 1: Increase public awareness as to the hazards that could be experienced in Concord Township.

Objective 2: Ensure preparedness for hazard resilience in the area near the TriPoint Hospital development.

LEROY TOWNSHIP

Goal: Reduce the negative effects of severe winter storms in Leroy Township.

Objective 1: Maintain safe road conditions on the highways that traverse Leroy Township during winter storms.

MADISON TOWNSHIP

Goal: Reduce the negative effects of flooding in Madison Township.

Objective 1: Lessen flood damage by preserving the natural course of waterways.

PAINESVILLE TOWNSHIP

Goal: Reduce the negative effects of flooding in Painesville Township.

Objective 1: Reduce the potential for injuries and loss of life as a result of flooding.

PERRY TOWNSHIP

Goal: Reduce the negative impacts of drought in Perry Township.

Objective 1: Increase public awareness as to the agricultural effects of drought as well as the ramifications to the public water supply.

4.0 PROJECT IMPLEMENTATION

§201.6(c)(3)(ii)	[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.
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§201.6(c)(3)(iii)	[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.
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This portion of the plan builds on the goals and objectives presented in Section 3.0. Each strategy below is listed with a timeframe, primary coordinator, support agencies, potential funding source (and cost estimate), and its current status. Strategies are also categorized by six different types of mitigation projects.

1. Prevention,
2. Property protection,
3. Natural resource protection,
4. Structural projects,
5. Emergency services, and
6. Public education and awareness.

It is important to note that the cost estimates are tentative and meant as a starting point for research on project feasibility. More specifically, these cost estimates are only ranges of probable project costs; all figures are approximations. At the time the implementation of any strategy is considered, a full cost estimate should be sought prior to securing funding. The benefit-cost review was emphasized in the prioritization process. Mitigation actions were evaluated by their pros and cons, which are represented as costs and benefits.

Project prioritization occurred in three phases. First, the core planning committee ranked the hazards considered by this plan, with “1” being the one to which they felt the county was most vulnerable. Second, the committee ranked the projects under each hazard by priority. Projects receiving a rank of “1” were considered to be the highest

priority project *for that particular hazard*. (A copy of the worksheet used to prioritize the hazards is included in Appendix 1.) Generally, there have been no changes in priorities. The plan validates information in the previously-approved mitigation plan. Finally, to generate a complete, prioritized project list, the prioritized list of projects corresponding to the highest ranked hazard (i.e., the one to which the committee felt the county was most vulnerable) was listed, followed by the prioritized list of projects corresponding to the second-highest ranked hazard, and so on.

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	1	Consider installing, re-routing, or increasing the capacity of existing storm drainage systems on an as-needed basis.	Jan. 1, 2016	Dec. 31, 2020	Lake County Storm Water Mgmt. Dept. Director	Structural Projects	Avg. \$281K	HMGP, CDBG, Local Funding
Status: The following projects have been COMPLETED: • Kellogg Creek Restoration (Concord Twp.) • Jordan Creek Bank Stabilization (Concord Twp.) • Viewmont Drive Improvement (Concord Twp.) • Melridge Drive Culvert Replacement (Concord Twp.) • Quail Hollow Ponds-Forebay Retrofits (Concord Twp.) • Oakridge Drive Dam Restoration (Concord Twp.) • Conley Road Culvert Replacement (Concord Twp.) • Riverwood Way Sedimentation Basin (Kirtland) • Oldsmar Drive Storm Improvement (Madison Twp.) • Bennet Road Storm Sewer Improvement (Madison Twp.) • North Watling Way/Bathgate Improvement (Madison Twp.) • Green Road Culvert Replacement (Madison Twp.) • Redbird Road Storm Improvements (Madison Twp.) • Andrews Road (Mentor-on-the-Lake) • Ivy Drive Storm Sewer Improvement (Mentor-on-the-Lake) • Barton Ditch Culvert Improvement (Painesville Twp.) • Wintergreen Hill Drive Outfall Improvement (Painesville Twp.) • Newell Street Culvert Replacement (Painesville Twp.) • Overlook Road Storm Sewer Improvement (Painesville Twp.) • Tiber Creek Drainage Study (Painesville Twp./City) • Center Park Estates Drainage Study (Painesville Twp.) • Maplegrove Slope Repair (Willoughby Hills) • Rosewood Drive Storm Improvement (Willoughby Hills) • East 322nd Street Outfall Improvement (Willowick) This project is listed as ON-GOING because the storm water management department currently has a roster of approximately 20 projects listed as 'active' or 'pending'.									
2	Flooding	2	Clean/drag creeks and streams, clearing log jams, trees and shrubs, and sediment bars.	Jan. 1, 2016	Dec. 31, 2020	Lake County Storm Water Mgmt. Dept. Director	Prevention	Up to \$50K	Local Funding
Status: ON-GOING. A division was created under the Lake County Commissioners to address storm water issues; this division coordinates stream cleaning projects throughout the county. Additionally, a number of community-based storm water departments have been formed. Most recently, a storm water assessment committee comprised of local zoning and building officials has been formed and meets regularly to assess needs, determine property owners that may need to be involved, etc.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
3	Flooding	3	Continue to enforce appropriate building codes.	Jan. 1, 2016	Dec. 31, 2020	Eastlake City Chief Bldg. Official, Mentor Bldg. Inspector, Mentor-on-the-Lake Director of Admin. & Finance, Painesville Chief Bldg. Official, Wickliffe Bldg. Commissioner, Willoughby Chief Bldg. & Zoning Inspector, Willoughby Hills Bldg. & Zoning Commissioner, Willowick Building Inspector, Lake County Building Dept. Director	Prevention	N/A	Local Funding. Enforcement is already a part of building dept. budgets.
Status: ON-GOING. Code enforcement is completed on a daily basis throughout Lake County. Additionally, the county's subdivision regulations have been revised to discourage building in the floodplain.									
4	Flooding	4	Consider the implementation of buy-out, elevation, and/or relocation projects.	Jan. 1, 2016	Dec. 31, 2020	Lake County Board of Commissioners	Structural Projects	Avg. \$128K	HMGP
Status: COMPLETED. However, this project was continued in the 2015 update. (Completed projects include the Millstone and Grist Mill projects near Painesville, in which 86 units were bought out, as well as Concord Township [four homes moved out the floodplain] and Mentor [involving five homes].)									
5	Severe Weather	1	Ensure that severe weather hazards are included in EPI campaigns.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Public Education & Awareness	Up to \$3,000	PDM, EMPG, Local Funding
Status: NEW. This project was added as part of the 2015 update since the committee consolidated weather hazards into a single listing.									
6	Severe Weather	2	Coordinate efforts with local media providers, the NWS, etc. to post advance warnings of severe weather.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Public Education & Awareness	N/A	NWS
Status: NEW. This project was added as part of the 2015 update since the committee consolidated weather hazards into a single listing.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
7	Severe Weather	3	Encourage the use of EAS on commercial radio, TV, and cable systems; encourage facilities housing vulnerable populations to purchase NOAA all-hazard radios.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Public Education & Awareness	N/A	NWS, NOAA
Status: NEW. This project was added as part of the 2015 update since the committee consolidated weather hazards into a single listing.									
8	Terrorism	1	Ensure that threat status and other terrorism preparedness information are included in on-going Emergency Public Information (EPI) campaigns.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Public Education & Awareness	Up to \$3,000	PDM, USDHS, Local Funding
Status: This project was COMPLETED as part of periodic EPI campaigns sponsored by the LCEMA and other emergency services organizations (e.g., regularly-updated websites, etc.). The committee elected to re-list this project with more general language to afford those sponsoring information campaigns greater flexibility.									
9	Hazardous Materials	1	Increase public education and awareness regarding hazardous materials incidents.	Jan. 1, 2016	Dec. 31, 2020	Lake County LEPC Information Coordinator	Public Education & Awareness	Up to \$5,000	Local Funding
Status: This project is COMPLETED annually by the LEPC. Additionally, the EMA was added during the 2015 update as a support agency because it maintains its website, which also includes preparedness information for the public. The HMC elected to re-list it to support the on-going efforts of the LEPC.									
10	Hazardous Materials	2	Assess the safety and effectiveness of the transportation network.	Jan. 1, 2016	Dec. 31, 2020	Lake County Engineer	Structural Projects	Range \$100,000 to \$1M+	ODOT, USDOT
Status: Several projects have been COMPLETED. For example, Willoughby is cleaning up the 91/20 interchange. There have been improvements to US 20 near the fairgrounds. Lanes have been added to Interstate 90. The intersection near Tri Point Hospital has been re-worked. Within the county, a partnership of towing companies and local officials has formed to address such items as traffic flow during/after emergencies. (It is known as the TIM – traffic incident management – committee.)									
11	Hazardous Materials	3	Maintain the county's commodity flow study.	Jan. 1, 2016	Dec. 31, 2020	Lake County LEPC Hazmat Technical Advisor	Emergency Services	Up to \$15,000	SERC, Local Funding
Status: Lake County has completed an initial commodity flow study. ON-GOING efforts include annual collection of data from railway shippers.									
12	Infectious Disease	1	Produce public awareness campaigns on local media outlets.	Jan. 1, 2016	Dec. 31, 2020	Lake County General Health District Public Info. Officer	Public Education & Awareness	N/A	Local Funding, PDM
Status: This project was COMPLETED as part of the H1N1 response in late 2009 as well as the Ebola response in 2014. The HMC elected to re-list the project to show support for the LCGHD's on-going efforts.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
13	Infectious Disease	2	Ensure coordination of local partners to identify the source of an epidemic/pandemic and further ensure that appropriate information is pushed out to the public (and emergency services stakeholders).	Jan. 1, 2016	Dec. 31, 2020	Lake County General Health District Threat Prep. Coordinator	Emergency Services	N/A	N/A
Status: This project was COMPLETED as part of the H1N1 response in late 2009. Additionally, in 2014, the LCGHD formed an Ebola task force comprised of the health district, Lake Health, and University Hospitals. A number of meetings were held as the situation unfolded. That task force is transitioning to a more general infectious disease/other special pathogens focus within public health and includes, but is not limited to, membership from the local emergency management, fire service, law enforcement, school superintendents, and agencies serving functional and access needs groups. The strategy originally called for coordination specifically with the health district to ensure information is pushed out but was revised to be representative of the evolving task force structure.									
14	Winter Storm	1	Coordinate with local private contractors to develop mutual aid agreements for emergency snow removal.	Jan. 1, 2016	Dec. 31, 2020	Lake County Administrator	Emergency Services	N/A	N/A
Status: COMPLETED. Several communities in Lake County have developed shared services agreements for such resources as heavy equipment. Generally, FEMA's force accounting schedule is followed and agreements include issues such as general liability, workers' compensation, etc. Such efforts were born out of the 2006 flood and utilized extensively during the 2011 flood in the western end of the county. Additionally, such information has been included in the EMA's resource asset inventory. The HMC elected to re-list this project to encourage additional resource inventorying.									
15	Winter Storm	2	Encourage adherence to proper building codes, which contain measures to snow/ice-proof new construction.	Jan. 1, 2016	Dec. 31, 2020	Lake County Building Department Director	Prevention	N/A	N/A
Status: This project was originally stated as "Enforce existing codes..." which has been COMPLETED. The HMC wanted to keep the spirit of the project, but implement it through existing codes and programs.									
16	Earthquake	1	Encourage adherence to proper building codes, which contain measures to earthquake-proof new construction.	Jan. 1, 2016	Dec. 31, 2020	Lake County Building Department Director	Prevention	N/A	N/A
Status: ON-GOING. This project was added during the 2010 update and continues to be a part of education and enforcement efforts.									
17	Earthquake	2	Ensure that earthquake hazards are included in on-going emergency public information campaigns.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Public Education & Awareness	Up to \$3,000	PDM, Local Funding
Status: This project was COMPLETED as part of periodic EPI campaigns sponsored by the LCEMA and other emergency services organizations (e.g., regularly-updated websites, etc.). The HMC elected to re-list this project with more general language to afford those sponsoring information campaigns greater flexibility. Also, other emergency services organizations were added as coordinating agencies.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
18	Earthquake	3	Support efforts to enhance seismic monitoring in Northeast Ohio.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Emergency Services	N/A	N/A
Status: NEW. This project was added during the 2015 update.									
19	Coastal Erosion	1	Pursue funding sources/partnerships to strategically place groins, break walls, revetment structures, and other appropriate structures to slow erosion.	Jan. 1, 2016	Dec. 31, 2020	Lake County Ohio Port & Economic Development Authority Director of Coastal Dev.	Prevention, Structural Projects	Approx. \$1M	CDBG, Local Funding
Status: COMPLETED. Break walls were constructed in Mentor and North Perry prior to the 2011 update. Currently, the port authority is working with the US Army Corps of Engineers to identify and accomplish coastal erosion mitigation projects. Additionally, Lake MetroParks is in the process of shoring up the coast at Painesville Township Park. The HMC elected to re-list this project to allow these and other lakefront jurisdictions the flexibility to pursue these types of partnerships.									
20	Coastal Erosion	2	Continue the implementation of the county's "coastal plan".	Jan. 1, 2016	Dec. 31, 2020	Lake County Planning Commission Director	Prevention	See coastal plan.	Local Funding, ODNR
Status: ON-GOING. This project was added as part of the 2010 update. The HMC elected to re-list this project to continue supporting mitigation through existing/other planning mechanisms.									
21	Coastal Erosion	3	Develop mutual aid agreements with private contractors to expeditiously deliver large quantities of sand to problem areas, if needed.	Jan. 1, 2016	Dec. 31, 2020	Lakeline Village Mayor, Mentor City Manager, Mentor-on-the-Lake Director of Admin. & Finance, Timberlake Village Mayor, Willoughby City Mayor, Willowick City Mayor, Madison Twp. Trustee, Lake County Administrator	Property Protection	N/A	N/A
Status: COMPLETED by Fairport Harbor, Painesville Township, and North Perry prior to the 2011 update. Since then, the Lake County EMA has compiled an update resource asset inventory. The HMC elected to re-list this project to show support for local governments continuing to identify support.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
22	Infestation	1	Coordinate with the ODNR to develop a program to control or slow the spread of gypsy moth caterpillars and zebra mussels in Lake County.	Jan. 1, 2016	Dec. 31, 2020	Aqua Ohio Representative	Property Protection	N/A	ODNR
Status: This project has been COMPLETED via local compliance with state initiatives. Perry Village has a mitigation plan in place for mussels. Additionally, various agencies in the county inspect water intakes for mussels. The HMC elected to re-list this project to show that coordination, but included zebra mussels to represent existing conditions.									
23	Fire	1	Undertake various public information campaigns about outdoor fire safety in wooded, marshy areas, especially during dry conditions, as well as about general fire safety in the home.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Public Education & Awareness	Up to \$3,000	Local Funding
Status: NEW. This project was added as part of the 2015 update when committee members elected to create a general "Fire" hazard (as opposed to focusing the assessment on wildfires only). The Lake County EMA is listed as a coordinating agency; however, implementation of the strategy would likely be done by local fire departments.									
24	Dam Failure	1	Coordinate with the ODNR, Dam Safety and Engineering Program to conduct periodic safety inspections of existing dams in Lake County.	Jan. 1, 2016	Dec. 31, 2020	Mentor City Engineer, Willoughby City Director of Public Service, Concord Twp. Fire Chief, Leroy Twp. Trustee, Madison Twp. Trustee, Lake County EMA Director	Prevention	N/A	ODNR
Status: This project is COMPLETED as necessary and to the level required of local government per compliance with existing dam safety regulations. The HMC elected to re-list this project to show mitigation through existing laws and programs.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
25	Dam Failure	2	Coordinate with the ODNR, Division of Water, in accordance with ORC Section 1512.062, to periodically reclassify any dam within Lake County as a result of a change in circumstances not in existence at the time of the initial classification to ensure adequate safety according to the potential for downstream damage.	Jan. 1, 2016	Dec. 31, 2020	ODNR Dam Specialist	Prevention	N/A	N/A
Status: COMPLETED. Jurisdictions throughout Lake County comply with ODNR and other dam safety regulations accordingly. Since the previous adoption of the plan, two dams have been removed along Morley Road. Circumstances have also changed with the lake at the Holden Arboretum. Finally, the Lake County EMA has received updated EAP documents from Class I dam owners. As in 2011, the HMC elected to re-list this project because other projects under this goal may result in the "changes in circumstances" noted by this project.									
26	Dam Failure	3	Consider projects that decrease the number of structures in the immediate hazard area of a dam facility.	Jan. 1, 2016	Dec. 31, 2020	Mentor City Engineer, Willoughby City Director of Public Service, Concord Twp. Fire Chief, Leroy Twp. Trustee, Madison Twp. Trustee, Lake County EMA Director	Prevention	N/A	ODNR, HMGP
Status: ON-GOING. This project was added during the 2010 update. It was based on a successful project in Concord Township where six families (in four buildings) that lived just below the Brightwood Dam on Prouty Road were bought out and relocated. No additional projects have been completed since the 2011 adoption of this plan; however, the committee elected to re-list the project.									
27	Drought	1	Coordinate mutual aid agreements with water hauling companies to have emergency supplies of water hauled into Lake County.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Emergency Services	N/A	N/A
Status: This project has been COMPLETED as local fire departments have developed a regional capability to supply each other with emergency water. Additionally, the county EMA maintains a resource database with a variety of providers listed. The HMC elected to re-include this project given the dynamic nature of resource identification and so that additional agreements could be negotiated with non-public sector agencies, if necessary.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
28	Drought	2	Educate local residents and farmers on the benefits of conserving water at all times, not just during a drought. Invite water providers into the mix to provide information about relevant water quality issues, as necessary (such as harmful algae blooms in Lake Erie).	Jan. 1, 2016	Dec. 31, 2017	Aqua Ohio Representative	Public Education & Awareness	Up to \$3,000	PDM, Local Funding
Status: ON-GOING. The HMC elected to combine this project with an earlier version of a public outreach project related to drought and re-list it. As such, "farmers" was added as a recipient of the information. The coordinating agency was also revised to better reflect actual responsibilities.									
29	Drought	3	Revise the water ban, as appropriate.	Jan. 1, 2016	Dec. 31, 2020	Lake County Board of Commissioners	Prevention	N/A	N/A
Status: This project was COMPLETED as originally stated because provisions for declaration of a water ban are in place. The HMC elected to re-list this project so that the water ban ordinance could be reviewed and revised as necessary.									
30	Land Subsidence	1	Coordinate with the ODNR, Division of Mineral Resources Management, Office of Abandoned Mine Lands and Reclamation to undertake reclamation projects if subsidence occurs at a specific location.	Jan. 1, 2016	Dec. 31, 2020	Painesville City Engineer, Painesville Township Trustee	Property Protection	Up to \$2M	ODNR (AML&R)
Status: ON-GOING. Officials in the county are concerned about potential subsidence surrounding salt mine(s) near Painesville. At this point, there are no mitigation efforts underway, but the HMC elected to leave this project in the plan as a recognition of the issue.									

The following miscellaneous projects were identified by Lake County's planning committee. These projects do not relate to a single specific hazard; rather, they address multiple hazards.

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
MISC-1	N/A	N/A	Continue the education and training of first responders and emergency personnel.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director, Lake County LEPC Hazmat Technical Advisor	Public Education & Awareness	N/A	USDHS, OEMA, OFCA, Local Funding
Status: This project has been COMPLETED through the regular training the response agency personnel receive. The HMC elected to re-list this project to show continued support for these efforts. The LEPC and individual emergency services agencies were added as coordinating agencies to more accurately depict actual responsibilities.									
MISC-2	N/A	N/A	Continue to update lists of resources (e.g., equipment and services) that are available throughout the county and region.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Emergency Services	N/A	Local Funding
Status: ON-GOING. This project was added as part of the 2010 update. Since 2011, the county has migrated to the IRIS system provided by the US Department of Homeland Security. Additionally, Lake County has worked with Cuyahoga County to develop and support a common-operating picture tool.									
MISC-3	N/A	N/A	Continue to support the Highway Alert Radio (HAR) System that has been established in Mentor.	Jan. 1, 2016	Dec. 31, 2020	Lake County Homeland Security Committee Chair	Public Education & Awareness	Up to \$50,000	Local Funding
Status: ON-GOING. This project was added as part of the 2010 update. The system was used to disseminate information during the H1N1 event.									
MISC-4	N/A	N/A	Coordinate with first responders and Lost Nation Airport for interagency cooperation to assist in collaborative planning.	Jan. 1, 2016	Dec. 31, 2020	Lake County Ohio Port & Economic Development Authority Airport Manager	Prevention	N/A	N/A
Status: This project has been COMPLETED through several specific planning projects (e.g., the latest three county EOP updates) and through the continued efforts of the Homeland Security Committee. Recently, there has been an expansion of regional special response capabilities. Additionally, Lost Nation Airport has been included as a partner in this effort since it may be the transportation link used to get resources into the county.									

The following charts list the mitigation projects for the participating jurisdictions.

EASTLAKE CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Install backup power sources (such as generators) at critical facilities.	Jan. 1, 2016	Dec. 31, 2018	Eastlake City Fire Chief	Prevention	Up to \$25,000 per generator	PDM, Local Funding
Status: This project was COMPLETED in 2013 when a generator was installed at the police department; however, the installation of a generator at city hall has since become the highest priority mitigation project for the city.									

FAIRPORT HARBOR VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Add and/or maintain backup power capabilities at critical facilities throughout Fairport Harbor, to include the water plant and senior center.	Jan. 1, 2016	Dec. 31, 2020	Fairport Harbor Village Fire Chief	Emergency Services	Up to \$25,000 per generator	USDHS, Local Funding
Status: ON-GOING. This project was added as part of the 2010 update; it currently stands at 0% complete. A generator at the water plant has been requested via various funding sources numerous times over the past five years. Further, the senior center is utilized as a warming/cooling and/or evacuation center and would benefit from auxiliary power capabilities.									

GRAND RIVER VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Consider participating in the CRS program.	Jan. 1, 2016	Dec. 31, 2020	Grand River Village Mayor	Prevention	N/A	N/A
Status: ON-GOING. Grand River HMC representatives elected to re-list this project. It had not been completed following the previous adoptions of the plan.									

KIRTLAND CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Winter Storm	N/A	Coordinate with local private contractors to develop mutual aid agreements for emergency snow removal.	Jan. 1, 2016	Dec. 31, 2020	Kirtland City Service Director	Emergency Services	N/A	LCEMA
Status: NEW. This project was added as part of the 2015 update.									
2	Multiple	N/A	Encourage adherence to proper building codes, which contain measures to snow/ice-proof new construction.	Jan. 1, 2016	Dec. 31, 2020	Kirtland City Zoning Inspector	Prevention	N/A	N/A
Status: NEW. This project was added as part of the 2015 update.									

KIRTLAND HILLS VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Severe Weather	N/A	Coordinate with the LCEMA to develop and distribute information to residents detailing the types of hazards associated with severe winter weather and actions they can take to safeguard against those hazards. Such information may be distributed as part of an overall, county public outreach effort.	Jan. 1, 2016	Dec. 31, 2020	Kirtland Hills Village Mayor, Lake County EMA Director	Public Education & Awareness	N/A	LCEMA
Status: This project was COMPLETED as part of participation in the EAS and other on-going countywide efforts with the LCEMA. Kirtland Hills HMC representatives elected to re-list this project.									

LAKELINE VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Winter Storm	N/A	Consider constructing “snow fences”, or planting rows of trees to serve as “living snow fences” to limit the blowing and drifting of snow over critical roadway segments.	Jan. 1, 2016	Dec. 31, 2020	Lakeline Village Mayor	Prevention	Up to \$10,000	Under evaluation
Status: ON-GOING. This project was included in the original plan but was not completed as the village continues to evaluate its options for winter storm mitigation. Village HMC representatives, though, elected to re-list this project to show their commitment to addressing the issue.									

MADISON VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Add and/or maintain backup power capabilities at critical facilities throughout Madison.	Jan. 1, 2016	Dec. 31, 2020	Madison Village Fire Chief	Emergency Services	Up to \$25,000 per generator	USDHS, Local Funding
Status: ON-GOING. This project was originally added in 2010 and re-listed in 2015.									

MENTOR CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Work with critical facilities throughout the city to ensure that facility-specific evacuation plans are up-to-date.	Jan. 1, 2016	Dec. 31, 2016	Mentor Fire Department (Deputy Chief)	Prevention	N/A	Local Funding
Status: ON-GOING. This project was added as part of the 2010 update.									
2	Multiple	N/A	Continue to strengthen the capabilities of the backup EOC and the redundancy communications equipment located in the Training Room of the Mentor Fire Department.	Jan. 1, 2016	Dec. 31, 2020	Lake County EMA Director	Emergency Services	N/A	USDHS, Local Funding
Status: ON-GOING. This project was added as part of the 2010 update.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
3	Multiple	N/A	Add and/or maintain backup power capabilities at shelters and city services facilities throughout Mentor.	Jan. 1, 2016	Dec. 31, 2020	Mentor City Manager	Emergency Services	Up to \$25,000 per generator	USDHS, Local Funding
Status: ON-GOING. This project was added as part of the 2010 update.									
4	Multiple	N/A	Make such resources as the city's website, local access cable channel, etc. available for public education campaigns.	Jan. 1, 2016	Dec. 31, 2016	Mentor Fire Department (Deputy Chief)	Public Education & Awareness	N/A	MFD serves as conduit to appropriate city resource
Status: ON-GOING. This project was added as part of the 2010 update.									
5	Fire	N/A	Coordinate with the ODNR to regulate or control open burning near the Mentor Marsh.	Jan. 1, 2016	Dec. 31, 2020	Mentor City Manager, ODNR Field Staff (NE Dist.)	Prevention	N/A	ODNR
Status: This project has been COMPLETED as the city coordinates with the ODNR on an as-necessary basis for protection of the marsh and the areas adjacent to it. Mentor representatives on the HMC elected to re-list this project due to the likelihood of such coordinating efforts to continue.									

MENTOR-ON-THE-LAKE CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Winter Storm	N/A	Coordinate with the LCEMA to develop and distribute emergency preparedness information for winter storms. Such information may be distributed as part of an overall, county public outreach effort.	Jan. 1, 2016	Dec. 31, 2020	Mentor-on-the-Lake Fire Chief	Public Education & Awareness	N/A	LCEMA
Status: This project was COMPLETED through the city's participation with a variety of other public outreach programs. Mentor-on-the-Lake HMC representatives elected to re-list this project to support on-going cooperative efforts with the LCEMA and other municipalities.									

NORTH PERRY VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Mitigate flooding concerns in the Red Mill Creek area located at Parmly Road and US Route 20, where unsafe conditions are created during heavy rain/snow melt situations.	Jan. 1, 2016	Sept. 30, 2020	North Perry Village Mayor	Property Protection	Up to \$500,000	HMGP, Local Funding
Status: NEW. This project was added as part of the 2015 update.									

PAINESVILLE CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Consider investing in an early warning siren system as well as incorporating amateur radio capabilities into the city's emergency capabilities.	Jan. 1, 2016	Dec. 31, 2020	Painesville City Fire Chief	Public Education & Awareness	Up to \$20,000 per siren	USDHS, PDM, Local Funding
Status: ON-GOING. Painesville HMC representatives elected to re-list this project with a new timeframe.									
2	Flooding	N/A	Consider the implementation of buy-out, elevation, and/or relocation projects.	Jan. 1, 2016	Dec. 31, 2020	Painesville City Engineer	Property Protection	Avg. \$127,900 per purchase	HMGP, Local Funding
Status: ON-GOING. This project was originally added as part of the 2010 update (based largely on the success of the Grist Mill and Millstone buyout projects). It remains on the list for periods when funding may be available.									

PERRY VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Assist residents and business owners in mitigating areas with known flooding problems, such as those near the Western Reserve Land Conservancy, where water is restricted by SR 84 and empties into the village.	Jan. 1, 2016	Sept. 30, 2020	Perry Village Mayor	Property Protection	Up to \$500,000	HMGP, Local Funding
Status: NEW. This project was added as part of the 2015 update.									
2	Multiple	N/A	Enhance communications with local schools, service departments, and the power plant.	Jan. 1, 2016	Dec. 31, 2020	Perry Fire Chief	Emergency Services	N/A	N/A
Status: ON-GOING. This project was originally added as part of the 2010 update. It was re-listed to support continued communications enhancements.									

TIMBERLAKE VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Coordinate with the LCEMA to develop and distribute emergency preparedness information. Such information may be distributed as part of an overall, county public outreach effort.	Jan. 1, 2016	Dec. 31, 2016	Timberlake Village Mayor, Lake County EMA Director	Public Education & Awareness	N/A	LCEMA
Status: This project was COMPLETED through the village's participation with a variety of other public outreach programs. Timberlake HMC representatives elected to re-list this project to support on-going cooperative efforts with the LCEMA and other municipalities.									

WAITE HILL VILLAGE

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Schedule training of first responders on natural hazard preparedness as well as on new and updated equipment (some of which may be refresher training).	Jan. 1, 2016	Dec. 31, 2020	Waite Hill Police Chief	Emergency Services	N/A	Supported by the village fire department
Status: ON-GOING. This project was originally added as part of the 2010 update; it is re-listed to support continued training.									

WICKLIFFE CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Multiple	N/A	Coordinate with the LCEMA to develop and distribute emergency preparedness information for a variety of hazards. Such information may be distributed as part of an overall, county public outreach effort.	Jan. 1, 2016	Dec. 31, 2016	Wickliffe Fire Chief, Lake County EMA Director	Public Education & Awareness	N/A	LCEMA
Status: COMPLETED. The city coordinated with the LCEMA (as part of an overall, countywide effort) to participate in a number of public outreach efforts. Wickliffe HMC representatives elected to re-list this project to support on-going cooperative efforts with the LCEMA and other municipalities.									
2	Flooding	N/A	Continue an aggressive storm sewer catch basin clean-out program.	Jan. 1, 2016	Dec. 31, 2020	Wickliffe City Service Director	Prevention	N/A	Local Funding
Status: ON-GOING. This project was originally added as part of the 2010 update; it was re-listed to support on-going efforts.									
3	Flooding	N/A	Continue an aggressive storm/sanitation infiltration mitigation program to alleviate sanitation water flooding basements.	Jan. 1, 2016	Dec. 31, 2020	Wickliffe City Service Director	Prevention	N/A	Local Funding
Status: NEW. This project was added as part of the 2015 update.									
4	Infestation	N/A	Continue an aggressive ash tree removal program as a result of infestation. Alleviate hazards of falling trees into the roadways.	Jan. 1, 2016	Dec. 31, 2020	Wickliffe City Service Director	Prevention	N/A	Local Funding
Status: NEW. This project was added as part of the 2015 update.									

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
5	Multiple	N/A	Continue to participate in local all-hazards emergency response planning.	Jan. 1, 2016	Dec. 31, 2020	Wickliffe Fire Chief, Wickliffe Police Chief	Emergency Services	N/A	Local Funding
Status: NEW. This project was added as part of the 2015 update.									

WILLOUGHBY CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Continue implementation of the Top 17 priority projects in the master drainage plan, such as the Lake Shore Boulevard Culvert Replacement, Two-Town Ditch Channel Improvements, and Nason Basin Outlet.	Jan. 1, 2016	Dec. 31, 2020	Willoughby City Director of Public Service	Prevention	Avg. \$10.7M	CDBG, HMGP, Local Funding
Status: COMPLETED. A number of projects have been completed, including the Todd Field Bendway Weir Project and the repair of the retaining wall at the Daniels Park location.									
2	Multiple	N/A	Consider developing a plan to ensure backup power for other critical facilities in the city.	Jan. 1, 2016	Dec. 31, 2020	Willoughby Fire Chief	Prevention	N/A	N/A
Status: ON-GOING. This project was originally added as part of the 2010 update; it is re-listed to support efforts to ensure backup power for a greater number of critical facilities.									

WILLOUGHBY HILLS CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Coordinate with the USGS to strategically place rain gauges along the Chagrin River to allow for a local river monitoring capability.	Jan. 1, 2016	Dec. 31, 2020	Lake County Storm Water Management Dept. Director	Public Education & Awareness	N/A	USGS
Status: ON-GOING. This project was originally added as part of the 2010 update.									

WILLOWICK CITY

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Severe Weather	N/A	Reduce sanitary sewer inflow and infiltration (I&I) associated with thunderstorms. Optimize conveyance capacity of existing sewer system.	Jan. 1, 2016	Sept. 30, 2020	Willowick Service Director, Willowick City Engineer	Prevention	N/A	Currently in place and funded through the sewer levy.
Status: NEW. This project was added as part of the 2015 update.									
2	Multiple	N/A	Provide for backup power capabilities at municipal facilities for sheltering and emergency operations.	Jan. 1, 2016	Sept. 30, 2020	Willowick Service Director, Willowick City Engineer	Emergency Services	Up to \$25,000 per generator	General Fund, Police & Fire Capital Improvement Levy
Status: NEW. This project was added as part of the 2015 update.									
3	Flooding	N/A	Explore the feasibility of creating "storm water discharge ordinances" or amendments to zoning ordinances to address storm water discharge.	Jan. 1, 2016	Dec. 31, 2020	Willowick Zoning Board of Appeals Members, Willowick Planning Commission Chair, Lake County Storm Water Management Dept. Director	Prevention	N/A	Supported by the Willowick Zoning Board of Appeals and Willowick Planning Commission
Status: ON-GOING. City council enacted an amendment to Ordinance 921.04 Construction Specifications; Section (k)(3) on October, 22, 2013 to allow for splash blocking on residential housing that meet the minimum required land area. The Willowick Building Department monitors compliance with new construction through the permitting process. The impact has yet to be determined.									

CONCORD TOWNSHIP

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Hazardous Materials	N/A	Coordinate with Lake Health and University Hospitals to ensure that they factor both transportation and fixed-facility hazardous material incidents into their emergency planning.	Jan. 1, 2016	Dec. 31, 2020	Concord Twp. Fire Chief	Prevention	N/A	Lake Health, University Hospitals
Status: ON-GOING. This project was originally added as part of the 2010 update.									
2	Multiple	N/A	Work with the LCEMA to compose a traffic diversion plan for the TriPoint area to alleviate congestion and to serve as a companion to the county's evacuation plan.	Jan. 1, 2016	Dec. 31, 2020	Concord Twp. Fire Chief	Prevention	N/A	LCEMA
Status: ON-GOING. This project was originally added as part of the 2010 update.									
3	Multiple	N/A	Support on-going site-specific response planning with Ricera Corporation to ensure an appropriate sharing of public safety information.	Jan. 1, 2016	Dec. 31, 2020	Concord Twp. Fire Chief	Prevention	N/A	Ricera Corporation
Status: ON-GOING. This project was originally added as part of the 2010 update.									
4	Flooding	N/A	Coordinate with the LCEMA to develop and distribute emergency preparedness information for flooding (primarily the Fay Road and Cascade Road areas), tornados, and thunderstorms. Such information may be distributed as part of an overall, county public outreach effort.	Jan. 1, 2016	Dec. 31, 2020	Concord Twp. Fire Chief	Public Education & Awareness	N/A	LCEMA
Status: This strategy was COMPLETED for winter storms, which were originally identified in previous versions of this plan. Due to the success of the project, township representatives on the HMC requested that the project be re-listed and revised to focus on flooding, tornados, and thunderstorms.									
5	Flooding	N/A	Purchase structures that are located in the floodplain to mitigate flood risk in the township.	Jan. 1, 2010	Dec. 31, 2015	Concord Twp. Trustee	Prevention	N/A	HMGP
Status: This strategy was COMPLETED with the purchase of four homes.									

LEROY TOWNSHIP

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Winter Storm	N/A	Develop mutual aid agreements with surrounding townships and private contractors to aid in snow removal.	Jan. 1, 2016	Dec. 31, 2020	Leroy Twp. Trustee	Emergency Services	N/A	N/A
Status: This project was COMPLETED through the development agreements with neighboring jurisdictions as well as the purchase of a plow. Township HMC representatives, though, elected to re-list the project to support on-going efforts to identify resources.									

MADISON TOWNSHIP

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Ensure the on-going clean up of ditches throughout the township, but especially along roadways.	Jan. 1, 2016	Dec. 31, 2020	Madison Twp. Trustee	Prevention	N/A	N/A
Status: ON-GOING. This project was originally added as part of the 2010 update.									

PAINESVILLE TOWNSHIP

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Flooding	N/A	Pre-determine and clearly label flood evacuation routes to be used in Painesville Township.	Jan. 1, 2016	Dec. 31, 2020	Painesville Twp. Trustee	Emergency Services	Up to \$7,500 for signage	Local Funding
Status: ON-GOING. This project has been started. Painesville Township HMC representatives elected to re-list the project with the hope that it is complete before the next update of this document.									

PERRY TOWNSHIP

Overall Priority	Haz. Type	Haz. Priority	Strategy	Start Date	End Date	Primary Coord.	Mit. Type	Est. Cost	Resources
1	Drought	N/A	Educate local residents and farmers on the benefits of conserving water at all times, not just during a drought.	Jan. 1, 2016	Dec. 31, 2020	Perry Twp. Trustee	Public Education & Awareness	Up to \$3,000	PDM, Local Funding
Status: This project was COMPLETED through participation in a variety of public outreach efforts. Perry Township HMC representatives elected to re-list the strategy as support for future participation in outreach efforts.									
2	Drought	N/A	Coordinate with appropriate agencies, such as the United States Department of Agriculture (USDA) and the LCEMA, to distribute information materials to local farmers and residents.	Jan. 1, 2016	Dec. 31, 2020	Perry Twp. Trustee, Lake County EMA Director	Public Education & Awareness	Up to \$2,000	USDA, Local Funding
Status: This project was COMPLETED through participation in a variety of public outreach efforts. Perry Township HMC representatives elected to re-list the strategy as support for future participation in outreach efforts.									

5.0 PLAN MAINTENANCE PROCESS

§201.6(c)(4)(i)	[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.
§201.6(c)(4)(ii)	[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
§201.6(c)(4)(iii)	[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

5.0.1 Monitoring, Evaluating, and Updating the Plan

The Lake County Emergency Management Agency (LCEMA) and the core planning team have established a method for the systematic and periodic review of this document. The LCEMA and committee will monitor the performance of the plan in several ways (see below). Participating jurisdictions will also evaluate mitigation strategies as the chance to implement them arises.

2010-2015 UPDATING CYCLE

Additional information about progress made during the 2010-2015 cycle can be found as follows.

- **Section 1.1:** Additional information regarding the planning process
- **Section 2.2:** Hazard profiles contain narrative notes about certain updates (e.g., noting partnerships for terrorism mitigation and preparedness, data regarding flood map modernization, descriptions of dam failure mitigation efforts, etc.)
- **Section 4.0:** Additional information about completed and on-going mitigation projects, organized by jurisdiction

Jurisdictions throughout Lake County made significant progress in the implementation of this plan during the 2010-2015 updating cycle. First and foremost, the county's flood map modernization project was completed (as described in Section 2.2). Additionally, much progress was made mitigating storm water flooding issues. A department was created at the county level – the Lake County Storm Water Management Department – to address storm water issues. This department coordinates stream cleaning projects as well as capital improvement projects to storm water system (see Section 4.0 for a listing of

completed projects). Additional flood mitigation projects were done in the form of property buy-outs. Four homes were moved out of the floodplain in Concord Township and five homes were purchased in Mentor. The City of Willoughby completed two flood mitigation projects: the Todd Field Bendway Weir Project and the Daniels Park Dam retaining wall repair. Willowick City enacted an amendment to its zoning ordinance in 2013 to address, in part, storm water discharge.

In the previous update, several municipalities noted the need to equip local critical facilities with auxiliary power capabilities. The City of Eastlake completed the installation of a generator at the police department and has since prioritized a similar project for city hall. Fairport Harbor and Madison also indicated that similar projects were on-going but had not been completed as per funding shortfalls.

A number of other, more general efforts were also completed. The county planning department has continued to work with the appropriate municipalities to implement the coastal development plan. The county recently completed a comprehensive communications upgrade that involved partnership with several agencies. Additionally, warning capabilities have been enhanced, particularly through the installation of additional sirens. Most notably, mitigation has been done regarding transportation-based hazards throughout the county. Significant work has been done (and is on-going) at Auburn Road/SR 44 in Concord Township. Willoughby is cleaning up the 91/20 interchange. US 20 has been improved near the fairgrounds. Additionally, lanes have been added at various locations along I-90. These projects have positively impacted traffic flow.

Partnerships to ensure more effective outreach to citizens have also been formed. For instance, Kirtland Hills, Mentor-on-the-Lake, Timberlake, and Wickliffe partnered with the Lake County Emergency Management Agency for a variety of public outreach projects of an all-hazard nature. Partnerships for mitigative purposes emerged as a theme during the 2010-2015 update. As other examples, Lake County representatives, particularly in the emergency services sector, partnered with representatives in Cuyahoga County to update resource sharing information inventories. These same agencies along with public health and medical representatives partnered for improved information sharing relative to infectious disease (particularly during the 2014 Ebola incident).

Finally, and perhaps most significantly, the core planning committee was very engaged throughout 2015 to oversee updates to this plan. Invitations to participate were forwarded to a number of partners beyond local government, including industry (e.g., Ricera, Cleveland Electric Illuminating, and First Energy), higher education (e.g., Lakeland Community College and Lake Erie College), and transportation (e.g., Lost Nation Airport). As a result, the depth of information included, particularly in the risk assessment, improved significantly.

Local government participation was also greater in 2015 than in previous updates. As a result, jurisdiction-specific information, such as the capability assessment and description of the planning area were refined. Jurisdictional representatives significantly revised the asset inventory sections of the plan, ultimately deciding to group assets geographically rather than in a single composite list. The local government involvement in hazard mitigation is significant for another reason as well. Several mitigation projects are referenced above as completed or substantially underway. While projects such as buy-outs were completed with grant funding, the majority of these projects were completed with local funds or other – i.e., non-FEMA mitigation – grant funds.

This plan will continue to be updated at five-year intervals, regardless of the number of hazard events that occur during that period. The LCEMA will serve as the coordinator of the updates. As such, the LCEMA will contact participating jurisdictions to schedule meetings, facilitate virtual or other discussions, obtain lists of completed projects, collected updated asset inventory data, etc. (see Section 1.1.1). It is also significant to note that a number of meetings may be held as and if mitigation strategies are implemented, but such meetings would only anecdotally discuss this document (to ensure that projects to be implemented are included within). Further, such sections as 2.0: Risk Assessment may be reviewed and utilized for other planning processes, as it contains a comprehensive overview of hazard risks in Lake County at a macro level.

The formal updating process will consist of a series of meetings (either face-to-face or virtual) to review mitigation projects, the hazard identification and risk assessment, and to compare the two. The effectiveness of any implemented mitigation strategies should also be determined.

As mentioned above, the HMC will monitor the performance of the plan based on several criteria. For instance, the committee should consider revising mitigation strategies if it appears that the plan is failing according to one of the following measures.

- **Cost Effectiveness:** Is sufficient funding available to implement the project at a cost manageable by the local government? If not, is funding available? Will the costs of implementing the project be significantly less than the cumulative future costs potentially incurred by an un-corrected situation?
- **Property Protection:** How significant will the action be at eliminating or reducing damage to structures and infrastructure?
- **Life Safety:** How effectively will the action protect lives and prevent injuries?
- **Environmental Impacts:** Will implementing the project adversely affect the environment in any way? Will implementing the project actually benefit the environment?
- **Social Impacts:** Will the public perceive the project as positively lessening hazard-related losses? Will implementing the project adversely affect any segment of the population?
- **Legal Impacts:** Do your governmental organizations and/or partner agencies have the authority to implement the actions?
- **Political Impacts:** Will implementing the project create negative political issues?
- **Overall Feasibility:** Do local policies and capabilities currently allow for the implementation of the project? Are programs available to assist in funding the implementation of the project? Do local leaders generally agree that implementing the project will be beneficial to the community?

The monitoring of this plan also includes methods for ensuring that projects are successfully implemented and contribute to the achievement of the mitigation goals outlined in Section 3.0. All of the individual projects listed in this plan are accompanied by a series of potential funding sources. Many of these funding sources require stringent project administration tasks (including performance measures and close-out procedures), all of which would be followed by the jurisdiction implementing a project. Adherence to these requirements will ensure the successful implementation of projects funded by such programs. For projects funded

locally, existing purchasing policies will be followed, including competitive bidding, maintenance of invoice copies, regular departmental budget reviews, etc. All files associated with purchasing at the local level are maintained. This procedure has been successful while implementing mitigation projects since the original development of this plan and will continue to be followed.

5.0.2 Implementation through Existing Programs / Capabilities Assessment

The members of the HMC are leaders within the communities and agencies that they represent. They are often involved in the overall community, economic development, and capital improvements planning efforts of their jurisdictions. As members of the mitigation planning team, these individuals will carry mitigation concepts into other planning areas.

To date, local policies have not hindered hazard mitigation efforts. The jurisdictions participating in this planning process have used a variety of funding to complete mitigation projects in the past, including the Hazard Mitigation Grant Program, Homeland Security Grant Program, Emergency Management Performance Grant, Community Development Block Grant, and local funding. Local government policies and programs have supported the use of this funding and, thus, the implementation of mitigation projects. Further, all participating government jurisdictions have demonstrated a capability to successfully implement and administer mitigation projects.

Participating jurisdictions have a number of capabilities that can support (or at least be related to) mitigation efforts. The table below outlines those efforts.

COMMUNITY	PLANNING COM-MISSION ¹	COM-PREHENSIVE PLANS	FLOOD-PLAIN REGS	BLDG DEPT. ²	ZONING ORDINANCES	CAPITAL BUDGET ³	PUBLIC WORKS BUDGET ²
Lake County	YES	YES	YES	YES	YES	(none)	Limited in-kind wages only
Concord Township	YES	YES	YES	NO	YES	(none)	Limited in-kind wages only
Leroy Township	NO	NO	YES	NO	YES	(none)	Limited in-kind wages only
Madison Township	YES	YES	YES	NO	YES	(none)	Limited in-kind wages only
Painesville Township	NO	YES	YES	NO	YES	YES	Limited in-kind wages most probable
Perry Township	YES	YES	YES	NO	YES	(none)	Limited in-kind wages only
Eastlake, City of	YES	YES	YES	YES	YES	(none)	Limited in-kind wages only
Fairport Harbor, Village of	YES	NO	YES	NO	YES	(none)	Limited in-kind wages only
Grand River, Village of	NO	NO	YES	NO	YES	(none)	Limited in-kind wages only
Kirtland, City of	YES	YES	YES	NO	YES	YES	YES
Kirtland Hills, City of	YES	NO	YES	NO	YES	(none)	(none)
Lakeline, Village of	NO	NO	YES	NO	NO	(none)	Limited in-kind wages only
Madison, Village of	NO	NO	YES	NO	YES	(none)	Limited in-kind wages only
Mentor, City of	YES	YES	YES	YES	YES	YES	YES
Mentor-on-the-Lake, City of	NO	YES	YES	YES	YES	(none)	Limited in-kind wages only
North Perry, Village of	YES	YES	YES	NO	YES	(none)	Limited in-kind wages only
Painesville, City of	YES	YES	YES	YES	YES	YES	YES
Perry, Village of	YES	NO	YES	NO	YES	(none)	Limited in-kind wages only
Timberlake, Village of	YES	NO	YES	NO	YES	YES	(none)
Waite Hill, Village of	YES	NO	YES	NO	YES	(none)	Limited in-kind wages only
Wickliffe, City of	YES	YES	YES	YES	YES	YES	YES
Willoughby, City of	YES	YES	YES	YES	YES	(none)	Limited in-kind wages only
Willoughby Hills, City of	YES	YES	YES	YES	YES	(none)	Limited in-kind wages only
Willowick, City of	YES	NO	YES	YES	YES	(none)	Limited in-kind wages only

1. Planning commissions in townships are noted as different than those in cities and villages. The townships with planning commissions actually have zoning commissions that operate in similar ways as well as work closely with the county planning commission.
2. All jurisdictions within the state now follow the State Building Code (Ohio Administrative Code 4101:1). As such, all jurisdictions have building codes. This table shows which have building departments of their own; those marked "NO" utilize county support for building code enforcement.
3. Budget that would allow the jurisdiction to devote financial resources towards hazard mitigation activities.

A number of existing plans and reports were reviewed to (a) identify any obvious inconsistencies between other development and mitigation efforts, (b) as baseline information for such sections as 2.5 Analyzing Development Trends, and (c) to support discussions surrounding mitigation projects. Those documents included the following.

DOCUMENT TYPE	DOCUMENT CITATION	HOW INCORPORATED INTO PLAN
Map	USDHS FEMA. (February, 2010). <i>Flood insurance rate map</i> . Federal Government: Washington, D.C.	Used to identify locations of 100-year floodplains in studied areas
Plan	City of Eastlake. (2009). <i>City of Eastlake 2009 Comprehensive Plan</i> . Local Government: Eastlake, OH.	Used to identify targeted development areas, validate city administrative capabilities
Plan	City of Kirtland. (2012). <i>City of Kirtland Comprehensive Plan Update</i> . Local Government: Kirtland, OH.	Used to identify targeted development areas, validate city administrative capabilities
Plan	City of Mentor. (2009). <i>City of Mentor Comprehensive Plan 2009</i> . Local Government: Mentor, OH.	Used to identify targeted development areas, validate city administrative capabilities
Plan	City of Painesville. (2009). <i>City of Painesville 2006 Comprehensive Plan Update</i> . Local Government: Painesville, OH.	Used to identify targeted development areas, validate city administrative capabilities
Plan	City of Wickliffe. (2008). <i>City of Wickliffe Comprehensive Plan</i> . Local Government: Wickliffe, OH.	Used to identify targeted development areas, validate city administrative capabilities
Plan	City of Willoughby. (2008). <i>City of Willoughby Comprehensive Plan Vision 20/20</i> (Phases 1 and 2). Local Government: Willoughby, OH.	Used to identify targeted development areas, validate city administrative capabilities
Plan	City of Willoughby Hills. (2011). <i>The Willoughby Hills Comprehensive Land Use Plan</i> . Local Government: Willoughby Hills, OH.	Used to identify targeted development areas
Plan	LCEMA. (2014). <i>Lake County Emergency Operations Master Plan</i> . Local Government: Mentor, OH.	Used to validate emergency response capabilities and supplement HIRA data
Plan	LCGHD. (as amended). <i>Lake County General Health District Emergency Operations Plan</i> . Local Government: Painesville, OH.	Used to supplement discussions for infectious disease profile
Plan	Lake County Planning Commission. (2005). <i>Lake County Coastal Development Plan</i> . Local Government: Painesville, OH.	Used to identify/confirm coastal erosion hazards and mitigation projects

DOCUMENT TYPE	DOCUMENT CITATION	HOW INCORPORATED INTO PLAN
Plan	OEMA. (2012). <i>State of Ohio Enhanced Hazard Mitigation Plan</i> . State Government: Columbus, OH.	Used as supplemental risk assessment data (drought, earthquake, flooding, land subsidence, landslide, terrorism, wildfire, wind)
Plan	Perry Township Trustees. (2009). <i>2009 Comprehensive Plan Update</i> . Local Government: Perry, OH.	Used to identify targeted development areas
Plan	Village of North Perry. (2008). <i>North Perry Comprehensive Plan 2008</i> . Local Government: North Perry, OH.	Used to identify targeted development areas, validate city administrative capabilities
Report	USDHS FEMA. (2014). <i>Disaster declarations for Ohio</i> . Online. www.fema.gov/disasters/grid/state-tribal-government	Used as data on types of significant hazards incidents to have occurred in Lake County
Report	Ohio DSWR Dam Safety. (2013). <i>Ohio dam information</i> . State Government: Columbus, OH.	Used to create list of names and locations of dams in Lake County
Report	ODNR. (2014). <i>Earthquakes/OhioSEIS</i> . Online. geosurvey.ohiodnr.gov/earthquakes-ohioseis/ohioseis-home	Used to determine locations of any earthquakes that occurred (or might have impacted) Lake County
Report	USEPA. (2014). <i>EnviroFacts data warehouse</i> . Online. echo.epa.gov	Used to create list of locations of facilities using/storing hazardous materials, data on any material releases
Technical Information	USACE. (2014). <i>National inventory of dams</i> . Online. geo.usace.army.mil/pgis	Used to validate list of names and locations of dams in Lake County
Technical Information	USAMRICD. (July, 2000). <i>Field management of chemical casualties</i> 2 nd ed. Aberdeen, MD.	Used as supplemental risk assessment data (terrorism)
Technical Information	USAMRIID. (September, 2011). <i>Medical management of biological casualties handbook</i> 7 th ed. Fort Detrick, MD.	Used as supplemental risk assessment data (terrorism)
Technical Information	USDHS FEMA. (March, 2013). <i>Local mitigation planning handbook</i> . Federal Government: Washington, D.C.	Used as general guidance on revised mitigation planning process

Historically, the only administrative issue that has hampered the implementation of mitigation projects has been confusion as to the specific function of this document. Committee participation throughout the development and maintenance of this document has been excellent; however, many of the specific departments within the participating jurisdictions' structure have been generally unaware of the existence of this document and how it can be used to leverage

funding for mitigation projects. This past confusion was the principle reason that committee members were “assigned” tasks at each of the committee meetings.

Additionally, hazard mitigation is a component of a number of other planning processes undertaken throughout the county. For example, the LCEMA incorporates mitigation principles into its emergency operations planning in an effort to predetermine the hazards to which responders may respond. The LCEMA’s operations plan works to primarily address the negative effects of natural, technological, and man-made hazards. Additionally, the Lake County General Health District (LCGHD) has become increasingly involved in emergency preparedness in recent years. The types of hazard analyses contained in this document aid the LCGHD’s planning efforts. Further, as with the LCEMA’s operations planning efforts, the LCGHD’s plans support mitigative efforts by creating a framework to ensure mitigation occurs.

The emergency response agencies are heavily involved in emergency planning at the local level, to include the identification and implementation of mitigation strategies. As noted in Section 1.1, such officials as fire chiefs and police chiefs are just as involved on the planning committee as elected officials. As such, these individuals are integrating, where applicable, the four phases of emergency management – the first of which is mitigation – into the development of their agency-specific standard operating guidelines.

Additionally, as county government departments, the LCEMA, Lake County Planning and Committee Development, and the Lake County Ohio Port and Economic Development Authority maintain frequent contact. Many of the discussions between the agencies focus on the services that can be provided to areas that are targeted for development; however, the LCEMA is consulted as to what hazards could affect an area that is developable. The comprehensive plans for Lake County communities that had been completed since the original adoption of this plan were reviewed as part of the updating process; such a practice will be continued in subsequent updates. As such, local officials can be made aware of the hazards to which targeted development areas may be susceptible.

5.0.3 Continued Public Involvement

The LCEMA and planning committee understand that the general public must be involved in the planning process as well as the update processes scheduled

every five years. As such, the LCEMA will ensure public involvement through invitations to future public and/or committee meetings, distributing questionnaires, etc.

The LCEMA, at a minimum, will maintain file copies of this document to be available for review and perusal at any time. The LCEMA intends to log all comments received regarding the mitigation plan. Members of the public are invited to contact the LCEMA with comments regarding hazard events, etc. Local officials are also invited to review the plan's effectiveness at determining hazard susceptibility based on data from hazard events as they occur.

APPENDIX 1: EVIDENCE OF PUBLIC INVOLVEMENT

This appendix contains evidence that the public and participating jurisdictions were involved in the development of the hazard mitigation plan. It contains copies of sign-in sheets from meetings as well as copies of newspaper and/or other advertisements providing notice of those meetings. Finally, it contains copies of notices of where and when the plan could be reviewed.



VILLAGE OF LAKELINE, OHIO

December 21, 2016

Larry Greene
Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, Ohio 44060

Dear Larry:

The purpose of this letter is to confirm the Village of Lakeline's desire to participate in the plan update process. The Village would like to keep the snow fence project that is contained in the current plan as a continuing initiative in the updated Hazard Mitigation Plan (HMP).

As Mayor I inherited the snow fence project and we continue to be supportive of the strategy, particularly the concept of planting trees as living snow fences. While we are a small Village and were unable to attend your meetings last summer, the Village is interested in the updated HMP and supports the work that the County does on behalf of its municipalities.

The Lakeline Village Council intends to pass a Resolution at our next regularly scheduled Council meeting that indicates our participation in the County's plan.

Please let me know what further information I can provide to the County or to FEMA.

Thank you for your assistance

Sincerely,

Deborah L. Neale

Mayor, Village of Lakeline



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 17, 2015

Mayor Dennis Morley
City of Eastlake
35150 Lakeshore Boulevard
Eastlake, OH 44095

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Morley:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

To ensure the continued countywide scope and application of our plan, I am respectfully seeking official representation from your city to participate in its update process. The person(s) selected should know your community's specific risks/vulnerabilities and agree to serve as the jurisdiction's primary point-of-contact. The latter will involve securing input from department heads and other public/private stakeholders in your community to assess local risk and develop mitigation strategies and projects for inclusion in the revised plan.

The first update committee meeting is scheduled for Tuesday, 7/14/2015, at the Lake County Emergency Operations Center, 8505 Garfield Road, Mentor, OH 44060. The meeting, which will be facilitated by JH Consulting LLC., will begin at 10:00am and last approximately two hours. The goal of the meeting will be to update the status of mitigation projects and strategies contained in our current plan. Subsequent meetings (2) occurring in late-Summer and mid-Fall, will then be used to define identified risks and vulnerabilities, develop mitigation strategies and, most importantly, provide the public an opportunity to comment at each step of the process.

Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the Plan Update Committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Mark Tyler
City of Kirtland
9301 Chillicothe Road
Kirtland, OH 44094

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Tyler:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Richard J. Bonde
City of Willowick
30435 Lake Shore Boulevard
Willowick, OH 44095

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Bonde:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor David E. Anderson
City of Willoughby
One Public Square
Willoughby, OH 44094

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Anderson:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Robert M. Weger
City of Willoughby Hills
35405 Chardon Road
Willoughby Hills, OH 44094

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Weger:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor William A. Margalis
City of Wickliffe
28730 Ridge Road
Wickliffe, OH 44092

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Margalis:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

City Manager Kenneth J. Filipiak
City of Mentor
8500 Civic Center Boulevard
Mentor, OH 44060

RE: Hazard Mitigation Plan Update Committee

Dear Mr. Filipiak:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor David R. Eva
City of Mentor-on-the-Lake
5860 Andrews Road
Mentor-on-the-Lake, OH 44060

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Eva:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Dennis Morley
City of Eastlake
35150 Lakeshore Boulevard
Eastlake, OH 44095

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Morley:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

City Manager Anthony Carson
City of Painesville
7 Richmond Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Mr. Carson:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Trustee Chairman Rick C. Amos
Perry Township
3740 Center Road
Perry, OH 44081

RE: Hazard Mitigation Plan Update Committee

Dear Trustee Amos:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Trustee Chuck Klco
Leroy Township
5920 Paine Road
Leroy Twp, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Trustee Klco:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,


Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Trustee Chairman Gabe Cicconetti
Painesville Township
55 Nye Road
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Trustee Cicconetti:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Trustee Chairman Peter Wayman
Madison Township
2065 Hubbard Road
Madison, OH 44057

RE: Hazard Mitigation Plan Update Committee

Dear Trustee Wayman:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

To ensure the continued countywide scope and application of our plan, I am respectfully seeking official representation from your township to participate in its update process. The person(s) selected should be familiar with your community's specific risks/vulnerabilities and agree to serve as the jurisdiction's primary point-of-contact. The latter will involve securing input from department heads and other public/private stakeholders in your community to assess local risk and help develop mitigation strategies and projects for inclusion in the revised plan.

The first update committee meeting is scheduled for Tuesday, 7/14/2015, at the Lake County Emergency Operations Center, 8505 Garfield Road, Mentor, OH 44060. The meeting, which will be facilitated by JH Consulting LLC., will begin at 10:00am and last approximately two hours. The goal of the meeting will be to update the status of mitigation projects and strategies contained in our current plan. Subsequent meetings (2-3) to occur in late-Summer and mid-Fall will then be used to define identified risks and vulnerabilities, develop mitigation strategies and, most importantly, provide the public an opportunity to comment at each step of the process.

Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,


Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Trustee Chairman Christopher A. Galloway
Concord Township
7229 Ravenna Road
Concord, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Trustee Galloway:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Timothy Manross
Fairport Harbor Village
220 Third Street
Fairport Harbor, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Manross:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Christopher W. Conley
Grand River Village
P. O. Box 216, 205 Singer Avenue
Grand River, OH 44045-0216

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Conley:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor John F. Turben
Kirtland Hills Village
8026 Chillicothe Road
Kirtland Hills, OH 44060

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Turben:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Deborah L. Neale
Lakeline Village
33801 Lake Shore Boulevard
Lakeline, OH 44095

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Neale:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Robert Ranallo
Waite Hill Village
7215 Eagle Road
Waite Hill, OH 44094

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Ranallo:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,


Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Vicky L. Stevens
Perry Village
3758 Center Road, P. O. Box 100
Perry, OH 44081

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Stevens:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor David Cattani
Timberlake Village
11 Eastshore Boulevard
Timberlake, OH 44095-1937

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Cattani:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,



Larry Greene, Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Ed Klco
North Perry Village
4449 Lockwood Road
North Perry, OH 44081

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Klco:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,


Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mayor Sam Britton Jr.
Madison Village
126 West Main Street
Madison, OH 44057

RE: Hazard Mitigation Plan Update Committee

Dear Mayor Britton:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,


Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Dr. Morris Beverage-President
Lakeland Community College
7700 Clocktower Drive
Kirtland, OH 44094-5198

RE: Hazard Mitigation Plan Update Committee

Dear Dr. Beverage:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

To ensure the continued countywide scope and application of our plan, I am respectfully seeking official representation from Lakeland Community College to assist in the update process. The person(s) selected should be familiar with Lake County's risks/vulnerabilities and able to help develop mitigation strategies and projects for inclusion in the revised plan.

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Sincerely,


Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Michael T. Victor, J.D., LL.D.-President
Lake Erie College
391 West Washington Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Dr. Victor:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Dan Donaldson-District Administrator
Soil and Water Conservation District
125 East Erie Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Mr. Donaldson:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Mark Rantala- Executive Director
Lake County Port Authority
One Victoria Place, Suite 265A
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Director Rantala:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

James Branch-Director
Lake County GIS
105 Main Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Director Branch:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

James R. Gills-County Engineer
Lake County Engineer's Office
550 Blackbrook Road
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Mr. Gills:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Tim Miller-Director
Lake County Stormwater Management
125 East Erie Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Director Miller:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

To ensure the continued countywide scope and application of our plan, I am respectfully seeking official representation from your department to assist in the update process. The person(s) selected should be familiar with Lake County's risks/vulnerabilities and able to help develop mitigation strategies and projects for inclusion in the revised plan.

The first update committee meeting is scheduled for Tuesday, 7/14/2015, at the Lake County Emergency Operations Center, 8505 Garfield Road, Mentor, OH 44060. The meeting, which will be facilitated by JH Consulting LLC., will begin at 10:00am and last approximately two hours. The goal of the meeting will be to update the status of mitigation projects and strategies contained in our current plan. Subsequent meetings (2-3) to occur in late-Summer and mid-Fall will then be used to define identified risks and vulnerabilities, develop mitigation strategies and, most importantly, provide the public an opportunity to comment at each step of the process.

Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Paul Palagyi- Executive Director
Lake MetroParks
11211 Spear Road
Concord, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Director Palagyi:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

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Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

Richard L. Martin- Executive Director
Lake County Utilities Department
105 Main Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Director Martin:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

To ensure the continued countywide scope and application of our plan, I am respectfully seeking official representation from your department to assist in the update process. The person(s) selected should be familiar with Lake County's risks/vulnerabilities and able to help develop mitigation strategies and projects for inclusion in the revised plan.

The first update committee meeting is scheduled for Tuesday, 7/14/2015, at the Lake County Emergency Operations Center, 8505 Garfield Road, Mentor, OH 44060. The meeting, which will be facilitated by JH Consulting LLC., will begin at 10:00am and last approximately two hours. The goal of the meeting will be to update the status of mitigation projects and strategies contained in our current plan. Subsequent meetings (2-3) to occur in late-Summer and mid-Fall will then be used to define identified risks and vulnerabilities, develop mitigation strategies and, most importantly, provide the public an opportunity to comment at each step of the process.

Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA



Board Of Commissioners
Daniel P. Troy, Judy Moran, Kevin D. Malecek
Lake County Emergency Management Agency
Larry D. Greene, Director

June 22, 2015

David Radachy- Director
Lake County Planning and Development
125 Main Street
Painesville, OH 44077

RE: Hazard Mitigation Plan Update Committee

Dear Director Radachy:

The effective period of Lake County's current Multi-Jurisdictional All-Hazards Mitigation Plan will end in December of this year. Formally adopted by the county's twenty-three political subdivisions in 2010, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act requires the plan be updated every five years if covered communities are to remain eligible to receive funding under FEMA's Hazard Mitigation Grant Program.

To ensure the continued countywide scope and application of our plan, I am respectfully seeking official representation from your department to assist in the update process. The person(s) selected should be familiar with Lake County's risks/vulnerabilities and able to help develop mitigation strategies and projects for inclusion in the revised plan.

The first update committee meeting is scheduled for Tuesday, 7/14/2015, at the Lake County Emergency Operations Center, 8505 Garfield Road, Mentor, OH 44060. The meeting, which will be facilitated by JH Consulting LLC., will begin at 10:00am and last approximately two hours. The goal of the meeting will be to update the status of mitigation projects and strategies contained in our current plan. Subsequent meetings (2-3) to occur in late-Summer and mid-Fall will then be used to define identified risks and vulnerabilities, develop mitigation strategies and, most importantly, provide the public an opportunity to comment at each step of the process.

Thank you, in advance, for your help with this important initiative. Once chosen, please have your representative contact me via email Larry.Greene@lakecountyohio.gov by July 10th so they may be added to the update committee roster.

Sincerely,

Larry Greene-Director
Lake County EMA

Greene, Larry

From: Greene, Larry
Sent: Friday, June 19, 2015 9:36 AM
To: 'Wendy Zele (wfzele@firstenergycorp.com)'
Subject: Committee Membership
Attachments: Corporate Invitation.doc

Contacts: Wendy Zele

Good Morning Wendy,

You're not an LEPC member but, as Lake County's Governmental Affairs Rep, I think you'd be a good fit for this committee.

Let me know when convenient.

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

Greene, Larry

From: Greene, Larry
Sent: Friday, June 19, 2015 9:24 AM
To: pat.cassella@lhs.net; 'Shannon, Patrick'; 'Drcar, Mary Jo'; Cooper, Juliet; Gaglione, Robert
Subject: Hazard Mitigation Update Committee Invitation
Attachments: Corporate Invitation.doc

Good Morning Everyone,

As members of the county's Local Emergency Planning Committee, I was hoping to possibly solicit your assistance with an important planning project that will be occurring over the next few months.

Lake County's All-Hazards Mitigation Plan is due for its FEMA-mandated five-year revision in December of this year.

Part of the update process involves convening a committee to review projects currently in our plan and then developing new ones as necessary. One of the things FEMA wants to see this time around is evidence of more public/private partnerships in the plan update process. Participating will not obligate your company to anything other than your time.

I've attached an invitation with all the details and am hoping you will be permitted to participate. Thanks, in advance, and please let me know if you have any questions.

Have a great weekend,

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

7/14/2015

HAZARDOUS MITIGATION 2015

9/15
Meeting
↓

	NAME	AGENCY	E-MAIL	PHONE
1	Jim Powers	WICKLIFFE F.D.	jpowers@wickcliffe fire.org	440-943-7142
2	Ken Gaunther	MADISON Township	kgaunther@madison township.net	440-428-1454
3	Bob Gagliardi	WINDSOR LAURELWOOD	robert.gagliardi@UHSINC.COM	216-409-6649
4	STEVEN PAYNE	KIRTLAND HILLS	SPAYNE@KIRTLANDHILLS.ORG	440-974-9090
5	Wendy Zele	CEI	wfzele@firstenergycorp.com	440 465 0446
6	Robert Zepke	WILLOW	bzsepke@cityofwillow.com	440-585-1202
7	Randy Fulep	Lake County Port & Economic Development	rfulep@lcpport.org	440-321-9036
8	Billie Dunn	Lake Erie College	bdunn@lec.edu	440-375-7506
9	David Dillon	First Energy	ddillon@firstenergycorp.com	216-295-5143
10	John Church	Lake Co EMA	jchurch@lakecountychio.gov	440-350-5304
11	Ted Whittington	Eastlake FD	EFIRE1700@AOL.COM	440 463-4120
12	RANDY ROTHLIBERGER	LAKE COUNTY UTILITIES	Randy.Rothliberger@lake countychio.gov	440-350-2652
13	John Gielink	MOLPD	policechief@city.mol.org	440-252-7234
14	Steve Gagliardi	CCCPD	sgagliardi@lakeandcccpd.com	440-525-7496
15	AL ZWEGAT	WILLOUGHBYP F.D.	AZWEGAT@WILLOUGHBYPFIRE.COM	440-953-7373
16	JAMES McDONALD	PEERY FIRE DIST.	jmcDonald@PEERYFIRE.INFO	440-487-2729
17	David Phares	WS	dphares@lakecountychio.gov	440 350-5982
18	Jim Branch	GIS	Jim.branch@lakecountychio.gov	440-350-5970

9/15

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9/15

9/15

HAZARDOUS MITIGATION 2015

	NAME	AGENCY	E-MAIL	PHONE	
1 9	Tony Hutton	KFD	thutton@kurtlodgeinc.com	440-256-8979	9/15
2 0	George Hadden	Lake County Stormwater management	George.hadden@lakecountyohio.gov	440-350-2710	9/15
2 1	David Radachy	Lc Planning and Comm. Dev.	david.radachy@lakecountyohio.gov		9/15
2 2	Frank Whittaker	PTFD	FWhittaker@PainesvilleTwp.com		
2 3	Bob Lloyd	GRAND RIVER FIRE	firechief@grandriverohio.com		
2 4	Leanne Exum	City of Painesville	Leanne.Exum@lakecountyohio.gov	440-392-5926	
2 5	LARRY GREENE	Lake Co. EMA	Larry.Green@lakecountyohio.gov	440-350-5499	9/15
2 6	JASON BOYD	LAKE COUNTY COMMISSIONERS	jboyd@lakecountyohio.org	(4) 350 2334	
2 7	MIKE MANNARY	PAINESVILLE TOWNSHIP	MMANNARY@PAINESVILLETWP.COM	440 352-1445	9/15
2 8	Ted McCoy	Lake county EMA	mccoy.theodore@gmail.com	216-224-9453	
2 9	JEFF HARVEY	JH CONSULTING LLC	jharvey@jhperegrinadess.com	304-473-1009	9/15
3 0					
3 1					

9/15 HMP MEETING —
ALSO IN ATTENDANCE:

BOB SEARLES - Mentor
Jim Decker - Mentor
Ritu Sharma - TIMBERlake
Bruce Van Scot - Ricerca
Walter Siebel - Perry Twp

HAZARDOUS MITIGATION 2015

11/3/2015

	NAME	AGENCY	E-MAIL	PHONE
1	AL ZWEGAT	WILLOUGHBY F.D.	AZWEGAT@WILLOUGHBYOHIO.COM	440-343-1994
2	TED WHITTINGTON	EASTAHE FD	EFIRE1700@AOL.COM	440 951-2287
3	Steve Gagliardi	Lakeland College P.D.	sgagliardi@lakelandcc.edu	440-525-7496
4	Bob Lloyd	Grand River F.D.	firechief@grandriverchiro.com	440 352 9133
5	TOMMY HUTTON	Kirtland FD	thutton@kirtlandfire.com	440-256-4706
6	Bob Searles	MENTOR FIRE	Searles@Cityofmentor.com	440 974-5765
7	RANDY ROTHUSBERGER	LAKE CO. UTILITIES	Randy.Rothusberger@lakecountyohio.gov	440 350 2652
8	JASON BOYO	LAKE CO. COMMISSIONERS	jboydelakecountyohio.org	(4) 350-2745
9	JIM DECKER	CITY OF MENTOR	DECKER@CITYOFMENTOR.COM	974-5785
10	George Hadden	Lake Co. Storm water / Engineer	george.hadden@lakecountyohio.gov	(440) 350 2770
11	Larry Greene	Lake Co. EMA	Larry.Greene@lakecountyohio.gov	440-350-8455
12	JAMES McDONALD	PERRY FD	jmcDonald@PERRYFIRE.INFO	440-259-2880
13	Leanne Exum	City of Painesville	lexum@painesville.com	440-392-8926
14	Laura Blackson	Windsor Laurelwood	laura.blackson@uttsinc.com	440-602-8179
15				
16				
17				
18				

12/15/2015

	NAME	AGENCY	E-MAIL	PHONE
1 9	LARRY GREENE	LAKE CO. EMA	Larry.Greene@lakecountyohio.gov	(440) 350-5455
2 0	Jim Decker	CITY OF MENTOR	DECKER@CITYOFMENTOR.COM	440-255-1100
2 1	CHIEF SEARLES	CITY OF MENTOR	SEARLES@CITYOFMENTOR.COM	440-255-1100
2 2	George Hadden	LCE & LCSMD	george.hadden@lakecountyohio.gov	440-350-2770
2 3	JASON BOYD	LAKE COUNTY COMMISSIONERS	jboyd@lakecountyohio.org	(4) 350-2745
2 4	Wendy Zele	FirstEnergy	wfzele@firstenergycorp.com	440-358-4987
2 5	MATT SABO	CONCORD FIRE	msabo@concordtwp.com	440-354-7503
2 6	Steve Gagliardi	Lakeland Community College P.D.	sgagliardi@lakelandcc.edu	440-525-7496
2 7	JOHN GIELINK	MENTOR-ON-THE-LAKE POLICE DEPT	Policechief@citymol.org	(440) 257-7234
2 8	JIM GILLS	LAKE COUNTY ENGINEER	James.Gills@lakecountyohio.gov	(440) 350-2770
2 9				
3 0				
3 1				

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Thursday, September 03, 2015 11:17 AM
To: Anthony Hutton
Subject: Hazard Mitigation Plan (HMP) Update Committee Meeting Notice
Attachments: Public Notice of 9-15-2015 Meeting.docx

Good Morning HMP Update Committee Member,

Just a reminder that our second HMP update meeting is scheduled for Tuesday (September 15th) at the Lake County Emergency Operations Center, 8505 Garfield Road, Mentor (OH) 44060.

The meeting will begin at 10:00am and should not exceed an hour. Public comment on our plan update will begin at 11:00am.

Thank you, in advance, for your help with this important initiative. Hope to see you on 9/15.

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

The News-Herald

News-Herald.com

Proof of Ad 09/08/15

7085 Mentor Avenue,
Willoughby, Ohio 44094

Account: 69225

Name: TERRI LANGE
Company: LAKE COUNTY COMMISSIONERS
Address: 105 MAIN ST
P.O. BOX 490
PAINESVILLE, OH 44077
Telephone: (440) 350-2719

Ad ID: 739104
Description: MEETING FOR MITIGATION PLAN
UPDATE T

Run Dates: 09/11/15 to 09/11/15
Class: 1201
Orig User: CRBDEVER
Words: 133
Lines: 33
Agate Lines: 34
Column width: 1
Depth: 3.76
Blind Box:

MEETING FOR MITIGATION PLAN UPDATE

The Lake County Hazard Mitigation Core Planning Committee will be conducting a meeting concerning the updating of the Lake County Multi-Jurisdictional Hazard Mitigation Plan.

This plan identifies the hazards to which Lake County is susceptible as well as a variety of projects that can be undertaken to lessen the effects of those hazards. The public is invited to attend this meeting to be held at the Lake County Emergency Operations Center at 8505 Garfield Road, Mentor, OH 44061, on September 15, 2015, at 11:00 a.m.

The Lake County Multi-Jurisdictional Hazard Mitigation Plan was developed in 2005 per federal requirements in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000.

739104/September 11, 2015

We Appreciate Your Business!
Thank You TERRI LANGE!

Journal Register
C O M P A N Y

**7085 Mentor Avenue,
Willoughby, Ohio 44094**

Account:	69225
Name:	TERRI LANGE
Company:	LAKE COUNTY COMMISSIONERS
Address:	105 MAIN ST P.O. BOX 490 PAINESVILLE, OH 44077
Telephone:	(440) 350-2719
Ad ID:	803316
Description:	MEETING FOR MITIGATION PLAN UPDATE T
Run Dates:	10/30/15 to 10/30/15
Class:	1201
Orig User:	CRBDEVER
Words:	133
Lines:	33
Agate Lines:	34
Column width:	1
Depth:	3.76
Blind Box:	

**MEETING FOR MITIGATION
PLAN UPDATE**

The Lake County Hazard Mitigation Core Planning Committee will be conducting a meeting concerning the updating of the Lake County Multi-Jurisdictional Hazard Mitigation Plan.

This plan identifies the hazards to which Lake County is susceptible as well as a variety of projects that can be undertaken to lessen the effects of those hazards. The public is invited to attend this meeting to be held at the Lake County Emergency Operations Center at 8505 Garfield Road, Mentor, OH 44060, on November 3, 2015, at 11:00 a.m.

The Lake County Multi-Jurisdictional Hazard Mitigation Plan was developed in 2005 per federal requirements in Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000.

803316/October 30, 2015

*We Appreciate Your Business!
Thank You TERRI LANGE!*

Greene, Larry

From: Boyd, Jason
Sent: Tuesday, August 25, 2015 8:23 AM
To: Bell, Jennifer
Cc: Greene, Larry
Subject: RE: Public Notice
Attachments: Public Notice of 9-15-2015 Meeting.docx

Jen,

Can you work with IT to have this posted on one of the rotator slides on the county's homepage? I have copied Larry Greene should you have any questions.

thanks.

Can

Jason W. Boyd
County Administrator

105 Main Street
Painesville, Ohio 44077

e: jboyd@lakecountyohio.org
p: 440.350.2745
lakecountyohio.gov

From: Greene, Larry
Sent: Tuesday, August 25, 2015 8:13 AM
To: Boyd, Jason
Subject: FW: Public Notice

Good Morning Jason,

Do you think the Commissioners would mind if this notice appeared on the county homepage? If so, I'll check with IT about posting it on EMA's.

Jeff Harvey advised that the more public input we receive the better our chances are of securing FEMA approval of the updated plan.

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

Greene, Larry

From: Greene, Larry
Sent: Tuesday, January 5, 2016 9:52 AM
To: Anthony Hutton; azwegat@willoughbyohio.com; Billie Dunn-Lake Erie College; Bob Posipanka-Willowick; Chief Robert Lloyd-Grand River; Llewellyn, Daniel; Phares, David; Radachy, David; ddillon@firstenergycorp.com; Decker, Jim; Whittaker, Francis; Hadden, George; Gills, James; Boyd, Jason; Jeffery Harvey (jharvey@jhcreparedness.com); Branch, Jim; McDonald, James; Jim Powers; John Gielink-Mentor on the Lake ; Gauntner, Kenneth R.; Greene, Larry; Laura Blackson-UH ; Exum, Leanne; Sabo, Matthew; Fulop, Patty; Rothlisberger, Randy; Searles, Bob; Steve Gagilardi-Lakeland College PD; Payne, Steven; Ted Whittington (efire1700@aol.com); Van Scoy, Bruce (bruce.vanscoy@ricerca.com); Wendy Zele (wfzele@firstenergycorp.com); Ritu Sharma (ritu70@gmail.com)
Cc: Jeffery Harvey (jharvey@jhcreparedness.com)
Subject: Draft 2015 HMP
Attachments: Draft 2015 HMP.pdf

Good Morning Everyone,

Attached is a draft of Lake County's 2015 Hazard Mitigation Plan that's being submitted to OEMA for preliminary review.

As indicated by Jeff Harvey at our final update committee meeting, there will be a period of time between submission of the draft plan to Ohio and final FEMA approval. When convenient, it's being requested that you review the document and inform Jeff of any needed editions.

Thank you all again for your help with important project.

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Thursday, September 15, 2016 9:08 AM
To: Jeffery Harvey (jharvey@jhcpreadness.com)
Subject: FW: Hazard Mitigation Plan Update

J,

Here's Waite Hill's reply.

L

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Chief K DeWitt [mailto:chief@waitehilloh.gov]
Sent: Wednesday, September 14, 2016 12:37 PM
To: Greene, Larry
Subject: RE: Hazard Mitigation Plan Update

Hello Larry,

I think we were discussing the other day to just continue with the current plan how it is written, if that makes sense.....

Keith

From: Greene, Larry [mailto:Larry.Greene@lakecountyohio.gov]
Sent: Wednesday, September 14, 2016 10:26 AM
To: chief@waitehilloh.gov<mailto:chief@waitehilloh.gov>
Subject: FW: Hazard Mitigation Plan Update

Good Morning Keith,

Just checking back to see if the Village has a project(s) it wants included.

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Greene, Larry
Sent: Wednesday, September 7, 2016 10:25 AM
To: 'chief@waitehilloh.gov'
Subject: FW: Hazard Mitigation Plan Update

Keith,

Here's a draft of the updated plan. There may be some projects included that could apply to Waite Hill.

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Greene, Larry
Sent: Monday, August 29, 2016 1:47 PM
To: 'Keith DeWitt (Chief@waitehilloh.gov<mailto:Chief@waitehilloh.gov>)'
Subject: Hazard Mitigation Plan Update

Good Afternoon Keith,

Hoping to enlist you as the Point-of-Contact for a project I'm working on.

Lake County's updated Hazard Mitigation Plan (draft) is under final review by FEMA and there are some things that need to be addressed before it can be approved. One of these involves reaching back out to a few jurisdictions to verify their involvement in the update process.

Letters were mailed out last June inviting all 23 political subdivisions to participate in the HMP update process. Attendance was voluntary so, for that reason, I didn't follow-up with Waite Hill when it did not send a representative. However, before FEMA will approve our new plan, I need to confirm that the Village was invited and/or does not have any projects it would like to see included in the updated plan for its next 5-year cycle. I have attached the Village projects contained in our current plan for review and status-update (continue, suspend, delete, etc.) if needed.

When convenient, I would ask that you please check with the Mayor (and anyone else you deem appropriate) and let me know. If you do have projects, it's not too late to get them submitted.

Thanks in advance,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Monday, August 29, 2016 4:28 PM
To: Jeffery Harvey (jharvey@jhcreparedness.com)
Subject: FW: Hazard Mitigation Plan

Second.

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: James McDonald [mailto:jmcdonald@perryfire.info]
Sent: Monday, August 29, 2016 11:45 AM
To: Greene, Larry
Subject: RE: Hazard Mitigation Plan

Larry that is correct. After I passed the information on to all three entities Perry Village and North Perry is the only one that gave me projects to submit and I turned them in. Thanks Chief McDonald

From: Greene, Larry [mailto:Larry.Greene@lakecountyohio.gov]
Sent: Monday, August 29, 2016 10:05 AM
To: James McDonald
Subject: FW: Hazard Mitigation Plan

Good Morning Jim,

Lake County's updated Hazard Mitigation Plan is in final review by FEMA and there are some questions that need to be answered before it's approved.

In your capacity as Chief for the Perry Joint Fire District, is it correct to say that you represented Perry Township, Perry Village and North Perry Village in planning meetings conducted for the update process?

I thought this was the case but need to confirm.

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499

Fax (440) 953-5397

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Monday, August 29, 2016 4:27 PM
To: Jeffery Harvey (jharvey@jhcppreparedness.com)
Subject: FW: Hazard Mitigation Plan

First one.

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Laurie & Ken Gauntner [mailto:kennyg74@roadrunner.com]
Sent: Monday, August 29, 2016 3:56 PM
To: Greene, Larry
Subject: Re: Hazard Mitigation Plan

Yes Larry we did discuss some of the facilities in the village as well.

Ken Gauntner

From: Greene, Larry<mailto:Larry.Greene@lakecountyohio.gov>
Sent: Monday, August 29, 2016 10:01 AM
To: mailto:kennyg74@roadrunner.com
Subject: Hazard Mitigation Plan

Good Morning Ken,

Lake County's updated Hazard Mitigation Plan is in final review by FEMA and there are some questions that need to be answered before it's approved.

In your capacity as Madison Township Trustee Chairman, is it correct to say that you also represented Madison Village in planning meetings conducted for the update process?

I thought this was the case but need to confirm.

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499

Fax (440) 953-5397

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Tuesday, August 30, 2016 9:57 AM
To: Jeffery Harvey (jharvey@jhcreparedness.com)
Subject: Lakeland College
Attachments: 2504_001.pdf

J,

Lakeland's response.

L

Thanks Steve,

Appreciate the quick response.

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Steve Gagliardi [mailto:SGagliardi@Lakelandcc.edu]
Sent: Tuesday, August 30, 2016 8:01 AM
To: Greene, Larry
Subject: Re: Hazard Mitigation Plan Update

Hi Director Greene,

Thank you for getting back to me, as of now, the prior submission would be the only thing that comes to mind at this time.

Thank you,

Steve
[cid:image001.jpg@01D20296.13DD0ED0]

Steve Gagliardi
Sergeant
(p)440.525.7496
sgagliardi@lakelandcc.edu<mailto:sgagliardi@lakelandcc.edu>
lakelandcc.edu<http://www.lakelandcc.edu/>

From: "Greene, Larry" <Larry.Greene@lakecountyohio.govmailto:Larry.Greene@lakecountyohio.gov>>
To: Billie Dunn-Lake Erie College <bdunn@lec.edumailto:bdunn@lec.edu>>, "sgagliardi@lakelandcc.edumailto:sgagliardi@lakelandcc.edu"<sgagliardi@lakelandcc.edumailto:sgagliardi@lakelandcc.edu>>
Date: 08/29/2016 02:36 PM
Subject: Hazard Mitigation Plan Update

Good Afternoon Billie and Steve,

First of all, I want to thank you for your valued participation in the update process of Lake County's Hazard Mitigation plan.

The plan (draft) is under final review by FEMA and there are some things that need to be addressed before it can be approved. One of these involves reaching back out to a few jurisdictions to verify their involvement in the update process.

Although it was apparent both Lake Erie College and Lakeland Community College participated in the work sessions conducted for the HMP update, FEMA wants to know if either of you had any identified hazards and/or mitigation strategies (projects) relating to your respective facilities that you want included in the updated plan.

Steve-I have your email from 9/15/2015 that details the need for active-shooter response equipment and training for the college which I can submit. Is there anything else you want me to include?

Billie-likewise, are there any identified hazards and/or mitigation strategies relating specifically to Lake Erie College that you would like to see included?

Thanks, in advance, for your help. Please let me know if you have any questions.

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Wednesday, August 31, 2016 9:54 AM
To: Jeffery Harvey (jharvey@jhcreparedness.com)
Subject: FW: Hazard Mitigation Plan Update- FAIRPORT HARBOR- GENRATOR FOR SENIOR CENTER

J,

Can we get this project added under Fairport Harbor?

L

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Village Administrator [mailto:administrator@fairportharbor.org]
Sent: Tuesday, August 30, 2016 5:04 PM
To: Greene, Larry
Cc: 'Mayor Tim Manross'; 'Jeff Hogya'
Subject: RE: Hazard Mitigation Plan Update- FAIRPORT HARBOR- GENRATOR FOR SENIOR CENTER

Hi Larry- The Chief forwarded me your email below (you will see the chain) regarding the Hazard Mitigation Plan Update for FEMA. I was wondering what it would take to add a generator at our senior center which is a warming & cooling center during our seasonal weather? I noticed another community has that on there and was hoping we could request it as well? If it is to late we can submit our request next year but thought this is a prime opportunity to see if we can get this included.

Thank you,
Rebecca Corrigan, Village Administrator
220 Third Street
Fairport Harbor, Ohio 44077
440.352.3620 x 112
440.567.9909 text/mobile
www.fairportharbor.org<<http://www.fairportharbor.org>>

From: Jeff Hogya [mailto:firechief@fairportharbor.org]
Sent: Monday, August 29, 2016 3:45 PM
To: Rebecca Corrigan
Cc: Mayor Tim Manross
Subject: Re: Hazard Mitigation Plan Update

Either is fine with me as long as I am included to make sure I see it's been completed since Larry asked me to get this wrapped up.

If you review the current plans you can see what would need to be provided to submit.

Sent from my iPhone

On Aug 29, 2016, at 15:32, Rebecca Corrigan

<administrator@fairportharbor.org<mailto:administrator@fairportharbor.org>> wrote:

Ok- should I communicate that to them or will you? Let me know Thanks

Rebecca Corrigan

On Aug 29, 2016, at 2:46 PM, Jeff Hogya <firechief@fairportharbor.org<mailto:firechief@fairportharbor.org>> wrote:

In the past I attended when I was given the invite that always went to Dave McGurik. He would forward it to me. We added a generator in the past for the water plant and were denied it every 5 years for two cycles so I doubt they would include it but if the Village seems that as part of. Hazard Mitigation then it can be attempted . The generator currently listed on the sheet for Eastlake is in its second or third cycle also. The Senior Center generator would be as a possible evacuation point and I am unsure if it would qualify under this plan.

You can probably review the old plan as it was sent to the Village offices when it was presented before to see what typical items are included . Something like barriers, sand, flood control etc qualify for mitigation.

This program usually doesn't get a lot of funding. The one listed now was done just so the Village had something in 2010. I don't like how they disburse the money but as with the government we have little control.

I don't believe it would hurt the Village to ask for it to be submitted I just wouldn't hold much faith in it happening Sent from my iPhone

On Aug 29, 2016, at 14:32, Rebecca Corrigan

<administrator@fairportharbor.org<mailto:administrator@fairportharbor.org>> wrote:

Hi- are you comfortable with the proposed item for Fairport? Typically in the past have you sent someone or PD? In reviewing briefly this email, I know for years there has been discussion on back up power- generator at the senior center. This seems to be an eligible activity to keep in mind. It seems as if they are on a timetable I was not sure of so to add an item might not work. What are your recommendations?

Rebecca Corrigan

On Aug 29, 2016, at 2:14 PM, Jeff Hogya <firechief@fairportharbor.org<mailto:firechief@fairportharbor.org>> wrote: Mayor Manross/ Mrs. Corrigan

Please review the below email and see if there are any projects you would like included in the Hazard Mitigation Plan other than what is listed. Should there be or not be any please communicate that back to me ASAP so this project can be submitted to FEMA

Chief Hogya

Sent from my iPhone

Begin forwarded message:

From: "Greene, Larry" <Larry.Greene@lakecountyohio.gov<mailto:Larry.Greene@lakecountyohio.gov>>

Date: August 29, 2016 at 13:37:19 EDT

To: "firechief@fairportharbor.org<mailto:firechief@fairportharbor.org>"

<firechief@fairportharbor.org<mailto:firechief@fairportharbor.org>>

Subject: Hazard Mitigation Plan Update

Good Afternoon Jeff,

Hoping to enlist you as the Point-of-Contact for a project I'm working on.

Lake County's updated Hazard Mitigation Plan (draft) is under final review by FEMA and there are some things that need to be addressed before it can be approved. One of these involves reaching back out to a few jurisdictions to verify their involvement in the update process.

Letters were mailed out last June inviting all 23 political subdivisions to participate in the HMP update process. Attendance was voluntary so, for that reason, I didn't follow-up with Fairport Harbor when it did not send a representative. However, before FEMA will approve our new plan, I need to confirm that the Village was invited and/or does not have any projects it would like to see included in the updated plan for its next 5-year cycle. I have attached the Village projects contained in our current plan for review and status-update (continue, suspend, delete, etc.) if needed.

When convenient, I would ask that you please check with the Mayor (and anyone else you deem appropriate) and let me know. If you do have projects, it's not too late to get them submitted.

Thanks in advance,

Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

<2499_001.pdf>

Jeffery Harvey

From: Greene, Larry <Larry.Greene@lakecountyohio.gov>
Sent: Friday, September 16, 2016 8:34 AM
To: Jeffery Harvey (jharvey@jhcreparedness.com)
Subject: FW: Hazard Mitigation Plan Update
Attachments: Planning Update Committee Invitation Letter-Willoughby Hills.doc; Willoughby Hills Project.pdf

Good Morning Jeff,

I just spoke with Mayor Weger and he advised that Willoughby Hills does not have any new projects it wants added to the updated HMP. It would, however, like to continue with the river gage project included in the 2010 HMP.

Also, just as a point of correction, Willoughby Hills needs to be listed as a city (not a village).

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Thomas Talcott [mailto:ttalcott@earthlink.net]
Sent: Thursday, September 15, 2016 5:03 PM
To: Robert Weger
Cc: Greene, Larry; Patty Heller
Subject: Fwd: Hazard Mitigation Plan Update

Mayor Weger,

Attached is the information I received from EMA Director Greene reference Willoughby Hills' participation in the HMP process. As we discussed, Director Greene needs our input tomorrow, Friday, 9-16-2016.

Thank you,

Tom

Assistant Chief Thomas Talcott, EFO
Willoughby Hills FD
35405 Chardon Rd.
Willoughby Hills, OH 44094

Office:440-942-7207
talcott.whfd@gmail.com<mailto:talcott.whfd@gmail.com>

Begin forwarded message:

From: "Greene, Larry" <Larry.Greene@lakecountyohio.gov<mailto:Larry.Greene@lakecountyohio.gov>>
Subject: Hazard Mitigation Plan Update
Date: September 15, 2016 at 2:36:54 PM EDT
To: Tom Talcott <ttalcott@earthlink.net<mailto:ttalcott@earthlink.net>>

Tom,

Thanks for your help. I have attached the only project Willoughby Hills had included in the 2010 HMP. If desired, it can be continued, deleted, suspended or added to.

The only problem is that our consultant is under a time constraint from FEMA to secure your city's information. Once it's determined that Willoughby Hills either has (or does not have) a project(s) it would like to see included during the next 5-year coverage period, FEMA can then formally approve our updated plan.

Please let me know if there are any questions.

Thanks,
Larry

Larry Greene-Director
Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Greene, Larry
Sent: Tuesday, September 6, 2016 10:24 AM
To: 'Willoughby Hills Fire Chief DiSanto'
Subject: RE: Hazard Mitigation Plan Update

Good Morning Chief,

No problem.

As a point of reference, I have attached the letter that was mailed to Mayor Weger last year. It provides some general details about the HMP, the planning processes of which are typically assigned to the Police and/or Fire Chiefs to help determine what hazards their jurisdictions are susceptible to. Sometimes the city engineer (or service director) is also enlisted in the event there is a project the jurisdiction may want to apply for under FEMA's Hazard Mitigation Grant Program. If a project is included in the HMP by a community, it could increase the chance of it getting funded. The main reason for me reaching back out to communities that were not represented in the update process is to make sure there's nothing on the drawing board in the upcoming five years they may want to see included.

I'm in the office all week and available to talk when convenient for you. My direct line is (440) 350-5455.

Thanks,
Larry

Larry Greene-Director

Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

From: Willoughby Hills Fire Chief DiSanto [mailto:firechiefdisanto@willoughbyhills-oh.gov]
Sent: Thursday, September 1, 2016 8:45 AM
To: Greene, Larry
Subject: RE: Hazard Mitigation Plan Update

Hi Larry,

If you don't mind, I would like to speak to you further on this matter.
I need to familiarize myself with the HMP before I commit. I am interested and hope we can find some time in the near future. Feel free to contact me any time.
Thanks

Bobby DiSanto
Fire Chief

City of Willoughby Hills
35405 Chardon RD.
Cell 216-337-7970

From: Greene, Larry [mailto:Larry.Greene@lakecountyohio.gov]
Sent: Monday, August 29, 2016 1:58 PM
To: Willoughby Hills Fire Chief DiSanto <firechiefdisanto@willoughbyhills-oh.gov> [mailto:firechiefdisanto@willoughbyhills-oh.gov]>
Subject: Hazard Mitigation Plan Update

Good Afternoon Chief,

Hoping to enlist you as the Point-of-Contact for a project I'm working on.

Lake County's updated Hazard Mitigation Plan (draft) is under final review by FEMA and there are some things that need to be addressed before it can be approved. One of these involves reaching back out to a few jurisdictions to verify their involvement in the update process.

Letters were mailed out last June inviting all 23 political subdivisions to participate in the HMP update process. Attendance was voluntary so, for that reason, I didn't follow-up with Willoughby Hills when it did not send a representative. However, before FEMA will approve our new plan, I need to confirm that the city was invited and/or does not have any projects it would like to see included in the updated plan for its next 5-year cycle. I have attached the city project contained in our current plan for review and status-update (continue, suspend, delete, etc.) if needed.

When convenient, I would ask that you please check with the Mayor (and anyone else you deem appropriate) and let me know. If you do have projects, it's not too late to get them submitted.

Thanks in advance,
Larry

Larry Greene-Director

Lake County Emergency Management Agency
8505 Garfield Road
Mentor, OH 44060
Office (440) 350-5499
Fax (440) 953-5397

Project Prioritization Matrix

[illegible]

Prioritization Matrix Instructions

List projects across the top row of the matrix.

On a scale of 1 to 5 (5 being the best), score each project according to the criteria in the left-hand column. Score each project according to your opinion of its merit. No comparison is made during the initial scoring.

Tally the score for each project by adding the numbers in the column under the project. Place the answer in the same column of the "Total" row.

The highest score is the highest-priority project. (NOTE: Multiple projects may have the same ranking.)

Definition of Scoring Criteria:

Cost Effectiveness:	Is sufficient funding available to implement the project at a cost manageable by the local government? If not, is funding available? Will the costs of implementing the project be significantly less than the cumulative future costs potentially incurred by an un-corrected situation?
Property Protection:	How significant will the action be at eliminating or reducing damage to structures and infrastructure?
Life Safety:	How effectively will the action protect lives and prevent injuries?
Environmental Impacts:	Will implementing the project adversely affect the environment in any way? Will implementing the project actually benefit the environment?
Social Impacts:	Will the public perceive the project as positively lessening hazard-related losses? Will implementing the project adversely affect any segment of the population?
Legal Impacts:	Do your governmental organizations and/or partner agencies have the authority to implement the actions?
Political Impacts:	Will implementing the project create negative political issues?
Overall Feasibility:	Do local policies and capabilities currently allow for the implementation of the project? Are programs available to assist in funding the implementation of the project? Do local leaders generally agree that implementing the project will be beneficial to the community?

Jurisdiction:

Hazard		Number (2010-2015)	Known Losses (2010- 2015) - Dollars	Known Losses (2010- 2015) - Lives/Injuries	Known Losses (2010- 2015) - Function/Use	Specific Locations/ Instances	Misc. Details
Coastal Erosion							
Dam Failure							
Drought							
Earthquake							
Epidemic							
Flooding							
	Flash Flood						
	Riverine Flood						
Hailstorm							
Hazmat Incident							
	Facility						
	Road						
	Rail						
	Other						
Infestation							
Land Subsidence							
	Slips						
	Sink Holes						
	Other						
Temp. Extreme							
Terrorism							
	Domestic						
	Other						
Thunderstorm							
Tsunami							
Wildfire							
Wind							
	Tornado						
Winter Storm							

APPENDIX 2: GLOSSARY

This appendix contains definitions of commonly-used terms throughout the hazard mitigation plan. These terms are considered because they are either unique to the mitigation planning process or used in a different way in a mitigation context as compared to other emergency preparedness contexts. This appendix also contains a list of the acronyms used throughout this document and their corresponding definitions.

Definition of Terms

Asset Inventory: A listing of critical facilities, historical facilities, facilities housing vulnerable populations (e.g., schools, nursing homes, hospitals), large economic assets in the community, and other, community-designated special considerations on which a risk assessment is completed.

Benefit Cost Review: A process by which a community considers both the potential benefits of mitigation projects in comparison with their costs. It is a way to determine if the costs are achievable and feasible based on the benefits that can be realistically anticipated.

Emergency Services Project: Action that protects people and property during and immediately after a disaster or hazard event.

Hazard Risk Assessment: The process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from hazards by assessing the vulnerability of people, buildings, and infrastructure to hazards.

Loss Estimate: A mathematical calculation of the potential damage – structural, contents, and functional – a facility and/or community could occur as a result of a specific hazard.

Mitigation: Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or man-made disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction,

and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect.

Natural Resource Protection: Action that, in addition to minimizing hazard losses, also preserves or restores the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, watershed management, forest and vegetation management, and wetland restoration and preservation.

Prevention: Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses.

Property Protection: Actions that involve the modification of existing buildings or structures to protect them from a hazard, or removal from the hazard area.

Public Education and Awareness Project: Action to inform and educate citizens, elected officials, and property owners about the hazards and potential ways to mitigate them.

Robert T. Stafford Disaster Relief and Emergency Assistance Act: Section 322 was added as part of the Disaster Mitigation Act (DMA) of 2000 to take a new and revitalized approach to mitigation planning. This new section emphasizes the need for local entities to closely coordinate mitigation planning and implementation efforts. In succinct terms, this is the mandate requiring local communities to compile and adopt a mitigation plan as an eligibility requirement for mitigation funding.

STAPLEE Method: A technique for identifying, evaluating, and prioritizing mitigation actions based on existing local conditions. It advocates an analysis based on the following conditions: social, technical, administrative, political, legal, economic, and environmental.

Structural Project: Action that involves the construction of structures to reduce the impact of a hazard.

Definition of Acronyms

AP	Action Plan
CDBG	Community Development Block Grant
CFR	Code of Federal Regulations
CRS	Community Rating System
DHS	Department of Homeland Security (US)
EAS	Emergency Alert System
EMA	Emergency Management Agency
EMPG	Emergency Management Performance Grant
EOC	Emergency Operations Center
EOP	Emergency Operations Plan
EPI	Emergency Public Information
FD	Fire Department
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GIS	Geographic Information System
HMC	Hazard Mitigation Core Planning Committee
HMGP	Hazard Mitigation Grant Program
HRA	Hazard Risk Assessment
HS GP	Homeland Security Grant Program
LCEMA	Lake County Emergency Management Agency
LCGHD	Lake County General Health District
LEPC	Local Emergency Planning Committee
NCDC	National Climatic Data Center
NOAA	National Oceanic & Atmospheric Administration
NPL	National Priorities List
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
ODH	Ohio Department of Health
ODNR	Ohio Department of Natural Resources
OEMA	Ohio Emergency Management Agency

OEPA	Ohio Environmental Protection Agency
ORC	Ohio Revised Code
PDM	Pre-Disaster Mitigation
SOG	Standard Operating Guideline
US	United States
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey

APPENDIX 3: ADOPTING RESOLUTIONS

This appendix contains copies of the resolutions signed and adopted by each participating jurisdiction.