



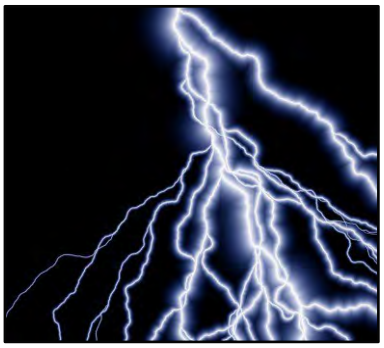


Hazard Mitigation Plan

Genesee County, MI

April 2022

This document was prepared by the GLS Region V Planning and Development Commission staff in collaboration with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division.

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Introduction

Genesee County is vulnerable to a wide range of natural, technological and human-related hazards. The intent of this hazard mitigation plan update is to educate local policy makers and emergency service organizations on the hazards of the area, providing a comprehensive reference document for planning and mitigation activities. The plan provides an update of hazard data and includes mitigation activities that have changed since the last plan was updated. This document will also help identify the vulnerability of Genesee County to natural, technological and human-related hazards. Managing these many varied threats, and protecting life and property, are the challenges faced by emergency management officials at all levels of government.

To attain an effective emergency management capability to mitigate, prepare for, respond to, and recover from all types of hazards, an understanding of the multitude of hazards that confront the county must first be obtained. To accomplish this, the hazard mitigation plan was developed to provide an understanding of those threats. It identifies important local features, the hazards affecting the area, and discusses the county's vulnerability to the identified hazards. This is created and adopted by the community, describing the ways the community will be protected from the hazards that may affect it. The plan update includes strategies to achieve the agreed-upon mitigation goals and objectives. The hazard mitigation plan is a powerful tool that enables emergency management officials to set priorities and goals for resource allocation and mitigation and preparedness activities.

In Genesee County, the Office of the Genesee County Sheriff's Department of Emergency Management and Homeland Security Division is the coordinating agency for all emergency management activities. The office is responsible for continually monitoring and updating the Emergency Action Guidelines, as well as many other disaster related activities.

Questions and comments concerning this document should be addressed to the Genesee County Sheriff's Emergency Management and Homeland Security Division:

Jeff Wilson, Emergency Management Coordinator
1002 S. Saginaw Street, Flint, MI 48502
Telephone (810) 257-3064
Fax (810) 237-6169

For more information on Genesee County's Emergency Management program, please visit their website at: https://www.gc4me.com/departments/emg_mgt_homeland_sec/index.php.

Staff of the Genesee, Lapeer, Shiawassee Region V Planning and Development Commission worked in conjunction with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division to produce the update to the Genesee County Hazard Mitigation Plan.

Genesee County Hazard Mitigation Plan Review Committee Members

- Ascension Genesys Hospital - Megan Siemiantkowski
- City of Burton Fire Department - Mike Vogt (Chairperson)
- City of Flint Fire Department - Carrie Edwards-Clemons
- Genesee County 9-1-1 - Spring Tremaine
- Genesee County Emergency Management Department - Jeff Wilson (Vice-Chairperson)
- Genesee County Equalization Department - Mellissa Hayduk
- Genesee County Health Department - Suzanne Cupal
- Genesee County Metropolitan Planning Commission - Sheila Taylor
- Genesee County Medical Control Authority - Bruce Trevithick
- Genesee County Sheriff Department - Chris Metropoulos
- Genesee County Water and Waste Department - Dave Thibeault
- Grand Blanc Township Fire Department - Robert Burdette
- Grand Blanc Township Police Department - Ron Wiles
- Hurley Medical Center - John Stewart
- McLaren Hospital - David Benn
- Mundy Township Fire Department - Ed Blight

Genesee County Board of Commissioners

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- Charles H. Winfrey
- Ellen Ellenburg
- Domonique Clemons
- Shaun Shumaker
- Meredith Davis
- Debra Newman
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Genesee County Metropolitan Planning Commissioners

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- Alexander Isaac (Vice-Chairperson)
- Gloria Nealy (Secretary)
- Domonique Clemons
- Meredith Davis
- Debra Newman
- Reggie Smith
- Cheryl Sclater
- Jeffrey Peake
- Mike LaPointe
- Tyler Rossmaessler

Communities Represented by the Genesee County Hazard Mitigation Plan

The Genesee County Hazard Mitigation Plan includes eleven cities, seventeen townships, and five villages; see list below. When the Hazard Mitigation Plan was updated in 2021, staff contacted each local unit of government and requested that they consider including recommendations from the Genesee County Hazard Mitigation Plan into the next update of their master and zoning plans. Each one of the local units of government in Genesee County agreed to consider this request. See the Action Plan and Plan Maintenance Section for a table listing the local units of government that submitted projects and signed forms.

City of Burton - Duane Haskins, Mayor
City of Clio - Bonnie Bare, Mayor
City of Davison - Tim Bishop, Mayor
City of Fenton - Sue Osborn, Mayor
City of Flint - Sheldon Neeley, Mayor
City of Flushing - Joseph Karlichek, Mayor
City of Grand Blanc - Susan Soderstrom, Mayor
City of Linden - Danielle Cusson, Mayor
City of Montrose - Colleen Brown, Mayor
City of Mt. Morris - Jeffrey Roth, Mayor
City of Swartz Creek - David Krueger, Mayor

Village of Gaines - Samuel Stiff, President
Village of Goodrich - Doug McAbee, President
Village of Lennon - Barbara BakerOmerod, President
Village of Otisville - Jeffrey Lutze, President
Village of Otter Lake - David Dorr, President

Argentine Township - Brian Saad, Supervisor
Atlas Township - Shirley Kautman-Jones, Supervisor
Clayton Charter Township - Thomas Spillane, Supervisor
Davison Township - James Slezak, Supervisor
Fenton Charter Township - Vince Lorraine, Supervisor
Flint Charter Township - Karyn Miller, Supervisor
Flushing Charter Township - Fredrick Thorsby, Supervisor
Forest Township - Mary Ann Price, Supervisor
Gaines Township - Paul Fortino, Supervisor
Genesee Charter Township - Daniel Eashoo, Supervisor
Grand Blanc Charter Township - Scott Bennett, Supervisor
Montrose Charter Township - Mark Emmendorfer, Supervisor
Mt. Morris Charter Township - Jolena Sims, Supervisor
Mundy Charter Township - Tonya Ketzler, Supervisor
Richfield Township - Joseph Madore, Supervisor
Thetford Township - Rachel Stanke, Supervisor
Vienna Charter Township - Joseph Rizk, Supervisor

Plan Development and Oversight

The Genesee County Local Emergency Planning Committee (LEPC) has the following responsibilities in Genesee County:

1. Develop emergency response plans for section 302 sites in Genesee County listed on the Michigan Department of Environment, Great Lakes, and Energy (EGLE) list under S.A.R.A Title III.
2. Community outreach information on hazardous materials spills.
3. Inform the public on how to access information through the Michigan Community Right to Know Act
4. File Tier II reports and make them available to the public upon request through the Freedom of Information Act

Part of the mission of the LEPC is to enhance public safety. It was designed to be inclusive of many agencies, and there are currently 35 LEPC members in Genesee County. The Genesee County Hazard Mitigation Plan Review Committee was formed to guide the development of the Genesee County Hazard Mitigation Plan. One of the goals of the Genesee County Hazard Mitigation Plan Review Committee is to protect public safety, so there is overlap between the two committees. There is also shared membership. For example, the Manager of the Genesee County Emergency Management and Homeland Security Division is on both committees. The next section provides a description of the work items and meetings that the Genesee County Hazard Mitigation Plan Review Committee has overseen in the development of the Plan.

Plan Development Work Items and Meetings

1. In January 2019, staff submitted an application to the MSP/FEMA for funding to update the Lapeer County Hazard Mitigation Plan.

2. In September 2020, staff received a finalized grant agreement from the MSP/FEMA to begin updating the plan.

3. On November 12, 2020, staff held the first meeting of the Genesee County Hazard Mitigation Plan Review Committee. At the first meeting, the Hazard Mitigation Plan update process was discussed. Staff shared the purpose of the plan update, overall timeline, goals and objectives, public involvement opportunities and discussed hazard analysis, vulnerability assessment and other components of the plan. Following the meeting, staff began collecting data related to Genesee County hazards from various local, county and state agencies as well as planning public and stakeholder involvement.

4. A public meeting notice was placed in the Flint Journal on January 17, 2021 for a Genesee County Hazard Mitigation Plan Update public meeting. The notice was also posted on social media, the GCMPC website, and emailed to local governments and a public involvement list. This mailing list has approximately 1,400 entries and its breakdown can be summed up by the following categories:
    - 20% other businesses (287)
    - 20% elected officials (280)
    - 17% governmental organizations (241)
    - 8% religious organizations (120)
    - 8% educational organizations (116)
    - 7% community organizations (101)
    - 6% transportation-related businesses (88)
    - 6% concerned citizens (81)
    - 6% neighborhood associations (78)
    - 2% senior citizen organizations (24)
    - <1% organizations for the disabled (7)

5. On January 11, 2021, surveys were sent out to government officials, community organizations, and the public to gain input on the challenges that face each individual community within Genesee County. A copy of the survey utilized to collect information about community hazards and priorities can be found in Appendix B.

6. On January 26, 2021, staff held a Genesee County

Hazard Mitigation Plan Public Meeting. During the meeting, staff reviewed the following information about Genesee County's Hazard Mitigation Plan Update: purpose of the plan, goals and objectives, and hazard vulnerability. Staff also answered questions and responded to comments from those who attended the meeting. A survey was available during the meeting for input as well.

7. On February 11, 2021, staff held the second meeting of the Genesee County Hazard Mitigation Plan Review Committee. Staff presented information about survey results, goals and objectives, and worked with the Committee to update the Hazard Rankings for the plan. Staff also shared information about project requests forms.

8. A description of the process used to create the prioritized list of hazards as well as the goals and objectives of the plan are included in the Genesee County Hazard Summary section of the plan.

9. On March 12, 2021, staff released a call for hazard mitigation projects to all Genesee County municipalities. Projects were to be received no later than March 26, 2021. A copy of the form for requested projects is attached. Please see Appendix C for documentation regarding the projects received.

10. Staff reviewed the project applications and surveys that were received and drafted a list of mitigation strategies for each hazard.

11. Using information collected on Genesee County hazards, the goals and objectives, the prioritized list of hazards and mitigating strategies, staff composed a draft of the Genesee County Hazard Mitigation Plan update.

12. In May 2021, staff submitted a draft of the Genesee County Hazard Mitigation Plan update to the Hazard Mitigation Plan Review Committee members for review and feedback. The plan was also sent to local agencies, surrounding counties, the state, and public for a 30-day comment period starting May 17, 2021 and ending June 18, 2021.

13. On June 3, 2021, staff held a virtual open house to get input from community leaders, first responders, and the public. Staff explained the importance of hazard mitigation and went over the changes since the previous plan. Staff stressed the importance of local units of government adopting the plan at the local level once the plan is finalized.

14. Based on committee and public feedback, staff revised the Genesee County Hazard Mitigation Plan with comments received during a 30-day comment period that began May 17, 2021 and ended June 18, 2021.

15. On June 10 ,2021, staff held a third Genesee County Hazard Mitigation Plan Review Committee meeting where members approved the Genesee County Hazard Mitigation Plan update draft for submission to the Michigan State Police and FEMA for review and approval. This approval included any final comments received during the 30-day comment period.

Genesee County Community Profile

Historical Perspective

Genesee County, Michigan is located in southeastern Michigan. The area was organized in 1836 and was named after Genesee County, New York in an effort to attract settlers from there. Genesee means "Beautiful Valley" and is derived from the Seneca language. Jacob Smith, traveling from Quebec, was the first settler in the county in 1819. Flint was a fur trading center, and also a lumber center. Next, the Village of Geneseeville was established. This area is now a large parks and recreation area owned by the county and has many historical sites such as Crossroads Village and Huckleberry Railroad. The area quickly grew due to the convenience of the Flint River for the lumber industry. Lumber was a predominant industry, and the county had a large sorting and processing business.

Jacob Smith and his Chippewa wife opened a trading post in 1819. He named the area Grand Traverse. Flint went through many name changes over the next few years, including "Todd's Crossing", "Sidney", and "Flint River" after the Ojibwa name Pawanunking. The name was shortened to Flint in 1836 and incorporated as a city in 1855.

Regional Setting

Genesee County is situated near the southeastern portion of Michigan's Lower Peninsula, approximately fifty miles northwest of Detroit. **Figure 1-1** illustrates the county's location within the State of Michigan. The county is approximately 649 square miles in area, and includes eleven cities, seventeen townships, and five villages. It is the 5th most populous county in the state, with 406,892 residents according to the 2018 ACS 1-Estimates. Genesee County is bordered by six neighboring counties: to the north are Saginaw and Tuscola Counties, Lapeer County is to the east, to the south are Oakland and Livingston Counties, and to the west are Shiawassee and Saginaw Counties. See **Figure 1-2** for a map of Genesee County.

Figure 1-1

Government

The governing board and policy-making body of the county is the Genesee County Board of Commissioners. While many of its powers, duties and responsibilities are prescribed by law, and diffused through the wide-spread use of commissions, boards, committees, and independently elected county officers, the Board is in charge of developing and approving county policy setting the budget.

The Director of Administration provides general administrative and liaison support for the Board of Commissioners, coordinates Board Committee Meetings, and maintains committee files. The Director of Administration assists the Board and County departments with analysis of legislative matters at the state and federal level. I

There are nine districts in the county with one commissioner from each district elected every two years.

Each year a Commissioner is chosen among the nine to serve as Chairperson. There are six other elected local officials in the county. They are the County Clerk, the Prosecutor, the Register of Deeds, the Sheriff, the Treasurer, and the Drain Commissioner, in addition to judges from Probate, Circuit, and District Courts. There are seventeen appointed positions in the county government filled by the Board of Commissioners.

Figure 1-2

Source: Genesee County GIS

Transportation

There are approximately 3,210 total miles of roads in Genesee County with about 70 of those miles being interstate roadway. Genesee County is served by three interstates: I-69, running east/west, I-75 running north/south, and I-475, passing north/south through the City of Flint.

Splitting off I-75, there is also US-23 running north/south. The I-69 corridor is a major trade route from Toronto, Canada to Michigan, Chicago, Illinois, and other Midwest destinations. 2019 traffic counts on I-69 show approximately 60,300 vehicles per day, between Center Street and Belsay Road. I-75 is a popular route to northern Michigan and the Upper Peninsula and serves Automation Alley. 2019 traffic counts on I-75 show approximately 88,700 vehicles per day between Miller Road and the M-21 junction. US-23 heads south to Ohio.

Trucking

Several trucking firms operate in the county, with daily trips ranging from 1 to 500, depending on the fleet size of the company. Over 16,000 trucks travel daily on I-69 and I-75 in Genesee County. The passage of the North American Free Trade Agreement (NAFTA) has resulted in more cargo and freight movement into and out of Genesee County, as trade barriers dissolve between the U.S., Canada and Mexico.

Railroad

The Canadian National from Toronto, CSX, and Central Michigan railroad companies operate freight routes through Genesee County. They serve the automotive industry and rail/highway transfer operations by providing both "piggyback" and flow-through rail/truck distribution facilities. Amtrak provides passenger services from Port Huron through Genesee County to Chicago, Illinois on the CN line. There is also one recreational railroad operated by the Genesee County Parks and Recreation Commission. It is nearly four miles long, crossing one minor arterial highway on its route.

Airplane

The county's largest and busiest airport is Bishop International Airport (BIA), which is centrally located with direct access to I-69, I-75, and US-23 at the Bristol Road exit. BIA is located within a Foreign Trade Zone, which has international import/export implications for Genesee County. Fed Ex has a large presence and BIA is the regional hub site of Fed Ex shipments for the state outside of Detroit. Strategies are in progress to further develop the Foreign Trade Zone so that local businesses can pursue additional international import/export opportunities. In 2019, BIA served over 300,000 passengers and shipped over 24 million pounds of cargo. Genesee County also has four smaller general use airports open to the public as well.

Bus Routes

Genesee County has a public transportation system, the Mass Transportation Authority (MTA). The MTA provides local citizens with county-wide service. It provides not only county-wide transportation service, but also service to five surrounding counties. There are also several charter transit services in Genesee County, which offer service to the public either daily or on an on-call basis. In addition, there are taxicab and limousine services in the county. Bus routes are represented in **Figure 1-3**.

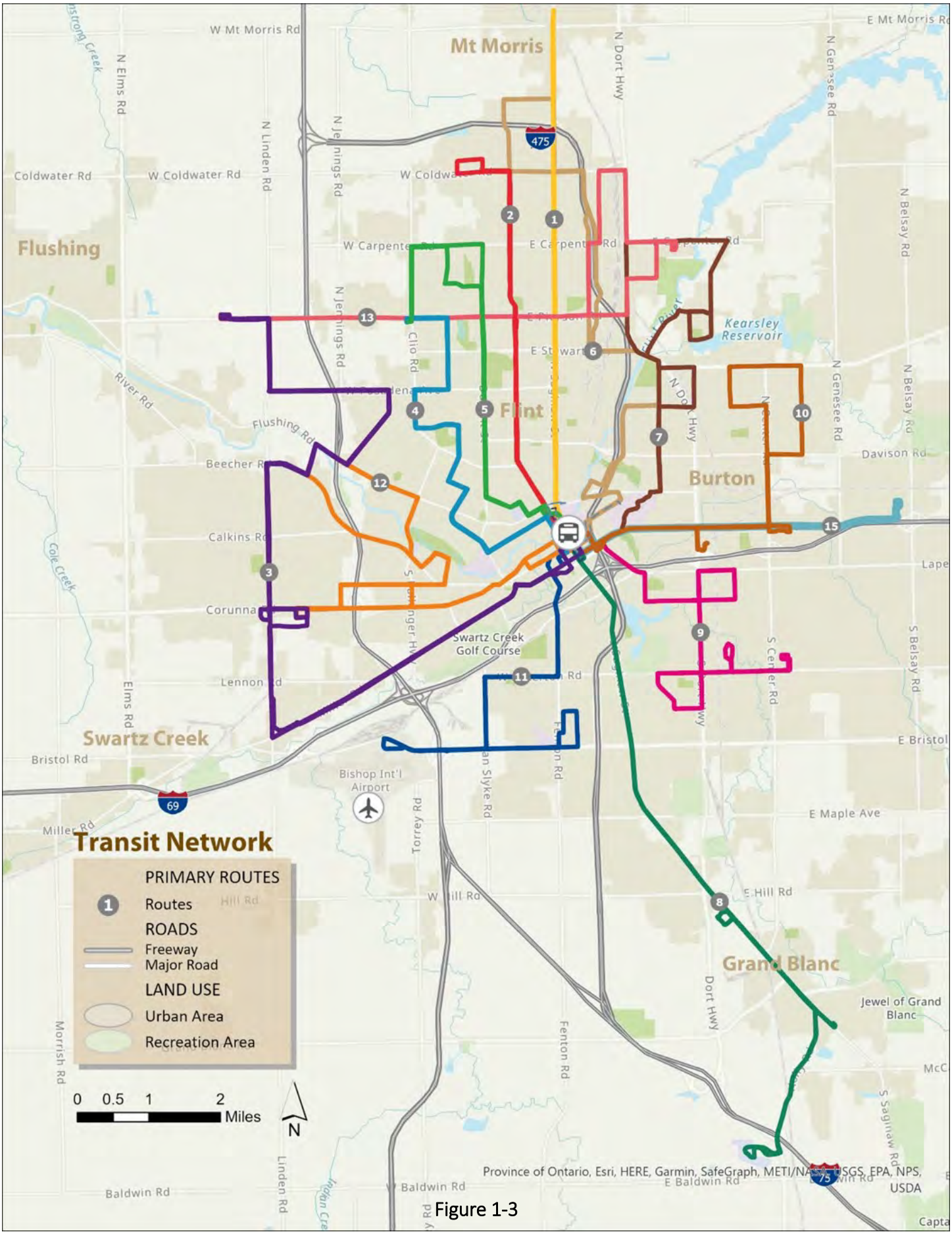


Figure 1-3

Source: Flint MTA

Climate

Genesee County is situated in southeastern Michigan, where the lake effect is not as pronounced as in other counties. The main lake effect noticed in the county is the increased cloudiness late in fall and early winter when the prevailing winds move cold air across the warmer lake water. Genesee County is subject to a wide variety of weather characteristics. There is a wide range of seasonal temperatures that may occur, and frequent weather changes are very common. **Table 1-1** indicates the temperatures that Genesee County may experience in any given year. Annual precipitation is about 32 inches, and the county receives approximately 37 inches of snowfall yearly. The growing season averages about 148 days.

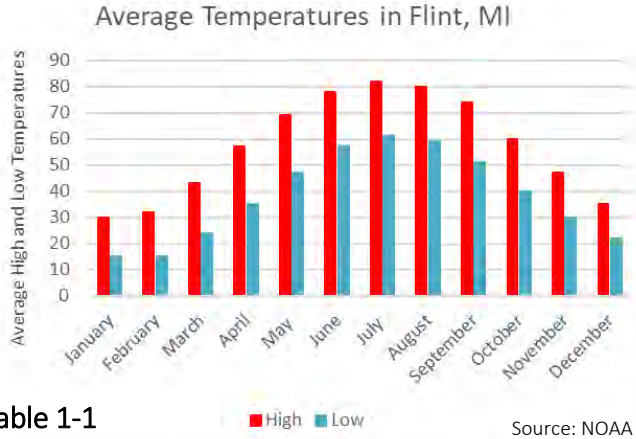


Table 1-1

Source: NOAA

Soils/Topography

The prevalent parent material in Genesee County is Glacial Overburden. A generalized soils survey has been completed for Genesee County by the United States Soil Conservation Service. Over fifty types of soils have been identified within the county. The survey classifies soils by characteristics and slopes and provided an assessment of their suitability for various uses.

Relief of Genesee County ranges from nearly level to steep. About one-third of the county is nearly level and slightly undulating, and steep banks cut this landscape along the Flint River and its tributaries. The level or nearly level land is mostly in the western and central parts of the county. The extreme southwestern part is somewhat hilly or rolling, and the northeastern, southeastern and extreme eastern parts have a generally rolling landscape that rises to low hills in some areas. Steep banks border local depressions and streams. Elevations within the county range from 580 feet in the northwestern corner of Montrose Township to about 1,000 feet in the southern and southeastern parts of the county. Genesee County has also had its floodplains mapped.

Population and Housing

According to 2018 ACS 5-Year Estimates, Genesee County has a population of 409,361 persons. With a land area of 639.6 square miles, Genesee County has approximately 634 persons per square mile. The county has an estimated 8,603 large apartment buildings (structures with 20 or more units according to the 2018 ACS 5-year Census Estimates) and 78 mobile home parks. Highlights from 2018 ACS 1-Year Estimates are included here in **Table 1-2** for a demographic profile of the county. The City of Flint is the largest political jurisdiction in the county, with a population of 97,161 people according to 2018 ACS 5-Year Estimates. See **Figure 1-4** for a map showing the population density of Genesee County.

Table 1-2 Genesee County Demographics Highlights

General Charateristics	Number	Percent	US
Population Estimates	409,361	100%	100%
Male Population	197,382	48.2%	49.2%
Female Population	211,979	51.8%	50.8%
Median Age (years)	40.9		37.9%
Under five years	24,387	6.0%	6.1%
18 years and over	315,261	77.0%	77.2%
65 years and over	67,774	16.6%	15.2%
One Race	306,623		
White	306,623	74.9%	74.2%
Black or African American	81,213	19.8%	12.6%
American Indian or Alaskan Native	1,510	0.4%	0.8%
Asian	4,253	1.0%	4.8%
Native Hawiian or Other Pacific Islander	130	0.0%	0.2%
Some other race	2,051	0.5%	4.8%
Hispanic or Latino (of any race)	13,797	3.4%	16.4%
Social Characteristics			
Highschool Graduate or Higher		31.9%	87.7%
Bachelor's Degree or Higher		13.3%	31.5%
Housing Characteristics			
Persons per household	2.41		2.63
Homeownership Rate		69.5%	63.8%
Median Value (dollars)	$104,800		$204,900
Total Housing Units	192,073		

Source: 2018 ACS 1-Year Estimates

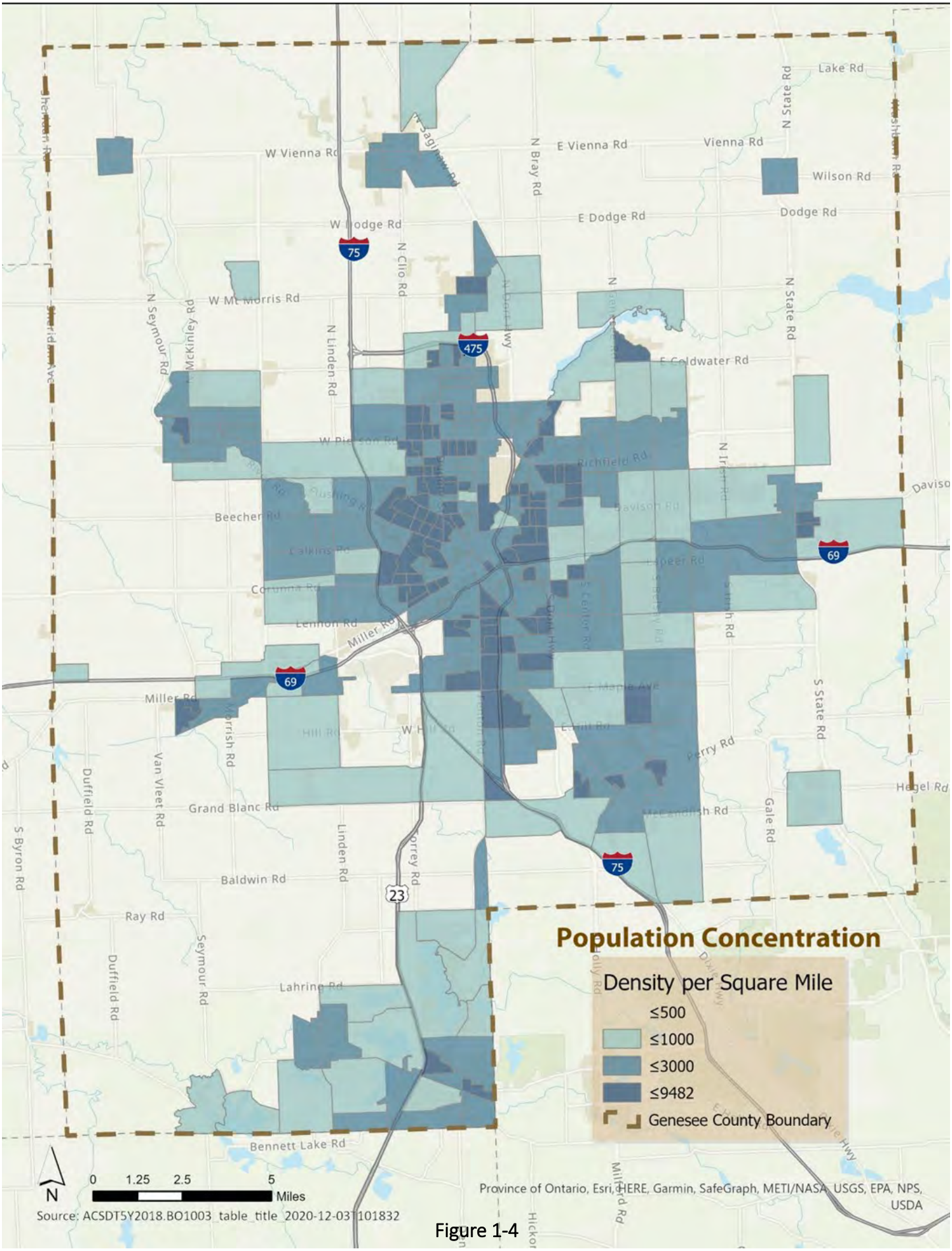


Figure 1-4

Source: Genesee County GIS and 2018 ACS 5-Year Estimates

Economy

Genesee County can offer businesses many advantages when they choose to do business here. Genesee County is intersected by I-69, I-75 and US-23, making a variety of transportation options available for area businesses. The North American Free Trade Agreement (NAFTA) has widened commerce with Canada and Mexico, and I-69 has had an increase in truck traffic. Combined with local sports venues, tourist areas, and recreational areas, Genesee County has the potential to attract new growth. In addition, many Oakland County workers are relocating to the southern portion of Genesee County, as they seek the more affordable housing available here.

There are many other incentive programs available through the Michigan Economic Development Corporation, Community Development Block Grants (CDBG), Industrial tax incentives and through new initiatives such as the I-69 International Trade Corridor. The corridor aids economic development by promoting the corridors multi-modal transportation infrastructure including Bishop International Airport, access to major freeways, the connection to the Blue Water Bridge, and multiple large rail providers.

In addition, there are workforce training incentives available to employers who hire unemployed, displaced or disabled workers. See **Table 1-3** for 2018 5-Year ACS Estimates on economic characteristics in Genesee County and the United States.

Table 1-3 Economic Characteristics

	Number	Percent	US
In labor force (population 16 years and over)	X	57.6%	62.9%
Mean travel time to work in minutes (population 16 years and over)	X	26.2	26.6
Median household income (dollars)	$27,008	X	$60,293
Per capita income	$26,386	X	$32,621
Persons in poverty	X	18.8%	10.5%

Source: 2018 ACS 5-Year Estimates

Land Use Characteristics

Genesee County can be divided into two land use categories: Urban & Built-Up and Undeveloped. The Urban & Built-Up category includes residential, commercial, industrial and other developments, and the Undeveloped category includes farmland, forested lands, rangelands, and wetlands. See **Table 1-4** for a breakdown of Genesee County land use based on these two categories. In recent years, local manufacturers downsized and moved out of the area. This not only cost Genesee County thousands of manufacturing jobs but left many Brownfields in its wake.

Table 1-4. Land Use Characteristics

Type	Acres	% of Total Acres
Urban & Built-up	201,863	50%
Undeveloped	205,455	50%
Totals	407,318	100%

Source: Genesee: Our County, Our Future Combined Plan

A Brownfield is an abandoned, idled, or under- used industrial and commercial facility where expansion or redevelopment is complicated by real or perceived environmental contamination. Also, according to the 2018 5-Year ACS Estimates, more than 25% of the City of Flint's housing stock is empty. Flint has many abandoned houses and empty lots and suffers from aging infrastructure such as water main breaks. Since 2010, nearly 8,000 homes have been demolished in Flint and Genesee County.

Changes in Local Land Development

Since the last plan was completed, development in Genesee County has declined in comparison to previous years. The lack of a significant level of new development throughout the County will not impact current or planned Hazard Mitigation actions. There were 2,586 demolitions in the County from 2017-2019, mostly within the City of Flint. The demolitions were of blighted structures that posed a health or safety risk. The demolitions have not affected the way that hazards are dealt with, but they have made neighborhoods safer and less susceptible to structure fires and other man-made hazards.

The automotive industry continues to be the major employer for the county, and still has several large manufacturing facilities here. Adjacent Oakland

County is a hub of economic activity, and many of its employees come to Genesee County to take advantage of the more affordable homes here. In 2019, there were approximately 643 building permits for new housing starts (Single Family, Multi-Family, Mobile Home) issued in Genesee County.

Community Facilities

Below is a description of facilities throughout Genesee County that provide various public services to the community including healthcare, public safety, infrastructure, and recreation.

Hospitals/Health Facilities

Genesee County has three large hospitals, McLaren Regional Medical Center, Hurley Medical Center, and Ascension Genesys Regional Medical Center. The Genesee County Health Department offers health-related services to the community. There are also many clinics available throughout the county, as well as, nursing homes and adult care facilities.

Police and Fire Stations

Genesee County has 40 police stations, 40 fire stations, a Michigan State Police post, a National Guard Armory, the Genesee County Sheriff's Department, and two 911 Centers. The City of Fenton has their own 911 dispatch center, and there is one county 911 center. See Figure 1-5 for a map of the county's emergency facilities. The Grand Blanc Fire Department has equipment and limited staff certified to perform Michigan Urban Search and Rescue (MUSAR) tasks, but Genesee County primarily relies on Michigan Task Force 1 out of Oakland County to perform tasks associated with MUSAR.

Emergency Management and Homeland Security

The Office of Genesee County Sheriff's Emergency Management and Homeland Security Division serves as the disaster services coordination office for the county and has an Emergency Operations Center located in the Genesee County Administration Building in downtown Flint.

The Emergency Management and Homeland Security Division is responsible for continually monitoring and updating the County's Emergency Response Plan, as well as many other disaster related activities:

Mitigation: Eliminate, reduce or prevent long-term risk to human life and property from natural and man-made hazards.

Emergency Preparedness: Advance emergency planning that develops operational capabilities and facilitates an effective response in the event an emergency occurs.

Emergency Response: Action taken immediately before, during or directly after an emergency to save lives, minimize damage to property and enhance the effectiveness of recovery.

Recovery: Short-term activity to return vital life support systems to minimum operating standards and long-term activity designed to return life to normal or improved levels.

The Emergency Management and Homeland Security Division works closely each year with the National Weather Service and Amateur Radio to provide SKYWARN classes twice a year, free to the public. These trainings provide valuable information about severe weather, how to spot severe weather and when to seek shelter. Every three years, Winter Weather Awareness Training is also hosted in Genesee County in coordination with the above agencies bringing more public education to the residents regarding the threats and hazards in Genesee County.

Throughout the year, Genesee County Emergency Management participates in preparedness events and public speaking engagements which educate residents on the threat of severe weather, flooding, promotes NOAA weather radios, National Flood Insurance Program (NFIP), and family disaster plans and kits.

In 2011 Genesee County Emergency Management Division secured a Homeland Security Grant to reprogram all 81 sirens at the time within the county to meet FCC compliancy.

In May of 2013 Genesee County experienced a tornado outbreak that affected four jurisdictions. Since

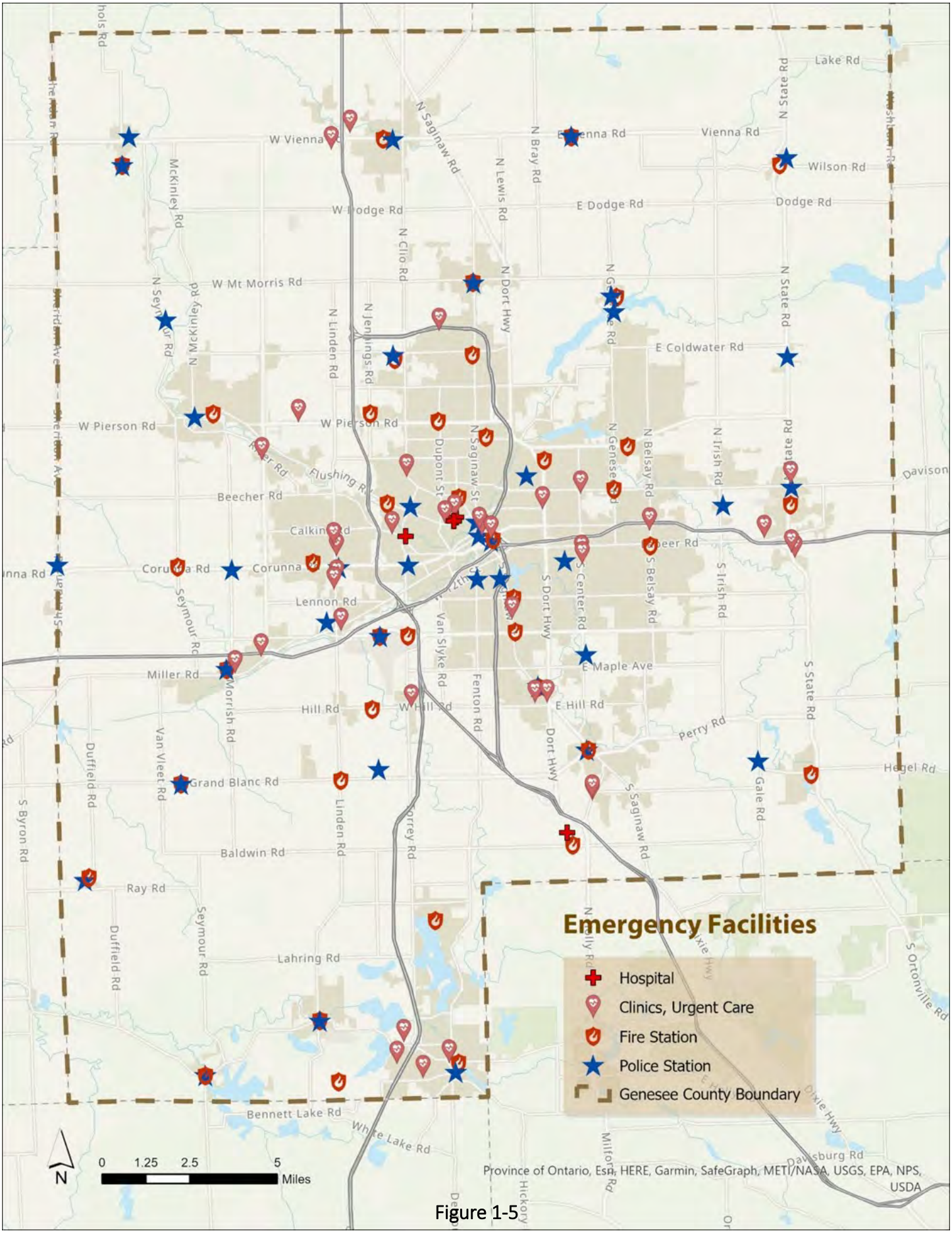


Figure 1-5

Source: Genesee County GIS and Genesee County Emergency Management

that time, multiple jurisdictions have submitted grant applications for additional sirens within their areas. Some of the jurisdictions are partnering on projects to cover jurisdictional boarders with heavy populations. Since the last plan update in 2014, there have been 30 new early warning sirens installed throughout the county.

In the recent past, Genesee County Emergency Management Division has managed the challenges that the Flint Water Crisis and COVID-19 Pandemic have presented. There have also been updates to the Emergency Operation Center (EOC) Technology System.

With the history of flooding in Genesee County and the 34 dams that exist, it is important that going forward key individuals at local jurisdictions and at the county level become Certified Floodplain Managers to continue the important mitigation planning that needs to be continued forward.

The Federal Emergency Management Agency (FEMA) requires that each community have a FEMA approved hazard mitigation plan to be eligible for future FEMA hazard mitigation funding. The Genesee County Hazard Mitigation Plan complies with the requirements of a multi-jurisdictional hazard mitigation plan as outlined by FEMA. Communities within Genesee County that have adopted this plan also comply with the FEMA requirement.

Shelters

Genesee County has community shelters that can be used to serve residents after a hazardous event has occurred. Many of these are schools, churches, or community centers.

Early Warning Sirens

The county currently has 120 installed early warning sirens. See **Figure 1-6** for a map showing the early warning sirens. The map includes precise buffer zones for the range the siren can be heard. This allows for accurate coverage to be evaluated by the magnitude of the range for each specific siren. These buffer zones indicate areas of early warning coverage in the county. Approximately 72.1% of the population is covered by a siren, leaving 27.9% of the population outside the estimated range of a siren.

Dams and Bridges

A total of 34 dams can be found in the county, with three of those dams classified as a “High Hazard” and another seven classified as a “Significant Hazard”. In addition, there are 372 bridges included in the county’s infrastructure. See **Figure 1-7** for a map of Genesee County dams and **Figure 1-8** for Genesee County bridges.

Educational Facilities

The Genesee Intermediate School District (GISD) serves a region with nearly 66,000 students and 8,500 educators. That number includes kindergarten through 12th grade, chartered academy, alternative education, special education, and adult education students. Its primary service area consists of the 21 public school districts and 15 public school academies (charter schools) in Genesee County, Michigan (GISD). Genesee County is also home to three large colleges: The University of Michigan at Flint, Kettering University, and Mott Community College.

Utilities/Solid Waste

Genesee County has 41 oil wells, 3 natural gas well and 2 brine disposal wells . (See “Oil or Natural Gas Well/Pipeline Accidents” for more information on wells.) There are 72 electrical substations and 17 water storage tanks located throughout the county. There are 32 communities in Genesee County that have curbside recycling available, and two privately-owned landfills. Genesee County also holds Hazardous Household Waste Recycling Events several times a year. In 2019, 2.4 million cubic yards of waste were disposed of in Genesee County landfills. Area phone companies include SBC, Century, AT&T, and Sprint. Consumers Energy supplies electricity and gas to the area, and Detroit Edison is another energy provider.

Groundbreaking for the construction of the Karegnondi Water Pipeline occurred in June of 2013. The waterline distributes water from Lake Huron to communities along the I-69 corridor to Genesee County.

The water supply encompasses over 2,400 square miles and serves over half a million people including residents, industrial customers, and agribusiness.

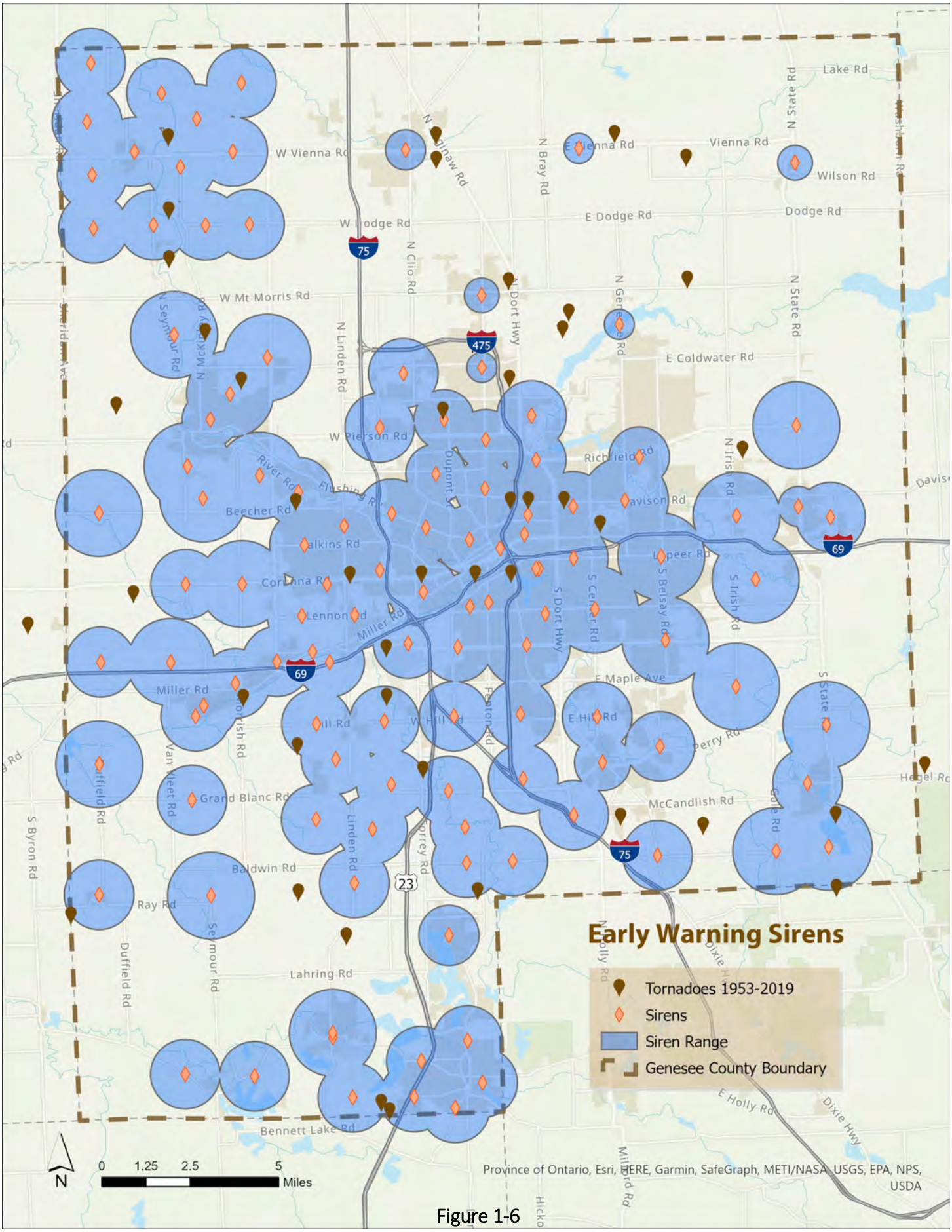


Figure 1-6

Source: Genesee County GIS and National Oceanic and Atmospheric Administration

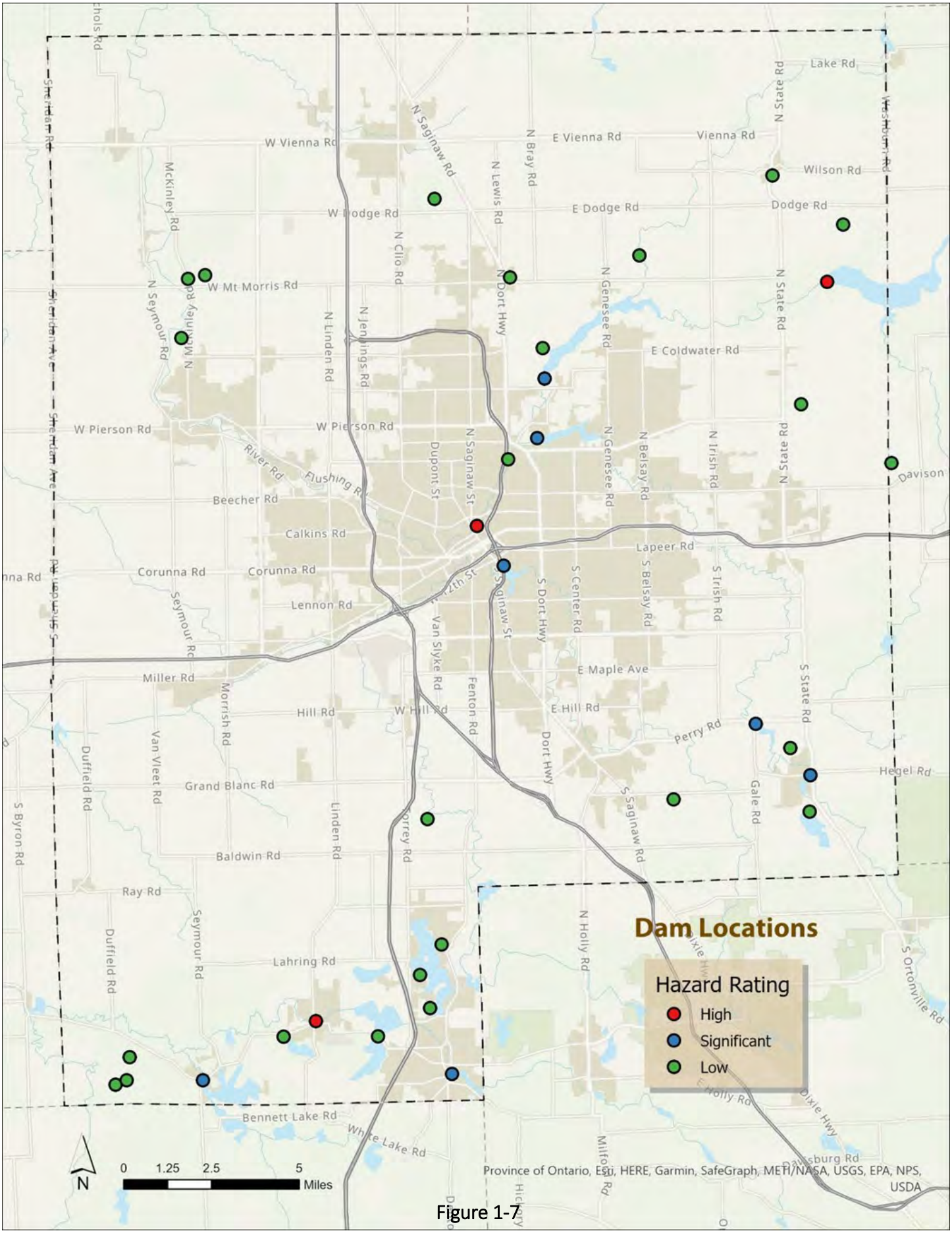


Figure 1-7

Source: Genesee County GIS

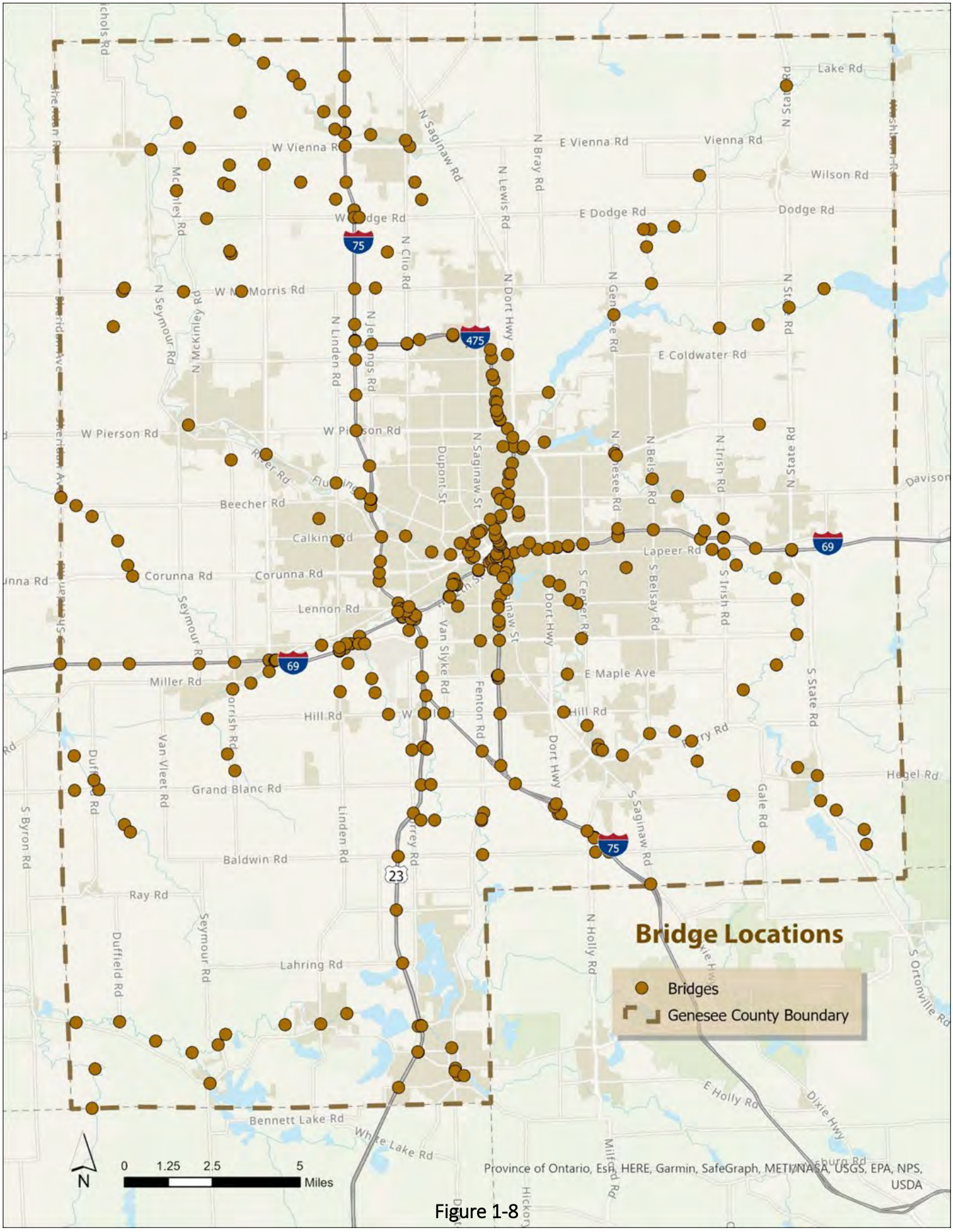


Figure 1-8

Source: Genesee County GIS

Construction was completed, and the pipeline became operational in June of 2016.

Cultural Facilities

The Flint Cultural Center includes nine major fine arts institutions that reach over 600,000 residents, students, and visitors each year. At the Center, residents can enjoy theater venues, art galleries, an orchestra, and a planetarium. In addition, there are many more art galleries scattered across the county. See the listing below for the major attractions available at the Flint Cultural Center.

- The Flint Institute of Arts (DeWaters Art Center)
- The Flint Institute of Music (Dort Music Center)
- Flint Symphony Orchestra
- Flint School of Performing Arts
- The Flint Youth Theatre
- Longway Planetarium
- Alfred P. Sloan Museum
- The Whiting Auditorium
- F.A. Bower Theater
- Flint Public Library
- Applewood

Recreational Facilities

The Genesee County Parks system contains seven major parks and provides recreational facilities and attractions such as beaches, boat ramps, fishing sites, campgrounds, and equestrian areas. One of the main attractions is Crossroads Village, a "living village" that offers a glimpse of Michigan village life in the 1860 to 1880 historical period. The Huckleberry Railroad is a steam-powered train that winds through the Village for eight miles providing scenic rides to visitors. Another attraction is the Genesee Belle Riverboat, which provides cruises. Nature enthusiasts can enjoy For-Mar Nature Preserve and Arboretum, which has almost 400 acres for citizens to enjoy.

The Mounds Off-Road Vehicle Area is available for off-road vehicle enthusiasts to use. See the listing below for the major parks and regional recreational facilities and attractions.

Major Parks

- Bluebell Beach – Genesee Township
- Linden County Park – Fenton Township
- Flushing County Park – Flushing Township
- Buell Lake County Park – Thetford Township
- For-Mar Nature Preserve and Arboretum – Burton
- Richfield County Park – Richfield Township
- Davison Roadside Park – Burton

Regional Recreational Facilities/Attractions

- Holloway Reservoir Regional Park - Genesee and Lapeer Counties
- Genesee Recreation Area - Richfield Township and Genesee Township
- Mounds Off-Road Vehicle Area - Genesee Township
- Crossroads Village and the Huckleberry Railroad – Genesee Township
- Stepping Stone Falls - Genesee Township
- Everett A. Cummings Center - Genesee Township
- Timber Wolf Campground - Richfield Township
- Wolverine Campground and Buttercup Beach - Richfield Township
- Goldenrod Disc Golf Course - Richfield Township
- Elba Equestrian Complex - Lapeer County
- Hogbacks Area - Richfield Township
- Zemmer Park - Lapeer County

Hazardous Material Sites

As of March 2019, there are currently 58 Sites in Genesee County designated Superfund Amendments and Reauthorization Act (SARA) Title III, Section 302 Sites. These are sites where hazardous materials are stored. (See "Hazardous Materials Incidents at Fixed Sites" in the Hazards Section for more details regarding 302 Sites.) These sites are required to have an emergency plan on file with the Emergency Management and Homeland Security Office, Fire Department, and their own facility. See **Figure 1-9** for a map of the 302 Sites.

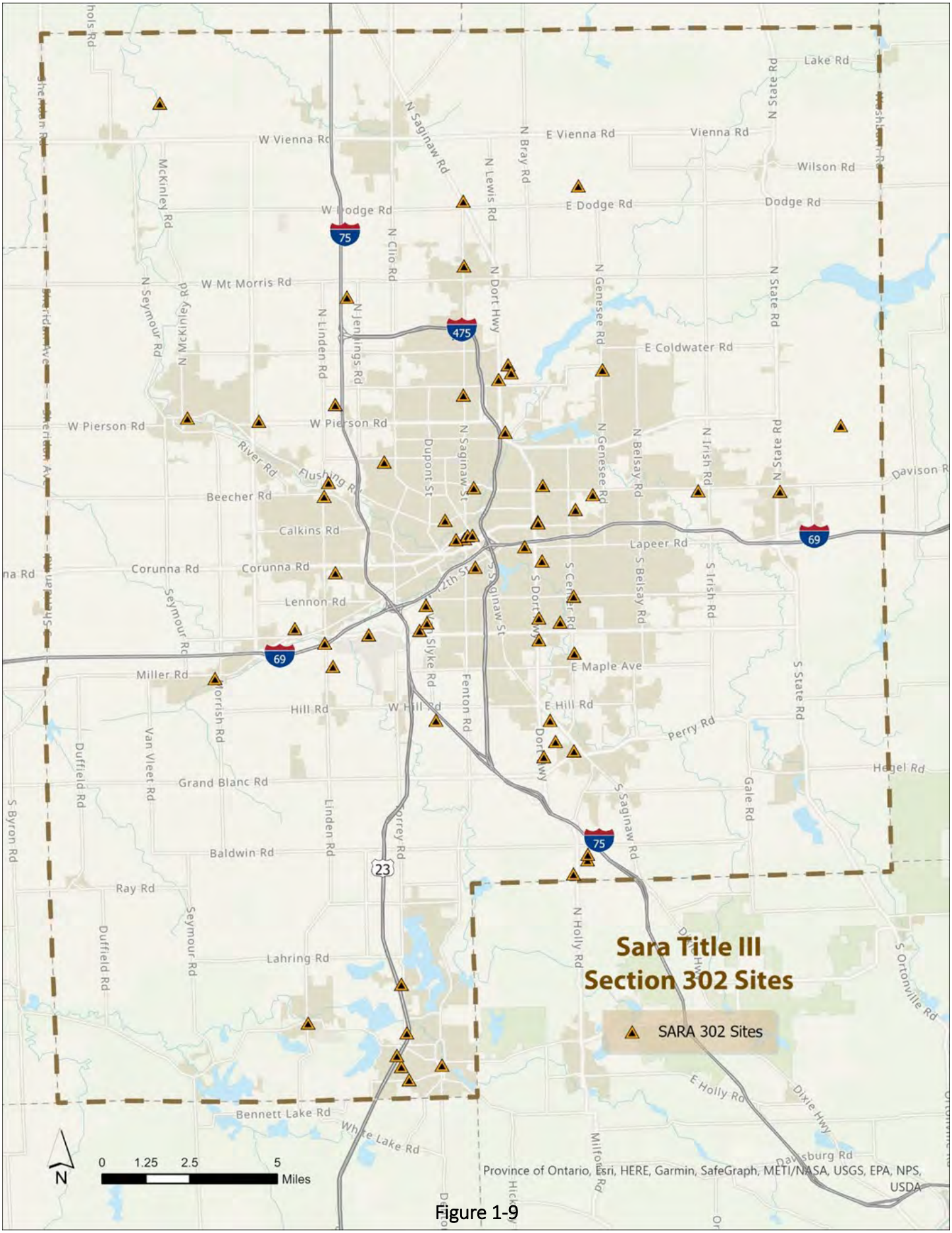


Figure 1-9

Source: Genesee County GIS and Michigan EGLE

Community Profiles

The Community Profiles provide basic characteristics of each local unit of government. The Hazard Priorities and Hazard Mitigation Strategies for the individual local units are included where available, as well as public and governmental input. Several attempts were made to gather input from all local units, including: local meetings, surveys, participation forms, memos, phone calls and emails.

To gain the participation of the local units, staff held local meetings throughout the County, sent out surveys, requested input from the public and community organizations, reached out to each local government. In addition, the Genesee County Hazard Mitigation Plan Review Committee, made up of experts involved in local government, emergency response, fire, education, health, and law enforcement from around the County was an integral part of the update. The information that was gathered received from the local units is included in the individual Community Profiles, as well as under the Hazard sections, where applicable. Information was not received from all communities.

To include not only local officials' input, staff also sent a Hazard Mitigation Plan Update Public Participation Survey (see Appendix B) to the public participation list that includes neighboring agencies, businesses, universities and school districts, nonprofits, and citizens. The Genesee County Hazard Mitigation Plan Review Committee (consisting of experts involved in local government, emergency response, fire, education, health, and law enforcement, etc.) was a very large part of the update. Staff held Public Input Sessions open to anyone who was interested in learning more about the Plan and making comments or suggestions. The Plan was sent to neighboring communities, all the local units within Genesee County, posted on Genesee County Metropolitan Planning Commission's website, and advertised as a public notice in the Flint Journal.

Staff requested information from each jurisdiction regarding the existing authorities, policies, programs, and resources to accomplish hazard mitigation at the local level (the information that was provided can be found in Appendix B, under Hazard Mitigation Plan Update Government Participation Survey). Many of the communities intend to put policies in place and staff will continue to encourage the communities to make those changes.

In the previous plan, many communities agreed to incorporate Hazard Mitigation in the update of their Master Plans. However, some of the local units have not had a Master Plan update since the completion of the previous Hazard Mitigation Plan. Staff has reminded the local units of their commitment to include Hazard Mitigation in their next update. Staff will continue to impress upon the local units the importance of incorporating Hazard Mitigation into their master plans and other important planning tools. Staff has emphasized to local officials the importance of integrating pre-hazard mitigation into other planning mechanisms as well. Each local unit is encouraged to consider the importance of being prepared for natural or man-made hazards when adopting policy and programs for their community.

Below is relevant statistics and hazard mitigation information that staff collected for each municipality in Genesee County. This information includes details provided by local officials through surveys and project applications.

Argentine Township

- 2018 Population: 6,611 (down 4.3% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Argentine Township is a continuing participant in the updated plan.
- National Flood Insurance Program (NFIP) Participant
- Four dams
- 265 potential structures in the floodplain, only 17 with insurance policies
- No repetitive loss structures
- One mobile home park
- Two warning sirens
- No "302" sites but has a hazardous materials transport route
- No emergency shelter available during emergency situations

Staff collected the following information from Argen-

tine Township officials:

- Community has been impacted by a natural or man-made disaster in the past five years - large drawbridge placed and removed on Lobdell Lake
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Dam Failure
    - Hazardous Materials Incidents (Transportation)
    - Infrastructure Failure
    - Structure Fires
- In the last five years to mitigate future hazards, the Township has reviewed public safety response and preparedness, updated dam emergency action plan, consulted with fire professionals to improve response and collaborates daily with the public
- Willing to incorporate hazard mitigation into future community plans
- Ways to improve existing policies or programs not provided
- The communities prioritized mitigation strategy is to map floodplains, update emergency response plan, update building codes, and provide outreach through social media
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Argentine Township showed the following:

- Citizens are not concerned or are moderately concerned about the possibility of their community being impacted by a disaster
- Argentine Township residents feel that the following hazards could most impact their community:
    - Dam Failure
    - Riverine Flooding
    - Snow and Ice Storms
    - Tornadoes
- Additional Public Comments:
    - Would like to see more infrastructure upgrades due to recent power loss and natural gas not being available at their house

Mitigation Projects: None submitted

Atlas Township

- 2018 Population: 7,806 (down 2.3% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Atlas Township is a continuing participant in the updated plan.
- NFIP Participant
- Three dams
- 60 potential structures in the floodplain, only 8 with insurance policies
- No repetitive loss structures
- No mobile home parks
- Five warning sirens
- No “302” sites but does have a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Atlas Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Dam Failure
    - Inclement Weather
    - Oil or Natural Gas Well Accidents
    - Public Health Emergencies
- In the last five years to mitigate future hazards, the Township has added sirens
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by coordinating efforts between communities and improve outreach and preparedness with citizens
- Do not have a list of prioritized hazard mitigation strategies
- Additional Local Official Comments:
    - Need to develop and implement plans for “what if” scenarios

Staff sent out public input surveys to include citizens in the plan. The input from Atlas Township showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster

- Atlas Township residents feel that the following hazards could most impact their community:
    - Dam Failure
    - Hazardous Materials Incidents (Transportation)
    - Major Transportation Accidents
    - Public Health Emergencies
    - Tornadoes
- Additional Public Comments:
    - More funding for emergency management staff

Mitigation Projects:

1. Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000.00 (Have currently received quote from Consumers Energy - waiting for quotes from 2 private contractors). Update: Project completed.

2. Project: Dead Ash tree removal. Project Description: Dead ash trees affect road safety throughout the entire township, along various roads, streets, and neighborhoods. Budget: $80,000.00: Update: Project is still ongoing.

3. Project: Drainage improvements to reduce risk of flooding to residential structures. Project Description: None. Location: Catherwood/Farnsworth, Hill Road, Washburn Road between County Line (Ray Road) and Kipp Road. Proposed timeframe for implementation: 1-5 years. Budget: $500,000.00. Update: Project is still ongoing.

4. Project: High pressure 10 inch water wells (electric). Project Description: To be used by the Fire Department to fight fires in various Township locations. Township would like eight wells. Proposed timeframe for implementation: 1-5 years. Budget: Approximately $36,000.00 per well. Update: Project is ongoing - cost for the high pressure 10-inch water wells has risen to $36,000 from $28,000.

5. Project: Boat for water or ice rescue. Project Description: Purchase a boat for the Fire Department to help with evacuation in the event of floods or dam failure within the village of Goodrich. Proposed timeframe for implementation: 1-5 years. Budget: $5,000.00. Update: Project is still ongoing - cost of boat has increased from $9,000 from $5,000. Still looking to do project when funding becomes available.

6. Project: Emergency Warning Sirens. Project Description: Emergency warning sirens placed in various locations within Atlas Township to be audible by all residents in all sections. Township would like eight sirens. Proposed timeframe for implementation: 1 - 5 years. Map included. Budget: Approximately $25,000.00 per siren. Update: Two emergency warning sirens have been installed. Looking to install more as funding becomes available.

City of Burton

- 2018 Population: 28,574 (down 5% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Burton is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 245 potential structures in the floodplain, only 40 with insurance policies
- 11 repetitive loss structures
- Seven mobile home parks
- Five warning sirens
- Seven “302” sites and has a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Burton officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Hazardous Materials Incidents (Transportation)
    - Public Health Emergencies
    - Snow and Ice Storms

    - Tornadoes
- In the last five years to mitigate future hazards, the City has upgraded existing warning sirens and have added some as well, all major city buildings have back up generators installed, and some property in a flood plain was also deemed unbuildable and unable to be sold to the public
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by outreach and educational opportunities as well as additional training for police, fire, and DPW employees
- The communities prioritized mitigation strategy is to complete sirens installations
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from the City of Burton showed the following:

- Citizens range from not concerned, moderately concerned, and extremely concerned about the possibility of their community being impacted by a disaster
- City of Burton residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Hazardous Materials Incidents (Fixed Sites)
    - Inclement Weather
    - Public Health Emergencies
    - Snow and Ice Storms
    - Structure Fires
    - Subsidence (Sinkholes)
    - Tornadoes
- Additional Public Comments:
    - Constant communication is needed to reduce the risk of hazards
    - Better communication with the private sector, more site inspections
    - Try to be more informed about hazards

Mitigation Projects:

1. Project: Drainage - Bellingham Court. Project description: Drainage project to reduce the risk of flooding to residential structures. Remove existing culvert drain crossing of the Gilkey Creek on Bellingham Court just east of Belsay Road and replace culver with a similar size. The replacement would conform with 2006 drainage study of a 19' span by 5' rise. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $560,000. Update: None, this is a newly submitted project.

2. Project: Drainage - Bristol Road. Project description: Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Road. The project includes the removal of the existing 3-sided cast-in-place concrete box culver drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Road. Replace with 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $700,000. Update: None, this is a newly submitted project.

Clayton Township

- 2018 Population: 7,298 (down 4.6% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Clayton Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 104 potential structures in the floodplain, only four with insurance policies
- No repetitive loss structures
- One mobile home park
- Seven warning sirens
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Clayton Township officials:

- Community has been impacted by a natural or man-made disaster in the past five years - torna-

do touched down in Calkins-Morrish Rd area
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Hazardous Materials Incidents (Transportation)
    - Snow and Ice Storms
    - Structure Fires
    - Tornadoes
- In the last five years to mitigate future hazards, the Township has installed backup generators for the police and fire departments
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by working with police, fire, and EMS to coordinate services and training with neighboring communities
- The communities prioritized mitigation strategy is to continue reviewing mapped flood plains and updating building codes
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However no public surveys for Clayton Township were received.

Mitigation Projects: None submitted

City of Clio

- 2018 Population: 2,524 (down 4.6% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Clio is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- One mobile home park
- Two warning sirens
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Clio officials:
- Community has been impacted by a natural or man-made disaster in the past five years - COVID-19, storm events, and flooding
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Inclement Weather
    - Infrastructure Failure
    - Snow and Ice Storms
- In the last five years to mitigate future hazards, the City has completed significant potable water distribution system improvements, planned significant sanitary sewer improvements, made street improvements, and adopted a storm water program
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by incorporating hazard mitigation in construction projects, communication with residents, and communication with other jurisdictions
- The communities prioritized mitigation strategy is to provide basic and essential services and meeting existing obligations
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from the City of Clio showed the following:
- Citizens range from not concerned and moderately concerned about the possibility of their community being impacted by a disaster
- City of Clio residents feel that the following hazards could most impact their community:
    - Dam Failure
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather
    - Infrastructure Failure
    - Public Health Emergencies
    - Snow and Ice Storms
    - Tornadoes
- Additional Public Comments:
    - Repair, maintain, and replace sewer and water infrastructure

- Invest in additional snow remediation equipment and/or hire additional crews
- Engine breaking on semi's should be prohibited due to the noise that it creates

Mitigation Projects: None submitted

City of Davison

- 2018 Population: 4,951 (down 4.2% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Davison is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 25 potential structures in the floodplain, only six with insurance policies
- No repetitive loss structures
- One mobile home park
- One warning siren
- One "302" sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Davison officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
  - Hazardous Materials Incidents (Transportation)
  - Inclement Weather
  - Infrastructure Failure
  - Public Health Emergencies
- In the last five years to mitigate future hazards, the City continues to be a part of the MI-Warn system, have completed drainage improvements, purchased equipment and enhanced pumps
- Willing to incorporate hazard mitigation into future community plans
- The communities prioritized mitigation strategy is to prepare emergency and contingency plans for utilities, update building codes, and map floodplains
- Additional Local Official Comments:
  - None

Staff sent out public input surveys to include citizens in the plan. The input from the City of Davison showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- City of Davison residents feel that the following hazards could most impact their community:
  - Hazardous Materials Incidents (Transportation)
  - Inclement Weather
  - Infrastructure Failure
- Additional Public Comments:
  - Need first responder training and exercises
  - Seasonal equipment maintained and in place
  - Emergency operation plans written and exercised

Mitigation Projects: None submitted

Davison Township

- 2018 Population: 19,150 (down 2.2% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Davison Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 76 potential structures in the floodplain, only 35 with insurance policies
- No repetitive loss structures
- Four mobile home parks
- Three warning sirens
- One "302" site and is located along a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Davison Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Not concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
  - Civil Disturbances

    - Inclement Weather
    - Infrastructure Failure
    - Public Health Emergencies
    - Tornadoes
- Projects or policies completed in the past five years to mitigate hazards not provided
- Willing to incorporate hazard mitigation into future community plans
- Existing community policies and programs can be improved by better communicating with the residents
- No prioritized mitigation strategy provided
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from the Davison Township showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- Davison Township residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather
    - Infrastructure Failure
    - Major Transportation Accidents
    - Oil or Natural Gas Well Accidents
    - Public Health Emergencies
    - Snow and Ice Storms
    - Tornadoes
- Additional Public Comments:
    - Maintain open communication with MDOT, C&N railway, and gas pipeline operators to prevent and prepare for hazards
    - Educate the public on action taken to keep the community safe

Mitigation Projects:

1. Project: Warning Sirens. Project description: The purchase and installation of three advance warning sirens within Davison Township. Proposed timeframe for implementation: 1-5 years. Map included. Budget: $60,000. Update: Not provided.

City of Fenton

- 2018 Population: 11,336 (down 3.6% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Fenton is a continuing participant in the updated plan.
- NFIP Participant
- Two dams
- Six potential structures in the floodplain, only four with insurance policies
- No repetitive loss structures
- One mobile home park
- Five warning sirens
- Four “302” sites and is located along a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Fenton officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Dam Failure
    - Hazardous Materials Incidents (Transportation)
    - Major Transportation Accidents
    - Tornadoes
- In the last five years to mitigate future hazards, the City has updated their emergency operations support plan and had an assessment of a dam completed
- Willing to incorporate hazard mitigation into future community plans
- Ways to improve existing programs and policies not provided
- No prioritized mitigation strategy provided
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from the City of Fenton showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster

- City of Fenton residents feel that the following hazards could most impact their community:
    - Public Health Emergencies
    - Riverine Flooding
    - Tornadoes
- Additional Public Comments:
    - City should monitor the hazards that could potentially affect our community and have projects in place to less the impact of those hazards

Mitigation Projects: None submitted.

Fenton Township

- 2018 Population: 15,363 (down 1.2% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Fenton Township is a continuing participant in the updated plan.
- NFIP Participant
- Four dams
- 147 potential structures in the floodplain, only 33 with insurance policies
- No repetitive loss structures
- Four mobile home parks
- Two warning sirens
- Two "302" sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Fenton Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Infrastructure Failure
    - Public Health Emergencies
    - Snow and Ice Storms
    - Tornadoes
- In the last five years to mitigate future hazards, the Township has upgraded sewer pump stations to reduce the risk of backups and overflows
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by educating the community on emergency preparedness
- The communities prioritized mitigation strategy is to use social media to provide access to emergency preparedness and safety information
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However no public surveys for Fenton Township were received.

Mitigation Projects:

1. Project: Emergency shelter. Project description: The project would involve renovations to the Township Hall basement to make it suitable as an emergency shelter for residents, including the addition of a back-up generator. Budget: $60,000. Update. Project is still ongoing.

City of Flint

- 2018 Population: 97,161 (down 6.1% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Flint is a continuing participant in the updated plan.
- NFIP Participant
- Four dams
- 432 potential structures in the floodplain, only 74 with insurance policies
- 21 repetitive loss structures
- 12 mobile home parks
- 19 warning sirens
- 17 "302" sites and is located along a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from the City of Flint in the previous plan update; see below. Staff requested information from City of Flint officials regarding their hazard mitigation efforts since the last plan update. However this information has not been submitted.

- Hazard Priorities:
    - Civil Disturbances
    - Dam Failure
    - Extreme Temperatures

- Hazardous Materials Incidents (Fixed Site)
- Hazardous Materials Incidents (Transportation)
- Inclement Weather
- Infrastructure Failure
- Major Transportation Accidents
- Oil or Natural Gas Well Accidents
- Public Health Emergencies
- Riverine Flooding
- Scrap Tire Fires
- Snow and Ice Storms
- Structure Fires
- Subsidence (Sinkholes)
- Terrorism
- Tornadoes
- Wildfires

Staff sent out public input surveys to include citizens in the plan. The input from the City of Flint showed the following:

- Citizens range from moderately concerned and extremely concerned about the possibility of their community being impacted by a disaster
- City of Flint residents feel that the following hazards could most impact their community:
  - Civil Disturbances
  - Dam Failure
  - Hazardous Materials Incidents (Fixed Sites)
  - Infrastructure Failure
  - Public Health Emergencies
  - Riverine Flooding
  - Snow and Ice Storms
  - Tornadoes
- Additional Public Comments:
  - Fix existing infrastructure and prepare better
  - Invest in infrastructure, education, housing, and nutrition
  - A serious investment need is infrastructure
  - With all the buses being fueled by natural gas, a natural gas outage would stop our services within a day
  - Resolve problem areas

Mitigation Projects:

1. Project: Stand-by power. Project description: The project includes stand-by power (for the Cedar Street pump station and reservoir) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include construction of a building, equipment, engineering, and engineering inspection. Budget: $1,000,000. Update: Not provided.

2. Project: Stand-by power. Project description: The project includes stand-by power (for the Westside pump station) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include engineering, construction, and construction inspection. Budget: $500,000. Update: Not provided.

3. Project: Stand-by power. Project description: The project includes stand-by power (for the Torrey Road booster pumping station) to ensure that water main pressure remains a constant for a high-elevation water district during an emergency. A preliminary engineering cost estimate was generated that reflects design engineering, construction, and construction inspection. Budget: $100,000. Update: Not provided.

4. Project: Stand-by power. Project description: The project includes stand-by power (for the Flint Water Plant) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include engineering, construction, and construction inspection. Budget: $1,800,000. Update: Not provided.

5. Project: Hamilton Dam. Project description: The project includes removal and replacement of Hamilton Dam. Estimated costs reflect engineering, construction, removal, and construction inspection. Budget: $8,000,000. Update: The Hamilton Dam superstructure has been removed and repairs to the substructure are being made. The Dam will not be replaced.

6. Project: Thread Dam. Project description: The project includes the removal of Thread Dam which is in a state of failure. Estimated costs reflect completing engineering, construction, removal, and construction inspection. Budget:

$2,100,000. Update: Instead of Thread Dam being removed, it was repaired in 2018.

Flint Township

- 2018 Population: 30,768 (down 3.6% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Flint Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 93 potential structures in the floodplain, only 42 with insurance policies
- Four repetitive loss structures
- 12 mobile home park
- 11 warning sirens
- Seven "302" sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Flint Township officials:

- Community has been impacted by a natural or man-made disaster in the past five years - COVID-19
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Major Transportation Accidents
    - Public Health Emergencies
    - Snow and Ice Storms
    - Tornadoes
- In the last five years to mitigate future hazards, the Township has installed four tornado sirens, developed a hazard mitigation policy, and are in the process of acquiring a larger generator
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by having additional training and community outreach
- The communities prioritized mitigation strategy is to develop or update emergency response plan and map of floodplains
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Flint Township showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- Flint Township residents feel that the following hazards could most impact their community:
    - Infrastructure Failure
    - Public Health Emergencies
    - Riverine Flooding
    - Snow and Ice Storms
- Additional Public Comments:
    - Need better stormwater drainage

Mitigation Projects: None submitted.

City of Flushing

- 2018 Population: 8,012 (down 4.5% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Flushing is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 60 potential structures in the floodplain, only 12 with insurance policies
- No repetitive loss structures
- One mobile home park
- One warning siren
- One "302" site
- Emergency shelter available during emergency situations

Staff collected the following information from City of Flushing officials:

- Community has been impacted by a natural or man-made disaster in the past five years - COVID-19
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Civil Disturbances
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather
    - Infrastructure Failure
    - Public Health Emergencies
    - Riverine Flooding
    - Snow and Ice Storms

    - Structure Fires
- In the last five years to mitigate future hazards, the City has upgraded water/sewer lines and DPW equipment
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by the police department receiving coordinated training for civil disturbances
- The communities prioritized mitigation strategy is to utilize existing floodplain maps and implement a recently updated hazard plan
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from the City of Flushing showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- City of Flushing residents feel that the following hazards could most impact their community:
    - Infrastructure Failure
    - Public Health Emergencies
    - Riverine Flooding
- Additional Public Comments:
    - Maintain emergency response plan

Mitigation Projects: None submitted.

Flushing Township

- 2018 Population: 10,274 (down 3.4% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Flushing Township is a continuing participant in the updated plan.
- NFIP Participant
- Three dams
- 22 potential structures in the floodplain, only 15 with insurance policies
- One repetitive loss structure and one severe repetitive loss structure
- Two mobile home parks
- Four warning sirens
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Flushing Township officials in the previous plan update; see below. Staff requested information from Flushing Township officials regarding their hazard mitigation efforts since the last plan update. However this information has not been submitted.

- Hazard Priorities:
    - Dam Failure
    - Drought
    - Hazardous Material Incidents (Fixed Site)
    - Hazardous Material Incidents (Transportation)
    - Inclement Weather
    - Major Transportation Accidents
    - Public Health Emergencies
    - Riverine Flooding
    - Scrap Tire Fires
    - Snow and Ice Storms
    - Structure Fires
    - Subsidence (Sinkholes)
    - Tornadoes
    - Wildfires

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for Flushing Township were received.

Mitigation Projects:

1. Project: Tornado Sirens. Project description: Install tornado warning sirens in the Charter Township of Flushing. Proposed timeframe of implementation: 1-5 years. Budget: $10,000-$30,000. Update: Not provided.

2. Project: Dredge Brent Creek and Cole Creek. Project description: Dredge creeks to prevent the flooding of roads caused by heavy rainfall. Proposed timeframe for implementation: 1-5 years. Budget: $10,000-$30,000. Update. Not provided.

3. Project: Back-up Generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

Forest Township

- 2018 Population: 4,535 (down 3.5% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Forest Township is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- No mobile home parks
- One warning siren
- No "302" sites
- Emergency shelter available during emergency situations

Staff collected the following information from Forest Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Extreme Temperatures
    - Hazardous Materials Incidents (Fixed Sites)
    - Inclement Weather
    - Snow and Ice Storms
- Projects or policies completed in the last five years to mitigate hazards not provided
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by coordinating with the Village of Otisville
- The communities prioritized mitigation strategy is to update emergency response plan
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Forest Township showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- Forest Township residents feel that the following hazards could most impact their community:
    - Inclement Weather
    - Snow and Ice Storms
    - Tornadoes
- Additional Public Comments:
    - Weather alerts are needed to improve hazard mitigation

Mitigation Projects:
Project: Warning sirens. Project description: The purchase and installation of three warning sirens throughout Forest Township. Budget: Unknown. Update: Not provided.

Gaines Township

- 2018 Population: 6,540 (down 4.1% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Gaines Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 59 potential structures in the floodplain, only 16 with insurance policies
- One repetitive loss structure
- One mobile home park
- Three warning sirens
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Gaines Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Not concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Civil Disturbances
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather
    - Public Health Emergencies
- In the last five years to mitigate future hazards, the Township has acquired supplies from the 10-33 program to house the public in the event of any emergency and made drain improvements
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by

having additional training for the emergency response team and use future land use and zoning ordinance to limit sites with use of hazardous materials
- The communities prioritized mitigation strategy is to work with Genesee County Surface Water to identify sources with hazardous materials
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However no public surveys for Gaines Township were received.

Mitigation Projects:

1. Project: Warning sirens. Project description: The purchase and installation of warning sirens. Budget: $80,000. Update. Not provided.

Village of Gaines

- 2018 Population: 382 (up 0.5% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The Village of Gaines is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- No mobile home parks
- One warning siren
- No “302” sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Village of Gaines officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Not concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Hazardous Materials Incidents (Transportation)
    - Infrastructure Failure
    - Snow and Ice Storms
    - Tornadoes
- Projects completed in the last five years to mitigate hazards not provided
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by continuing to communicate with Gaines Township
- The communities prioritized mitigation strategy is to focus attention on rental property inspection program
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for the Village of Gaines were received.

Mitigation Projects: None submitted.

- Additional Public Comments:
    - The dam needs to be addressed as soon as possible

Genesee Township

- 2018 Population: 20,665 (down 4.4% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Genesee Township is a continuing participant in the updated plan.
- NFIP Participant
- Four dams
- Nine potential structures in the floodplain, only three with insurance policies
- One repetitive loss structure
- Nine mobile home parks
- Two warning sirens
- Four “302” sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Genesee Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Extremely concerned about the possibility of their community being impacted by a disaster

- Hazard Priorities:
    - Hazardous Materials Incidents (Transportation)
    - Snow and Ice Storms
    - Tornadoes
- Projects completed over the last five years to mitigate future hazards were not provided
- Willing to incorporate hazard mitigation into future community plans
- Ways to improve existing policies and programs not provided
- The communities prioritized mitigation strategy not provided
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Genesee Township showed the following:

- Citizens range from not concerned, moderately concerned, and extremely concerned about the possibility of their community being impacted by a disaster
- Genesee Township residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Dam Failure
    - Inclement Weather
    - Infrastructure Failure
    - Public Health Emergencies
    - Scrap Tire Fires
    - Snow and Ice Storms
    - Structure Fires
    - Tornadoes
- Additional Public Comments:
    - Need advanced planning, communication, and training

Mitigation Projects: None submitted.

Village of Goodrich

- 2018 Population: 1,941 (up 4.4% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The Village of Goodrich is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- 17 potential structures in the floodplain, only seven with insurance policies
- No repetitive loss structures
- No mobile home parks
- One warning siren
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Village of Goodrich officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Dam Failure
    - Inclement Weather
    - Snow and Ice Storms
    - Tornadoes
- In the last five years to mitigate future hazards, the Village has created a committee to monitor the dam and contracted with an engineering firm for guidance as well as keeping residents informed via Facebook and website on issues
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by additional training
- The communities prioritized mitigation strategy is to map floodplains and update building codes
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from the Village of Goodrich showed the following:

- Citizens are not concerned about the possibility of their community being impacted by a disaster
- Village of Goodrich residents feel that the following hazards could most impact their community:
    - Dam Failure

Mitigation Projects:

1. Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/hall and the DPW building. The Village Hall serves as a safe haven room year-round for resi-

dents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

2. Project: Goodrich Dam. Project description: The project includes work on the Goodrich Dam relating to floodgates, stabilization, spillway-wing walls, etc. Budget: Not provided. Project update: Improvements have been made to the Goodrich/ Mill Pond Dam. Two additional gates were altered to allow them to open but only under special situations. Update: Improvements have been made to the Goodrich/Mill Pond Dam. Two additional gates were altered to allow them to open but only under special situations.

City of Grand Blanc

- 2018 Population: 7,925 (down 4.2% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Grand Blanc is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 87 potential structures in the floodplain, only 29 with insurance policies and
- Three repetitive loss structures
- No mobile home parks
- One warning siren
- One “302” site and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Grand Blanc officials:

- Community has been impacted by a natural or man-made disaster in the past five years - COVID-19
- Extremely concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Inclement Weather
    - Public Health Emergencies
    - Structure Fires
    - Tornadoes
- In the last five years to mitigate future hazards, the City has upgraded their emergency management plan and purchased DPW, police and fire supplies
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by reviewing existing plans and providing better communication through social media
- The communities prioritized mitigation strategy is to continually review and update emergency management plan
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for the City of Grand Blanc were received.

Mitigation Projects:

1. Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Grand Blanc Township

- 2018 Population: 36,706 (down 2.1% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Grand Blanc Township is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- 108 potential structures in the floodplain, only 28 with insurance policies
- One severe repetitive loss structure
- Four mobile home parks
- Seven warning sirens
- Six “302” sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Grand Blanc Township officials:

- Community has been impacted by a natural or man-made disaster in the past five years - snow,

ice, and strong wind storms
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Inclement Weather
    - Snow and Ice Storms
    - Structure Fires
    - Tornadoes
- In the last five years to mitigate future hazards, the Township has completed ongoing sewer system preventative maintenance
- Willing to incorporate hazard mitigation into future community plans
- Ways to improve existing policies or programs not provided
- The communities prioritized mitigation strategy is to inspect establishments that are considered high hazards annually with those classified as low hazards inspected every three years in terms of structure fires
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Grand Blanc Township showed the following:
- Citizens range from not concerned and moderately concerned about the possibility of their community being impacted by a disaster
- Grand Blanc Township residents feel that the following hazards could most impact their community:
    - Extreme Temperatures
    - Infrastructure Failure
    - Public Health Emergencies
    - Snow and Ice Storms
    - Structure Fires
    - Subsidence (Sinkholes)
    - Tornadoes
- Additional Public Comments:
    - Planning is the best and likely only step that can be taken with the threats identified
    - Training and standardized excavation processes such as gold shovel is needed
    - Communication about plans and preparation with stakeholders is also needed

Mitigation Projects:

1. Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

2. Project: Deadfall tree removal. Project description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

3. Project: Warning sirens. Project description: The purchase and installation of warning sirens. Budget: $48,000. Update: The Township is no longer pursuing this project.

Village of Lennon

- 2018 Population: 541 (up 5.9% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The Village of Lennon is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- No mobile home parks
- No warning sirens
- No “302” sites but is located near a hazardous materials transport route
- Emergency shelter not identified

Staff collected the following information from Village of Lennon officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Not concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Tornadoes
- In the last five years to mitigate future hazards, the Village has purchased backup generators
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by continuing to work with the Shiawassee County Emergency Management team
- The communities prioritized mitigation strategy is to update building and zoning codes
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for the Village of Lennon were received.

Mitigation Projects:

1. Project: Repair sirens. Project description: The project includes repair of broken weather siren. Budget: $1,000 - $16,000. Update: Completed in 2011.

2. Project Back-up generator. Project description: The project includes a back-up generator for the Police Department. Budget: $3,000. Update: This project was tabled due to cost.

3. Project: Back-up generator. Project description: The project includes a back-up generator for the Village Hall. Budget: $3,000. Update. This project was tabled due to cost.

City of Linden

- 2018 Population: 3,882 (down 2.7% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Linden is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- Three potential structures in the floodplain, only one with an insurance policy
- No repetitive loss structures
- One mobile home park
- Two warning sirens
- One “302” site and is located near a hazardous material transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Linden officials in the previous plan update; see below. Staff requested information from City of Linden officials regarding their hazard mitigation efforts since the last plan update. However, this information has not been submitted.

- Hazard Priorities:
    - Hazardous Material Incidents (Transportation)
    - Inclement Weather
    - Major Transportation Accidents
    - Riverine Flooding
    - Snow and Ice Storms
    - Structure Fires

Staff sent out public input surveys to include citizens in the plan. The input from the City of Linden showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- City of Liden residents feel that the following hazards could most impact their community:
    - Infrastructure Failure
    - Structure Fires
    - Tornadoes
- Additional Public Comments:
    - None

Mitigation Projects:

1. Project: Stand-alone generator for City Hall Project description: The City of Linden’s Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being

turned on and emergency personnel would not be able to operate equipment. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000. Update: This project has been completed.

City of Montrose

- 2018 Population: 1,550 (down 6.5% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Montrose is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- No mobile home parks
- One warning siren
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter not identified

Staff collected the following information from City of Montrose officials in the previous plan update; see below. Staff requested information from City of Montrose officials regarding their hazard mitigation efforts since the last plan update. However, this information has not been submitted.

- Hazard Priorities:
    - Hazardous Material Incidents (Transportation)
    - Inclement Weather
    - Snow and Ice Storms
    - Tornadoes
    - Transportation Accidents
- Hazard Mitigation Strategies:
    - Have county drains cleaned to prevent flooding
    - Have railroad ties removed from ditches to prevent flooding
    - Conduct a mock disaster drill to simulate a train derailment

Staff sent out public input surveys to include citizens in the plan. The input from the City of Montrose showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- City of Montrose residents feel that the following hazards could most impact their community:
    - Hazardous Materials Incidents (Fixed Sites)
    - Hazardous Materials Incidents (Transportation)
- Additional Public Comments:
    - Continue monitoring potential areas where a hazard could cause problems

Mitigation Projects: None submitted.

Montrose Township

- 2018 Population: 5,981 (down 3.9% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Montrose Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- Three potential structures in the floodplain, only two with insurance policies
- No repetitive loss structures
- Four mobile home parks
- Twelve warning sirens
- One "302" site and is located near a hazardous materials transport route
- Emergency shelters not identified

Staff collected the following information from Montrose Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Earthquakes
    - Hazardous Materials Incidents (Transportation)
    - Major Transportation Accidents
    - Tornadoes
- In the last five years to mitigate future hazards, the Township has installed tornado sirens and backup generators at public buildings
- Willing to incorporate hazard mitigation into fu-

ture community plans
- Existing policies or programs can be improved by coordinating efforts between communities
- The communities prioritized mitigation strategy was not provided
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for Montrose Township were received.

Mitigation Projects: None submitted.

City of Mt. Morris

- 2018 Population: 2,887 (down 6.4% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Mt. Morris is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- No mobile home parks
- One warning siren
- One "302" site and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Mt. Morris officials in the previous plan update; see below. Staff requested information from City of Mt. Morris officials regarding their hazard mitigation efforts since the last plan update. However, this information has not been submitted.

- Hazard Priorities:
    - Hazardous Material Incidents (Fixed Site)
    - Hazardous Material Incident (Transportation)
    - Inclement Weather
    - Major Transportation Accidents
    - Snow and Ice Storms
    - Structure Fires
    - Tornadoes
- Hazard Mitigation Strategies:
    - Write a plan to address hazard priorities

Staff sent out public input surveys to include citizens in the plan. The input from the City of Mt. Morris showed the following:

- Citizens are extremely concerned about the possibility of their community being impacted by a disaster
- City of Mt. Morris residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Inclement Weather
    - Major Transportation Accidents
- Additional Public Comments:
    - There should be a plan in place in case something comes up

Mitigation Projects: None submitted.

Mt. Morris Township

- 2018 Population: 21,501 (down 4.1% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Mt. Morris Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- 29 potential structures in the floodplain, only three with insurance policies
- No repetitive loss structures
- Four mobile home parks
- Three warning sirens
- Three "302" sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Mt. Morris Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Extremely concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Public Health Emergencies
    - Snow and Ice Storms
    - Structure Fires
    - Terrorism

- In the last five years to mitigate future hazards, the Township has completed ditching to combat residential flooding and taken a pro-active stance with fire and police to train for potential scenarios.
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by working with neighboring communities
- The communities prioritized mitigation strategy is to be more aggressive with building codes and inspections
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Mt. Morris Township showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- Mt. Morris Township residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Drought
    - Hazardous Materials Incidents (Fixed Sites)
    - Inclement Weather
    - Infrastructure Failure
    - Tornadoes
- Additional Public Comments:
    - Need better weather sirens

Mitigation Projects: None submitted.

Mundy Township

- 2018 Population: 14,592 (down 3.2% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Mundy Township is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- 19 potential structures in the floodplain, only 12 with insurance policies
- No repetitive loss structures
- One mobile home park
- 11 warning sirens
- One "302" sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Mundy Township officials:

- Community has been impacted by a natural or man-made disaster in the past five years - flooding
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Hazardous Materials Incidents (Fixed Sites)
    - Hazardous Materials Incidents (Transportation)
    - Major Transportation Accidents
    - Public Health Emergencies
    - Riverine Flooding
- In the last five years to mitigate future hazards, the Township has completed drainage improvements
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by having additional training
- The communities prioritized mitigation strategy is to enforce building codes
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Mundy Township showed the following:

- Citizens range from not concerned, moderately concerned and extremely concerned about the possibility of their community being impacted by a disaster
- Mundy Township residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Dam Failure
    - Hazardous Materials Incidents (Fixed Sites)
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather

    - Infrastructure Failure
    - Public Health Emergencies
    - Snow and Ice Storms
    - Tornadoes
- Additional Public Comments:
    - Need coordinated plans for the entire county, not just individual communities
    - Since all concerns are due to nature, I am not sure how we could be proactive in preventing these occurrences
    - Need pre-planning

Mitigation Projects:

1. Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

2. Project: Emergency Warning Sirens. Project description: The purchase and installation of two advance warning sirens within Mundy Township. Proposed timeframe for implementation: 1 - 5 years. Budget: $40,000. Update: None, this is a newly submitted project.

Village of Otisville

- 2018 Population: 977 (up 13.1% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The Village of Otisville is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- One mobile home park
- One warning siren
- No “302” sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Village of Otisville officials:

- Community has been impacted by a natural or man-made disaster in the past five years - COVID-19
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Hazardous Materials Incidents (Transportation)
    - Infrastructure Failure
    - Snow and Ice Storms
    - Tornadoes
- In the last five years to mitigate future hazards, the Village has required retention basins with new construction
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by additional training and funding
- The communities prioritized mitigation strategy is to update the emergency response plan
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, as no public surveys for the Village of Otisville were received.

Mitigation Projects: None submitted.

Village of Otter Lake

- 2018 Population: 380 (down 17.9% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The Village of Otter Lake is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain with no insurance policies
- No repetitive loss structures
- No mobile home parks
- No warning sirens
- No “302” sites but is located near a hazardous materials transport route
- Emergency shelter not identified

Staff collected the following information from the Village of Otter Lake officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Not concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
  - Snow and Ice Storms
- Projects completed in the last five years to mitigate future hazards not provided
- Willing to incorporate hazard mitigation into future community plans
- Ways to improve existing policies or programs not provided
- The communities prioritized mitigation strategy was not provided
- Additional Local Official Comments:
  - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for the Village of Otter Lake were received.

Mitigation Projects: None submitted.

Richfield Township

- 2018 Population: 8,730 (down 3.5% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Richfield Township is a continuing participant in the updated plan.
- NFIP Participant
- Two dams
- 54 potential structures in the floodplain, only two with insurance policies
- No repetitive loss structures
- Two mobile home parks
- One warning siren
- One "302" sites and is located near a hazardous materials transport route
- Emergency shelter not identified

Staff collected the following information from Richfield Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Not concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
  - Dam Failure
  - Inclement Weather
  - Public Health Emergencies
  - Snow and Ice Storms
  - Tornadoes
- In the last five years to mitigate future hazards, the Township has installed an emergency warning siren at Richfield Rd just west of M-15 and completed drain improvements
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved with public service announcements
- The communities prioritized mitigation strategy is to utilize floodplain maps and keep floodplain info updated
- Additional Local Official Comments:
  - None

Staff sent out public input surveys to include citizens in the plan. The input from Richfield Township showed the following:

- Citizens range from not concerned and moderately concerned about the possibility of their community being impacted by a disaster
- Richfield Township residents feel that the following hazards could most impact their community:
  - Hazardous Materials Incidents (Transportation)
  - Infrastructure Failure
  - Public Health Emergencies
  - Tornadoes
- Additional Public Comments:
  - Knowledge of hazardous materials being transported via rail so appropriate response can be planned

Mitigation Projects: None submitted.

City of Swartz Creek

- 2018 Population: 5,531 (down 3.9% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- The City of Swartz Creek is a continuing participant in the updated plan.
- NFIP Participant
- No dams

- 203 potential structures in the floodplain, only 28 with insurance policies
- No repetitive loss structures
- One mobile home park
- Three warning sirens
- Two "302" sites and is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from City of Swartz Creek officials:

- Community has been impacted by a natural or man-made disaster in the past five years - COVID-19
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Civil Disturbances
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather
    - Infrastructure Failure
    - Public Health Emergencies
    - Riverine Flooding
    - Snow and Ice Storms
- In the last five years to mitigate future hazards, the City has invested in their water system, completed drainage and sewer capacity improvements, purchased generators, lift station upgrades and removal, inflow/infiltration mitigation for sanitary sewers, road improvements, and shelter requirement for new homes
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by attending regional training exercises and education for the public and government
- The communities prioritized mitigation strategy is to conduct drain dredging with the County and other infrastructure improvements
- Additional Local Official Comments:
    - Require local officials to attend basic emergency response education class

Staff sent out public input surveys to include citizens in the plan. The input from the City of Swartz Creek showed the following:

- Citizens are moderately concerned about the possibility of their community being impacted by a disaster
- City of Swartz Creek residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Hazardous Materials Incidents (Fixed Sites)
    - Hazardous Materials Incidents (Transportation)
    - Infrastructure Failure
    - Major Transportation Accidents
    - Public Health Emergencies
- Additional Public Comments:
    - None

Mitigation Projects: None submitted.

Thetford Township

- 2018 Population: 6,768 (down 4% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Thetford Township is a continuing participant in the updated plan.
- NFIP Participant
- No dams
- No potential structures in the floodplain since floodplain is not mapped. However, there are two insurance policies
- No repetitive loss structures
- One mobile home park
- One warning siren
- Two "302" sites and is located near a hazardous materials transport route
- Emergency shelter not identified

Staff collected the following information from Thetford Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Inclement Weather
    - Public Health Emergencies
    - Snow and Ice Storms
    - Tornadoes
- Projects completed in the last five years to miti-

gate future hazard not provided
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by additional training and preparation
- The communities prioritized mitigation strategy is to use the emergency response plan
- Additional Local Official Comments:
    - None

Staff conducted a public survey to give residents an opportunity to provide input relevant to the Hazard Mitigation Plan update. However, no public surveys for Thetford Township were received.

Mitigation Projects: None submitted.

Vienna Township

- 2018 Population: 12,751 (down 3.8% from 2010, U.S. Census Bureau, 2018 ACS 5-Year Estimates)
- Vienna Township is a continuing participant in the updated plan.
- NFIP Participant
- One dam
- Three potential structures in the floodplain, only two with insurance policies
- No repetitive loss structures
- Two mobile home parks
- No warning sirens
- No "302" sites but is located near a hazardous materials transport route
- Emergency shelter available during emergency situations

Staff collected the following information from Vienna Township officials:

- Community has not been impacted by a natural or man-made disaster in the past five years
- Moderately concerned about the possibility of their community being impacted by a disaster
- Hazard Priorities:
    - Hazardous Materials Incidents (Transportation)
    - Major Transportation Accidents
    - Snow and Ice Storms
    - Structure Fires
- In the last five years to mitigate future hazards, the Township has installed sewage pumping stations to prevent back ups and floods
- Willing to incorporate hazard mitigation into future community plans
- Existing policies or programs can be improved by providing outreach, coordinating efforts between communities and additional training
- The communities prioritized mitigation strategy was not provided
- Additional Local Official Comments:
    - None

Staff sent out public input surveys to include citizens in the plan. The input from Vienna Township showed the following:

- Citizens range from not concerned, moderately concerned, and extremely concerned about the possibility of their community being impacted by a disaster
- Vienna Township residents feel that the following hazards could most impact their community:
    - Civil Disturbances
    - Drought
    - Extreme Temperatures
    - Hazardous Materials Incidents (Transportation)
    - Inclement Weather
    - Infrastructure Failure
    - Public Health Emergencies
    - Snow and Ice Storms
    - Structure Fires
    - Terrorism
    - Tornadoes
- Additional Public Comments:
    - Ensure warning systems are up to date
    - Security and preventative maintenance is needed
    - Mandatory mask wearing
    - More training and funding for police and fire departments

Mitigation Projects: None submitted.

Genesee County Hazard Summary

Hazard Assessment

Hazard assessment is a process that incorporates historical data, social factors, geographic and climatic factors, population data and public perception to determine a community's vulnerability to specific hazards. Each community must determine which hazards they consider to be a risk. The Emergency Management Division of the Michigan State Police has developed a summary of known hazards, which is found in the Michigan Hazard Analysis document. Staff used this hazard summary as a starting point to identify the hazards that can affect Genesee County.

Note: When reading the hazard rankings, please remember they are subjective. It is impossible to rate the likelihood of a hazard occurrence to an exact degree of accuracy. It is also important to remember that the local capability is a community rating, considering all facets of response and recovery, and is not limited solely to emergency response.

Meetings were held with the Genesee County Hazard Mitigation Plan Review Committee to further the development of the Genesee County Hazard Mitigation Plan. A virtual public meeting was held on January 26, 2021 via Zoom. Staff presented an overview of the Hazard Mitigation Plan process to the public and provided information on the known hazards in Genesee County.

During the development of the previous plan, staff developed a hazard matrix that assessed the impact each hazard had on the community. These hazards were then prioritized based on the calculated level of impact. The hazard matrix for Genesee County used the following six variables:

1. Potential to Occur in Genesee County - Has this hazard ever occurred in the past, or could it happen in the future?
2. Frequency of Occurrence - How often has this hazard happened before?
3. Number of People Affected - How many residents have been affected by this hazard in the past, or could be affected by it in the future?
4. Economic Impact - What types of damage did this hazard cause? What was the associated cost in property and lives?
5. Deaths - How many lives were taken by the hazard in past incidents?
6. Ability of Genesee County to Mitigate the Hazard - What can Genesee County do to reduce the hazard's effects the next time it happens?

A scoring system had to be determined for the hazard matrix. Staff developed a system that was simple to fill out and that allowed easy factoring of each variable. Based on these criteria, staff developed the following scoring system:

1. Potential to Occur in Genesee County
   A ranking of 0-5 (5 = Great Potential, 0 = Little to No Potential)

2. Frequency of Occurrence
   A ranking of 0-5 (5 = Frequent, 0 = Rare or not Applicable)

3. Number of People Affected
   A ranking of 0-5 (5 = Large Number, 0 = Few People)

4. Economic Impact
   A ranking of 0-5 (5 = Lots of Damage, 0 = Little Damage)

5. Deaths
   A ranking of 0-5 (5 = Large Number of Deaths, 0 = No Deaths)

6. Ability of Genesee County to Mitigate the Hazard
   A ranking of 0-5 (5 = Has Ability to Reduce or Mitigate Hazard, 0 = No Ability to Reduce or Mitigate Hazard)

At the February 11, 2021 meeting of the Hazard Mitigation Plan Review Committee, the committee members reviewed information regarding the frequency

and costs associated with the identified Genesee County hazards. After discussing the information, they scored the hazards based on the six variables mentioned above. While the matrix required that the committee members enter scores in the range of 0 to 5, staff calculated the final ranking by factoring each of the variables according to its level of importance in determining the level of impact for each hazard. The following factors were used to calculate rank:

1. Potential to Occur in Genesee County
2. Frequency of Occurrence
3. Number of People Affected
4. Economic Impact
5. Deaths
6. Ability of Genesee County to Mitigate the Hazard

Hazards for Genesee County were selected for inclusion in this plan based upon records of historical occurrence, known risks, and guidance provided by the County Hazard Mitigation Plan Review Committee and by the Michigan State Police Emergency Management and Homeland Security Division.

To rank the hazard from most severe threat to least threatening to the area, each of the hazards were assigned evaluation measures; a specific point value of multiplication of 1-6 based on each element's relative severity and negative impacts. The more severe the potential impact an event could have, the more points that hazard was assigned.

Each hazard evaluation measure was then assigned a "weight." The purpose of weighing the hazards was to stress measures that were deemed more important, and thus produce a more valid assessment of the relative significance of each hazard. When the point value of measure was multiplied by the weight, the measure received more emphasis (points) than measures that had not been assigned such a heavy weight.

The total hazard scores determined each hazard's ranking, with the highest scores for hazards posing the greatest threat to the most people in Genesee County. The ranking process is not intended to discount the threat of any hazard, for those hazards elaborated upon in this hazard mitigation plan all present significant elements of threat to Genesee County.

The final hazard rankings are as follows in Table 2-1.

Table 2-1 Hazard Rankings

Hazard	Final Ranking
Infrastructure Failure	1
Riverine Flooding	2
Terrorism	2
Structure Fire	3
Inclement Weather	4
Extreme Temperatures	5
Hazardous Materials Incidents (Transportation)	5
Snow and Ice Storms	6
Public Health Emergencies	7
Tornadoes	8
Civil Disturbances	9
Dam Failure	10
Hazardous Materials Incidents (Fixed Sites)	11
Oil or Natural Gas Well/Pipeline Accidents	12
Transportation Accidents (Bus, Plane, Train)	13
Drought	14
Scrap Tire Fires	14
Nuclear Attack	15
Wildfires	16
Nuclear Power Plant Accidents	17
Subsidence (Sinkholes)	18
Earthquakes	19

Source: Genesee County Hazard Assessment

Each hazard in the above list is defined and described in the following sections, according to its ranking. Recorded incidents, if available, are documented to give the reader a sense of how often the hazard has occurred in Genesee County, and what the estimated costs were for the hazard. Vulnerability assessments were developed for each hazard. However please note, it is not possible to accurately estimate costs associated with every hazard that affects Genesee County.

Vulnerability Assessment

A vulnerability assessment provides a quantitative estimate of the persons and property in the County that are susceptible to each hazard. A basic method of determining vulnerability is to compare the susceptible area of the County with locations of population, infrastructure, and structures to see what kind of overlap will result. The overlap between the area where the hazard may happen, and the affected people and property, is the vulnerable area. Urban and rural areas of the County that experience the same hazard may have different types of damage, and different costs may be assessed accordingly. Also, some hazards, such as snowstorms, may be experienced by the whole county at once. Other hazards, such as riverine flooding will be very localized, determined by the presence of a nearby waterway.

Vulnerability assessments provide information that measures the threats associated with each hazard. Measures would include data such as how many injuries occurred, how many buildings were flooded, how many crops were damaged, the cost of clean-up afterwards, and so on. The vulnerability assessments, based on history, also gives the County an idea of what it can reasonably expect to experience when another hazard of that type occurs. Since the vulnerability assessments sometimes may give a monetary cost to the hazards, the hazards can be used for cost-benefit comparisons. These comparisons are helpful in justifying the expense of mitigation projects, land use restrictions and other policy decisions. However, it is important to remember that the vulnerability assessments are based on a series of assumptions and estimates, and they should be used as a guide only. Actual hazard events may incur greater losses than what has been developed in the vulnerability assessments. Also, there may be additional costs associated with a hazard event that have not been included in the assessments, as the costs presented are not exhaustive. Vulnerability assessments were developed for each hazard. However please note, it is not possible to accurately estimate costs associated with every hazard that affects Genesee County.

Goals and Objectives

The mission of the Genesee County Hazard Mitigation Plan is to protect the health and safety of the public and to preserve its property by taking action to permanently eliminate or reduce the long-term risk to human life and property from natural and technological hazards. To accomplish this mission, goals and objectives were established. These goals and objectives were based on the community's hazard analysis, as well as input from the public and local agencies.

Goals are general guidelines that explain what the community wants to achieve. They are usually long-term and represent global visions such as "to protect public health and safety." Objectives, on the other hand, define strategies on how to reach the identified goals.

Objectives tend to be more specific and address the details of who will do what and when to reach the goals. Communities need to identify clear goals and objectives, which can then be used as a guide for the plans and actions that will help meet the community's needs. The following goals and objectives were established in previous plan updates and were presented at the Genesee County Hazard Mitigation Plan Review Committee meeting held on February 11, 2021. These goals and objectives are being reaffirmed for this plan update.

Goals:

1. Prevent loss of life
2. Improve response and recovery for man-made and natural disasters
3. Enhance early warning systems
4. Maintain essential public services
5. Enhance public awareness
6. Protect public health, welfare, and safety
7. Reduce losses from man-made and natural disasters
8. Protect the environment
9. Provide resources for effective mitigation of hazardous materials incidents

Objectives

1. Amend zoning to limit new development in flood

plains
2. Enhance coordination between response agencies
3. Increase warning siren coverage and weather radio
4. Provide resources to ensure provision of essential services
5. Provide opportunity for public education
6. Provide additional storm shelters
7. Moving existing homes that are in a floodplain
8. Enhance early warning systems and education for all hazards
9. Enhance warning systems and notifications for special populations

Mitigation Strategy

The above goals and objectives can be met by various methods called mitigation strategies. Mitigation strategies reduce or eliminate the amount of harm that could be caused in the future by a hazard. There are five basic hazard mitigation approaches:

Approach #1 Modify the Hazard - This approach removes or eliminates the hazard, such as widening a stream to improve water flow and stop flooding.

Approach #2 Segregating the Hazard - This approach keeps the hazard away from people, such as building a floodwall to retain high water levels.

Approach #3 Preventing or Eliminating Development - This approach keeps people away from the hazard, by various land use planning and zoning techniques

Approach #4 Altering Design or Construction - This approach provides engineering solutions for at-risk structures, such as elevating buildings above the flood level.

Approach #5 Early Warning and Public Education - This approach keeps the public informed of potential hazard and makes sure that early warning/ communication systems are available.

Suggested mitigation strategies are included in each hazard section. While some of the previous Plan's mitigation activities were completed, others were deferred by the local governments because of cost. Due to changes in officials of the communities in charge of maintaining the Plan between updates, some information was not readily available.

Staff reviewed and collected data from the National Oceanic and Atmospheric Administration (NOAA) and the Michigan Department of Licensing and Regulatory Affairs (LARA) as well as contacting other State and local agencies to attain the necessary information for the Plan Update.

Expansion of Existing Authorities, Policies, Programs, and Resources

The following information identifies existing programs, mitigation efforts and response efforts implemented within Genesee County communities, some since the last Hazard Mitigation Plan was developed. In addition, information about future project ideas and implementation are discussed. For existing authorities, policies, programs, and resources for individual communities, as well as how they can be expanded upon, please see the Community Profiles section of the plan. The goal of hazard mitigation is to reduce future impacts to property and residents and lessen disruption to local services. Mitigation efforts should be ongoing to adapt to the needs of the communities and residents. In addition, efforts should include efficiencies in which residents can benefit during times of emergency.

Building Codes – Many of the Genesee County communities have adopted building codes that are enforced. The codes were developed based upon international and State of Michigan building codes. Mitigation activities, such as a continued emphasis on no development in flood prone areas, will continue to be a focus in the local communities.

Changes in Local Land Development - Since 2006, the population in Genesee County has continued to decrease by about 9 percent. This dramatic decrease occurred primarily due to the Great Recession. While population fell, additional land consumption

also diminished. Housing infrastructure built in expectation of an increasing population remained vacant. Ultimately this led to the built environment increasing by only 2 percent since 2006. Currently, 50% of the county is considered Urban/Built-up and 50% Undeveloped. Most new development that is occurring in the county is infill development. Infill development is the process of developing vacant or under-used land within existing urban areas that are already largely developed. To combat urban sprawl, several local units of government within Genesee County have recognized the need to preserve or reduce the impact on undeveloped lands by directing where growth takes place within their community and reusing existing public infrastructure. Moving forward, communities are setting goals to find a balance between occupancy of vacant homes, pursuing infill redevelopment, and the expansion of the built environment onto undeveloped lands, while at the same time, considering the relationship between development and hazard mitigation activities.

Master Planning – The majority of municipalities within Genesee County agreed to consider including Hazard Mitigation in their next Master Plan update, as well as incorporating Hazard Mitigation Planning into other important guiding documents.

Mutual Aid Agreements – Genesee County fire departments throughout the county, and state, worked together to create and organize a system for locating needed equipment from other departments with only one call. This will assist during possible large-scale emergencies to be better prepared and organized.

National Flood Insurance Program (NFIP) – All local units of government in Genesee County participate in the NFIP. Within the County, there are approximately 2,118 structures located in a flood hazard area. Currently, there is only one community in the County that participates in the Community Rating System (CRS) which is a voluntary program that provides incentives and recognizes floodplain management activities that go beyond the minimum requirements of the NFIP; this is Richfield Township. Over the next five years, communities who have experienced recent flooding may want to consider having CRS coordinator to act as the local contact and expert when a flooding event occurs. In addition, jurisdictions should continue to consider changes to make insurance premiums lower.

Reverse 911 System/Mass Notification System – Genesee County has recently upgraded to a Reverse 911 System which allows residents added security and information when an incident occurs. There are numerous telephone lines, which allow for thousands of residents to be contacted each hour during an event. Areas in which an incident might be isolated can be targeted to receive specific information. In addition, wireless mass notifications are utilized.

Soil Erosion Management – The Genesee County Drain Commission, Division of Water and Waste Services is the responsible agency for issuing Soil Erosion and Sedimentation Control Permits.

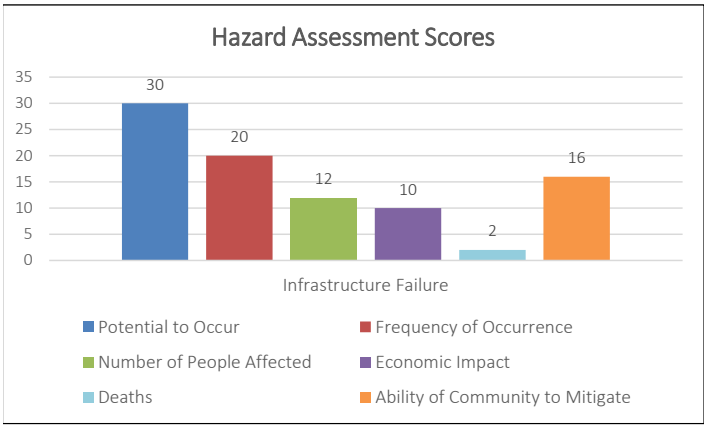
Storm Water Management – Genesee County Drain Commission, Surface Water Management Division maintains the drainage systems, as included under Act 40 Public Acts of 1956 (Drain Code). Within the County, there are over 1,400 established drainage districts.

Tornado Sirens – All local units of government hold responsibility for the warning sirens in their communities. Maintenance of these systems is taken care of by each local unit as well.

Zoning Management – Communities within the County have locally adopted zoning ordinances. As communities update portions of their ordinances, they will be encouraged to consider hazard mitigation in the decisions they make regarding any zoning changes.

Hazards

#1 - Infrastructure Failure



Infrastructure Failure

Infrastructure failure is the failure of critical public or private utility infrastructure such as water lines or roads resulting in a temporary loss of essential functions and/or services.

Hazard Description

Infrastructure failure is ranked as the number one hazard in Genesee County. Michigan's citizens are dependent on the public and private utility infrastructure to provide essential life supporting services such as electric power, heating and air conditioning, water, sewage disposal and treatment, storm drainage, communications, and transportation. When one or more of these independent, yet interrelated systems fail due to disaster or other cause, even for a short period of time, it can have devastating consequences. For example, when power is lost during periods of extreme heat or cold, people can die in their homes if immediate mitigative action is not taken. When the water or wastewater treatment systems in a community are inoperable, serious public health problems arise that must be addressed immediately to prevent outbreaks of disease. When storm drainage systems fail due to damage or capacity overload, serious flooding can occur.

These are just some examples of the types of infrastructure failures that can occur, and all these situations can lead to disastrous public health and safety consequences if immediate mitigative actions are not taken. Typically, it is the most vulnerable members of society (i.e., the elderly, children, impoverished individuals, and people in poor health) that are the most heavily impacted by an infrastructure failure. If the failure involves more than one system, or is large enough in scope and magnitude, whole communities and possibly even regions can be severely impacted. Refer to the "Dam Failure" and "Oil or Natural Gas Well/Pipeline Accidents" sections for more information on those particular types of infrastructure failure.

Genesee County Perspective and Vulnerability

Infrastructure failures are common in Genesee County. The most common infrastructure failure is loss of power. In our community, the elderly and handicapped, adult foster care homes, schools, and hospitals must be given special consideration when these types of events occur. From August 14 through August 17, 2003, parts of Genesee County experienced the nation's worst power blackout in history. Because of an overworked, outdated power grid system, cities from Toronto, Canada, to Cleveland, Ohio to New York City were in the dark. Eight states were affected by the blackout. Thousands of public water customers in the county were advised to boil water or use bottled water until August 19th when the water emergency ended. Genesee County received an emergency declaration for this infrastructure failure. Another incident occurred on August 29, 2003, when an electrical transformer failed. This shut down Detroit's water treatment plant at Lake Huron and resulted in a second water emergency. Luckily, this second emergency only lasted about twelve hours.

In April of 2014, officials from Flint, Michigan switched their city's water supply from the Detroit Water and Sewerage Department to the Flint River as a temporary water source until the Karegnondi Water Authority pipeline was constructed and functional. This caused dangerous levels of lead and other contaminations to enter Flint's water source and into the homes of Flint residents. Nearly 9,000 children were supplied lead-contaminated water for 18 months. The city's recovery has been slow, as it works to replace 30,000 lead pipes. In 2017, reports showed that the water in most homes was generally safe, but many residents still don't trust what comes out of their tap.

While it is hard to calculate the specific damages that infrastructure failures cause to Genesee County, a single event can easily cause the County over $1 million due to infrastructure damages, lost wages, and lost profit.

Mitigation Strategies for Infrastructure Failures

The following strategies are suggested to minimize the effects of Genesee County's number one hazard, infrastructure failure:

- Emergency generators
- Emergency shelters for the public
- Emergency water supply
- Maintain trimmed trees near power lines
- Public education
- Identify deficiencies in infrastructure
- Maintain and repair infrastructure
- Update Disaster Response Plan if necessary
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects:

City of Burton

Project: Drainage - Bellingham Court. Project description: Drainage project to reduce the risk of flooding to residential structures. Remove existing culvert drain crossing of the Gilkey Creek on Bellingham Court just east of Belsay Road and replace culver with a similar size. The replacement would conform with 2006 drainage study of a 19' span by 5' rise. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $560,000. Update: None, this is a newly submitted project.

Project: Drainage - Bristol Road. Project description: Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Road. The project includes the removal of the existing 3-sided cast-in-place concrete box culver drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Road. Replace with 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $700,000. Update: None, this is a newly submitted project.

Village of Goodrich

Project: Natural gas backup generator. Project d scription: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

Project: Deadfall tree removal. Project description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/

upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects:

Atlas Township

Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000. Update: Project completed

Project: Dead Ash tree removal. Project Description: Dead ash trees affect road safety throughout the entire township, along various roads, streets, and neighborhoods. Budget: $80,000.00: Update: Project is still ongoing.

Project: Boat for water or ice rescue. Project Description: Purchase a boat for the Fire Department to help with evacuation in the event of floods or dam failure within the village of Goodrich. Proposed timeframe for implementation: 1-5 years. Budget: $5,000.00. Update: Project is still ongoing - cost of boat has increased from $9,000 from $5,000. Still looking to do project when funding becomes available.

City of Flint

Project: Stand-by power. Project description: The project includes stand-by power (for the Cedar Street pump station and reservoir) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include construction of a building, equipment, engineering, and engineering inspection. Budget: $1,000,000. Update: Not provided.

Project: Stand-by power. Project description: The project includes stand-by power (for the Westside pump station) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include engineering, construction, and construction inspection. Budget: $500,000. Update: Not provided.

Project: Stand-by power. Project description: The project includes stand-by power (for the Torrey Road booster pumping station) to ensure that water main pressure remains a constant for a high-elevation water district during an emergency. A preliminary engineering cost estimate was generated that reflects design engineering, construction, and construction inspection. Budget: $100,000. Update: Not provided.

Project: Stand-by power. Project description: The project includes stand-by power (for the Flint Water Plant) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include engineering, construction, and construction inspection. Budget: $1,800,000. Update: Not provided.

Flushing Township

Project: Back-up Generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

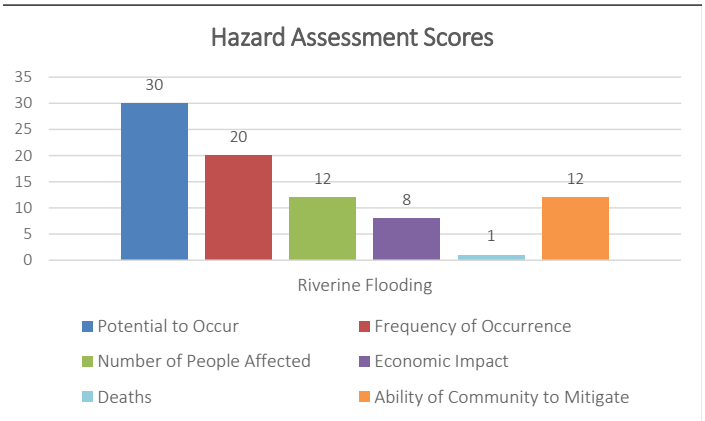
University of Michigan Flint

Project: Enhance First Street Residence Hall evacuation and sheltering. Project description: To include developing plans and specifications for construction of a storm shelter to house over 300 residents. Also, develop a strategy that can be used to integrate plans for a shelter into any expansion of the residence hall. In addition, install two outdoor warning sirens to alert students/residents of severe weather. Following development of drawings for a shelter, construct a shelter to house residents. Proposed timeframe for implementation: 1-5 years. Budget: $550,000. Update: Not provided.

Project: Upgrading and improving the UofM Flint EOC and Department of Public Safety. Project description: Upgrading and providing improvements to the UofM Flint Emergency Operations Center and Department of Public Safety operations. This in-

cludes moving the dispatch center and adding additional equipment to the center and EOC. Proposed timeframe for implementation: 1-5 years. Budget: $500,000. Update: Not provided.

#2 - Riverine Flooding



Riverine Flooding

Riverine flooding is the overflowing of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice.

Hazard Description

Riverine flooding is ranked as the number two hazard in Genesee County. Flooding of land adjoining the normal course of a stream or river has been a natural occurrence since the beginning of time. If these floodplain areas were left in their natural state, flooding would not cause significant damage. Development has increased the potential for serious flooding because rainfall that used to soak into the ground or take several days to reach a river or stream via a natural drainage basin, now quickly runs off streets, parking lots, and rooftops, and through man-made channels and pipes.

Floods can damage or destroy public and private property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and result in fatalities. People may be stranded in their homes for several days without power or heat, or they may be unable to reach their homes at all. Long- term collateral dangers include the outbreak of disease, widespread animal death, broken sewer lines causing water supply pollution, downed power lines, broken gas lines, fires, and the release of hazardous materials.

Flood-prone areas are found throughout the state, as every lake, river, stream and county drain have a floodplain. The type of development that exists within the floodplain will determine whether flooding will cause damage. The Michigan Department of Environment, Great Lakes, and Energy estimates that about 6% of Michigan's land is flood-prone, which includes about 200,000 buildings in those areas.

Floodplain areas are identified based on hydrological and topographical surveys, as well as, soil studies and land cover characteristics. The result of this research is a statistical model that indicates an area vulnerable to the "100-year" flood. The term "100-year flood" is often used incorrectly and can be misleading. It does not refer to a certain flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1% chance of being equaled or exceeded each year. So, the 100-year flood could occur more than once in a relatively short period of time. It is also referred to as the "1% annual chance flood."

The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and to determine the need for flood insurance. The 100-year flood only has a 1% chance of occurring in any given year, but structures located in the flood hazard area have a 26% percent chance of suffering flood damage during the term of a 30-year mortgage. This means a home in the mapped flood hazard area is five times more likely to be damaged by flood than to have a major fire.

The southern half of the Lower Peninsula contains the areas with the most flood damage potential. The primary flooding sources include the Great Lakes and connecting waters (Detroit River, St. Clair River, and

St. Mary's River), thousands of miles of rivers and streams, and hundreds of inland lakes. Michigan is divided into 63 major watersheds. All of these watersheds experience flooding, although the following watersheds have experienced the most extensive flooding problems or have significant damage potential: 1) Clinton River; 2) Ecorse River; 3) Grand River; 4) Huron River; 5) Kalamazoo River; 6) Muskegon River; 7) Saginaw River; 8) Rifle River; 9) River Raisin; 10) Rouge River; 11) St. Joseph River; and 12) Whitefish River. None of those listed are located within Genesee County The flooding is not restricted to the main branches of these rivers. Most riverine flooding occurs in early spring and is the result of excessive rainfall and/or the combination of rainfall and snowmelt. Ice jams also cause flooding in winter and early spring.

Severe thunderstorms may cause flooding during the summer or fall, although these are normally localized and have more impact on watercourses with smaller drainage areas. Oftentimes, flooding may not necessarily be directly attributable to a river, stream or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall and/or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations - areas that are often not in a floodplain. This type of flooding is becoming increasingly prevalent in Michigan, as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow. Flooding also occurs due to combined storm and sanitary sewers that cannot handle the tremendous flow of water that often accompanies storm events. Typically, the result is water backing up into basements, which damages mechanical systems and can create serious public health and safety concerns.

Genesee County Perspective and Vulnerability

From 1975 to 1999, Michigan experienced seven flood disasters that resulted in both a Presidential Major Disaster declaration and a Governor's Disaster Declaration, and seven that resulted in a Governor's Disaster Declaration. Combined, these flood disasters have caused hundreds of millions of dollars in damage to homes, businesses, personal property, and agriculture. See **Table 2-2** for a list of recent Genesee County floods. During the last 24 years, Genesee County has had 46 flood events. Based on these numbers, the county can expect 1.9 flood events per year.

Table 2-2 Genesee County Floods (1996 - 2019)

Year	Number of Floods
1996	6
1997	4
1998	2
1999	3
2000	4
2001	2
2002	1
2003	0
2004	3
2005	1
2006	2
2007	2
2008	1
2009	2
2010	0
2011	4
2012	1
2013	1
2014	4
2015	0
2016	0
2017	1
2018	2
2019	0
Annual Average	**1.9**
Total	**46**

Source: National Oceanic and Atmospheric Administration

An important step in hazard mitigation is knowing where the County's floodplains are located. This information could impact future land use decisions. Also, homes or businesses already located in the floodplain may need to take action to mitigate the effects of the next flood on their property. Floodplain maps for Genesee County were developed by the NFIP. These maps, called Flood Insurance Rate Maps (FIRM), indicate which areas are vulnerable to

flood hazards. These maps were then digitized using computer software and can now be used as an overlay on county maps that show, where property is located.

According to Genesee County's GIS Department, the County's mapped floodplain areas contain 2,118 structures that could potentially be flooded. Included in that number are 1,730 structures that have been identified as single- and multi-family homes. There are also 210 mobile homes, for a total of 1,940 residences. This means that 92 percent of the structures in the floodplains are homes. By using block-group information, staff determined that the average value of a Genesee County home in the floodplain was approximately $135,966.

A worst-case flood scenario could therefore jeopardize approximately $263.8 million worth of homes. However according to FEMA, there are only about 426 flood insurance policies in the County equaling $96 million in coverage. This indicates that most homes located in the flood plain are not currently covered by flood insurance and are at risk for flood losses. Due to the risk of flooding for not only single-family homes but other developments, many local municipalities continue to update their master plans and zoning ordinances to shift development away from flood-prone areas. See Figure 2-1 for a map of Genesee County's floodplain areas. Figure 2-2 shows structures located in the floodplain that could potentially be flooded.

Also, there are currently 44 repetitive loss structures in the county according to the Michigan Hazard Mitigation Plan. All of these structures are single-family residential. Note that staff were not able to access the latest repetitive loss data held by FEMA and therefore to fit the time schedule of approving this plan, staff used the best available data from the previous plan update; as of 9/29/21, a request was submitted to FEMA to obtain this data. Some of these structures have had losses up to five times as of 2001. The average total damage paid in claims (building and contents) per structure is $25,390.00. Repetitive loss structures put a strain on the flood insurance fund, as well as disrupt and threaten residents' lives repeatedly. The following communities have repetitive loss structures: City of Burton (11), City of Flint (21), Flint Township (4), Flushing Township (1), Gaines Township (1), Genesee Township (1), and City of Grand Blanc (3). The following communities have severe repetitive loss structures: Genesee Township (2), Flushing Township (1), and Grand Blanc Township (1). It is not possible to provide specific location and loss information as this is confidential.

Figure 2-3 shows the emergency facilities and 302 sites on the flood plain. It may be used to determine the possible added challenges that may be faced with flooding, such as the release of chemicals from 302 sites in to the flood water, or the inability to access a hospital in the event of a large flood.

- Since 2010, there have been 13 flood related events that have occurred in Genesee County according to the National Centers for Environmental Information – National Oceanic and Atmospheric Administration. These events resulted in no deaths or injuries. However, $7.3 million in property damages were reported for these events.

- On May 23 and 24, 2004, severe thunderstorms and heavy rains were to blame for widespread flooding in southeastern Michigan. Much of the rainfall occurred in saturated areas that had experienced well-above average precipitation for the month of May. May 2004 will go down as the wettest May on record at Flint and Detroit. During a 36-hour period (12AM May 22, 2004 to 8AM May 23, 2004), up to 6 inches of rain fell across southeastern Michigan. Genesee County was declared a major disaster area by President Bush along with Shiawassee, Livingston, Macomb and Oakland Counties due to the flooding and severe storms.

- On February 9, 2001, a flood knocked out the pump at a Flint Township wastewater treatment plant, starting a flow of at least 30 million gallons of sewer water into the Flint River system. The spill came on a day that Genesee County had declared a State of Emergency because of flooding. Two water mains broke, and residents battled for a second day to keep water out of their homes.

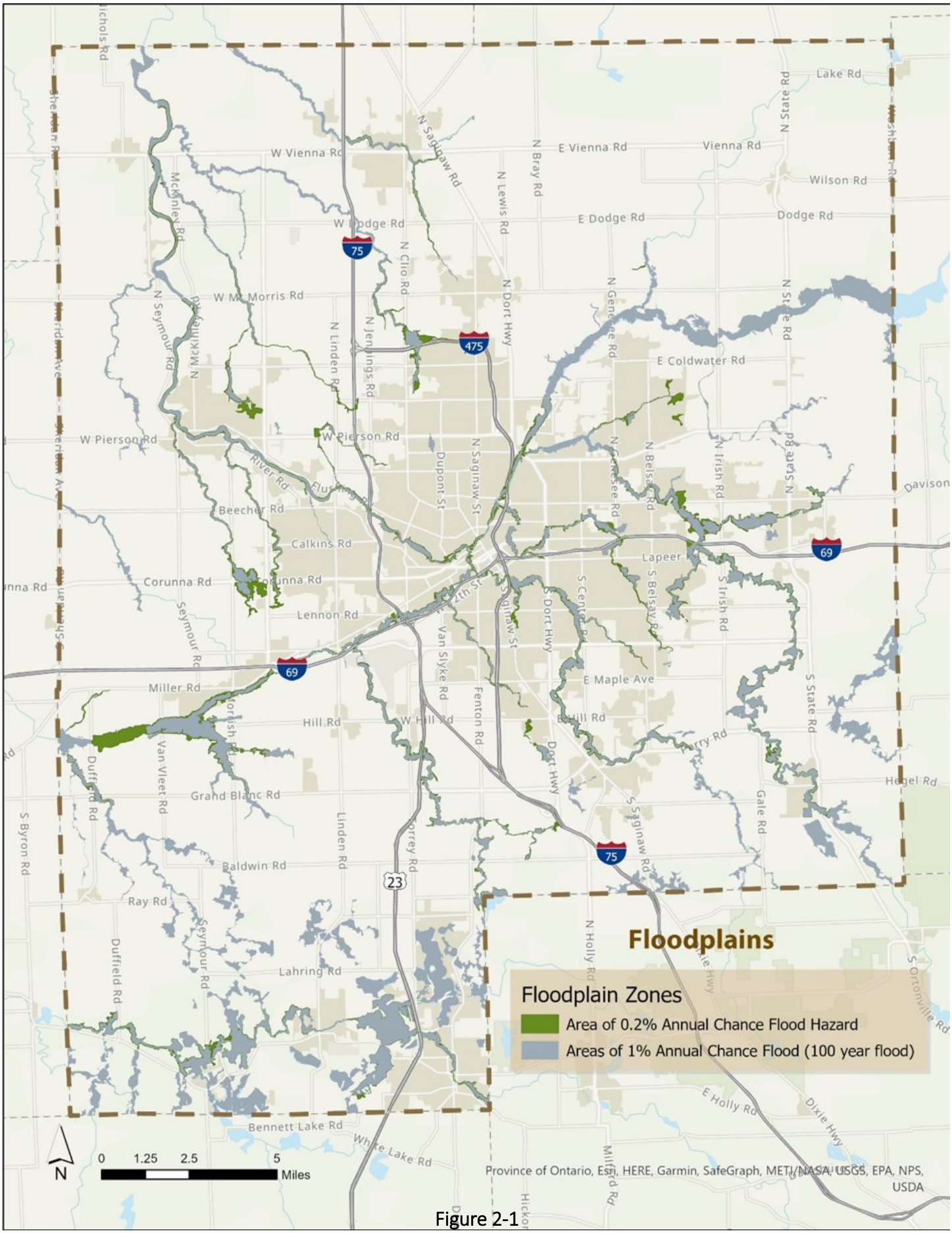


Figure 2-1

Source: Genesee County GIS and FEMA

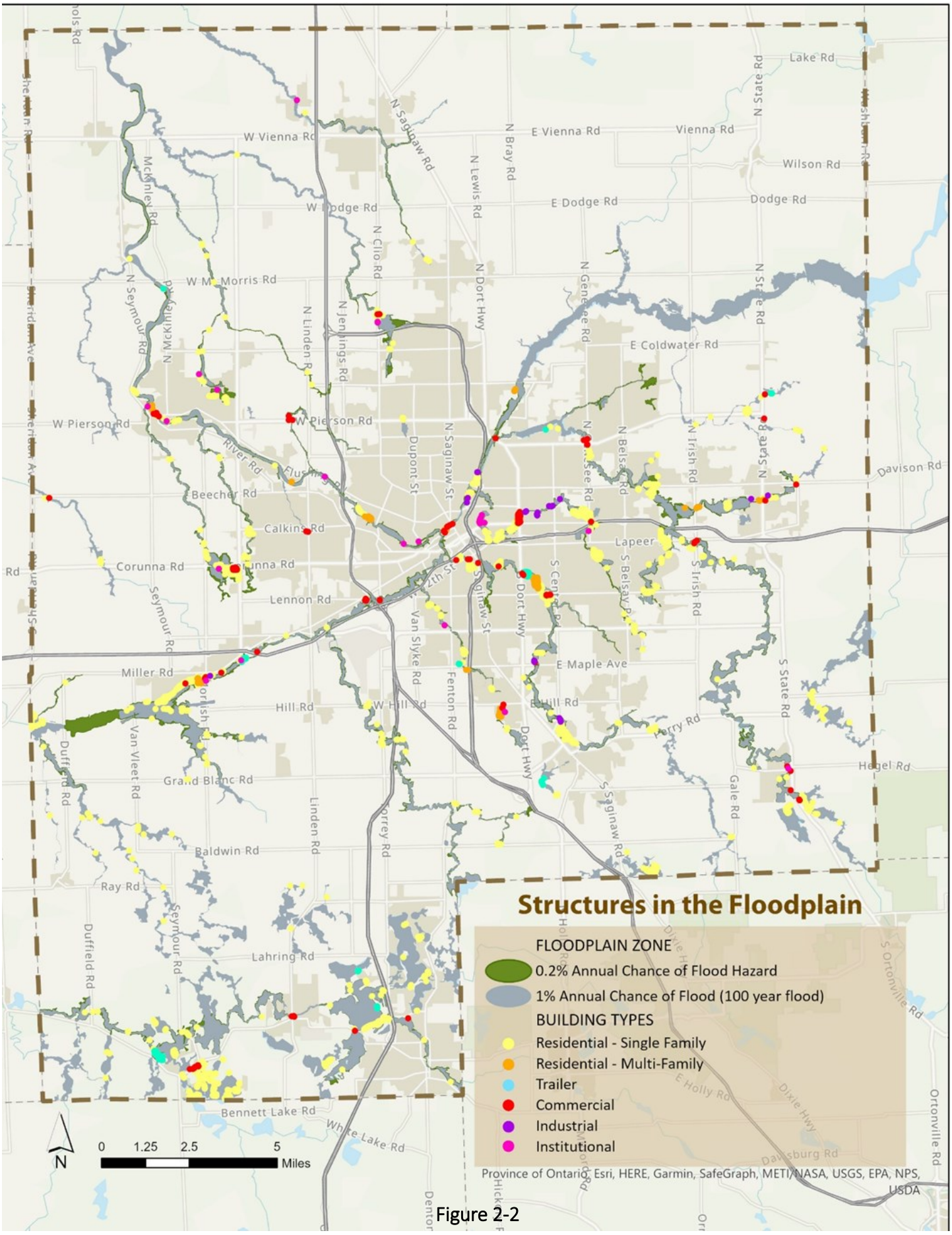


Figure 2-2

Source: Genesee County GIS and FEMA

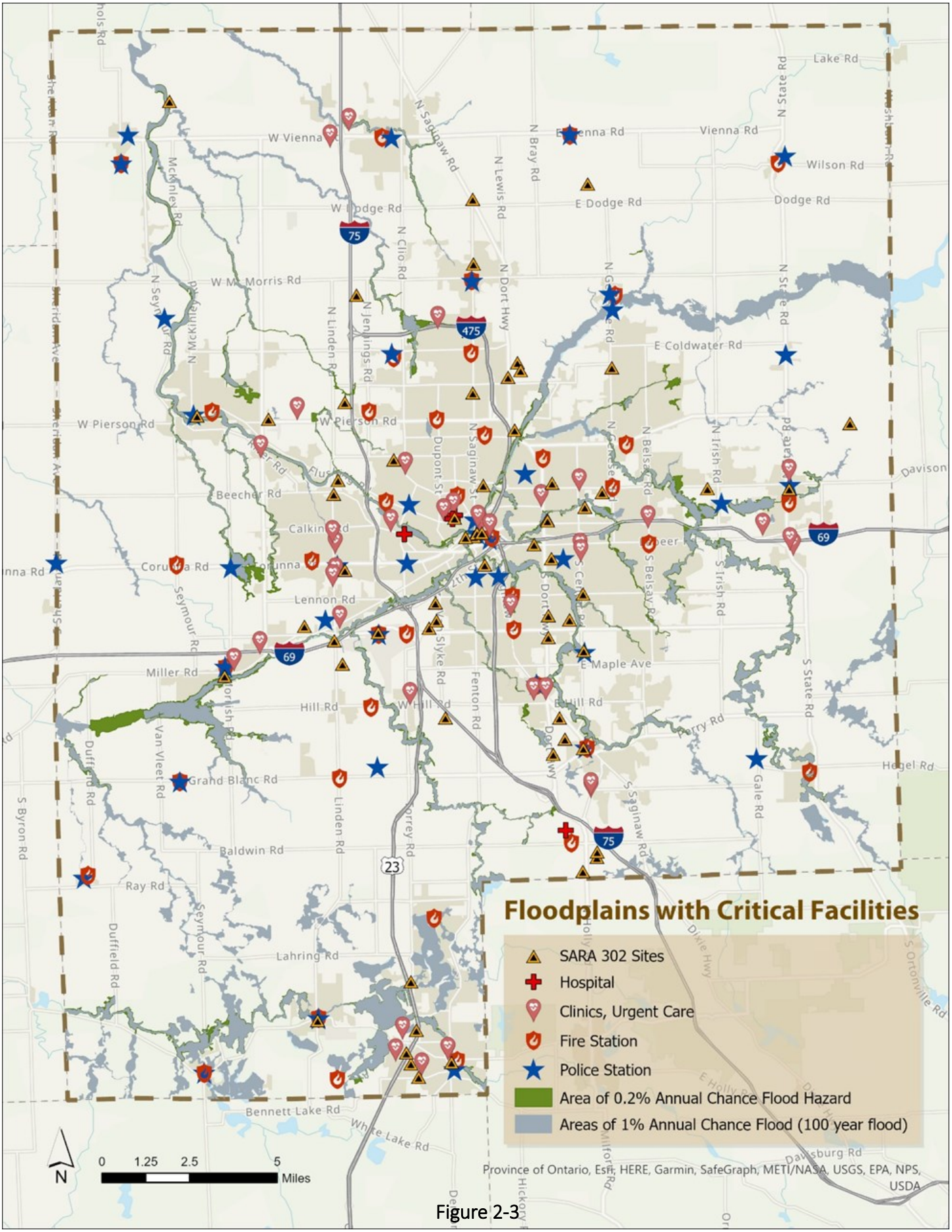


Figure 2-3

Source: Genesee County GIS and FEMA

- On July 29, 2000, Bishop International Airport recorded 2.65" of rain. This was the fourth straight day with heavy rains in the area. The previous day, 2.26" of rain were recorded. The resulting flood waters left just one lane of I-75 open in each direction in Flint and contributed to a major accident involving a large truck.

- On September 5, 1985, a severe thunderstorms struck east central Michigan, resulting in flooding in a six-county area. As much as 7.45 inches of rain fell in Genesee County, which was hardest hit. The heavy rainfall caused flash flooding in many areas. Damage occurred primarily from overbank flooding on major rivers and streams. In addition, widespread flooding occurred in residential areas due to overburdened storm water drainage systems. Over 2,500 homes were damaged, many roads were washed out and bridges damaged, and extensive agriculture damage occurred. Total public and private damage were estimated at $63 million. A Presidential Major Disaster declaration was granted for the six counties.

Table 2-3 Structures in the Genesee County Mapped Floodplain Areas

Types of Structures	Number of Structures	Percentages
Residential		
Single-Family	1,573	74%
Multi-Family	157	8%
Mobile Homes	210	10%
Total Residential	1,940	92%
Non-residential		
Commercial	133	6%
Industrial	22	1%
Institutional	23	1%
Total Non-residential	178	8%
Total of All Structures	2,118	100%

Source: Genesee County GIS

Costs associated with flooding include deaths, injuries, loss of infrastructure, damage to property and contents, temporary housing, use of emergency personnel and clean-up afterwards. Genesee County's mapped floodplain areas contain 2,118 homes. These homes account for 92% of all structures in the mapped floodplains. See Table 2-3 for a breakdown of the types of structures in the floodplain. Also, see Figure 1-4 for a map of Genesee County's population density.

To estimate the amount of residential flood damage that could occur in the mapped Genesee County floodplains, staff used some basic FEMA techniques. These techniques included finding the replacement values of the structures and estimating damages by equating flood depths with appropriate percentages of that replacement value. For the purposes of this flooding scenario, staff estimated that approximately one-quarter (530) of the 2,118 homes in the floodplain were damaged by 7' of flood water during the 100-year flood event. Flood Damage Estimation Tables adapted from the Flood Insurance Administration were used to estimate a damage percentage for different types of structures. See Table 2-4 for a Flood Damage Estimation Table.

The Flood Damage Estimation Table sorts residential structures into six categories. Using these six categories, staff estimated that 5% of the flooded homes (27) would be 1 story, no basement; 20% of the flooded homes (106) would be 2 story, no basement; 10% of the flooded homes (53) would be split-level, no basement; 40% of the flooded homes (212) would be 1 or 2 story, with a basement; 15% of the flooded homes (79) would be split-level with a basement; and 10% of the flooded homes (53) would be mobile homes. From the block-group information, staff calculated that the average value of a Genesee County home in the floodplain was approximately $135,966. This average value figure was then multiplied by the appropriate damage percentages in Table 2-5 to arrive at a damage cost for each type of structure. The resulting damage costs were then multiplied by the number of flooded homes in each structure category to arrive at the residential structure damages, as seen in Table 2-5. The total cost of residential structure damage for this flood scenario in Genesee County would be approximately $30,234,758.

Damage to the contents of these structures must also be calculated and then added to the structural

Table 2-4 Flood Damage Estimation (Numbers are damages as a percentage of the structure's replacement value)						
Depth of Flooding in Feet	1 story, no basement	2 story, no basement	Split-level, no basement	1 or 2 story with basement	Split-level with basement	Mobile Home
About 1' flooding at surface	14%	9%	9%	15%	16%	44%
About 2' flooding on ground floor	22%	13%	13%	20%	19%	63%
About 3' flooding on ground floor	27%	18%	25%	23%	22%	73%
About 4' flooding on ground floor	29%	20%	27%	28%	27%	78%
About 5' flooding on ground floor	30%	22%	28%	33%	32%	80%
About 6' flooding on ground floor	40%	24%	33%	38%	35%	81%
About 7' flooding on ground floor	43%	26%	34%	44%	36%	82%

Note: These tables are adapted from Flood Insurance Administration guidelines, based on historical averages from observed flood damages. Since replacement value may exceed the current market value of a structure, damages greater than 50% of the replacement value can be considered a total loss of the structure, unless special historic or service functions require that additional expenses be undertaken to repair and preserve it.

Source: Genesee County Flood Assessment

Table 2-5 Flood Scenario Estimated Structure Damage by Residential Structure Category				
Type of Structure	Average Cost of Home	Damage Percentage from Table 2-4	Number of Structures Affected by Flood	Estimated Damage to Structures
1 story, no basement	$135,966	.43	27	$1,578,565
2 story, no basement	$135,966	.26	106	$3,747,223
Split-level, no basement	$135,966	.34	53	$2,450,107
1 or 2 story with basement	$135,966	.44	212	$12,682,908
Split-level with basement	$135,966	.36	79	$3,866,873
Mobile Home	$135,966	.82	53	$5,909,082
Total Number of Structures: 530				
Total Estimated Structure Damage: $30,234,758				

Source: Genesee County Flood Assessment

Table 2-6 Flood Scenario Estimated Contents Damage by Residential Structure Category						
Types of Structure	Average Cost of Home x .30	Value of Contents	Damages to Contents	Damages to Contents of One Home	Number of Structures Affected by Flood Scenario	Estimated Damage to Contents
1 story, no basement	$135,966 x .3	$40,790	1.5 x .43	$26,310	27	$710,370
2 story, no basement	$135,966 x .3	$40,790	1.5 x .26	$15,908	106	$1,686,248
Split-level, no basement	$135,966 x .3	$40,790	1.5 x .34	$20,803	53	$1,102,559
1 or 2 story with basement	$135,966 x .3	$40,790	1.5 x .44	$26,921	212	$5,707,252
Split-level with basement	$135,966 x .3	$40,790	1.5 x .36	$22,027	79	$1,740,133
Mobile Home	$135,966 x .3	$40,790	1.5 x .82	$50,172	53	$2,659,116
Total Number of Structures: 530						
Total Estimated Contents Damage: $13,605,678						

Source: Genesee County Flood Assessment

damages to obtain a total estimated damage amount. It is assumed that the contents of a residential structure are equal to 30% of the replacement value of the home, then it is estimated that the damages to those contents will be 1.5 times the appropriate percentages from Table 2-4. An amount is then obtained that is estimated to be the contents damage in one flooded home in this scenario. That figure is then multiplied by the number of homes in that structure category to get the total contents damage in that category. The contents damage to all six categories are added together, resulting in the total estimated contents damage for residential structures as seen in Table 2-6.

Table 2-7 Flood Scenario Total Residential Damage	
Total Estimated Structure Damage	$30,234,758
Total Estimated Contents Damage	$13,605,678
Total Residential Damage	$43,840,436
Total Number of Structures	530

Source: Genesee County Flood Assessment

Adding together the structural damage and the contents damage from the scenario, the total residential damage is estimated to be $43,840,436 as shown in Table 2-7. It is important to note that only 25% of the residences in the mapped floodplains were included in this scenario, that is, only 530 of the 2,118 homes in the mapped floodplains. If the flooding scenario had included a larger percentage of homes, the already hefty damage estimate would have grown accordingly.

Mitigation Strategies for Riverine Flooding

The following strategies are suggested to minimize the effects of Genesee County's number two hazard, riverine flooding:

- Map all floodplains
- Identify all structures in the floodplain
- Enforce/adopt land use regulations to prevent development in floodplains
- Move existing mobile home parks from floodplains
- Retrofit existing structures in floodplains
- Emergency generators
- Public education about safety during a flood
- Update Disaster Response Plan if necessary
- Wireless Emergency Alerts warn anyone in the area with WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Burton

Project: Drainage - Bellingham Court. Project description: Drainage project to reduce the risk of flooding to residential structures. Remove existing culvert drain crossing of the Gilkey Creek on Bellingham Court just east of Belsay Road and replace culver with a similar size. The replacement would conform with 2006 drainage study of a 19' span by 5' rise. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $560,000. Update: None, this is a newly submitted project.

Project: Drainage - Bristol Road. Project description: Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Road. The project includes the removal of the existing 3-sided cast-in-place concrete box culver drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Road. Replace with 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $700,000. Update: None, this is a newly submitted project.

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South

State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

Project: Deadfall tree removal. Project description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Atlas Township

Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000. Update: Project completed

Project: Drainage improvements to reduce risk of flooding to residential structures. Project Description: None. Location: Catherwood/Farnsworth, Hill Road, Washburn Road between County Line (Ray Road) and Kipp Road. Proposed timeframe for implementation: 1-5 years. Budget: $500,000.00. Update: Project is still ongoing.

Project: Boat for water or ice rescue. Project Description: Purchase a boat for the Fire Department to help with evacuation in the event of floods or dam failure within the village of Goodrich. Proposed timeframe for implementation: 1-5 years. Budget: $5,000.00. Update: Project is still ongoing - cost of boat has increased from $9,000 from $5,000. Still looking to do project when funding becomes available.

Flushing Township

Project: Back-up Generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

Project: Dredge Brent Creek and Cole Creek. Project description: Dredge creeks to prevent the flooding of roads caused by heavy rainfall. Proposed timeframe for implementation: 1-5 years. Budget: $10,000-$30,000. Update. Not provided.

Genesee County Emergency Management

Project: Relocation of homes. Project description: This project includes relocation of mobile home parks in flood-prone areas. Budget: $4,000,000. Update: Project is still ongoing.

City of Linden

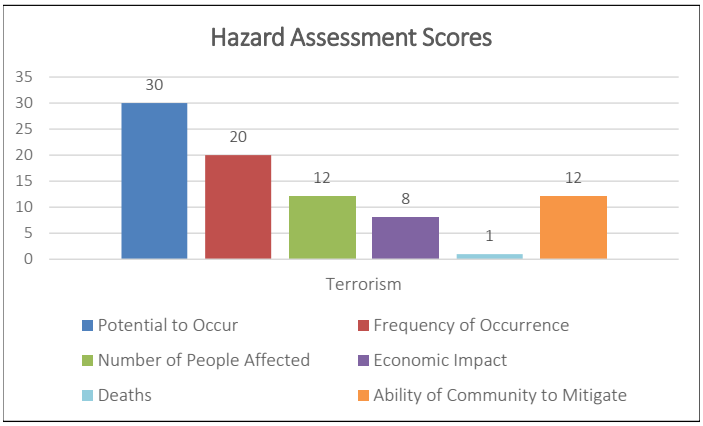
Project: Stand-alone generator for City Hall Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents

emergency sirens from being turned on and emergency personnel would not be able to operate equipment. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000. Update: This project has been completed.

University of Michigan Flint

Project: Flood Mitigation Plan. Project description: Provide the funding to develop a Flood Mitigation Plan. This plan will address ongoing mitigation needs such as installing USGS constructing berms/physical barriers that can resist the elevation associated with overflow of the Flint River. Proposed timeframe for implementation: 1-5 years. Budget: $50,000. Update: Not provided.

#2 - Terrorism (Includes Cyber Attacks)



Terrorism

Terrorism is an intentional unlawful use of force, violence or subversion against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political, social, or religious objectives.

Hazard Description

Terrorism is ranked as the number two hazard in Genesee County. In today's world, terrorism can take on many forms, although civilian bombings, assassination and extortion are probably the methods with which we are most familiar. Internationally, such acts have, unfortunately, become quite commonplace, as various religious, ethnic, and nationalistic groups have attempted to alter and dictate political agendas, seek revenge for perceived past wrongdoing, or intentionally disrupt the political, social and economic infrastructure of individual businesses, units of government, or nations.

The Middle East and parts of Europe have been hard hit by acts of terrorism over the past several decades. Parts of Asia and South America have also experienced a high level of activity. Tragically, with the events of September 11, 2001, terrorism has now occurred on our own soil. Equally alarming is the rapid increase in the scope and magnitude of terrorism methods and threats, which now include: 1) nuclear, chemical, and biological weapons; 2) information warfare such as cyberattacks; 3) ethnic/religious/gender intimidation (hate crimes); 4) state and local militia groups that advocate the overthrow of our government; 5) eco-extremism, designed to destroy or disrupt specific research or resource-related activities; and 6) widespread and organized narcotics (and other contraband) smuggling and distribution organizations.

Just as the methods and potential investigations have increased, so too have the potential targets of terrorism. As recent events across the country have shown, virtually any public facility or infrastructure, or place of public assembly can be considered a target of terrorism. In addition, certain types of businesses engaged in controversial activities are also potential targets. With the advent of the information age and growth in the number of computer "hackers", computer systems are potential targets as well (especially those of government agencies, large businesses, financial institutions, health care facilities, and colleges/universities).

One of the primary common denominators of most terrorists is their general desire for organizational recognition, but not necessarily individual recognition. They often seek publicity for their "cause" or specific agenda, but they go to great lengths to avoid individual detection by law enforcement agencies.

The exception to this might be individuals and organizations involved in narcotics or other contraband smuggling and distribution, who seek to keep their clandestine operations out of public and law enforcement scrutiny. Another commonality is that innocent people are always the ones that suffer the most in these senseless and cowardly criminal acts.

Genesee County Perspective and Vulnerability

Genesee County has several government buildings, churches, stadiums, recreation facilities, and many other large facilities that accommodate many people. Any government building or individual can become a target of domestic terrorism. In April 2019, Genesee County officials reported a ransomware attack on the County's computer network. The attack held hostage files and demanded payment for release. Eventually IT staff were able to isolate the attack, prevent further encryption, and restore services. However, this cyber-attack showed that any municipality could be a target. Although in recent years no violent acts of domestic terrorism have taken place in Genesee County, other examples of terrorism across the country can be used since there is always potential for these events to occur in this community. On April 15, 2013, the Boston Marathon was the target of a bombing. Genesee County and downtown Flint in particular, hold many large-scale public events and officials should be aware of a possible threat. The horrific events of September 11, 2001 have shown that anyone, anywhere, at any point in time, can be a target of terrorism. All citizens now have a responsibility to be aware of any situation that may indicate this type of threat, and to inform law enforcement of what may be occurring.

Although at first it might appear Genesee County is an unlikely target for terrorism, it cannot be totally discounted. Potential targets include: major natural gas lines; a water line that travels east/west serving Genesee County; major transportation routes; and all industrial sites in the area. Furthermore, any government building or individual can become a target of domestic terrorism.

Mitigation Strategies for Terrorism

The following strategies are suggested to minimize the effects of Genesee County's number three hazard, terrorism:

- Continued training for first responders, police, and fire personnel
- Riot gear for police personnel
- Public education about Homeland Security
- Update Disaster Response Plan if necessary
- Identify critical infrastructure
- Prepare vulnerability assessment for critical infrastructure including cyber security
- Homeland Security training for critical infrastructure employees
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

None

Previously Included Mitigation Projects

Atlas Township

Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000. Update: Project completed

Flushing Township

Project: Back-up Generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

City of Linden

Project: Stand-alone generator for City Hall Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being turned on and emergency personnel would not be able to operate equipment. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000. Update: This project has been completed.

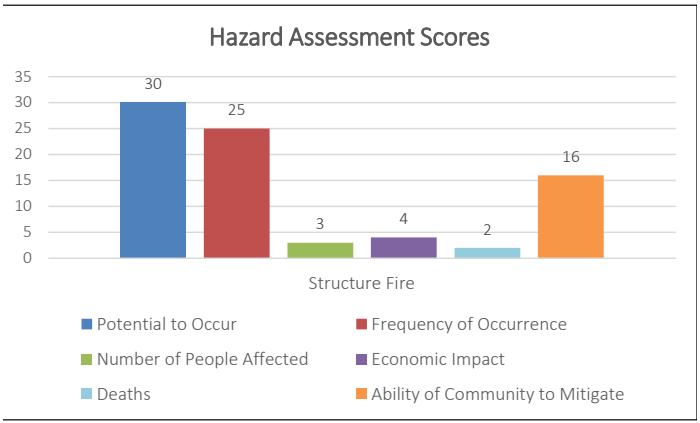
University of Michigan Flint

Project: Enhance First Street Residence Hall evacuation and sheltering. Project description: To include developing plans and specifications for construction of a storm shelter to house over 300 residents. Also,

develop a strategy that can be used to integrate plans for a shelter into any expansion of the residence hall. In addition, install two outdoor warning sirens to alert students/residents of severe weather. Following development of drawings for a shelter, construct a shelter to house residents. Proposed timeframe for implementation: 1-5 years. Budget: $550,000. Update: Not provided.

Project: Upgrading and improving the UofM Flint EOC and Department of Public Safety. Project description: Upgrading and providing improvements to the UofM Flint Emergency Operations Center and Department of Public Safety operations. This includes moving the dispatch center and adding additional equipment to the center and EOC. Proposed timeframe for implementation: 1-5 years. Budget: $500,000. Update: Not provided.

#3 - Structure Fires



Structure Fires

A structure fire is a fire, of any origin, that ignites one or more structures, causing loss of life and/or property.

Hazard Description

Structure fires are ranked as the number three hazard in Genesee County. Structure fires are often referred to as the "universal hazard" because they occur in virtually every community. The highest risk is during winter months, when wood stoves and faulty heaters are used. Each year in the United States, fires result in approximately 2,790 structure fire deaths and 11,525 injuries requiring medical treatment (FEMA). According to some sources, structure fires cause more loss of life and property damage than all types of natural disasters combined. Direct property losses due to fire are $8.2 billion per year – and much of that figure is the result of structure fires.

Ironically, while the United States has made great strides in lessening deaths and injuries caused by other types of disasters, the problem of structure fires is worse in this country than in many other industrialized countries (even those with a more densely developed population pattern). The United States Centers for Disease Control (CDC) figures indicate that fire-associated mortality rates in the United States are approximately 2-3 times greater than those in many other developed countries.

Genesee County Perspective and Vulnerability

According to statistics compiled by the Fire Marshal Division, Michigan Department of State Police for 2003 (the last year for which detailed statewide statistics are available), nearly 19,000 structural fires occurred in Michigan, resulting in 161 deaths and 624 injuries. The financial impact of these structural fires was estimated to be about $230 million. This data estimated that a structural fire occurred in Michigan every 28 minutes in 2003. Michigan's fire death rates in 2007 of about 15 persons per million puts it in the upper third compared to all other states in the nation.

Structure fires are a common occurrence in Genesee County which are handled by the 23 local fire departments. Between 1999 and 2003, Genesee County had 2,983 reported structure fires which resulted in 31 deaths and 181 injuries. The property and content losses of these fires was $47,624,950. This number accounts for almost 91 percent of fire-related losses between 1999 and 2003 for Genesee County. Between 2007 and 2012, Genesee County had 3,252 reported structure fires which resulted in 4 deaths and 182 injuries. Structural fires during this period resulted in $112,387,846 in property damage.

According to the Michigan Department of Licensing and Regulatory Affairs (LARA) National Fire Incident Reporting System (NFIRS), in the last 10 years there have been 7,719 structure fires in Genesee County. The number of injuries, deaths and dollar loss related to specifically structure fires was not provided. However, data for these statistics was provided by LARA for all fire related incidents in Genesee County. For all fire related incidents in the county over the past 10 years, there were 237 civilian injuries and 216 fire service injuries as well as 61 civilian deaths and 0 fire service deaths. The total property loss from fires in Genesee County is $210,903,144.

Costs associated with structure fires include deaths, injuries, temporary housing, use of emergency personnel, and damage to property. Damage costs for structure fires in Genesee County for 1999-2003 were used to determine an average annual cost of structure fires since this is the last time detailed statistics were available from the Fire Marshal Division, Department of State Police. According to the Federal Emergency Management Agency (FEMA), a death is estimated at $2,710,000, major injuries are estimat-

ed at $15,600, and minor injuries are $1,560. Using the historic data below, the cost of 31 deaths and 181 injuries (it was estimated that approximately half the injuries were major, and half were minor) was totaled at $85,570,000. When that figure is added to the property loss of $47,624,950, the total figure becomes $133,194,950 for the 2,983 recorded structure fires. Based on these damage costs, the estimated average cost of a structure fire in Genesee County is expected to be $44,651. As shown in Table 2-8, using this data to get an estimate, the County can expect to have an average of 597 structure fires per year. This calculates to a yearly cost of $26,656,647 for deaths, injuries, and property loss due to Genesee County structure fires.

Mitigation Strategies for Structure Fires

The following strategies are suggested to minimize the effects of Genesee County's number three hazard, structure fires:

- Continued fire department training
- Continued first responder training
- Upgrade fire department equipment as needed
- Public education on fire safety
- Enforce fire codes
- Continued mutual aid agreements

New Mitigation Projects

City of Grand Blanc

Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Atlas Township

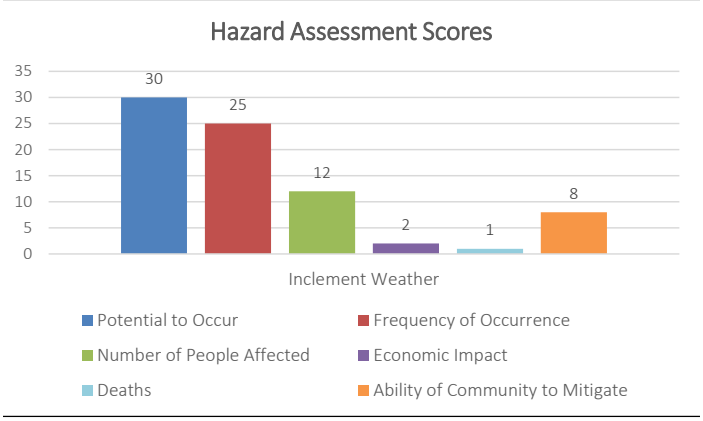
Project: High pressure 10 inch water wells (electric). Project Description: To be used by the Fire Department to fight fires in various Township locations. Township would like eight wells. Proposed timeframe for implementation: 1-5 years. Budget: Approximately $36,000.00 per well. Update: Project is ongoing - cost for the high pressure 10-inch water wells has risen to $36,000 from $28,000.

Table 2-8 Breakdown of Costs for Genesee County Structure Fires

Year	Number of Structure Fires	Deaths	Injuries	Property Loss
1999	405	5	32	$7,651,440
2000	957	10	54	$11,908,322
2001	387	4	18	$7,432,753
2002	405	8	48	$9,938,680
2003	829	4	29	$10,693,755
Totals	2,983	31 @ $2,710,000 = $84,010,000	181 (90 @ $1,560 = $140,400 and 91 @ $15,600 = $1,419,600 for a total of $1,560,000	$47,624,950
Grand Total	$133,194,950 (above costs for 2,983 structure fires)			
Estimated Average Cost of a Structure Fire				$44,651
Average Number of Structure Fires Per Year				597
Average Annual Estimated Cost of Structure Fires				$26,656,647

Source: Michigan Department of State Police, Fire Marshal Division

#4 - Inclement Weather



Inclement weather is ranked as the number four hazard, and the county is susceptible to this hazard all year long. Inclement weather includes a) tornadoes, b) thunderstorms, c) hail, d) lightning, e) severe winds, and f) snowstorms. These weather hazards are all combined under the "inclement weather" category because of their connectivity. For example, thunderstorms can produce lightning, severe winds, or hail, or can turn into tornadoes; snowstorms can also include severe winds.

A. Tornadoes (Inclement Weather)

A tornado is an intense rotating column of wind that extends from the base of a severe thunderstorm to the ground.

Hazard Description

Tornadoes in Michigan are most frequent in the spring and early summer when warm, moist air from the Gulf of Mexico collides with cold air from the Polar Regions to generate severe thunderstorms. These thunderstorms often produce the violently rotating columns of wind that are called tornadoes.

Michigan lies at the northeastern edge of the nation's primary tornado belt, which extends from Texas and Oklahoma through Missouri, Illinois, Indiana, and Ohio. Most of a tornado's destructive force is exerted by the powerful winds that knock down walls and lift roofs from buildings in the storm's path. The violently rotating winds then carry debris that can be blown through the air, becoming dangerous missiles.

A tornado may have winds up to 300 miles per hour and an interior air pressure that is 10-20% below that of the surrounding atmosphere. The typical tornado damage path is about one or two miles, with a width of around 50 yards, but paths much longer than that – even up to 200 miles – have been reported. Tornado path widths are generally less than one-quarter mile wide.

Typically, tornadoes last only a few minutes on the ground, but those few minutes can result in tremendous damage and devastation. Historically, tornadoes have resulted in loss of life, with the mean national annual death toll being 70 persons. Property damage from tornadoes is in the hundreds of millions of dollars every year.

Table 2-9 Fujita Tornado Intensity Scale

Magnitude	Description	Wind Speeds
FO	Gale Tornado	42-77 mph
F1	Moderate Tornado	78-112 mph
F2	Significant Tornado	113-157 mph
F3	Severe Tornado	158-206 mph
F4	Devastating Tornado	207-260 mph
F5	Incredible Tornado	261-318 mph

Source: National Oceanic and Atmospheric Administration

Tornado intensity is measured on the Fujita Scale, which examines the damage caused by a tornado on homes, commercial buildings, and other man-made structures. See **Table 2-9** for the Fujita Tornado Scale. The Fujita Scale rates the intensity of a tornado based on damage caused, not by its size. It is important to remember that the size of a tornado is not necessarily an indication of its intensity. Large tornadoes can be weak, and small tornadoes can be ex-

tremely strong, and vice versa. It is very difficult to judge the intensity and power of a tornado while it is occurring. Generally, that can only be done after the tornado has passed, using the Fujita Scale as the measuring stick. According to the National Weather Service (NWS), since 1950, the vast majority of tornadoes that occurred in the United States (approximately 74%) were classified as weak tornadoes (F0 or F1 intensity).

Approximately 25% were classified as strong tornadoes (F2 or F3 intensity), and only 1% was classified as violent tornadoes (F4 or F5 intensity). Unfortunately, those violent tornadoes, while few in number, caused 67% of all tornado-related deaths nationally. Strong tornadoes accounted for another 29% of tornado-related deaths, while weak tornadoes caused only 4% of tornado-related deaths. If the data prior to 1950 is examined, the percentage of deaths attributable to violent tornadoes climbs drastically. That is largely due to the fact that tornado forecasting and awareness programs were not yet established. As a result, it was not uncommon for death tolls from a single tornado to reach several hundred.

Genesee County Perspective and Vulnerability

In a statewide comparison of all Michigan counties for the years 1950 through 1999, Genesee County led the tornado statistics with 34 tornadoes. The county with the next highest number was Lenawee County with 30 tornadoes. As of February 2019, the number of Genesee County incidents has increased; the county now has 46 recorded tornadoes. Using thirty years of recent tornado statistics (from 1989-2019) as a guide, Genesee County can expect to have 1.3 tornadoes in any given year.

Please refer to hazard #8 - Tornadoes within this chapter for a more detailed analysis on tornadoes in Genesee County.

B. Thunderstorms (Inclement Weather)

Severe thunderstorms are weather systems accompanied by strong winds, lightning, heavy rain, and possibly hail and tornadoes.

Hazard Description

Inclement weather is ranked as the number four hazard in Genesee County, and thunderstorms are part of that weather picture. Severe thunderstorms can occur at any time in Michigan, although they are most frequent during the warm spring and summer months from May through September. The potential thunderstorm threat is often measured by the number of "thunderstorm days" – defined as days in which thunderstorms are observed. Michigan is, on average, subject to 30-40 thunderstorm days per year. The National Weather Service (NWS) in Michigan has further refined that statewide average figure and found that the southern two tiers of countries of the Lower Peninsula (roughly the area south of Interstate 94) is subject to 40-60 thunderstorm days per year.

The Lower Peninsula, in general, is subject to approximately 40 thunderstorm days per year, while the Upper Peninsula average is closer to 30 thunderstorm days per year. Thunderstorms form when a shallow layer of warm, moist air is overrun by a deeper layer of cool, dry air. Cumulonimbus clouds, frequently called "thunderheads", are formed in these conditions. These clouds are often enormous (up to six miles or more across and 40,000 to 50,000 feet high) and may contain tremendous amounts of water and energy. That energy is often released in the form of high winds, excessive rains, lightning, and possibly hail and tornadoes. Thunderstorms are typically short-lived (often lasting no more than 30-40 minutes) and fast moving (30-50 miles per hour). Strong frontal systems, however, may spawn one squall line after another composed of many individual thunderstorm cells. Other sections in this document address specific thunderstorm-related hazards such as hail, lightning, and tornadoes.

Genesee County Perspective and Vulnerability

There were 159 recorded incidents of thunderstorms and high winds in the last decade in Genesee County. Based on those numbers, the county is likely to have approximately 16 thunderstorm/high wind events per year. The highest cost to date was estimated at $25,000,000. (Due to the wide area of impact that many weather hazards have, this cost may include damage estimates from surrounding areas.) See **Table 2-10** for a detailed list of recorded incidents during the last 15 years.

Costs associated with thunderstorms include deaths, injuries, loss of power, damage to property, and clean-up afterwards. Available damage costs for past thunderstorms in Genesee County were used to calculate the average cost of a thunderstorm. See **Table 2-11**. The table shows the past twenty years of recorded thunderstorm and high wind events. The Federal Emergency Management Agency (FEMA) standard values for avoiding casualties quantifies injury and death costs from "Value of Statistical Life" academic research that was completed for the Department of Homeland Security for deaths as well as different levels of injuries. According to (FEMA), a death is estimated at $6,900,000, hospitalized injuries are estimated at $2,300,000, treat and release injuries are estimated at $61,000 and self-treated injuries are estimated at $14,000. Using the historic data below, the cost of three injuries (it was estimated that one was hospitalized, one treat and release, and one self-treat injury) was totaled at $2,375,000. Added to the property damages of $39,302,000 the total figure becomes $41,677,000 for the 97 thunderstorms that had recorded damages or injuries. Based on these figures, the estimated average cost of a thunderstorm that causes damage in Genesee County is expected to be $429,660.

Historically, the county usually has about 16 thunderstorm events per year; however, not every storm will have associated damages. Looking at the last 20 years of data, there were 307 of these events but only 97 had recorded damages or injuries. This means only 32% of thunderstorm and high wind events will have recorded damages. Using these figures, Genesee County can expect 4.8 thunderstorms per year to cause damage. This average annual cost is expected to be $2,062,368.

Mitigation Strategies for Thunderstorms

The following strategies are suggested to minimize

the effects of Genesee County thunderstorms:

- Increased weather radio coverage
- Distribution of weather radios
- Warning sirens
- Emergency generators for police and fire departments, special-needs facilities, and community shelters
- Stand-by power for water plants, pump stations, booster pumping stations
- Shelters for mobile home communities
- Enhance public awareness on correct safety procedures during tornados
- Direct phone lines between airport control tower, airport fire department, airport police, and the Transportation Security Administration (TSA) checkpoint
- Lightning warning system on airport airfield
- Upgrade/enforce local building codes
- Training for citizens to become Weather Spotters
- Update Disaster Response Plan, if needed
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

Table 2-10 Genesee County Thunderstorms and High Winds (2005-2020)

Date	Type	kts	Injuries	Property Damage
6/5/2005	Thunderstorm Wind	52	0	$0
6/5/2005	Thunderstorm Wind	52	0	$0
6/5/2005	Thunderstorm Wind	60	0	$20,000
6/5/2005	Thunderstorm Wind	54	0	$10,000
6/5/2005	Thunderstorm Wind	56	0	$0
7/18/2005	Thunderstorm Wind	54	0	$0
7/18/2005	Thunderstorm Wind	54	0	$0
7/18/2005	Thunderstorm Wind	52	0	$0
7/18/2005	Thunderstorm Wind	56	0	$0
9/22/2005	Thunderstorm Wind	51	0	$0
9/22/2005	Thunderstorm Wind	50	0	$0
11/6/2005	High Wind	52	0	$0
11/15/2005	Strong Wind	48	0	$450,000
2/16/2006	Thunderstorm Wind	60	0	$0
2/16/2006	Thunderstorm Wind	50	0	$0
3/13/2006	High Wind	52	0	$0
4/12/2006	Thunderstorm Wind	60	0	$20,000
5/25/2006	Thunderstorm Wind	52	0	$0
7/17/2006	Thunderstorm Wind	56	0	$0
7/17/2006	Thunderstorm Wind	55	0	$0
7/17/2006	Thunderstorm Wind	53	0	$0
7/27/2006	Thunderstorm Wind	52	0	$0
7/27/2006	Thunderstorm Wind	52	0	$0
7/30/2006	Thunderstorm Wind	55	0	$0
7/30/2006	Thunderstorm Wind	52	0	$0
7/30/2006	Thunderstorm Wind	52	0	$0
7/30/2006	Thunderstorm Wind	52	0	$0
8/1/2006	Thunderstorm Wind	50	0	$0
8/2/2006	Thunderstorm Wind	56	0	$0
8/2/2006	Thunderstorm Wind	54	0	$0
8/2/2006	Thunderstorm Wind	52	0	$0
9/23/2006	Thunderstorm Wind	52	0	$0
4/16/2007	Strong Wind	47	0	$20,000
5/15/2007	Thunderstorm Wind	54	0	$0
5/15/2007	Thunderstorm Wind	56	0	$50,000
5/15/2007	Thunderstorm Wind	56	0	$0
6/2/2007	Thunderstorm Wind	52	0	$3,000
6/2/2007	Thunderstorm Wind	52	0	$0
6/27/2007	Thunderstorm Wind	55	0	$3,000
6/27/2007	Thunderstorm Wind	55	0	$0
6/25/2009	Thunderstorm Wind	55	0	$2,000
8/9/2009	Thunderstorm Wind	54	0	$0
10/7/2009	High Wind	50	0	$100,000
6/18/2010	Thunderstorm Wind	54	0	$5,000
6/18/2010	Thunderstorm Wind	50	0	$0
6/18/2010	Thunderstorm Wind	50	0	$0
6/23/2010	Thunderstorm Wind	50	0	$1,000
7/15/2010	Thunderstorm Wind	50	0	$0
7/15/2010	Thunderstorm Wind	70	0	$15,000
7/15/2010	Thunderstorm Wind	56	0	$0
7/15/2010	Thunderstorm Wind	54	0	$0
7/15/2010	Thunderstorm Wind	62	0	$0
8/19/2010	Thunderstorm Wind	52	0	$0
8/19/2010	Thunderstorm Wind	61	0	$5,000
8/19/2010	Thunderstorm Wind	55	0	$15,000
9/7/2010	Strong Wind	39	0	$5,000
9/21/2010	Thunderstorm Wind	52	0	$0
9/21/2010	Thunderstorm Wind	52	0	$0
9/21/2010	Thunderstorm Wind	52	0	$0
9/21/2010	Thunderstorm Wind	54	0	$3,000
9/21/2010	Thunderstorm Wind	52	1	$0
9/21/2010	Thunderstorm Wind	53	0	$0
10/27/2010	High Wind	52	0	$5,000
5/29/2011	Thunderstorm Wind	58	0	$3,000
5/29/2011	Thunderstorm Wind	56	0	$0
5/29/2011	Thunderstorm Wind	58	0	$5,000
5/29/2011	Thunderstorm Wind	56	0	$0
5/29/2011	Thunderstorm Wind	61	0	$0
5/29/2011	Thunderstorm Wind	54	0	$0
5/29/2011	Thunderstorm Wind	64	0	$0
6/9/2011	Thunderstorm Wind	63	0	$50,000
6/9/2011	Thunderstorm Wind	66	0	$0
6/21/2011	Thunderstorm Wind	52	0	$0
6/22/2011	Thunderstorm Wind	61	0	$20,000
6/22/2011	Thunderstorm Wind	64	0	$0
6/22/2011	Thunderstorm Wind	65	0	$0
6/22/2011	Thunderstorm Wind	52	0	$0
7/18/2011	Thunderstorm Wind	52	0	$0
8/20/2011	Thunderstorm Wind	56	0	$5,000
10/15/2011	Strong Wind	39	0	$2,000
5/3/2012	Thunderstorm Wind	52	0	$2,000
5/3/2012	Thunderstorm Wind	52	0	$5,000
5/3/2012	Thunderstorm Wind	50	0	$5,000
5/3/2012	Thunderstorm Wind	50	0	$0
5/3/2012	Thunderstorm Wind	56	0	$5,000
5/3/2012	Thunderstorm Wind	56	0	$0
5/3/2012	Thunderstorm Wind	61	0	$0
7/3/2012	Thunderstorm Wind	52	0	$0
7/3/2012	Thunderstorm Wind	61	0	$0
7/3/2012	Thunderstorm Wind	61	0	$0
7/5/2012	Thunderstorm Wind	61	0	$15,000
7/5/2012	Thunderstorm Wind	50	0	$0
7/5/2012	Thunderstorm Wind	56	0	$5,000
7/5/2012	Thunderstorm Wind	56	0	$0
7/26/2012	Thunderstorm Wind	52	0	$0
7/31/2012	Thunderstorm Wind	52	0	$0
1/19/2013	High Wind	53	0	$1 mill.
5/20/2013	Thunderstorm Wind	50	0	$0
5/20/2013	Thunderstorm Wind	50	0	$0
5/20/2013	Thunderstorm Wind	61	0	$4,000
5/20/2013	Thunderstorm Wind	50	0	$0
5/20/2013	Thunderstorm Wind	54	0	$0
5/20/2013	Thunderstorm Wind	50	0	$1,000
5/30/2013	Thunderstorm Wind	56	0	$0

Source: National Oceanic and Atmospheric Administration; Kts = Knots

5/30/2013	Thunderstorm Wind	56	0	$5,000
5/30/2013	Thunderstorm Wind	52	0	$0
5/30/2013	Thunderstorm Wind	52	0	$0
5/30/2013	Thunderstorm Wind	52	0	$0
6/17/2013	Thunderstorm Wind	52	0	$0
6/17/2013	Thunderstorm Wind	56	0	$3,000
6/17/2013	Thunderstorm Wind	52	0	$0
6/17/2013	Thunderstorm Wind	54	0	$1,000
6/17/2013	Thunderstorm Wind	52	0	$0
6/17/2013	Thunderstorm Wind	52	0	$0
6/17/2013	Thunderstorm Wind	56	0	$0
6/17/2013	Thunderstorm Wind	56	0	$4,000
6/17/2013	Thunderstorm Wind	50	0	$0
6/17/2013	Thunderstorm Wind	56	0	$2,000
6/17/2013	Thunderstorm Wind	54	0	$3,000
8/7/2013	Thunderstorm Wind	65	0	$15,000
8/7/2013	Thunderstorm Wind	56	0	$5,000
8/7/2013	Thunderstorm Wind	52	0	$5,000
8/7/2013	Thunderstorm Wind	52	0	$0
9/11/2013	Thunderstorm Wind	52	0	$0
11/17/2013	Thunderstorm Wind	52	0	$0
11/17/2013	Thunderstorm Wind	54	0	$0
11/17/2013	High Wind	52	0	$2 mill.
4/12/2014	Thunderstorm Wind	52	0	$0
4/12/2014	Thunderstorm Wind	65	0	$20,000
4/12/2014	Thunderstorm Wind	56	0	$0
4/12/2014	Thunderstorm Wind	65	0	$0
4/12/2014	Thunderstorm Wind	56	0	$5,000
4/12/2014	Thunderstorm Wind	52	0	$0
6/18/2014	Thunderstorm Wind	50	0	$0
6/18/2014	Thunderstorm Wind	52	0	$5,000
6/18/2014	Thunderstorm Wind	50	0	$0
6/18/2014	Thunderstorm Wind	50	0	$2,000
7/1/2014	Thunderstorm Wind	52	0	$0
7/1/2014	Thunderstorm Wind	50	0	$0
7/1/2014	Thunderstorm Wind	50	0	$0
7/7/2014	Thunderstorm Wind	50	0	$5,000
7/27/2014	Thunderstorm Wind	54	0	$0
8/26/2014	Thunderstorm Wind	50	0	$0
9/5/2014	Thunderstorm Wind	50	0	$0
9/5/2014	Thunderstorm Wind	56	0	$5,000
9/5/2014	Thunderstorm Wind	50	0	$0
9/5/2014	Thunderstorm Wind	61	0	$5,000
9/5/2014	Thunderstorm Wind	50	0	$0
9/5/2014	Thunderstorm Wind	52	0	$0
9/5/2014	Thunderstorm Wind	61	0	$25,000
9/5/2014	Thunderstorm Wind	52	0	$0
9/20/2014	Thunderstorm Wind	56	0	$0
8/2/2015	Thunderstorm Wind	50	0	$0
8/14/2015	Thunderstorm Wind	54	0	$0
8/14/2015	Thunderstorm Wind	54	0	$2,000
8/14/2015	Thunderstorm Wind	56	0	$0
8/14/2015	Thunderstorm Wind	56	0	$0
8/14/2015	Thunderstorm Wind	50	0	$0
8/14/2015	Thunderstorm Wind	50	0	$0
8/14/2015	Thunderstorm Wind	56	0	$0
8/19/2015	Thunderstorm Wind	52	0	$5,000
9/3/2015	Thunderstorm Wind	51	0	$0
9/10/2016	Thunderstorm Wind	52	0	$3,000
9/10/2016	Thunderstorm Wind	52	0	$3,000
9/10/2016	Thunderstorm Wind	52	0	$3,000
11/18/2016	Thunderstorm Wind	56	0	$15,000
3/8/2017	High Wind	56	0	$25 mill.
7/7/2017	Thunderstorm Wind	50	0	$0
7/7/2017	Thunderstorm Wind	50	0	$0
7/7/2017	Thunderstorm Wind	52	0	$0
9/21/2017	Thunderstorm Wind	52	0	$0
10/7/2017	Thunderstorm Wind	52	0	$0
10/7/2017	Thunderstorm Wind	54	0	$0
5/4/2018	High Wind	52	0	$3.5 mill.
5/30/2018	Thunderstorm Wind	52	0	$0
5/30/2018	Thunderstorm Wind	52	0	$0
2/24/2019	High Wind	52	0	$500,000
3/14/2019	Thunderstorm Wind	54	0	$0
5/19/2019	Thunderstorm Wind	52	0	$0
6/1/2019	Thunderstorm Wind	52	0	$0
7/5/2019	Thunderstorm Wind	50	0	$0
7/11/2019	Thunderstorm Wind	54	0	$0
7/15/2019	Thunderstorm Wind	52	0	$0
7/20/2019	Thunderstorm Wind	52	0	$0
7/20/2019	Thunderstorm Wind	50	0	$0
7/20/2019	Thunderstorm Wind	54	0	$0
7/20/2019	Thunderstorm Wind	56	0	$0
7/20/2019	Thunderstorm Wind	56	0	$0
7/20/2019	Thunderstorm Wind	50	0	$500
4/20/2020	Thunderstorm Wind	52	0	$0
6/3/2020	Thunderstorm Wind	52	0	$0
6/3/2020	Thunderstorm Wind	54	0	$0
6/3/2020	Thunderstorm Wind	50	0	$0
6/10/2020	Thunderstorm Wind	52	0	$0
6/10/2020	Thunderstorm Wind	52	0	$2,000
6/10/2020	Thunderstorm Wind	52	0	$0
6/10/2020	Thunderstorm Wind	50	0	$0
7/19/2020	Thunderstorm Wind	54	0	$0

Source: National Oceanic and Atmospheric Administration

Table 2-11 2000-2020 Breakdown Costs for Genesee County High Winds and Thunderstorm Events				
Date	Type	kts	Injuries	Property Damage
5/9/2000	Thunderstorm Wind	50	0	$2,000
6/1/2000	Thunderstorm Wind	50	0	$3,000
6/1/2000	Thunderstorm Wind	52	0	$6,000
6/14/2000	Thunderstorm Wind	50	0	$3,000
7/14/2000	Thunderstorm Wind	69	0	$40,000
8/22/2000	Thunderstorm Wind	52	0	$5,000
9/11/2000	Thunderstorm Wind	50	1	$12,000
6/15/2001	Thunderstorm Wind	50	0	$1,000
8/28/2001	Thunderstorm Wind	60	0	$25,000
3/9/2002	High Wind	61	0	$150,000
5/31/2002	Thunderstorm Wind	61	0	$100,000
5/5/2003	Thunderstorm Wind	70	0	$5,000
11/12/2003	High Wind	72	0	$2 mill.
5/31/2004	Thunderstorm Wind	52	1	$0
10/30/2004	High Wind	54	0	$200,000
6/5/2005	Thunderstorm Wind	60	0	$20,000
6/5/2005	Thunderstorm Wind	54	0	$10,000
11/15/2005	Strong Wind	48	0	$450,000
4/12/2006	Thunderstorm Wind	60	0	$20,000
4/16/2007	Strong Wind	47	0	$20,000
5/15/2007	Thunderstorm Wind	56	0	$50,000
6/2/2007	Thunderstorm Wind	52	0	$3,000
6/27/2007	Thunderstorm Wind	55	0	$3,000
7/5/2007	Thunderstorm Wind	61	0	$20,000
7/5/2007	Thunderstorm Wind	56	0	$4,000
7/5/2007	Thunderstorm Wind	56	0	$1,500
7/5/2007	Thunderstorm Wind	54	0	$3,000
7/10/2007	Thunderstorm Wind	52	0	$3,000
7/10/2007	Thunderstorm Wind	52	0	$2,000
8/29/2007	Thunderstorm Wind	55	0	$1,000
9/25/2007	Thunderstorm Wind	70	0	$2,5000
12/23/2007	High Wind	50	0	$35,000
1/30/2008	High Wind	50	0	$3,000
6/6/2008	Thunderstorm Wind	55	0	$2,000
6/8/2008	Thunderstorm Wind	70	0	$25,0000
6/8/2008	Thunderstorm Wind	61	0	$30,000
6/8/2008	Thunderstorm Wind	61	0	$750,000
6/8/2008	Thunderstorm Wind	61	0	$600,000
6/26/2008	Thunderstorm Wind	53	0	$5,000
7/16/2008	Thunderstorm Wind	52	0	$5,000
8/23/2008	Thunderstorm Wind	52	0	$3,000
12/28/2008	High Wind	56	0	$2 mill.
6/25/2009	Thunderstorm Wind	55	0	$2,000
10/7/2009	High Wind	50	0	$100,000
6/18/2010	Thunderstorm Wind	54	0	$5,000
6/23/2010	Thunderstorm Wind	50	0	$1,000
7/15/2010	Thunderstorm Wind	70	0	$15,000
8/19/2010	Thunderstorm Wind	61	0	$5,000
8/19/2010	Thunderstorm Wind	55	0	$15,000
9/7/2010	Strong Wind	39	0	$5,000
9/21/2010	Thunderstorm Wind	52	1	$0
9/21/2010	Thunderstorm Wind	54	0	$3,000
10/27/2010	High Wind	52	0	$5,000
5/29/2011	Thunderstorm Wind	58	0	$3,000
5/29/2011	Thunderstorm Wind	58	0	$5,000
6/9/2011	Thunderstorm Wind	63	0	$50,000
6/22/2011	Thunderstorm Wind	61	0	$20,000
8/20/2011	Thunderstorm Wind	56	0	$5,000
10/15/2011	Strong Wind	39	0	$2,000
5/3/2012	Thunderstorm Wind	52	0	$2,000
5/3/2012	Thunderstorm Wind	52	0	$5,000
5/3/2012	Thunderstorm Wind	50	0	$5,000
5/3/2012	Thunderstorm Wind	56	0	$5,000
7/5/2012	Thunderstorm Wind	61	0	$15,000
7/5/2012	Thunderstorm Wind	56	0	$5,000
1/19/2013	High Wind	53	0	$1 mill.
5/20/2013	Thunderstorm Wind	61	0	$4,000
5/20/2013	Thunderstorm Wind	50	0	$1,000
5/30/2013	Thunderstorm Wind	56	0	$5,000
6/17/2013	Thunderstorm Wind	56	0	$3,000
6/17/2013	Thunderstorm Wind	54	0	$1,000
6/17/2013	Thunderstorm Wind	56	0	$4,000
6/17/2013	Thunderstorm Wind	56	0	$2,000
6/17/2013	Thunderstorm Wind	54	0	$3,000
8/7/2013	Thunderstorm Wind	65	0	$15,000
8/7/2013	Thunderstorm Wind	56	0	$5,000
8/7/2013	Thunderstorm Wind	52	0	$5,000
11/17/2013	High Wind	52	0	$2 mill.
4/12/2014	Thunderstorm Wind	65	0	$20,000
4/12/2014	Thunderstorm Wind	56	0	$5,000
6/18/2014	Thunderstorm Wind	52	0	$5,000
6/18/2014	Thunderstorm Wind	50	0	$2,000
7/7/2014	Thunderstorm Wind	50	0	$5,000
9/5/2014	Thunderstorm Wind	56	0	$5,000
9/5/2014	Thunderstorm Wind	61	0	$5,000
9/5/2014	Thunderstorm Wind	61	0	$25,000
8/14/2015	Thunderstorm Wind	54	0	$2,000
8/19/2015	Thunderstorm Wind	52	0	$5,000
9/10/2016	Thunderstorm Wind	52	0	$3,000
9/10/2016	Thunderstorm Wind	52	0	$3,000
9/10/2016	Thunderstorm Wind	52	0	$3,000
11/18/2016	Thunderstorm Wind	56	0	$15,000
3/8/2017	High Wind	56	0	$25 mill.
5/4/2018	High Wind	52	0	$3.5 mill.
2/24/2019	High Wind	52	0	$500,000
7/20/2019	Thunderstorm Wind	50	0	$500
6/10/2020	Thunderstorm Wind	52	0	$2,000
Thunderstorm Wind Total				$2,375,000
High Wind Total				$39,302,000
Grand Total				$41,677,000
Average Cost Per Event				$429,660
Average # of Storms/Year that Caused Damage				4.8
Estimated Annual Damage from Events				$2,062,368

Source: National Oceanic and Atmospheric Administration

C. Hail (Inclement Weather)

Hail is a condition where atmospheric water particles from thunderstorms form into rounded or irregular lumps of ice that fall to the earth.

Hazard Description

Hail is another product of the strong thunderstorms that frequently move across the state. As one of these thunderstorms passes over, hail usually falls near the center of the storm, along with the heaviest rain. Sometimes, strong winds occurring at high altitudes in the thunderstorms can blow the hailstones away from the storm center, causing an unexpected hazard at places that otherwise might not appear threatened. Most hailstones range in size from a pea to a golf ball, but hailstones larger than baseballs have occurred with the most severe thunderstorms.

Hail is formed when strong updrafts within the storm carry water droplets above the freezing level, where they remain suspended and continue to grow larger until their weight can no longer be supported by the winds. They finally fall to the ground, battering crops, denting autos, and injuring wildlife and people. Large hail is a characteristic of severe thunderstorms, and it may precede the occurrence of a tornado.

Genesee County Perspective and Vulnerability

Since 2000, there were 153 recorded incidents of hailstorms. Based on those numbers, Genesee County is likely to have 7.7 hailstorms per year. See **Table 2-12** for a detailed list of recorded incidents from 2000-2005, **Table 2-13** for 2006-2009, and **Table 2-14** for 2010-2020.

Costs associated with hail generally include crop and property damage. There were not enough property damage estimates available in order to calculate the average cost of a hailstorm. However, one hailstorm did have a cost of $5,000,000. (Due to the wide area of impact that a hailstorm can have, this cost may include damage estimates from surrounding areas.) The Michigan State University Extension Office estimates that there are 130 bushels of corn per acre. A bushel of corn is approximately $4.27, and there are 640 acres in a square mile of farmland. If one square mile of corn were destroyed by a hailstorm, the cost would be $355,264.

Mitigation Strategies for Hail

The following strategies are suggested to minimize the effects of Genesee County hail:

- Increased weather radio coverage
- Distribution of weather radios
- Emergency generators for police and fire departments, special-needs facilities, and community shelters
- Enhance public awareness on correct safety procedures during inclement weather
- Stand-by power for water plants, pump stations, booster pumping stations
- Shelters for mobile home communities
- Training for citizens to become Weather Spotters
- Direct phone lines between airport control tower, airport fire department, airport police, and the Transportation Security Administration (TSA) checkpoint. (When the airport receives severe weather alerts, the TSA is called. They are in charge of making sure that everyone in the terminal is in a secure area.)
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

Table 2-12 Genesee County Hail Storms (2000-2005)								
Location	Date	Magnitude	Location	Date	Magnitude	Location	Date	Magnitude
FENTON	4/9/2001	0.75	MONTROSE	8/21/2003	1	FENTON	6/14/2004	0.88
GRAND BLANC	5/28/2001	0.75	MT MORRIS	8/21/2003	0.75	BURTON	6/14/2004	0.75
DAVISON	8/19/2001	0.75	SWARTZ CREEK	8/21/2003	1.75	FENTON	6/14/2004	1
FLINT	4/19/2002	1	GAINES	8/21/2003	1.5	FLUSHING	6/23/2004	0.75
OTISVILLE	4/19/2002	0.75	SWARTZ CREEK	8/21/2003	1.25	FLINT	6/23/2004	0.88
MONTROSE	5/31/2002	0.88	FLINT	8/21/2003	0.75	BURTON	6/23/2004	0.88
FLINT	5/31/2002	0.75	OTISVILLE	8/21/2003	1.25	MT MORRIS	7/13/2004	0.75
LINDEN	5/5/2003	0.88	FLINT	8/21/2003	0.75	MT MORRIS	7/13/2004	0.75
FLINT	5/5/2003	0.88	GRAND BLANC	8/21/2003	0.75	GENESEE TWP	7/17/2004	0.88
FENTON	5/5/2003	0.75	BURTON	8/21/2003	0.88	CLIO	8/2/2004	0.75
GRAND BLANC	5/5/2003	0.88	MT MORRIS	5/14/2004	0.75	FLINT	8/2/2004	0.75
THETFORD	5/5/2003	0.75	OTISVILLE	5/14/2004	0.75	GOODRICH	6/5/2005	0.75
BURTON	5/5/2003	1	GENESEE	5/14/2004	0.75	MT MORRIS	6/14/2005	0.75
DAVISON	5/5/2003	0.88	OTISVILLE	5/14/2004	0.75	BURTON	6/29/2005	1
DAVISON	7/21/2003	0.75	FLUSHING	5/23/2004	1.75	BURTON	6/29/2005	0.88
BURTON	8/1/2003	0.75	LINDEN	6/14/2004	0.88			

Table 2-13 Genesee County Hail Storms (2006-2009)								
Location	Date	Magnitude	Location	Date	Magnitude	Location	Date	Magnitude
GRAND BLANC	3/31/2006	0.75	FENTON	5/15/2007	1	GOODRICH	4/11/2008	0.88
ATLAS	3/31/2006	0.75	BURTON	7/5/2007	0.75	BURTON	4/11/2008	0.75
GOODRICH	3/31/2006	0.88	BURTON	7/5/2007	1	GRAND BLANC	6/6/2008	0.88
FLINT	4/22/2006	1.75	FLINT	7/5/2007	1	GOODRICH	6/23/2008	0.88
MONTROSE	4/22/2006	1	FLINT	7/5/2007	1.25	GENESEE TWP	7/16/2008	1
CLIO	4/22/2006	0.75	FLINT	7/5/2007	0.88	GENESEE TWP	7/16/2008	1.75
FLINT	5/15/2006	1	BURTON	7/5/2007	1.5	GRAND BLANC	8/7/2008	1
ATLAS	5/25/2006	1.25	GRAND BLANC	7/5/2007	0.75	GRAND BLANC	8/13/2008	0.75
GRAND BLANC	5/25/2006	0.75	FLINT	7/5/2007	1	SWARTZ CREEK	5/27/2009	1
GOODRICH	5/25/2006	1	FLINT	7/5/2007	1	BURTON	5/27/2009	1.25
CLIO	6/8/2006	0.88	GRAND BLANC	7/5/2007	0.88	BEECHER	6/8/2009	1
BURTON	6/8/2006	0.75	GAINES	7/26/2007	1.25	GRAND BLANC	6/8/2009	0.88
FLUSHING	6/28/2006	0.75	LENNON	7/26/2007	1	GENESEE TWP	6/25/2009	1
OTISVILLE	6/28/2006	1.75	MONTROSE	8/29/2007	0.75	DAVISON	6/25/2009	1
OTISVILLE	6/28/2006	0.88	CLIO	8/29/2007	1	OTTER LAKE	6/25/2009	0.88
OTISVILLE	8/2/2006	0.75	CLIO	8/29/2007	1			
GRAND BLANC	8/2/2006	0.75	CLIO	10/19/2007	0.75			

Table 2-14 Genesee County Hail Storms (2010-2020)								
Location	Date	Magnitude	Location	Date	Magnitude	Location	Date	Magnitude
RICHFIELD TWP	7/15/2010	0.75	GOODRICH	7/3/2012	0.75	BURTON	6/17/2013	1.5
GENESEE TWP	5/13/2011	0.75	ATLAS	7/3/2012	1	GENESEE TWP	6/17/2013	0.88
GAINES	5/13/2011	1	GOODRICH	7/3/2012	0.75	RICHFIELD	6/17/2013	0.75
FLINT	6/22/2011	0.75	GOODRICH	7/3/2012	1.75	DAVISON	6/27/2013	0.75
VIENNA TWP	7/2/2011	1	GRAND BLANC	7/3/2012	1	GRAND BLANC	9/11/2013	0.88
OTISVILLE	7/2/2011	1	GRAND BLANC	7/3/2012	0.88	LINDEN	4/12/2014	0.88
FENTON	7/2/2011	0.75	GOODRICH	7/3/2012	1.75	OTISVILLE	9/20/2014	1
CLIO	8/20/2011	0.88	ATLAS	7/3/2012	0.88	FLUSHING TWP	8/2/2015	1
GENESEE TWP	8/20/2011	0.75	ATLAS	7/3/2012	1	MT MORRIS	7/7/2017	1
THETFORD TWP	8/20/2011	0.75	SWARTZ CREEK	7/3/2012	1	FLUSHING	7/7/2017	1.75
THETFORD TWP	8/20/2011	0.75	MUNDY TWP	7/3/2012	0.75	FLUSHING	8/28/2020	1.25
OTISVILLE	8/20/2011	0.75	CLIO	6/17/2013	0.75	FLUSHING	8/28/2020	1.75
OTISVILLE	3/15/2012	1.5	RICHFIELD	6/17/2013	1.75	FLUSHING TWP	8/28/2020	1
FLUSHING TWP	5/3/2012	1	RICHFIELD	6/17/2013	2	FLUSHING	8/28/2020	2
FLINT	7/3/2012	1.75	MT MORRIS	6/17/2013	1.75			
GRAND BLANC	7/3/2012	1.75	BEECHER	6/17/2013	1.75			

Source: National Oceanic and Atmospheric Administration

D. Lightning (Inclement Weather)

Lightning is the discharge of electricity from within a thunderstorm.

Lightning is a random and unpredictable product of a thunderstorm's tremendous energy. The energy in the storm produces an intense electrical field similar to a giant battery, with the positive charge concentrated at the top and the negative charge concentrated at the bottom. Lightning strikes when a thunderstorm's electrical potential (the difference between its positive and negative charges) becomes great enough to overcome the resistance of the surrounding air.

Bridging that difference, lightning can jump from cloud to cloud, cloud to ground, or even from the cloud to the air surrounding the thunderstorm. Lightning strikes can generate current levels of 30,000 to 40,000 amperes, with air temperatures often superheated to higher than 50,000 degrees Fahrenheit (hotter than the surface of the sun) and speeds approaching one-third the speed of light.

Globally, there are about 2,000 thunderstorms occurring at any given time, and those thunderstorms cause approximately 100 lightning strikes to earth each second. In the United States, approximately 100,000 thunderstorms occur each year, and every one of those storms generates lightning. It is not uncommon for a single thunderstorm to produce hundreds or even thousands of lightning strikes. However, to most of the general public, lightning is perceived as a minor hazard. That perception lingers even though lightning damages many structures and kills and injures more people in the United States per year, on average, than tornadoes or hurricanes. Many lightning deaths and injuries could be avoided if people would have more respect for the threat lightning presents to their safety.

Lightning deaths are usually caused by the electrical force shocking the heart into cardiac arrest or throwing the heartbeat out of its usual rhythm. Lightning can also cut off breathing by paralyzing the chest muscles or damaging the respiratory center in the brain stem. It takes only about one-hundredth of an ampere of electric current to stop the human heartbeat or send it into ventricular fibrillation. Lightning can also cause severe skin burns that can lead to death if complications from infection set in. Statistics compiled by the National Oceanic and Atmospheric Administration (NOAA) and the National Lightning Safety Institute (NLSI) for the period 1959-1994 revealed the following about lightning fatalities, injuries and damage in the United States:

Location of Lightning Strikes

- 40% are at unspecified locations
- 27% occur in open fields and recreation areas (not golf courses)
- 14% occur to someone under a tree (not on golf course)
- 8% are water-related (boating, fishing, swimming, etc.)
- 5% are golf-related (on golf course or under tree on golf course)
- 3% are related to heavy equipment and machinery
- 2.4% are telephone-related
- 0.7% are radio, transmitter and antenna-related

Gender of Victims

- 84% are male; 16% are female

Months of Most Strikes

- July (30%); August (22%); June (21%)

Days of Most Strikes

- #1 – Sunday; #2 – Wednesday; #3 – Saturday

Time of Most Strikes

- 2:00 p.m. – 6:00 p.m.

Number of Victims

- One victim (91%); two or more victims (9%)

The NLSI estimates that 85% of lightning victims are children and young men (ages 10-35) engaged in recreation or work-related activities. Approximately 20% of lightning strike victims die, and 70% of survivors suffer serious long-term after-effects such as memory and attention deficits, sleep disturbance, fatigue, dizziness, and numbness. Michigan is ranked the second highest state in number of deaths and number of injuries caused by lightning. (NLSI

Lightning-Related Property Losses

In terms of property losses from lightning, statistics vary widely according to source. The Insurance Information Institute (a national clearinghouse of insurance industry information) estimates that lightning damage amounts to nearly 5% of all paid insurance claims, with residential claims alone exceeding one billion dollars. Information from insurance companies shows one homeowner's damage claim for every 57 lightning strikes. It is estimated that lightning causes more than 22,600 fires annually, with damage to property exceeding $451 million per year. These estimates are based on data from the U.S. Fire Administration's (USFA's) National Fire Incident Reporting System (NFIRS) and the National Fire Protection Association's (NFPA's) annual fire department experience survey. Electric utility companies across the country estimate as much as one billion dollars per year in damaged equipment and lost revenue from lightning.

The Federal Aviation Administration (FAA) reports approximately two billion dollars per year in airline industry operating costs and passenger delays from lightning. Because lightning-related damage information is compiled by so many different sources, using widely varying collection methods and criteria, it is difficult to determine a collective damage figure for the U.S. from lightning.

However, suffice it to say that annual lightning-related property damages are conservatively estimated at several billion dollars per year, and those losses are expected to continue to grow as the use of computers and other lightning-sensitive electronic components becomes more prevalent. See **Table 2-15** for a detailed list of recorded lightning storms during the period from 1996-2005.

Genesee County Perspective and Vulnerability

There were 15 recorded lightning storms in 25 years. Based on those numbers, the county has a 60% chance of having a lightning event per year. See **Table 2-16** for a detailed list of recent lightning storms in Genesee County.

On May 25, 2004, lightning struck an abandoned oil well storage tank in Otter Lake. It caused a valve rupture and fire, which was put out by a blanket-type foam. On June 21, 1997 lightning struck a building in Otisville that waw housing a children's event. Eight children were taken to the hospital after complaining of numbness and tingling. None of the reported injuries were serious.

Table 2-15 Genesee County Lightning Storms (1996-2005)

Location	Date	Deaths	Injuries	Property Damage
RICHFIELD TWP	5/20/1996	0	1	$0
OTISVILLE	6/21/1997	0	8	$0
FLINT	6/12/1999	0	1	$0
FENTON	7/23/1999	1	1	$0
ATLAS	5/10/2004	0	0	$3,000
FENTON	7/13/2005	0	0	$0
DAVISON	9/22/2005	0	0	$15,000
FLINT	11/9/2005	0	0	$50,000

Source: National Oceanic and Atmospheric Administration

Table 2-16 Genesee County Lightning Storms (2006-2020)

Location	Date	Deaths	Injuries	Property Damage
DAVISON	6/2/2006	0	0	$55,000
MT MORRIS	8/2/2006	0	0	$2,500
FLUSHING	9/5/2006	0	0	$10,000
FLINT	5/15/2007	0	0	$75,000
FLINT DALTONS ARPT	9/18/2010	0	0	$5,000
FENTON	7/11/2011	0	0	$5,000
MT MORRIS	7/7/2014	0	0	$2,000

Source: National Oceanic and Atmospheric Administration

Costs associated with lightning include deaths, injuries, loss of power, and damage to property, and clean-up afterwards. Available damage costs for past lightning events in Genesee County were used to cal-

culate the average cost of a lightning event. See **Table 2-17** below. The Federal Emergency Management Agency (FEMA) standard values for avoiding casualties quantifies injury and death costs from "Value of Statistical Life" academic research that was completed for the Department of Homeland Security for deaths as well as different levels of injuries. According to (FEMA), a death is estimated at $6,900,000, hospitalized injuries are estimated at $2,300,000, treat and release injuries are estimated at $61,000 and self-treated injuries are estimated at $14,000. Using the historic data below, the cost of one death and eleven injuries (it was estimated that six injuries were hospitalized, three were treat and release and two were self-treat) was totaled at $20,911,000. Added to the property damages of $222,500, the total figure becomes $21,133,500 for the 15 recorded lightning events. Based on these damage figures, the estimated average cost of a lightning event in Genesee County is expected to be $1,408,900. Since Genesee County has about a 60% chance of having a lightning event each year, the average annual cost is estimated to be $845,340.

Mitigation Strategies for Lightning

The following strategies are suggested to minimize the effects of Genesee County lightning:

- Increased weather radio coverage
- Distribution of weather radios
- Emergency generators for police and fire departments, special-needs facilities, and community shelters
- Enhance public awareness on correct safety procedures during lightning
- Stand-by power for water plants, pump stations, booster pumping stations
- Lightning warning system on airport airfield
- Direct phone lines between airport control tower, airport fire department, airport police, and the Transportation Security Administration (TSA) checkpoint
- Training for citizens to become Weather Spotters
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

Table 2-17 1996-2020 Breakdown Costs for Genesee County High Winds and Thunderstorm Events

Location	Date	Deaths	Injuries	Property Damage
RICHFIELD TWP	5/20/1996	0	1	$0
OTISVILLE	6/21/1997	0	8	$0
FLINT	6/12/1999	0	1	$0
FENTON	7/23/1999	1	1	$0
ATLAS	5/10/2004	0	0	$3,000
FENTON	7/13/2005	0	0	$0
DAVISON	9/22/2005	0	0	$15,000
FLINT	11/9/2005	0	0	$50,000
DAVISON	6/2/2006	0	0	$55,000
MT MORRIS	8/2/2006	0	0	$2,500
FLUSHING	9/5/2006	0	0	$10,000
FLINT	5/15/2007	0	0	$75,000
FLINT DALTONS ARPT	9/18/2010	0	0	$5,000
FENTON	7/11/2011	0	0	$5,000
MT MORRIS	7/7/2014	0	0	$2,000
Totals:		$6,900,000	$14,011,000	$222,500
Grand Total		$21,133,500 (all costs for 15 lightning events)		
Estimated Average Cost of a Lightning Event		$1,408,900		
Chance Per Year of Lightning Event		.6		
Average Annual Cost of a Lightning Event		$845,340		

Source: Genesee County Storm Events Assessment and National Oceanic and Atmospheric Administration

E. Severe Winds (Inclement Weather)

Severe winds are winds of 58 miles per hour or greater.

Hazard Description

Severe winds spawned by thunderstorms or other storm events have had devastating effects on Michigan in terms of loss of life, injuries, and property damage. According to data compiled by the National Weather Service for the period 1970-1996, Michigan experienced over 8,300 severe wind events (does not include tornadoes), which resulted in 98 deaths and millions of dollars in damage. It is important to note that the high number of severe wind events is due in part to the fact that the data was compiled by county; thus, multi-county storms are counted more than once. Severe wind events are characterized by wind velocities of 58 miles per hour or greater, with gusts sometimes exceeding 74 miles per hour (hurricane velocity).

Genesee County Perspective and Vulnerability

There have been 76 recorded incidents of severe winds since 1963. One severe windstorm caused damage costing $5,000,000. (Due to the wide area of impact that many weather hazards have, this cost may include damage estimates from surrounding areas.) See Table 2-18 for a detailed list of recorded severe windstorms during recent years.

For a vulnerability assessment on high winds, please see part "b) Thunderstorms" in the previous text. High winds and thunderstorms usually occur together, so these two hazards are combined in the vulnerability assessment for thunderstorms.

Mitigation Strategies for Severe Winds

The following strategies are suggested to minimize the effects of Genesee County severe winds:

- Increased weather radio coverage
- Distribution of weather radios
- Emergency generators for police and fire departments, special-needs facilities, and community shelters
- Enhance public awareness on correct safety procedures during high winds
- Warning sirens
- Stand-by power for water plants, pump stations, booster pumping stations
- Shelters for mobile home communities
- Training for citizens to become Weather Spotters
- Direct phone lines between airport control tower, airport fire department, airport police, and the Transportation Security Administration (TSA) checkpoint
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

Table 2-18 Genesee County Severe Winds (2000-2020)				
Date	Type	kts	Injuries	Property Damage
7/14/2000	Thunderstorm Wind	69	0	$40,000
8/28/2001	Thunderstorm Wind	60	0	$25,000
3/9/2002	High Wind	61	0	$150,000
5/31/2002	Thunderstorm Wind	61	0	$100,000
5/5/2003	Thunderstorm Wind	70	0	$5,000
5/5/2003	Thunderstorm Wind	65	0	$0
5/5/2003	Thunderstorm Wind	61	0	$0
6/8/2003	Thunderstorm Wind	64	0	$0
11/12/2003	High Wind	72	0	$2,000,000
5/14/2004	Thunderstorm Wind	65	0	$0
5/14/2004	Thunderstorm Wind	65	0	$0
5/23/2004	Thunderstorm Wind	70	0	$0
5/23/2004	Thunderstorm Wind	70	0	$0
5/23/2004	Thunderstorm Wind	70	0	$0
5/23/2004	Thunderstorm Wind	61	0	$0
5/23/2004	Thunderstorm Wind	58	0	$0
6/9/2004	Thunderstorm Wind	61	0	$0
7/13/2004	Thunderstorm Wind	62	0	$0
8/2/2004	Thunderstorm Wind	58	0	$0
8/2/2004	Thunderstorm Wind	60	0	$0
6/5/2005	Thunderstorm Wind	60	0	$20,000
2/16/2006	Thunderstorm Wind	60	0	$0
4/12/2006	Thunderstorm Wind	60	0	$20,000
7/5/2007	Thunderstorm Wind	61	0	$20,000
8/29/2007	Thunderstorm Wind	61	0	$0
9/25/2007	Thunderstorm Wind	70	0	$25,000
6/8/2008	Thunderstorm Wind	70	0	$25,0000
6/8/2008	Thunderstorm Wind	61	0	$30000
6/8/2008	Thunderstorm Wind	61	0	$75,0000
6/8/2008	Thunderstorm Wind	61	0	$600,000
6/8/2009	Thunderstorm Wind	60	0	$0
7/15/2010	Thunderstorm Wind	70	0	$15,000
7/15/2010	Thunderstorm Wind	62	0	$0
8/19/2010	Thunderstorm Wind	61	0	$5,000
5/29/2011	Thunderstorm Wind	58	0	$3,000
5/29/2011	Thunderstorm Wind	58	0	$5,000
5/29/2011	Thunderstorm Wind	61	0	$0
5/29/2011	Thunderstorm Wind	64	0	$0
6/9/2011	Thunderstorm Wind	63	0	$50,000
6/9/2011	Thunderstorm Wind	66	0	$0
6/22/2011	Thunderstorm Wind	61	0	$20,000
6/22/2011	Thunderstorm Wind	64	0	$0
6/22/2011	Thunderstorm Wind	65	0	$0
5/3/2012	Thunderstorm Wind	61	0	$0
7/3/2012	Thunderstorm Wind	61	0	$0
7/3/2012	Thunderstorm Wind	61	0	$0
7/5/2012	Thunderstorm Wind	61	0	$15,000
5/20/2013	Thunderstorm Wind	61	0	$4000
8/7/2013	Thunderstorm Wind	65	0	$15,000
4/12/2014	Thunderstorm Wind	65	0	$20,000
4/12/2014	Thunderstorm Wind	65	0	$0
9/5/2014	Thunderstorm Wind	61	0	$5,000
9/5/2014	Thunderstorm Wind	61	0	$25,000

Source: National Oceanic and Atmospheric Administration

F. Snow and Ice Storms

Snow storms are a period of rapid accumulation of snow often accompanied by high winds, cold temperatures, and low visibility. In contrast, ice storms have the potential to be more severe then a snow storm by generating sufficient quantities of ice or sleet to result in hazardous conditions and/or property damage.

Hazard Description

As a result of being surrounded by the Great Lakes, Michigan experiences large differences in snowfall in relatively short distances. The annual mean accumulation ranges from 30 to 170 inches of snow. The highest accumulations are in the northern and western parts of the Upper Peninsula. In Lower Michigan, the highest snowfall accumulations occur near Lake Michigan and in the higher elevations of northern Lower Michigan. Blizzards are the most dramatic and perilous of all snowstorms, characterized by low temperatures and strong winds (35 miles per hour or greater) bearing enormous amounts of snow. Most of the snow accompanying a blizzard is in the form of fine, powdery particles that are wind-blown in such great quantities that, at times, visibility is reduced to only a few feet. Blizzards have the potential to result in property damage and loss of life. Just the cost of clearing the snow can be enormous.

Most of the severe winter weather events that occur in Michigan have their origin as Canadian and Arctic cold fronts that move across the state from the west or northwest. Michigan is susceptible to moderate snowfall and extreme cold, averaging 90-180 days per year below freezing in the Lower Peninsula, and over 180 days below freezing in most of the Upper Peninsula.

Genesee County also must deal with ice and sleet storms. Ice storms are sometimes incorrectly referred to as sleet storms. Sleet is like hail only smaller and can be easily identified as frozen raindrops (ice pellets), which bounce when hitting the ground or other objects. Sleet does not stick to trees and wires, but sleet in sufficient depth does cause hazardous driving conditions. Ice storms are the result of cold rain that freezes on contact with the surface, coating the ground, trees, buildings, overhead wires and other exposed objects with ice, sometimes causing extensive damage. When electric lines are downed, households may be without power for several days, resulting in significant economic loss and disruption of essential services in affected communities.

Genesee County Perspective and Vulnerability

Genesee County had 47 recorded snow storm and 4 ice storm incidents from 1999 to 2020 and based on those numbers the county is likely to have 2.1 snow storms per year and 1 ice storm every 5 years.

Please refer to hazard #6 - Snow and Ice Storms within this chapter for a more detailed analysis on snow and ice storms in Genesee County.

Table 2-19. Federal Disaster Declarations in Genesee County from 1953 to 2020				
Date of Declaration	Type of Incident	Type of Declaration	Begin Date	End Date
3/27/2020	COVID-19 PANDEMIC	Major Disaster	1/20/2020	Ongoing
3/13/2020	COVID-19	Emergency	1/20/2020	Ongoing
1/26/2016	CONTAMINATED WATER	Emergency	4/25/2014	8/14/2016
9/7/2005	HURRICANE KATRINA EVACUATION	Emergency	8/29/2005	10/1/2005
6/30/2004	SEVERE STORMS, TORNADOES, AND FLOODING	Major Disaster	5/20/2004	6/8/2004
9/23/2003	POWER OUTAGE	Emergency	8/14/2003	8/17/2003
1/10/2001	SNOW	Emergency	12/11/2000	12/31/2000
7/11/1997	SEVERE STORMS, TORNADOES, AND FLOODING	Major Disaster	7/2/1997	7/2/1997
9/18/1986	SEVERE STORMS & FLOODING	Major Disaster	9/10/1986	10/10/1986
9/18/1985	SEVERE STORMS AND FLOODING	Major Disaster	9/5/1985	9/28/1985
1/27/1978	BLIZZARDS & SNOWSTORMS	Emergency	1/27/1978	1/27/1978
3/19/1976	SEVERE STORMS, TORNADOES, ICING & FLOODING	Major Disaster	9/30/1975	9/30/1975
9/30/1975	SEVERE STORMS, HIGH WINDS & FLOODING	Major Disaster	3/19/1976	3/19/1976
4/26/1975	SEVERE STORMS, HIGH WINDS & FLOODING	Major Disaster	4/26/1975	4/26/1975

Source: Federal Emergency Management Agency

To sum up the inclement weather section, Table 2-19 shows a listing of ten Presidential Major Disaster Declarations that were issued during the years 1975 through 2020 that relate to weather. Genesee County received a total of fourteen Presidential Disaster Declarations from 1975 to 2020 with ten of those related to weather.

New Mitigation Projects

City of Burton

Project: Drainage - Bellingham Court. Project description: Drainage project to reduce the risk of flooding to residential structures. Remove existing culvert drain crossing of the Gilkey Creek on Bellingham Court just east of Belsay Road and replace culver with a similar size. The replacement would conform with 2006 drainage study of a 19' span by 5' rise. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $560,000. Update: None, this is a newly submitted project.

Project: Drainage - Bristol Road. Project description: Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Road. The project includes the removal of the existing 3-sided cast-in-place concrete box culver drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Road. Replace with 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $700,000. Update: None, this is a newly submitted project.

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

Project: Deadfall tree removal. Project description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Project: Emergency Warning Sirens. Project description: The purchase and installation of two advance warning sirens within Mundy Township. Proposed timeframe for implementation: 1 - 5 years. Budget: $40,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Atlas Township

Project: Emergency Warning Sirens. Project description: Emergency warning sirens placed in various locations within Atlas Township to be audible by all residents in all sections. Township would like eight sirens. Proposed timeframe for implementation: 1 - 5 years. Map included. Budget: Approximately $25,000 per siren. Update: Two emergency warning sirens have been installed. Looking to install more as funding becomes available.

Bendle Public Schools

Project: Equipment. Project description: Bendle High School is a designated disaster site for Genesee County emergencies. When the electrical power goes out, the freezer and refrigeration units stop working costing thousands of dollars to replace the loss of food. Bendle Family Health Services is an on-site health clinic operated by Bendle Schools. Bendle has partnered with the Genesee County Health Department to provide vaccines for preschool - grade 12 students. When the power goes out, the vaccines are ruined if they are not maintained at a specific temperature. The primary need is to purchase a large generator that is wired into the electrical system of the kitchen at the high school. Portable lighting would be purchased to enable staff to prepare food. The project would also purchase a generator for Bendle Family Health Services. Proposed timeframe for implementation: 1 - 5 years. Budget: $67,150. Update: This project description and cost has been revised to better reflect the needs of Bendle Schools. The project is still ongoing pending potential funding.

Bishop International Airport

Project: Weather computer. Project description: This project includes a weather computer to help forecast snow, thunderstorms and high winds; lightning warning systems for the airfield, and a direct phone line form the FAA Control Tower to the Airport Fire Department, Airport Police and the security checkpoint. Budget: Not provided. Update: This project has been completed.

Davison Township

Project: Warning Sirens. Project description: The purchase and installation of three advance warning sirens within Davison Township. Proposed timeframe for implementation: 1-5 years. Map included. Budget: $60,000. Update: Not provided.

Fenton Township

Project: Emergency shelter. Project description: The project would involve renovations to the Township Hall basement to make it suitable as an emergency shelter for residents, including the addition of a back-up generator. Budget: $60,000. Update. Project is still ongoing.

Flushing Township

Project: Back-up Generator. Project description: In-

stall a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

Project: Tornado Sirens. Project description: Install tornado warning sirens in the Charter Township of Flushing. Proposed timeframe of implementation: 1-5 years. Budget: $10,000-$30,000. Update: Not provided.

Forest Township

Project: Warning sirens. Project description: The purchase and installation of three warning sirens throughout Forest Township. Budget: Unknown. Update: Not provided.

Gaines Township

Project: Warning sirens. Project description: The purchase and installation of warning sirens. Budget: $80,000. Update. Not provided.

Genesee County Emergency Management

Project: Tornado shelters for mobile home parks. Budget: $16,000,000. Update: Project is still ongoing.

Project: Warning Sirens. Project description: The project includes a minimum of 100 storm warning sirens. Budget: $1,700,000. Update: Project is still ongoing.

Genesee Intermediate School District

Project: Back-up generator. Project description: The project includes a portable diesel-powered generator to provide back-up power to three separate locations that service special needs students, many with multiple impairments that prevent physical evacuation of the buildings. Budget: $500,000. Update: Not provided.

Project: Structural Improvements. Project description: The project includes structural reinforcement for the walls and roof of the gyms and multi-purpose rooms (open-space areas) at three separate locations that serve special-needs students, many with multiple impairments that prevent physical evacuation of the buildings. Budget: Not provided. Update: Not provided.

Goodrich Area Schools

Project: Equipment. Project description: The project includes two generators, emergency lighting, back-up air compressor, emergency radios, portable lighting, and caution tape. Budget: $5,000 - $8,000. Update: Not provided.

Grand Blanc Township

Project: Warning sirens. Project description: The purchase and installation of warning sirens. Budget: $48,000. Update: The Township is no longer pursuing this project.

Village of Lennon

Project: Repair sirens. Project description: The project includes repair of broken weather siren. Budget: $1,000 - $16,000. Update: Completed in 2011.

Project Back-up generator. Project description: The project includes a back-up generator for the Police Department. Budget: $3,000. Update: This project was tabled due to cost.

Project: Back-up generator. Project description: The project includes a back-up generator for the Village Hall. Budget: $3,000. Update. This project was tabled due to cost.

City of Linden

Project: Stand-alone generator for City Hall Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being turned on and emergency personnel would not be able to operate equipment. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000. Update: This project has been completed.

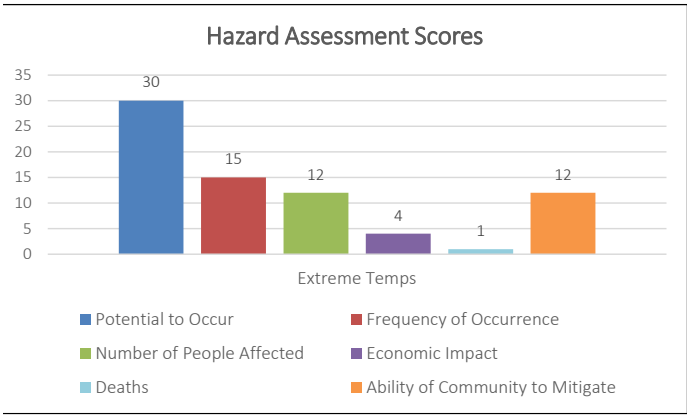
University of Michigan Flint

Project: Enhance First Street Residence Hall evacuation and sheltering. Project description: To include developing plans and specifications for construction of a storm shelter to house over 300 residents. Also,

develop a strategy that can be used to integrate plans for a shelter into any expansion of the residence hall. In addition, install two outdoor warning sirens to alert students/residents of severe weather. Following development of drawings for a shelter, construct a shelter to house residents. Proposed timeframe for implementation: 1-5 years. Budget: $550,000. Update: Not provided.

Project: Upgrading and improving the UofM Flint EOC and Department of Public Safety. Project description: Upgrading and providing improvements to the UofM Flint Emergency Operations Center and Department of Public Safety operations. This includes moving the dispatch center and adding additional equipment to the center and EOC. Proposed timeframe for implementation: 1-5 years. Budget: $500,000. Update: Not provided.

#5 - Extreme Temperatures



Extreme Temperatures

Extreme temperatures are prolonged periods of very high or very low temperatures, often accompanied by other extreme meteorological conditions.

Hazard Description

Extreme temperatures are ranked as the number five hazard in Genesee County. This county is susceptible to both extreme heat and extreme cold. It is not uncommon to have a 40-degree swing in temperature within a 24-hour period. Prolonged periods of extreme temperatures, whether extreme summer heat or extreme winter cold, can pose severe and often life-threatening problems for Michigan's citizens. Although they are radically different in terms of initiating conditions, the two hazards share a commonality in that they both primarily affect the most vulnerable segments of the population – the elderly, children, impoverished individuals, and people in poor health.

Extreme Summer Heat

Extreme summer weather is characterized by a combination of very high temperatures and exceptionally humid conditions. When persisting over a long period of time, this phenomenon is commonly called a heat wave. The major threats of extreme summer heat are heatstroke (a major medical emergency), and heat exhaustion. Heatstroke often results in high body temperatures, and the victim may be delirious, comatose, or fall into a stupor. Rapid cooling is essential to preventing permanent neurological damage or death.

Heat exhaustion is a less severe condition than heatstroke, although it can still cause severe problems such as dizziness, weakness and fatigue. Heat exhaustion is often the result of fluid imbalance due to increased perspiration in response to the intense heat. Treatment generally consists of restoring fluids and staying indoors in a cooler environment until the body returns to normal. Other, less serious risks associated with extreme summer heat are often exercise-related and include heat syncope (a loss of consciousness by persons not acclimated to hot weather), and heat cramps (an imbalance of fluids that occurs when people unaccustomed to heat exercise outdoors). Because the combined effects of high temperatures and high humidity are more intense in urban centers, heatstroke and heat exhaustion are a greater problem in cities than in suburban or rural areas. According to the EPA, some statistical approaches estimate that more than 1,300 deaths per year in the United States are due to extreme heat, compared with about 600 deaths per year when factoring “underlying and contributing causes”. Extreme summer heat is also hazardous to livestock and agricultural crops, and it can cause water shortages, exacerbate fire hazards, and prompt excessive demands for energy. Roads, bridges, railroad tracks and other infrastructure are susceptible to damage from extreme heat. Air conditioning is probably the most effective measure for mitigating the effects of extreme summer heat on people. Unfortunately, many of those most vulnerable to this hazard do not live or work in air-conditioned environments, especially in major urban centers where the vulnerability is highest. The use of fans to move air may help some, but recent research indicates that increased air movement may actually exacerbate heat stress in many individuals.

Extreme Winter Cold

Like heat waves, periods of prolonged, unusually cold weather can result in a significant number of temperature-related deaths. According to the EPA, between 1979 and 2014, the death rate as a direct result of exposure to cold (underlying cause of death) generally ranged from 1 to 2.5 deaths per million people, with year-to-year fluctuations. Overall, a total of more than 18,000 Americans have died from cold-related causes since 1979, according to death certificates. It should be noted that a significant

number of cold-related deaths are not the direct result of "freezing" conditions. Rather, many deaths are the result of illnesses and diseases that are negatively impacted by severe cold weather, such as stroke, heart disease and pneumonia. It could convincingly be argued that were it not for the extreme cold temperatures, death in many cases would not have occurred at the time it did from the illness or disease alone.

Hypothermia usually occurs in one of two sets of circumstances. One situation involves hypothermia associated with prolonged exposure to cold while participating in outdoor sports such as skiing, hiking, or camping. Most victims of this form of hypothermia tend to be young, generally healthy individuals who may lack experience in dealing with extreme cold temperatures. The second situation involves a particularly vulnerable person who is subjected to only a moderate, indoor cold stress. A common example would be that of an elderly person living in an inadequately heated home. In such circumstances, hypothermia may not occur until days, or perhaps weeks after the cold stress begins.

Certain population groups face higher risks of cold-related illness or death. For example, occupational groups that work outdoors during winter months, such as agricultural workers, construction workers, and electricity and pipeline utility workers, face higher risks of exposure to cold. Others at risk include older adults, infants, people with pre-existing medical conditions, people taking medications or using drugs (especially alcohol) that make them more susceptible to cold effects, homeless people, and those with inadequate winter clothing or home heating. In addition, high energy costs and the relative poverty among some elderly people may discourage their setting thermostats high enough to maintain adequate warmth. Because many elderly people live alone and do not have regular visitors, the cold conditions may persist for several days or weeks, thus allowing hypothermia to set in.

Babies and very young children are also very vulnerable to hypothermia. In addition, statistics indicate that death due to cold is more frequent among males than females in virtually all age groups. Part of that may be explained by differences in risk factors, and part may be due to different rates of cold exposure between the sexes.

Genesee County Perspective and Vulnerability

The record low for Genesee County is -14ºF (January 2019) and the record high is 111ºF (July 1936). Between 1995 and 2020, there were 27 extreme temperature events in the Genesee County region. 14 were extreme cold events and 13 were excessive heat events. Two of the events caused a combined $500,000 in damages, so based on the 27 year period it could be expected that $18,500 in damage could be caused annually. See Table 2-20 for a detailed list of extreme temperature events in Genesee County.

On January 5, 2014, a polar vortex made its way through Genesee County, bringing with it the worst snowstorm in nearly forty years and subzero temperatures with high winds. The coldest temperatures were on January 7, with temperatures reported as low as negative 45 degrees with the wind chill. Most schools, along with some businesses and local government offices were closed, as people were advised not to leave their homes.

For a three-week period in late December of 2002 and early January of 2003, the temperatures never rose above freezing. On January 10, 2003, the City of Flint had several reports of water main breaks. Broken water mains place a severe strain on residents, depriving them of a basic city service. The frigid temperatures also make repair of the broken water mains even more difficult. Several area schools had to cancel classes due to frozen pipes. Many homeless shelters in the area were filled to capacity and area hospitals reported dozens of cases of frostbite.

In June of 2002, Governor John Engler requested federal disaster assistance for 26 Michigan counties (including Genesee) that faced devastating grapefruit crop and some vegetable crop losses due to extreme weather conditions in the spring. These counties experienced record-high temperatures during the week of April 14, followed by freezing temperatures and frost that caused extreme bud damage. Hail and cold, wet weather conditions throughout the month

Table 2-20 Genesee County Extreme Temperature Events				
Date	Type	Deaths	Injuries	Property Damage
2/1/1996	Cold/Wind Chill	1	0	0
1/17/1997	Cold/Wind Chill	2	0	0
1/12/1999	Cold/Wind Chill	0	1	0
2/11/1999	Heat	0	0	0
7/4/1999	Heat	0	52	0
3/8/2000	Excessive Heat	0	0	0
12/21/2000	Extreme Cold/Wind Chill	0	0	$475,000
8/6/2001	Heat	1	200	0
1/10/2003	Cold/Wind Chill	0	0	0
5/29/2006	Heat	0	4	0
7/29/2006	Heat	0	0	0
8/1/2006	Heat	0	0	0
2/3/2007	Cold/Wind Chill	0	10	$25,000
1/14/2009	Extreme Cold/Wind Chill	0	0	0
7/17/2011	Excessive Heat	0	0	0
6/28/2012	Heat	0	8	0
7/1/2012	Heat	0	5	0
7/14/2013	Heat	0	6	0
1/6/2014	Cold/Wind Chill	0	0	0
1/28/2014	Cold/Wind Chill	0	0	0
2/14/2015	Extreme Cold/Wind Chill	0	0	0
2/19/2015	Extreme Cold/Wind Chill	0	0	0
2/23/2015	Extreme Cold/Wind Chill	0	0	0
1/1/2018	Cold/Wind Chill	0	0	0
6/30/2018	Heat	0	0	0
7/1/2018	Heat	0	0	0
1/29/2019	Cold/Wind Chill	0	0	0

Source: National Oceanic and Atmospheric Administration

of May also kept bee activity low, resulting in limited pollination of fruit crops. Additional frost and freezing temperatures May 17 to 22 further damaged crops.

Mitigation Strategies for Extreme Temperatures

The following strategies are suggested to minimize the effects of Genesee County's number five hazard, extreme temperatures:

- Emergency generators
- Community shelters
- Public education on safety during extreme temperatures
- Distribution of weather radios
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity

to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

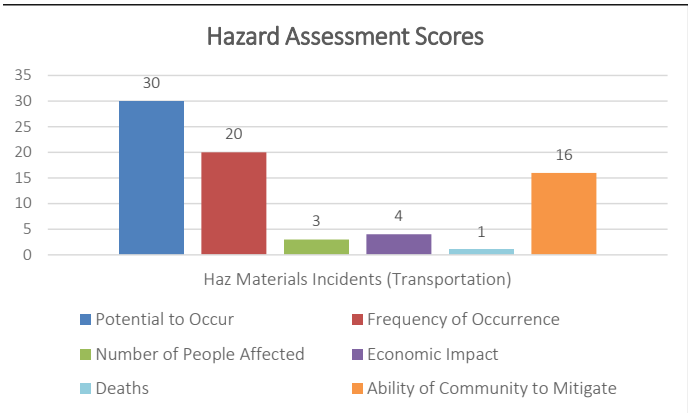
Atlas Township

Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000. Update: Project completed.

Flushing Township

Project: Back-up Generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

#5 - Hazardous Materials Incidents (Transportation)



Hazardous Materials Incidents (Transportation)

Hazardous materials incidents during transportation are uncontrolled releases capable of posing a risk to life, health, safety, property or the environment.

Hazard Description

Hazardous materials incidents during transportation are ranked as the number five hazard in Genesee County. As a result of the extensive use of chemicals in our society, all modes of transportation including highway, rail, air, marine, and pipeline are carrying thousands of hazardous materials shipments daily through local communities. A transportation accident involving any one of those hazardous material shipments could cause a local emergency affecting many people. Pipeline transportation accident issues are addressed in the "Oil or Natural Gas Well/ Pipeline Accidents" section of this document. Refer to that section for information on those hazards.

Michigan has had numerous hazardous material transportation incidents that affected the immediate vicinity of an accident site or a small portion of the surrounding community. Those types of incidents, while problematic for the affected community, are commonplace. They are effectively dealt with by local and state emergency responders and hazardous material response teams. Larger incidents, however, pose a whole new set of problems and concerns for the affected community. Large-scale or serious hazardous material transportation incidents that involve a widespread release of harmful material (or have the potential for such a release) can adversely impact the life, safety and/or health and well-being of those in the immediate vicinity of the accident site, as well as those who meet the spill or airborne plume. In addition, damage to property and the environment can be severe as well. Statistics show almost all hazardous material transportation incidents are the result of an accident or other human error. Rarely are they caused simply by mechanical failure of the carrying vessel.

Being surrounded by the Great Lakes, one of the most dangerous hazardous material transportation accident scenarios that could occur in Michigan would be a spill or release of oil, petroleum or other harmful materials into one of the lakes from a marine cargo vessel. Such an incident, if it involved a large quantity of material, could cause environmental contamination of unprecedented proportions. Fortunately, the Great Lakes states, working in partnership with oil and petroleum companies and other private industries, have taken significant steps to ensure that a spill of significant magnitude is not likely to occur on the Great Lakes.

Heating fuel and motor fuel account for approximately 98% of all the hazardous materials that are being transported on today's roadways. The remaining 2% includes all other hazardous materials. Available estimates from the Michigan State Police indicate that about 100 loads of propane go over I-69 daily during the winter season. In the warmer months, this amount declines. However, large quantities of anhydrous ammonia are transported during the warmer months. Anhydrous ammonia is sprayed on farm fields and is also used for air conditioning and refrigeration purposes. This would also be an extremely dangerous hazardous material if a release occurred during transportation.

Genesee County Perspective and Vulnerability

Genesee County has had numerous small-scale hazardous material transportation incidents that required a response by local fire departments and hazardous material teams, and many required the implementation of evacuation and other protective actions. As a major manufacturer, user and transporter of hazardous materials, Genesee County remains vulnerable to the threat of a serious hazardous material transportation incident at any point in time. Also, Genesee County is crisscrossed by major interstate

routes and state trunk line roads, all of which are used by commercial traffic that may be transporting hazardous materials.

To get an estimate of how many trucks may be carrying hazardous materials on these roads, MDOT's 2019 commercial traffic counts were used as a baseline. These counts are Average Daily Traffic (ADT) counts for major routes within the City of Flint. Using these numbers and estimating that 10% of all truck traffic in the county is carrying hazardous materials, Table 2-21 was developed. Using the same 10% methodology, staff can estimate the number of trains transporting hazardous materials through Genesee County as well using daily train volumes from the Federal Railroad Administration database as shown in Table 2-22. This data is also shown below.

Table 2-21 Commercial ADTs and Estimated Trucks Carrying Hazardous Materials

Major Route in Flint, MI	MDOT Commercial ADT	Estimated Trucks Carrying Hazardous Materials
I-69	6,030	603
I-75	6,691	669
I-475	2,437	244
M-54	1,105	111
M-21	553	55
Totals	16,846	1,685

Source: Michigan Department of Transportation

Table 2-22 Federal Railroad Administration ADTs and Estimated Trains Carrying Hazardous Materials

Major Route in Flint, MI	FRA ADT	Estimated Trains Carrying Hazardous Materials
CN (Flint)	20	2
CSX	2	0.2
CN (Fenton)	10	1
HE (Clio)	2	0.2
HE (Flushing)	4	0.4
Totals	38	3.8

Source: Federal Railroad Administration

Approximately 1,685 trucks and about 4 trains are transporting hazardous materials daily through the County. Also see Figure 2-4. This map includes a buffer zone of one mile where major transportation routes including railroads carry hazardous materials. These buffer zones cover approximately 262 square miles of the County and include about 61 percent of the County population. All hazardous material transportation incidents in the last 10 years which are listed below were obtained from the U.S. Department of Transportation, Pipeline and Hazardous Material Safety Administration.

- On September 24, 2019, a driver notified his center manager that he had a hazmat package wet in his package car. Manager notified responder who rode to site with another driver to pick up contents. Contents were placed in spill tubs and brought back to center for processing.

- On November 2, 2017, during a required car inspection, an employee reported smelling product coming from area around tank car. Contractor found valve loose and secured liquid valve.

- On August 12, 2017, product was reported coming from a tank car. Car moved to isolation track. Contractor replaced manway gasket that was leaking liquid.

- On March 3, 2017, a Hazardous Materials Manager was notified by a Federal Railroad Administration Inspector that he observed a loaded hazmat tank car containing gas emitting a strong product vapor from the service equipment. The car was isolated, and the shipper was notified. An emergency response contractor was dispatched to the scene.

- On October 13, 2016, an unloader noticed hazmat on the floor of a trailer that was leaking. He notified supervisor who notified designated responder.

- On May 18, 2016, a driver inspected his vehicle while he was re-manifesting the load in Burton. The driver noticed liquid leaking from a crack in the right rear corner of the roll-off container. The load was transferred into an undamaged roll-off for disposal.

- On July 17, 2015, during transit there was a pallet that had a nail sticking out and punctured the

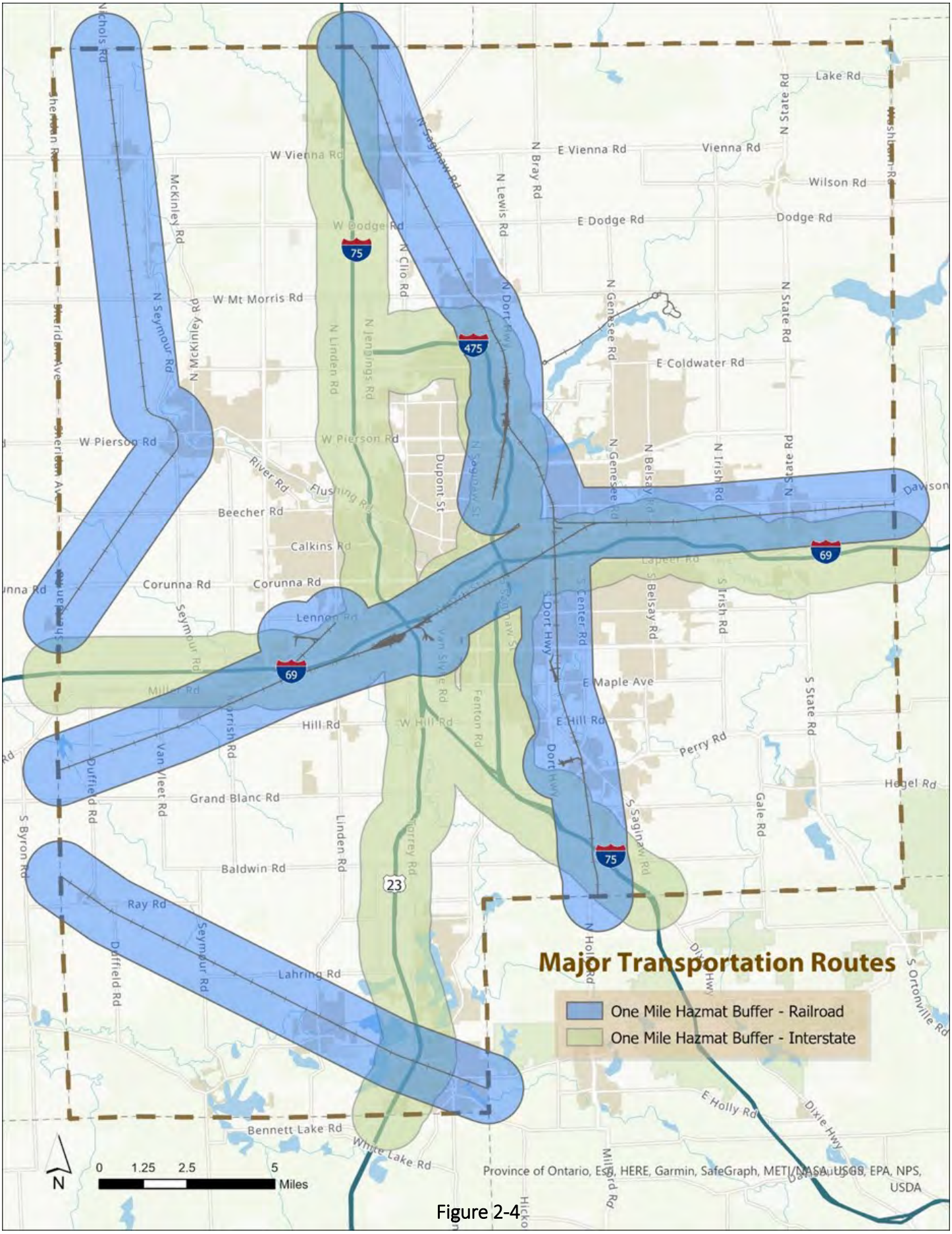


Figure 2-4

Source: Genesee County GIS

bottom of the bottle causing product to be released. Facility personnel utilized absorbents to recover product and placed into a container for disposal.

- On April 16, 2015, during transit there was a tote that had a valve that was leaking causing product to be released. Facility personnel utilized absorbents to recover product and placed into a container for disposal.

- On December 3, 2014, there was a pallet during transit that was secured causing damage to a drum and product was released. Facility personnel utilized absorbents to recover residual product and placed into a container for disposal.

- On May 20, 2014, it was reported that one 275-gallon tote of corrosive liquids, basic, inorganic had an apparent valve issue that resulted in a 0.5 -liter release to the trailer floor. A contractor was dispatched and repaired the loose packing material on the valve and cleaned up the minimal release.

- On March 6, 2014, a gasoline tanker was driving North on US-23 near Fenton when several cars pulled up beside the truck and informed the truck that it was leaking fluids. The truck proceeded about 2 miles to a rest area before stopping to assess the leak. The leak was identified and contained.

- On January 2, 2014, a tanker hauling crude oil fell off the I-69 overpass onto Irish Road in Davison and exploded. Residents were evacuated. Irish Road was closed at the point of explosion until MDOT was able to determine the extent of the damage. A cleanup crew was dispatched to absorb 200 gallons of oil. Irish Road was opened fully within a few days. I-69 was opened after MDOT determined there was no significant structural damage to the overpass.

Costs associated with hazardous materials incidents during transportation include deaths, injuries, loss of infrastructure, damage to property, and use of emergency personnel. The U.S. Department of Transportation recorded 106 hazardous materials incidents in Michigan for 2019 for a cost of $433,612. During a catastrophic event such as the Dort Highway explosion mentioned above, costs could easily climb into the millions. The cost of replacing just the destroyed bridges after that incident cost $1,500,000. The U.S. Department of Transportation reported 12 Hazardous Materials Incidents during transportation for Genesee County between 2014 and 2019, with a total cost of at least $66,252 (damages less than $500 were not recorded).

Mitigation Strategies for Hazardous Materials Incidents (Transportation)

The following strategies are suggested to minimize the effects of Genesee County's number five hazard, hazardous materials incidents during transportation:

- Warning sirens
- Emergency generators
- Continued training for Hazardous Materials Response Teams and Fire Department Personnel
- Upgrade hazardous materials response equipment as needed
- Safety training for hazardous materials transporters
- Public education
- Adoption of Hazardous Spills Expense Recovery Ordinance
- Update Disaster Response Plan if necessary
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Grand Blanc

Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing

aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Atlas Township

Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000. Update: Project completed.

Davison Township

Project: Warning Sirens. Project description: The purchase and installation of three advance warning sirens within Davison Township. Proposed timeframe for implementation: 1-5 years. Map included. Budget: $60,000. Update: Not provided.

Flushing Township

Project: Tornado Sirens. Project description: Install tornado warning sirens in the Charter Township of Flushing. Proposed timeframe of implementation: 1-5 years. Budget: $10,000-$30,000. Update: Not provided.

City of Linden

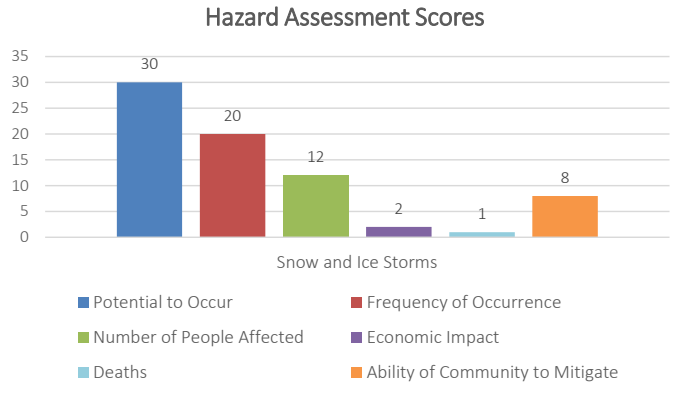
Project: Stand-alone generator for City Hall Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being turned on and emergency personnel would not be able to operate equipment. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000. Update: This project has been completed.

University of Michigan Flint

Project: Enhance First Street Residence Hall evacuation and sheltering. Project description: To include developing plans and specifications for construction of a storm shelter to house over 300 residents. Also, develop a strategy that can be used to integrate plans for a shelter into any expansion of the residence hall. In addition, install two outdoor warning sirens to alert students/residents of severe weather. Following development of drawings for a shelter, construct a shelter to house residents. Proposed timeframe for implementation: 1-5 years. Budget: $550,000. Update: Not provided.

Project: Upgrading and improving the UofM Flint EOC and Department of Public Safety. Project description: Upgrading and providing improvements to the UofM Flint Emergency Operations Center and Department of Public Safety operations. This includes moving the dispatch center and adding additional equipment to the center and EOC. Proposed timeframe for implementation: 1-5 years. Budget: $500,000. Update: Not provided.

#6 - Snow and Ice Storms



Snow and Ice Storms

Snow storms are a period of rapid accumulation of snow often accompanied by high winds, cold temperatures, and low visibility. In contrast, ice storms have the potential to be more severe then a snow storm by generating sufficient quantities of ice or sleet to result in hazardous conditions and/or property damage.

Hazard Description

As a result of being surrounded by the Great Lakes, Michigan experiences large differences in snowfall in relatively short distances. The annual mean accumulation ranges from 30 to 170 inches of snow. The highest accumulations are in the northern and western parts of the Upper Peninsula. In Lower Michigan, the highest snowfall accumulations occur near Lake Michigan and in the higher elevations of northern Lower Michigan. Blizzards are the most dramatic and perilous of all snowstorms, characterized by low temperatures and strong winds (35 miles per hour or greater) bearing enormous amounts of snow. Most of the snow accompanying a blizzard is in the form of fine, powdery particles that are wind-blown in such great quantities that, at times, visibility is reduced to only a few feet. Blizzards have the potential to result in property damage and loss of life. Just the cost of clearing the snow can be enormous.

Most of the severe winter weather events that occur in Michigan have their origin as Canadian and Arctic cold fronts that move across the state from the west or northwest. Michigan is susceptible to moderate snowfall and extreme cold, averaging 90-180 days per year below freezing in the Lower Peninsula, and over 180 days below freezing in most of the Upper Peninsula.

Genesee County also must deal with ice and sleet storms. Ice storms are sometimes incorrectly referred to as sleet storms. Sleet is like hail only smaller and can be easily identified as frozen raindrops (ice pellets), which bounce when hitting the ground or other objects. Sleet does not stick to trees and wires, but sleet in sufficient depth does cause hazardous driving conditions. Ice storms are the result of cold rain that freezes on contact with the surface, coating the ground, trees, buildings, overhead wires and other exposed objects with ice, sometimes causing extensive damage. When electric lines are downed, households may be without power for several days, resulting in significant economic loss and disruption of essential services in affected communities.

Genesee County Perspective and Vulnerability

Genesee County had 47 recorded snow storm and 4 ice storm incidents from 1999 to 2020 and based on those numbers the county is likely to have 2.1 snow storms per year and 1 ice storm every 5 years. See **Table 2-23** for a detailed list of recorded incidents during recent years.

On December 11, 2000, Genesee County, and several other counties, sustained 14" of snow along with 45 M.P.H. winds in a 24-hour period. Up to 200 cars were stranded on I-75 just south of Flint during the storm. The County was unable to respond to accidents, medical emergencies and stranded motorists due to four-foot snow drifts, which created impassable roads. This was the third largest snowfall on record, and it was believed to be the first time in its 124-year history that the Flint Journal was unable to publish due to a weather event. A State of Emergency was requested closing the entire county for a 24-hour period. A Federal Disaster Declaration was issued for Genesee and 26 other counties.

Then, on December 17, 2000, the county received more snow. In Flint, the weight of the accumulated snow collapsed the roof of a banquet room at a Ramada Inn. A home patio roof also gave way in Flint. The sheer volume of the snow was difficult to

Table 2-23 Genesee County Snow and Ice Storms (2000-2020)				
Date	Type	Deaths	Injuries	Property Damage
1/2/1999	Heavy Snow	0	0	$0
1/12/1999	Heavy Snow	0	0	$0
1/24/1999	Heavy Snow	0	0	$0
3/5/1999	Heavy Snow	0	0	$0
2/18/2000	Heavy Snow	0	0	$0
10/7/2000	Heavy Snow	0	0	$0
12/5/2000	Heavy Snow	0	0	$0
12/11/2000	Heavy Snow	0	1	$1,100,000
12/13/2000	Heavy Snow	0	0	$25,000
12/17/2000	Heavy Snow	0	0	$510,000
1/30/2002	Winter Storm	0	0	$0
2/26/2002	Winter Storm	0	0	$0
3/4/2003	Heavy Snow	0	0	$0
4/3/2003	Ice Storm	0	0	$10,000
1/14/2004	Heavy Snow	0	0	$0
1/26/2004	Winter Storm	0	0	$0
11/24/2004	Winter Storm	0	0	$0
12/23/2004	Winter Storm	0	0	$0
1/22/2005	Winter Storm	0	0	$0
2/20/2005	Heavy Snow	0	0	$0
4/23/2005	Winter Storm	0	0	$0
12/9/2005	Heavy Snow	0	0	$0
12/15/2005	Heavy Snow	0	0	$0
1/20/2006	Winter Storm	0	0	$0
2/5/2006	Winter Storm	0	0	$0
12/1/2006	Ice Storm	0	0	$0
1/14/2007	Ice Storm	0	0	$100,000
12/16/2007	Winter Storm	0	0	$0
1/1/2008	Winter Storm	0	0	$0
1/14/2008	Heavy Snow	0	0	$0
2/6/2008	Winter Storm	0	0	$0
2/12/2008	Heavy Snow	0	0	$0
12/19/2008	Winter Storm	0	0	$0
4/5/2009	Winter Storm	0	0	$0
2/9/2010	Heavy Snow	0	0	$0
2/22/2010	Heavy Snow	0	0	$0
2/1/2011	Winter Storm	0	0	$0
2/20/2011	Heavy Snow	0	0	$0
3/22/2011	Winter Storm	0	0	$15,000
12/21/2013	Ice Storm	0	0	$3,000,000
1/5/2014	Heavy Snow	0	0	$0
3/12/2014	Winter Storm	0	0	$0
2/1/2015	Heavy Snow	0	0	$0
11/21/2015	Heavy Snow	0	0	$0
2/24/2016	Heavy Snow	0	0	$0
3/1/2016	Heavy Snow	0	0	$0
12/11/2016	Heavy Snow	0	0	$0
12/13/2017	Heavy Snow	0	0	$0
1/29/2018	Heavy Snow	0	0	$0
4/14/2018	Winter Storm	0	0	$1,000,000
11/11/2019	Heavy Snow	0	0	$0
Total Snow Storms		0	1	$2,650,000
Total Ice Storms		0	0	$3,110,000

Source: National Oceanic and Atmospheric Administration

handle and the process of clearing the snow became tedious and expensive as there was almost no place to put it.

On December 22, 2013, freezing rain came through the County, causing extensive freezing of trees, power lines, and roadways. The storm left more than 64,000 Genesee County residents without electricity. Even with crews working around the clock, many people did not regain power for close to a week. The ice made roads very dangerous and there were numerous downed and arcing power lines.

On January 5, 2014, a massive snowstorm hit the region. Genesee County was at the epicenter of the storm and received about 18 inches of snow, with snow drifts making roads nearly impassable. Temperatures dropped to negative 45 degrees with the wind chill and roads were extremely icy. The majority of schools, businesses, and local governments were closed in Genesee County and surrounding areas. It was the largest snowstorm that affected the County in almost forty years. Road crews worked around the clock trying to clear the snow, but over a week later, some schools were still closed, and back roads remained impassable. Reported snowfall: Burton 13.2 inches; Flint: 17.1 inches; Flushing 14.5 inches; Goodrich: 11.8 inches; Grand Blanc: 13.9 inches, Linden: 16 inches; Swartz Creek: 18 inches.

Costs associated with snow and ice storms include deaths, injuries, loss of power, loss of revenues, damage to property, use of emergency personnel, and snow removal. Historic data for past snow and ice storms in Genesee County, and a 2003 Salt Institute Study were used to calculate the average cost of snow and ice storm. See the Vulnerability Assessment Chart, **Table 2-24**, below. The Federal Emergency Management Agency (FEMA) standard values for avoiding casualties quantifies injury and death costs from "Value of Statistical Life" academic research that was completed for the Department of Homeland Security for deaths as well as different levels of injuries. According to (FEMA), a death is estimated at $6,900,000, hospitalized injuries are estimated at $2,300,000, treat and release injuries are estimated at $61,000 and self-treated injuries are estimated at $14,000.

Table 2-24 Breakdown of Costs for Genesee County Snow and Ice Storms

Activation of Emergency Management*	$25,000
Response (plowing, tree removal, etc.)*	$846,658
Infrastructure Failure (road closure, car delays, etc.)*	$322,300
Property Damage	$1,800,000
Wages/Salaries Lost*	$7,257,386
State/Local Taxes Lost*	$383,804
Federal Taxes Lost*	$566,983
Retail Sales Lost*	$3,135,854
Hospitalized Injuries @ $2,300,000 per person x 1 (1 Injury during a snow storm)	$2,300,000
Self-treated Injuries @ $14,000 per person x 1 (1 Injury during a snow storm)	$14,000
Deaths @ $6,900,000 (average snow and/or ice storm in Genesee County does not cause a death)	$0
Estimated Cost of One Average Genesee County Snow Storm:	$16,651,985
Number of Expected Snows Storms each Year:	2.1
Total Estimated Annual Cost of Snow Storms:	$34,969,169
Estimated Cost of One Average Genesee County Ice Storm:	$14,377,985
Number of Expected Ice Storms each Year:	0.2
Total Estimated Annual Cost of Ice Storms:	$2,867,597

*Activation of Emergency Management figure based on estimate from the Michigan State Police
*Response figure based on the Oakland County Road Commission's formula of $333.33 per mile cost multiplied by Genesee County's 2,540 total roadway miles
*Infrastructure Failure figure based on 1 hour of delay during morning traffic on I-69 which is approximately 10,000 vehicles multiplied by FEMA's estimate of $32.23 cost of delay per vehicle
*Wages/Salaries Lost figure based on the 2003 Salt Institute Study formula of $16.64 per person factored for Genesee County's population
*State/Local Taxes Lost figure based on the 2003 Salt Institute Study formula of .88 per person factored for Genesee County's population
*Federal Taxes Lost figure based on the 2003 Salt Institute Study formula of $1.30 per person factored for Genesee County's population
*Retail Sales Lost figure based on the 2003 Salt Institute Study formula of $7.19 per person factored for Genesee County's population

Based on these figures, the estimated average cost of a snow storm in Genesee County is expected to be $16,651,985. Since Genesee County experiences an average of 2.1 snow storms per year, the average annual cost of snow storms is estimated to be $34,969,169. The average cost of a ice storm in Genesee County is expected to be $14,377,985. Since the county experiences 0.2 ice storms per year, the average annual cost of ice storms is estimated to be $2,867,597.

Mitigation Strategies for Snow and Ice Storms

The following strategies are suggested to minimize the effects of Genesee County's number six hazard, snow and ice storms:

- Increased weather radio coverage
- Distribution of weather radios
- Emergency generators for police and fire departments, special-needs facilities, and community shelters
- Enhance public awareness on correct safety procedures during snow and ice storms
- Stand-by power for water plants, pump stations, booster pumping stations
- Direct phone lines between airport control tower, airport fire department, airport police, and the Transportation Security Administration (TSA) checkpoint
- County/local utility tree-trimming program
- Shelters for mobile home communities
- Update Disaster Response Plan if needed
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Burton

Project: Drainage - Bellingham Court. Project description: Drainage project to reduce the risk of flooding to residential structures. Remove existing culvert drain crossing of the Gilkey Creek on Bellingham Court just east of Belsay Road and replace culver with a similar size. The replacement would conform with 2006 drainage study of a 19' span by 5' rise. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $560,000. Update: None, this is a newly submitted project.

Project: Drainage - Bristol Road. Project description: Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Road. The project includes the removal of the existing 3-sided cast-in-place concrete box culver drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Road. Replace with 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding. Proposed timeframe for implementation: 1-5 years. Budget: $700,000. Update: None, this is a newly submitted project.

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

Project: Deadfall tree removal. Project description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of

deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Project: Emergency Warning Sirens. Project description: The purchase and installation of two advance warning sirens within Mundy Township. Proposed timeframe for implementation: 1 - 5 years. Budget: $40,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Bishop International Airport

Project: Weather computer. Project description: This project includes a weather computer to help forecast snow, thunderstorms and high winds; lightning warning systems for the airfield, and a direct phone line form the FAA Control Tower to the Airport Fire Department, Airport Police and the security checkpoint. Budget: Not provided. Update: This project has been completed.

Goodrich Area Schools

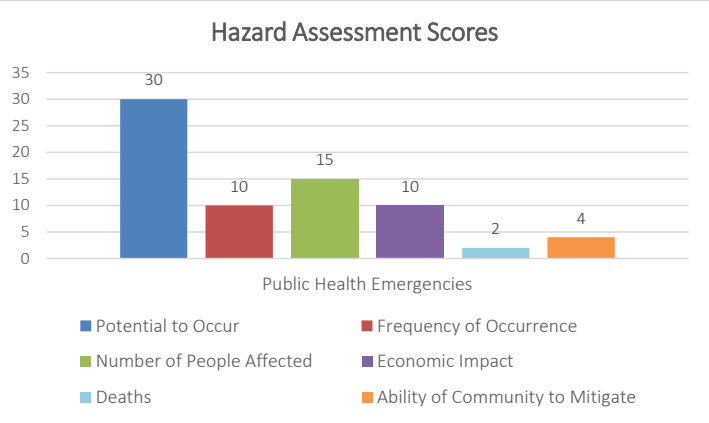
Project: Equipment. Project description: The project includes two generators, emergency lighting, back-up air compressor, emergency radios, portable lighting, and caution tape. Budget: $5,000 - $8,000. Update: Not provided.

Village of Lennon

Project Back-up generator. Project description: The project includes a back-up generator for the Police Department. Budget: $3,000. Update: This project was tabled due to cost.

Project: Back-up generator. Project description: The project includes a back-up generator for the Village Hall. Budget: $3,000. Update: This project was tabled due to cost.

#7 - Public Health Emergencies



Public Health Emergencies

A public health emergency is anything that causes or could cause injuries or illness to a large number of people. Public health emergencies include the following:

- Infectious disease outbreaks/pandemics
- Health-endangering effects of severe weather, natural disasters, and power outages
- Incidents resulting in mass casualties
- Toxic chemical or radiological releases
- Acts of bioterrorism

Hazard Description

Public health emergencies are ranked as the number seven hazard in Genesee County. Public health emergencies can take many forms – disease epidemics, large-scale incidents of food or water contamination, extended periods without power, adequate water and/or sewer services, effects of severe weather or natural disasters, harmful exposure to chemical, radiological or biological agents, and large-scale infestations of disease-carrying insects or rodents – to name just a few. Public health emergencies can occur as primary events by themselves, or they may be secondary events to another disaster or emergency such as a flood, tornado, or a hazardous materials incident. The common characteristic of most public health emergencies is that they adversely impact, or have the potential to adversely impact, many people. Public health emergencies can be statewide, regional, or localized in scope and magnitude.

The greatest public health hazard is the possibility of an infectious disease outbreak or epidemic such as what has occurred with COVID-19 in 2020. The public is at risk from common infectious diseases (e.g. influenza, norovirus, pertussis); infectious diseases that were once thought almost eliminated but that are now making a comeback (e.g. measles); and diseases that are not common in this part of the world but may be brought here by travelers or contaminated food (e.g. typhoid, hepatitis A). Even diseases for which the public has some immunity to or for which there is a vaccine can cause an epidemic because when viruses change and mutate, the general public loses its immunity. Depending on the nature and severity of the outbreak, an epidemic could cause widespread illness and death, the shutdown of public spaces (schools, buildings, events, etc.), and the crippling of the medical infrastructure. Government, healthcare facilities, and businesses could be severely impacted and even forced to close if enough workers were ill or afraid to go out in public.

Another public health hazard of great concern is the secondary health implications of contaminated food, air and/or water following a natural or manmade disaster. As has been observed following recent domestic and foreign natural disasters, access to clean water, unspoiled food, and sanitation is often an issue. Flooding can lead to human exposure to sewage and other contaminants that have leached into the water. Water damage in homes can lead to air quality issues caused by mold and other contaminants. Water damage and/or loss of power can cause food to become unsafe to eat and can lead to food borne illness outbreaks. And, as Genesee County is at a major transportation crossroads, pollution of the water system or air by a chemical release is also of concern.

A public health hazard that has received attention since 2001 is the possibility of an intentional release of a radiological, chemical or biological agent. Such a release would most likely be an act of terrorism aimed at the government or a specific organization or segment of the population. Fortunately, to date, Michigan has not yet experienced such a release aimed at mass destruction. However, it is probable that an incident of that nature and magnitude will occur. If and when it does, the public health implications – under the right set of circumstances – could be staggering.

Genesee County Perspective and Vulnerability

Like the rest of the United States and the world, Genesee County has had serious outbreaks of diseases like polio, smallpox, mumps, and influenza.

- Genesee County is susceptible to health emergencies such as infectious diseases, Severe Acute Respiratory Syndrome (SARS), Middle Eastern Respiratory Syndrome (MERS-COV), influenza; other common communicable disease outbreaks-meningitis, Pertussis (whooping cough), norovirus; and sexually transmitted diseases (Syphilis, Gonorrhea). Additionally, due to the diversity and mobility of the county's population, the county has seen incidences of uncommon communicable diseases including Typhoid and Hepatitis A.

- In early 2020, the coronavirus (COVID-19) reached pandemic proportions as it reached American soil. This resulted in many states, including Michigan, calling for a state-wide temporary closure of non-essential businesses, thereby resulting in the closure of schools, businesses, and parks. The full impact of this pandemic, which is still ongoing, may not be known for several years. As of December 2020, Genesee County has 15,444 confirmed cases and 448 confirmed deaths due to COVID-19 according to the MDHHS. Although the initial statewide shutdown was lifted in June 2020, a second measure of closures across Michigan were implemented in November 2020 as cases and deaths began to rise dramatically again. The pandemic has resulted in unprecedented economic turmoil for not only Genesee County, but the entire United Sates/ World.

- In September 2019, Michigan including Genesee County dealt with the Eastern Equine Encephalitis (EEE) virus. According to the CDC, EEE is a rare cause of brain infections which is spread to people by infected mosquitos. Across the state, there were 10 human cases as well as 6 deaths and 40 cases in animals reported by the Michigan Department of Health and Human Services. Residents were urged to avoid being bitten by a mosquito as this could potentially spread the deadly virus.

- The city's switch from Detroit water to the Flint River coincided with an outbreak of Legionnaires' disease (a severe form of pneumonia) that killed 12 and sickened at least 87 people between June 2014 and October 2015. The third-largest outbreak of Legionnaires' disease recorded in U.S. history—as well as the discovery in 2014 of fecal coliform bacteria in city water—was likely a result of the city's failure to maintain sufficient chlorine in its water mains to disinfect the water. Ironically, the city's corrective measure—adding more chlorine without addressing other underlying issues—created a new problem: elevated levels of total trihalomethanes (TTHM), cancer-causing chemicals that are by-products of the chlorination of water.

- In April of 2014, officials from Flint, Michigan switched their city's water supply from the Detroit Water and Sewerage Department to the Flint River as a temporary water source until the Karegnondi Water Authority pipeline was constructed and functional. This caused dangerous levels of lead and other contaminations to enter Flint's water source and into the homes of Flint residents. Nearly 9,000 children were supplied lead-contaminated water for 18 months. The city's recovery has been slow, as it works to replace 30,000 lead pipes. In 2017, reports showed that the water in most homes was generally safe, but many residents still don't trust what comes out of their tap. In the last couple years, the City of Flint has inspected more than 25,000 service lines and has replaced 85 percent of lead pipes.

- In mid-2009, Genesee County began experiencing an increase in diagnosed Pertussis cases. From July 2009 through June 2010, Genesee County experienced a 1,500% increase in identified Pertussis cases over the previous year.

- In 2009, the WHO declared that the world was experiencing an influenza pandemic caused by the 2009 H1N1 virus. The CDC estimates that 43 million to 89 million people had H1N1 between April 2009 and April 2010. They estimate between 8,870 and 18,300 H1N1 related deaths.

Genesee County experienced illness and deaths associated with the 2009 influenza pandemic.

- In 2008, Genesee County experienced a syphilis epidemic. The number of reported cases (over 109) represented a 2,000% increase in reported cases over the same period the previous year. This also gave Genesee County a higher syphilis rate than Detroit.

- In the 10-year period between 2003 and 2013, Genesee County had hundreds of cases involving foodborne illness. While most of them were individual or small clusters of illness, there were several larger outbreaks during that time. Additionally, several of the cases were linked to national foodborne illness outbreaks.

- According to the Centers for Disease Control, Genesee County had two confirmed cases of West Nile Virus in 2003.

- A sewer spill was discovered near Mott Lake on August 9th, 2002. This spill resulted in dangerously high E. Coli levels at nearby Blue Bell Beach. Officials were forced to close down the beach not only for the remainder of August, but also for the rest of the swimming season, which was scheduled to last until September 19th. As of September 21st, the water was still unsafe.

Costs associated with public health emergencies include deaths, hospitalizations, doctors' visits, mass immunization programs, lost wages, and lost productivity. There are not enough documented incidents of recent public health emergencies in Genesee County to estimate an average cost. However, national estimates put the total annual cost to employers for lost productive time for all health conditions at approximately $2,000 per worker per year. According to 2018 ACS 5-Year Estimates, Genesee County has about 169,798 workers in the labor force. Based on this data, Genesee County suffers $339,596,000 in lost worker productivity each year. However, a public health emergency such as the COVID-19 epidemic would raise that estimate drastically, which does not even include the non-labor force population.

Mitigation Strategies for Public Health Emergencies

The following strategies are suggested to minimize the effects of Genesee County's number seven hazard, public health emergencies:

- All hazards emergency planning involving all sectors of the community
- Continue treating known breeding grounds for disease-carrying insects
- Offer vaccinations when appropriate
- Start/continue public education on public health emergencies
- Health and safety training for first responders
- Continued and improved surveillance including in schools and hospital emergency departments
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

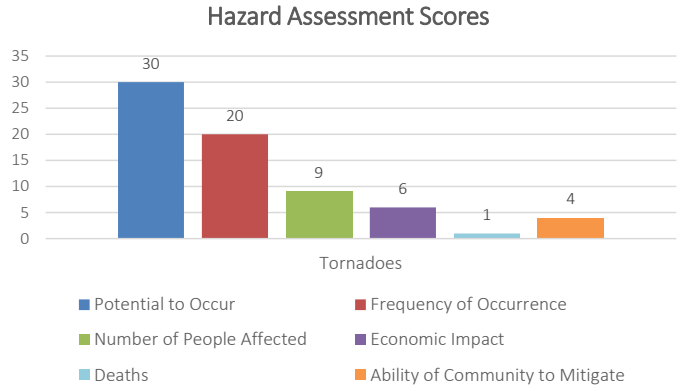
None

Previously Included Mitigation Projects

Bendle Public Schools

Project: Equipment. Project description: Bendle High School is a designated disaster site for Genesee County emergencies. When the electrical power goes out, the freezer and refrigeration units stop working costing thousands of dollars to replace the loss of food. Bendle Family Health Services is an on-site health clinic operated by Bendle Schools. Bendle has partnered with the Genesee County Health Department to provide vaccines for preschool - grade 12 students. When the power goes out, the vaccines are ruined if they are not maintained at a specific temperature. The primary need is to purchase a large generator that is wired into the electrical system of the kitchen at the high school. Portable lighting would be purchased to enable staff to prepare food. The project would also purchase a generator for Bendle Family Health Services. Proposed timeframe for implementation: 1 - 5 years. Budget: $67,150. Update: This project description and cost has been revised to better reflect the needs of Bendle Schools. The project is still ongoing pending potential funding.

#8 - Tornadoes



Tornadoes

A tornado is an intense rotating column of wind that extends from the base of a severe thunderstorm to the ground.

Hazard Description

Tornadoes in Michigan are most frequent in the spring and early summer when warm, moist air from the Gulf of Mexico collides with cold air from the Polar Regions to generate severe thunderstorms. These thunderstorms often produce the violently rotating columns of wind that are called tornadoes.

Michigan lies at the northeastern edge of the nation's primary tornado belt, which extends from Texas and Oklahoma through Missouri, Illinois, Indiana, and Ohio. Most of a tornado's destructive force is exerted by the powerful winds that knock down walls and lift roofs from buildings in the storm's path. The violently rotating winds then carry debris that can be blown through the air, becoming dangerous missiles.

A tornado may have winds up to 300 miles per hour and an interior air pressure that is 10-20% below that of the surrounding atmosphere. The typical tornado damage path is about one or two miles, with a width of around 50 yards, but paths much longer than that – even up to 200 miles – have been reported. Tornado path widths are generally less than one-quarter mile wide.

Typically, tornadoes last only a few minutes on the ground, but those few minutes can result in tremendous damage and devastation. Historically, tornadoes have resulted in loss of life, with the mean national annual death toll being 70 persons. Property damage from tornadoes is in the hundreds of millions of dollars every year.

Table 2-25 Fujita Tornado Intensity Scale

Magnitude	Description	Wind Speeds
FO	Gale Tornado	42-77 mph
F1	Moderate Tornado	78-112 mph
F2	Significant Tornado	113-157 mph
F3	Severe Tornado	158-206 mph
F4	Devastating Tornado	207-260 mph
F5	Incredible Tornado	261-318 mph

Source: National Oceanic and Atmospheric Administration

Tornado intensity is measured on the Fujita Scale, which examines the damage caused by a tornado on homes, commercial buildings, and other man-made structures. See **Table 2-25** for the Fujita Tornado Scale. The Fujita Scale rates the intensity of a tornado based on damage caused, not by its size. It is important to remember that the size of a tornado is not necessarily an indication of its intensity. Large tornadoes can be weak, and small tornadoes can be extremely strong, and vice versa. It is very difficult to judge the intensity and power of a tornado while it is occurring. Generally, that can only be done after the tornado has passed, using the Fujita Scale as the measuring stick. According to the National Weather Service (NWS), since 1950, the vast majority of tornadoes that occurred in the United States (approximately 74%) were classified as weak tornadoes (F0 or F1 intensity).

Approximately 25% were classified as strong tornadoes (F2 or F3 intensity), and only 1% was classified as violent tornadoes (F4 or F5 intensity). Unfortunately, those violent tornadoes, while few in number, caused 67% of all tornado-related deaths nationally. Strong tornadoes accounted for another 29% of tornado-related deaths, while weak tornadoes caused only 4% of tornado-related deaths. If the data prior to 1950 is examined, the percentage of deaths attributable to violent tornadoes climbs drastically. That is largely due to the fact that tornado forecasting and awareness programs were not yet established. As a result, it was not uncommon for death tolls from a single tornado to reach several hundred.

Genesee County Perspective and Vulnerability

In a statewide comparison of all Michigan counties for the years 1950 through 1999, Genesee County led the tornado statistics with 34 tornadoes. The county with the next highest number was Lenawee County with 30 tornadoes. As of February 2019, the number of Genesee County incidents has increased; the county now has 46 recorded tornadoes. Using thirty years of recent tornado statistics (from 1989-2019) as a guide, Genesee County can expect to have 1.3 tornadoes in any given year. See Table 2-26 for a detailed list of recorded incidents from 1953 to 2019. Figure 2-5 is a map of tornadoes that have touched down in Genesee County. Figure 2-6 compares these tornadoes to population density in Genesee County.

Figure 2-7 shows the locations of early warning sirens and one-mile buffer zones around the sirens. The buffer zones represent the estimated hearing range for the sirens. The county currently has 120 installed early warning sirens. Working off siren ranges, approximately 72.1% of the population, or approximately 295,085 people, are covered by a siren, leaving 27.9% of the population, or 114,276 people outside the estimated range of early warning sirens.

- On June 8, 1953, the eighth largest tornado in history with winds exceeding 300 mph, and a path almost a half-mile wide, occurred in Beecher, just north of Flint. It became known as the "Beecher Tornado", the deadliest tornado in Michigan history, and one of the top ten deadliest tornadoes in U.S. history. The tornado killed 116 people and injured 785 more. The Beecher Tornado was categorized as an F5 on the Fujita Scale.

- A few years later, on May 12, 1956, the second strongest tornado in Genesee County since 1950 resulted in 3 deaths and 116 injuries. This tornado was classified as an F4. It moved three miles east of Flint to three miles northwest of Atlas Township, destroying over 100 homes.

- On July 2, 1997, there was an outbreak of 13 tornadoes in southeast Lower Michigan, the largest number for a single day since records have been kept. These tornadoes caused over $4,000,000 in damages. Some of these were classified as F3, and some were classified as F1.

- On June 8, 2003, a tornado touched down in Camp Copneconic in Fenton and produced extensive tree damage. The tornado headed northeast to Grand Blanc Township and destroyed several garages and front porches. Other homes reported damaged roofs, lost shingles, and damaged siding. The Michigan Room on one home was destroyed, and several other homes sustained damage due to fallen trees. This tornado was classified as an F1. Oddly enough, while this tornado was making its way across the southern part of the county, commemoration ceremonies to mark the 50th anniversary of the deadly "Beecher Tornado" were going on just north of Flint.

- On August 24, 2007, a large tornado hit the City of Fenton, causing extensive damage to trees, businesses, and homes. The amount of damage totaled $13 million (NOAA).

- On October 19, 2007, a tornado hit Thetford Township, causing $100,000 in property damages.

- In May of 2013 six tornadoes were reported in northern and southern Genesee County with primary damage occurring in the Mount Morris and

Table 2-26 Genesee County Tornadoes (1953-2019)					
Location	Date	Magnitude	Deaths	Injuries	Property Damage
GENESEE CO.	6/8/1953	F5	116	785	$25,000,000
GENESEE CO.	6/8/1953	F5	0	0	$25,000,000
GENESEE CO.	4/7/1954	F2	0	2	$25,000
GENESEE CO.	8/24/1954	F2	0	0	$250
GENESEE CO.	5/12/1956	F4	3	116	$2,500,000
GENESEE CO.	6/11/1968	F0	0	0	$0
GENESEE CO.	6/2/1971	F1	0	0	$250,000
GENESEE CO.	8/10/1971	F2	0	1	$250,000
GENESEE CO.	6/3/1973	F0	0	1	$2,500
GENESEE CO.	6/3/1973	F0	0	0	$0
GENESEE CO.	7/14/1974	F3	0	0	$250,000
GENESEE CO.	9/17/1974	F2	0	0	$25,000
GENESEE CO.	7/4/1977	F1	0	1	$250,000
GENESEE CO.	9/17/1977	F2	0	1	$250,000
GENESEE CO.	6/26/1983	F1	0	0	$250,000
GENESEE CO.	8/8/1984	F2	0	0	$2,500,000
GENESEE CO.	8/8/1984	F3	0	0	$250,000
GENESEE CO.	8/8/1984	F1	0	0	$25,000
GENESEE CO.	8/30/1984	F0	0	0	$250,000
GENESEE CO.	7/25/1986	F1	0	1	$25,000
GENESEE CO.	8/26/1986	F0	0	0	$0
GENESEE CO.	9/29/1986	F2	0	0	$250,000
GENESEE CO.	9/29/1986	F1	0	0	$2,500
GENESEE CO.	7/18/1990	F1	0	0	$2,500
GENESEE CO.	7/18/1990	F0	0	0	$0
GENESEE CO.	10/4/1990	F2	0	1	$2,500,000
FLINT	6/7/1996	F0	0	0	$0
CLIO	6/21/1997	F0	0	0	$0
MONTROSE	7/2/1997	F1	0	0	$0
MONTROSE	7/2/1997	F1	0	0	$0
CLIO	7/2/1997	F3	0	0	$600,000
CLIO	7/2/1997	F3	1	1	$3,800,000
FLUSHING	5/31/1998	F0	0	0	$10,000
FENTON	5/21/2001	F0	0	0	$10,000
GOODRICH	5/21/2001	F0	0	0	$5,000
FENTON	6/8/2003	F1	0	0	$300,000
MONTROSE	5/23/2004	F0	0	0	$0
MT MORRIS	5/23/2004	F0	0	0	$0
FENTON	8/24/2007	EF2	0	1	$13,000,000
THETFORD CENTER	10/19/2007	EF0	0	0	$100,000
BEECHER	5/28/2013	EF1	0	0	$100,000
GAINES	5/28/2013	EF0	0	0	$10,000
LAKE FENTON	5/28/2013	EF2	0	0	$225,000
GRAND BLANC	5/28/2013	EF2	0	0	$350,000
LENNON	3/14/2019	EF0	0	0	$75,000
GENESEE DUFORD ARPT	3/14/2019	EF0	0	0	$100,000
		Total			$78,542,750

Source: National Oceanic and Atmospheric Administration

Genesee Township areas as well as Atlas Township. Many trees were damaged as well as the complete destruction of some homes and businesses.

- On March 14 of 2019, four tornadoes were reported in Shiawassee and Genesee Counties with primary damage occurring in Camelot Villas off Genesee Road where mobile homes were flipped and roof and siding damages were prevalent. Tornados also touched down in the Clayton Township and Genesee Township areas. Three out of the four tornadoes were weak and rated an EF-0. Many trees were damaged as well as the complete destruction of a pole barn.

Costs associated with tornadoes include deaths, injuries, loss of infrastructure, damage to property, temporary housing, use of emergency personnel and clean-up afterwards. For the thirty-year period from 1989 to 2019, Genesee County had 23 tornado events, giving the county an average of 1.3 tornadoes per year. Available damage costs for past tornadoes in Genesee County were used to calculate the average cost of a tornado, along with identified population density characteristics. See the Vulnerability Chart, **Table 2-27**, below.

Mitigation Strategies for Tornadoes

The following strategies are suggested to minimize the effects of Genesee County tornadoes:

- Additional warning sirens for complete county coverage; repair of broken sirens
- Increased weather radio coverage
- Distribution of weather radios
- Emergency generators for police and fire departments, special-needs facilities, and facilities identified as community shelters during hazardous weather
- Shelters for mobile home communities
- Enhance public awareness on correct safety procedures during tornadoes
- Structural reinforcement for community "safe rooms"
- Stand-by power for water plants, pump stations, booster pumping stations
- Update Disaster Response Plan, if needed
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Table 2-27 Breakdown of Costs for Genesee County Tornadoes

Population Density Categories (per square mile)	Average Number of Tornadoes Per Year	Average Amount of Damage	Percent of County Land in each Population Density Category	Estimated Annual Damage by Population Density Category
Population Density 0-500	1.3	$751,439	70%	$683,809
Population Density 501-1,000	1.3	$509,640	13%	$86,129
Population Density 1,001-3,000	1.3	$839,265	13%	$141,836
Population Density 3,000-13,351	1.3	$5,217,736	4%	$271,322
Total Estimated Damage for Genesee County Tornadoes				$1,183,096

Source: Genesee County Tornado Vulnerability Assessment using Data from NOAA

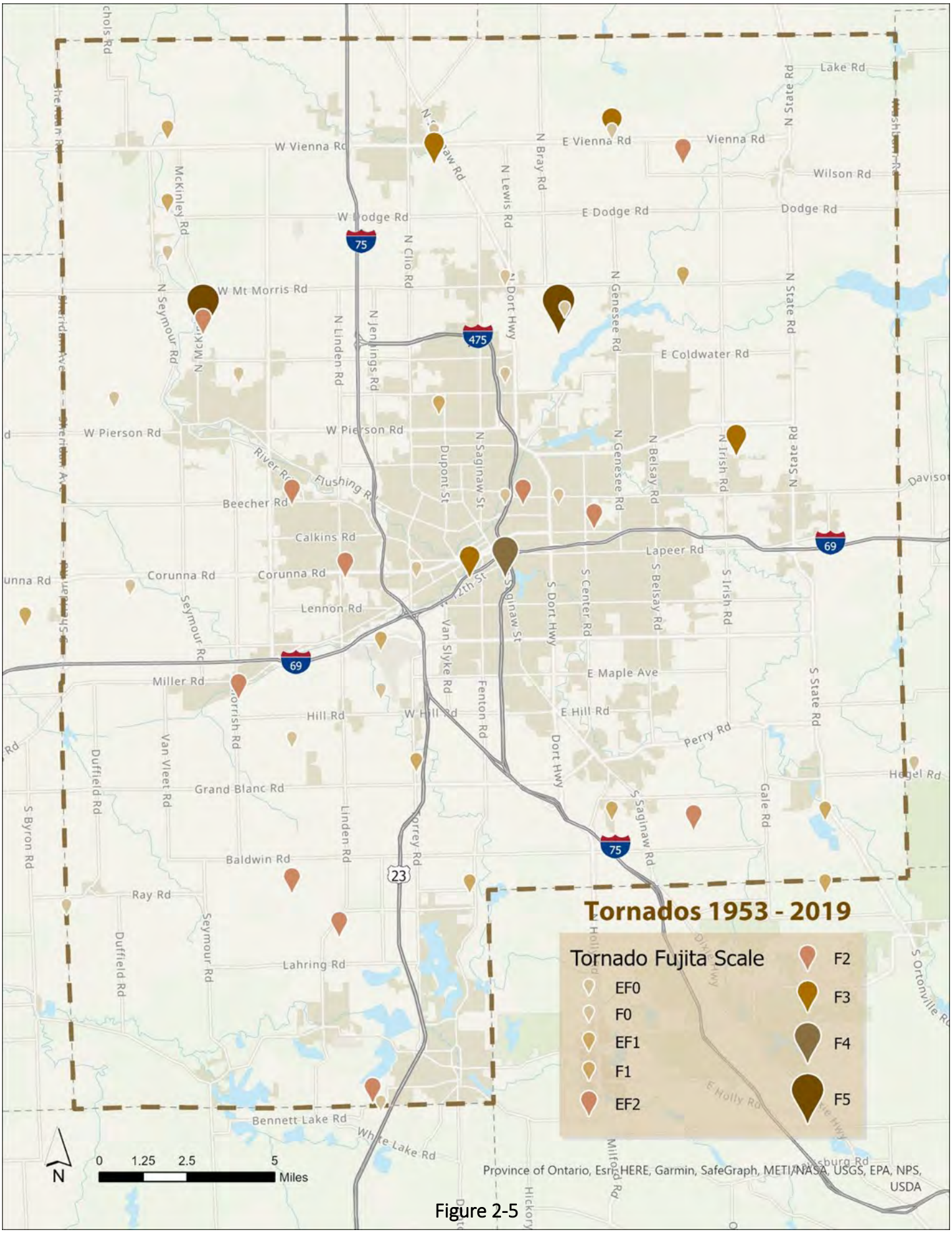


Figure 2-5

Source: Genesee County GIS and National Oceanic and Atmospheric Administration

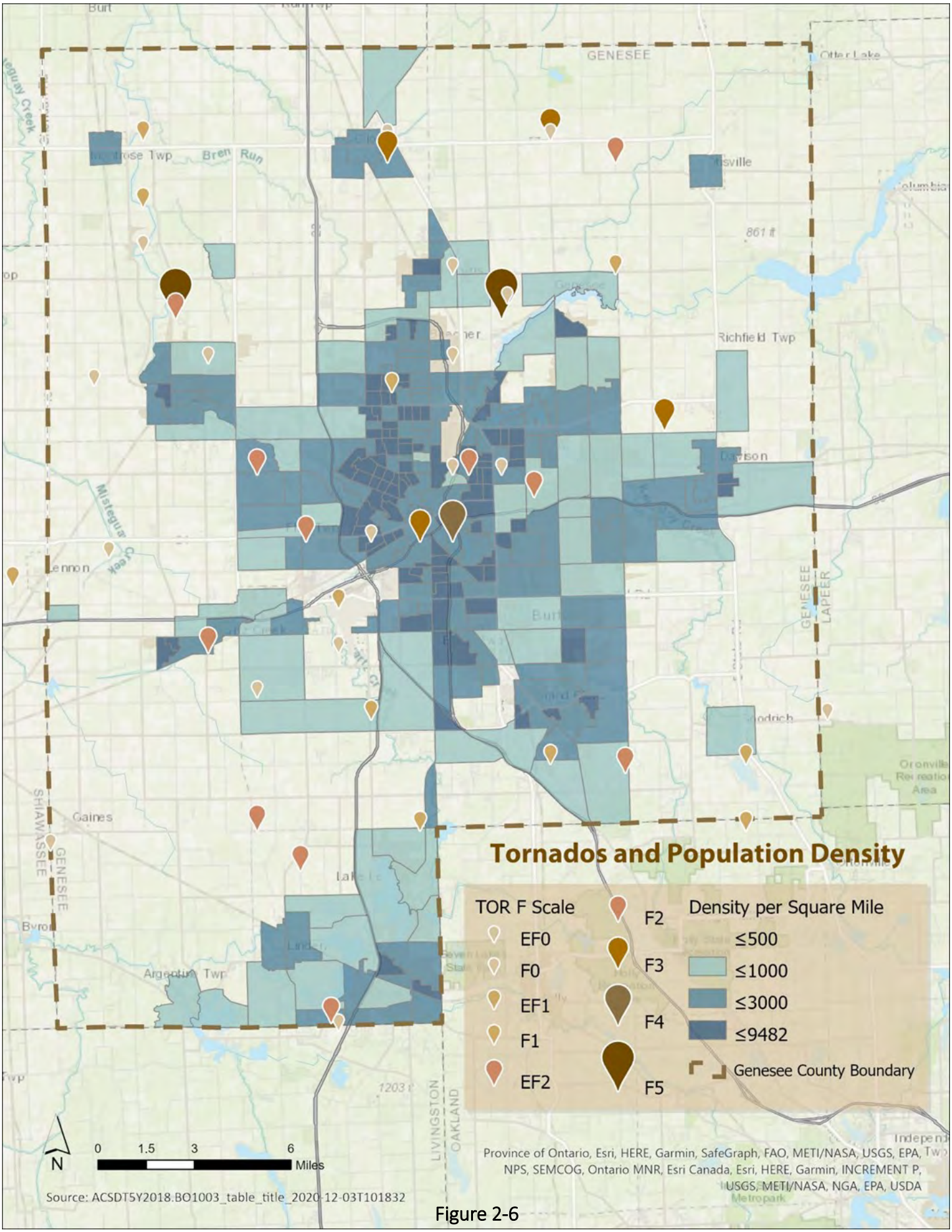


Figure 2-6

Source: Genesee County GIS and National Oceanic and Atmospheric Administration

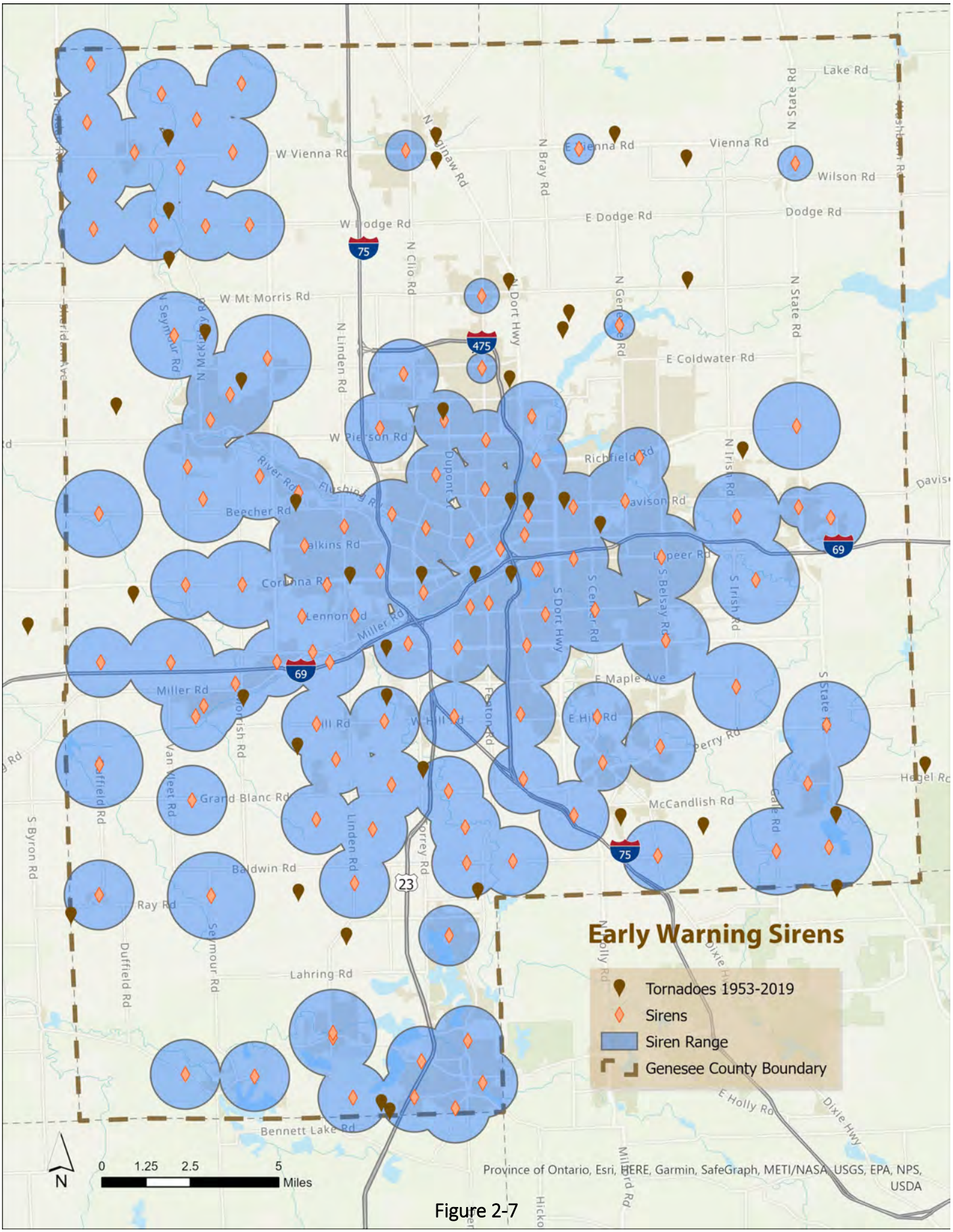


Figure 2-7

Source: Genesee County GIS and National Oceanic and Atmospheric Administration

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

Project: Deadfall tree removal. Project description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Project: Emergency Warning Sirens. Project description: The purchase and installation of two advance warning sirens within Mundy Township. Proposed timeframe for implementation: 1 - 5 years. Budget: $40,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Atlas Township

Project: Emergency Warning Sirens. Project Description: Emergency warning sirens placed in various locations within Atlas Township to be audible by all residents in all sections. Township would like eight sirens. Proposed timeframe for implementation: 1 - 5 years. Map included. Budget: Approximately $25,000 per siren. Update: Two emergency warning sirens have been installed. Looking to install more as funding becomes available.

Bendle Public Schools

Project: Equipment. Project description: Bendle High School is a designated disaster site for Genesee County emergencies. When the electrical power goes out, the freezer and refrigeration units stop working costing thousands of dollars to replace the loss of food. Bendle Family Health Services is an onsite health clinic operated by Bendle Schools. Bendle has partnered with the Genesee County Health Department to provide vaccines for preschool - grade 12 students. When the power goes out, the vaccines are ruined if they are not maintained at a specific temperature. The primary need is to purchase a large generator that is wired into the electrical system of the kitchen at the high school. Portable lighting would be purchased to enable staff to prepare food. The project would also purchase a generator for Bendle Family Health Services. Proposed timeframe for implementation: 1 - 5 years. Budget: $67,150. Update: This project description and cost has been revised to better reflect the needs of Bendle Schools. The project is still ongoing pending potential funding.

Davison Township

Project: Warning sirens. Project description: The purchase and installation of three advance warning sirens within Davison Township. Proposed timeframe for implementation: 1-5 years. Budget: $60,000. Update: Not provided.

Fenton Township

Project: Emergency shelter. Project description: The project would involve renovations to the Township Hall basement to make it suitable as an emergency shelter for residents, including the addition of a back-up generator. Budget: $60,000. Update: Project is still ongoing.

Flushing Township

Project: Back-up generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000. Update: Not provided.

Project: Warning sirens. Project description: Install tornado warning sirens in the Charter Township of Flushing. Proposed timeframe of implementation: 1-5 years. Budget $10,000 - $30,000. Update: Not provided.

Forest Township

Project: Warning sirens. Project description: The purchase and installation of three warning sirens throughout Forest Township. Budget: Unknown. Update: Not provided.

Gaines Township

Project: Warning sirens. Project description: The purchase and installation warning sirens. Budget: $80,000. Update: Not provided.

Genesee County Emergency Management

Project: Tornado shelters for mobile home parks. Budget: $16,000,000. Update: Project is still ongoing.

Genesee Intermediate School District

Project: Back-up generator. Project description: The project includes a portable diesel-powered generator to provide back-up power to three separate locations that service special needs students, many with multiple impairments that prevent physical evacuation of the buildings. Budget: $500,000. Update: Not provided.

Project: Structural Improvements. Project description: The project includes structural reinforcement for the walls and roof of the gyms and multi-purpose rooms (open-space areas) at three separate locations that serve special-needs students, many with multiple impairments that prevent physical evacuation of the buildings. Budget: Not provided. Update: Not provided.

Grand Blanc Township

Project: Warning sirens. Project description: The purchase and installation of warning sirens. Budget: $48,000. Update: The Township is no longer pursuing this project.

City of Linden

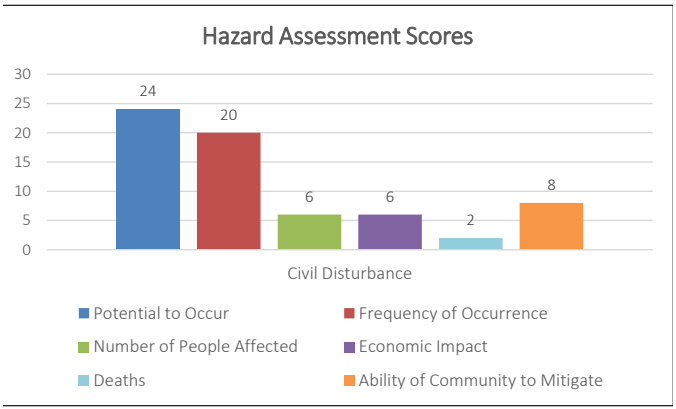
Project: Stand-alone generator for City Hall. Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being turned on and emergency personnel would not be able to operate. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000. Update: This project has been completed.

University of Michigan Flint

Project: Enhance First Street Residence Hall evacuation and sheltering. Project description: To include developing plans and specifications for construction of a storm shelter to house over 300 residents. Also, develop a strategy that can be used to integrate plans for a shelter into any expansion of the residence hall. In addition, install two outdoor warning sirens to alert students/residents of severe weather. Following development of drawings for a shelter, construct a shelter to house residents. Proposed timeframe for implementation: 1-5 years. Budget: $550,000. Update: Not provided.

Project: Upgrading and improving the UofM Flint EOC and Department of Public Safety. Project description: Upgrading and providing improvements to the UofM Flint Emergency Operations Center and Department of Public Safety operations. This includes moving the dispatch center and adding additional equipment to the center and EOC. Proposed timeframe for implementation: 1-5 years. Budget: $500,000. Update: Not provided.

#9 - Civil Disturbance



Civil Disturbance

Civil disturbance is a public demonstration or gathering, or a prison uprising, that results in a disruption of essential functions, rioting, looting, arson or other unlawful behavior.

Hazard Description

Civil disturbance is ranked as the number nine hazard in Genesee County. Large-scale civil disturbances rarely occur, but when they do they are usually an offshoot or result of one or more of the following events: 1) labor disputes where there is a high degree of animosity between the participating parties; 2) high profile/controversial judicial proceedings; 3) the implementation of controversial laws or other governmental actions; 4) resource shortages caused by a catastrophic event; 5) disagreements between special interest groups over a particular issue or cause; or 6) a perceived unjust death or injury to a person held in high esteem or regard by a particular segment of society. An example of a civil disturbance includes prison uprisings. Prison uprisings are normally the result of perceived injustice by inmates regarding facility rules, operating policies and/or living conditions, or insurrections started by rival groups or gangs within the facility.

Genesee County Perspective and Vulnerability

In recent years, there have been many protests across the country that have escalated to rioting, looting, and other acts of violence. These riots are the result of civil unrest related to racial inequalities as well as political ideologies. In May 2020, a large-scale peaceful assembly was held in Flint because of the issues mentioned above. The peaceful assembly resulted in local police officers and protesters walking together down a main roadway until the protest dispersed. In 2019, the United Auto Workers who staff a local General Motors Plant in Flint went on strike over labor related issues. The strike lasted 40 days until eventually the union's 48,000 members approved a four-year deal with GM. Although these various protests did not escalate to violence, it is important for local officials to be prepared for these situations that could potentially become threatening.

Arson can also be considered civil disobedience. In 2003, Genesee County had 313 arson fires, and 198 fires of a suspicious nature. Arson and suspicious fires accounted for 23% of all fires in the county for that year. These fires resulted in $8,432,685.00 in total losses. Four civilian injuries and two civilian deaths were also attributed to these fires.

Strike supporters smashing windows at Chevrolet Plant 9 in Flint to let out tear gas.

Beginning on December 30, 1936, the famous Flint Sit-Down Strike lasted for 44 days. Flint auto workers occupied the auto plants as a strike tactic. Supporters streamed into Flint from across the Midwest to man picket lines and other support activities. As the strike continued into January, tensions mounted. The police used tear gas and bullets to end the strike, and 14 strikers were injured. Governor Frank Murphy called in the National Guard to stand between the strikers and police.

After the strikers succeeded in taking General Motors' (GM) most important plant, GM was finally

forced to go to the bargaining table. The strike ended on February 11, 1937 and established the United Auto Workers (UAW) as the only bargaining representative for auto laborers.

Mitigation Strategies for Civil Disturbance

The following strategies are suggested to minimize the effects of Genesee County's number nine hazard, civil disturbance:

- Continued training for first responders
- Continued training for police and fire personnel
- Public education
- Update response equipment
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Grand Blanc

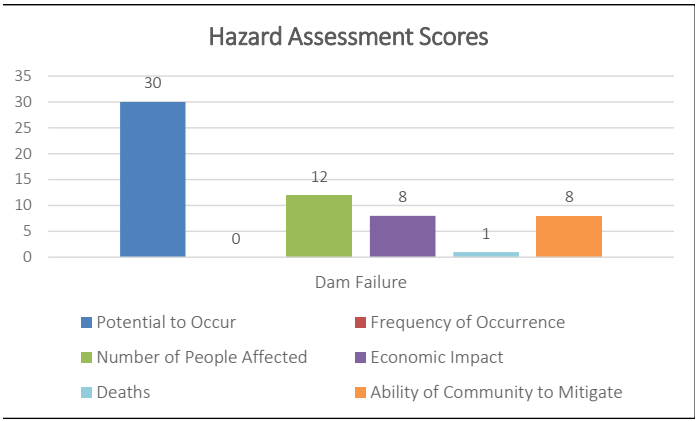
Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

Atlas Township

Project: Natural gas backup generator for Atlas Township Office/Hall which also serves as a Community Room and sub-station for Genesee County Sheriff Department. Project Description: To allow use as a safe haven room year round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeframe for implementation is 1-5 years. Budget: $31,000. Update: Project completed.

#10 - Dam Failure



Dam Failure

Dam failure is the collapse or failure of an impoundment resulting in downstream flooding.

Hazard Description

Dam failures are ranked as the number ten hazard in Genesee County. A dam failure can result in loss of life and extensive property or natural resource damage for miles downstream from the dam. Dam failures occur not only during flood events, which may cause overtopping of a dam, but also due to poor operation, lack of maintenance and repair, and vandalism. Such failures can be catastrophic because they occur unexpectedly, with no time for evacuation. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has documented over 263 dam failures throughout Michigan in the last ten years. There are over 2,523 dams in the state of Michigan and about 1,061 of them are regulated by Part 315 of the Dam Safety Program. Dams are regulated when they are over 6 feet in height, and when over 5 acres are impounded during the design flood (a flood that does not exceed the magnitude of the discharge for the design frequency).

Permits are required for construction and repair of regulated dams. Inspection reports are also required every three to five years for dams based on their hazard potential rating. The hazard potential rating is determined by the Dam Safety Program, and is based on an assessment of the potential for loss of life, property damage, and environmental damage in the area downstream of a dam in the event of dam failure or failure of appurtenant works. Hazard potential rating is not based upon the structural or hydraulic condition of the dam. The definitions for the hazard classification as specified in the state's Dam Safety Statute, Part 315, Dam Safety, of Act 451, P.A. 1994 are as follows:

"Low hazard potential dam" means a dam located in an area where failure may cause damage limited to agriculture, uninhabited buildings, structures, or township or county roads, where environmental degradation would be minimal, and where danger to individuals is slight or nonexistent.

"Significant hazard potential dam" means a dam located in an area where its failure may cause damage limited to isolated inhabited homes, agricultural buildings, structures, secondary highways, short line railroads, or public utilities, where environmental degradation may be significant, or where danger to individuals exists.

"High hazard potential dam" means a dam located in an area where a failure may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways, or Class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life.

Part 315 of the Dam Safety Program also requires that dam owners prepare and keep current, Emergency Action Plans (EAP) for all high hazard and significant hazard potential dams. An EAP is a plan developed by the owner that establishes notification procedures for its departments, public off-site au-

thorities, and other agencies of the emergency actions to be taken before and following an impending or actual dam failure.

After the events of September 11, 2001, it became evident that dams could be attractive targets to terrorists. Dam failures could not only cause enormous loss of life and property and infrastructure damage, but could have residual long-lasting social, economic, and public health impacts. These sobering facts point to the need to have dam security in place at critical locales.

Genesee County Perspective and Vulnerability

Genesee County has a total of 34 dams. 25 dams are rated as a Low Hazard, 7 dams are rated as a Significant Hazard and 2 dams are rated as a High Hazard. Although there are no recorded dam failures to date, the potential is very real because of Genesee County's aging infrastructure and strained budget. See Figure 2-8 for a map of Genesee County dams.

Costs associated with dam failures include deaths, injuries, loss of infrastructure, damage to property, temporary housing, use of emergency personnel and clean-up afterwards. Genesee County has no prior history of dam failure, so potential costs are taken from other communities' experiences. In May of 2003, Silver Lake Dam in the city of Marquette, Michigan failed. More than 1,800 people were evacuated from the city, and the total damages were estimated at more than $100 million. That figure includes $10 million in utility facility damages, $4 million in environmental damages, and $3 million in road and bridge damages. On May 19, 2020, the Edenville Dam in Midland County failed resulting in about $200 million in damages to more than 2,500 buildings. Some 10,000 people were forced to evacuate their homes in Midland, Gladwin, and Saginaw Counties due to the failure.

Locally, we can look at The City of Flint's Hamilton Dam for a possible dam failure example. It was a High Hazard Dam, built in 1920, located in the center of the downtown business district. It is bordered on each side by the University of Michigan, Flint campus. Failure of this dam could have generated significant damage to property, pose the threat of loss of life and potential injuries, and cost millions of dollars in repairs. However, the superstructure (the deck above the water line) of the Hamilton Dam was removed in 2018. The substructure, which is a concrete weir below the water, remains along with the foundation with repairs being made to the substructure after the superstructure was removed.

The Holloway Dam is a high hazard dam in Genesee County that provides recreation, fishing, swimming, and boating opportunities at the Holloway Reservoir. However, the dam was originally built in 1954 for the purpose of water supply. Although the Holloway Dam has a high hazard rating, according to a recent inspection in 2018, there were no indicators of any conditions that represent an immediate threat to the dam's stability. It is important though that dam is closely monitored and regularly maintained to mitigate against a potential dam failure.

Mitigation Strategies for Dam Failure

The following strategies are suggested to minimize the effects of Genesee County's number ten hazard, dam failure:

- Regular dam inspections
- Repairs done as recommended by State Inspection Reports
- Removal of dams that meet removal criteria; replacement if needed
- Public education on dam safety
- Identify area of impact if dam failure were to occur
- Evacuation plans
- Improvements to dams and spillways
- Update Disaster Response Plan if necessary and exercise plan when a dam failure occurs
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

None

Previously Included Mitigation Projects

Atlas Township

Project: Boat for water or ice rescue. Project Description: Purchase a boat for the Fire Department to help

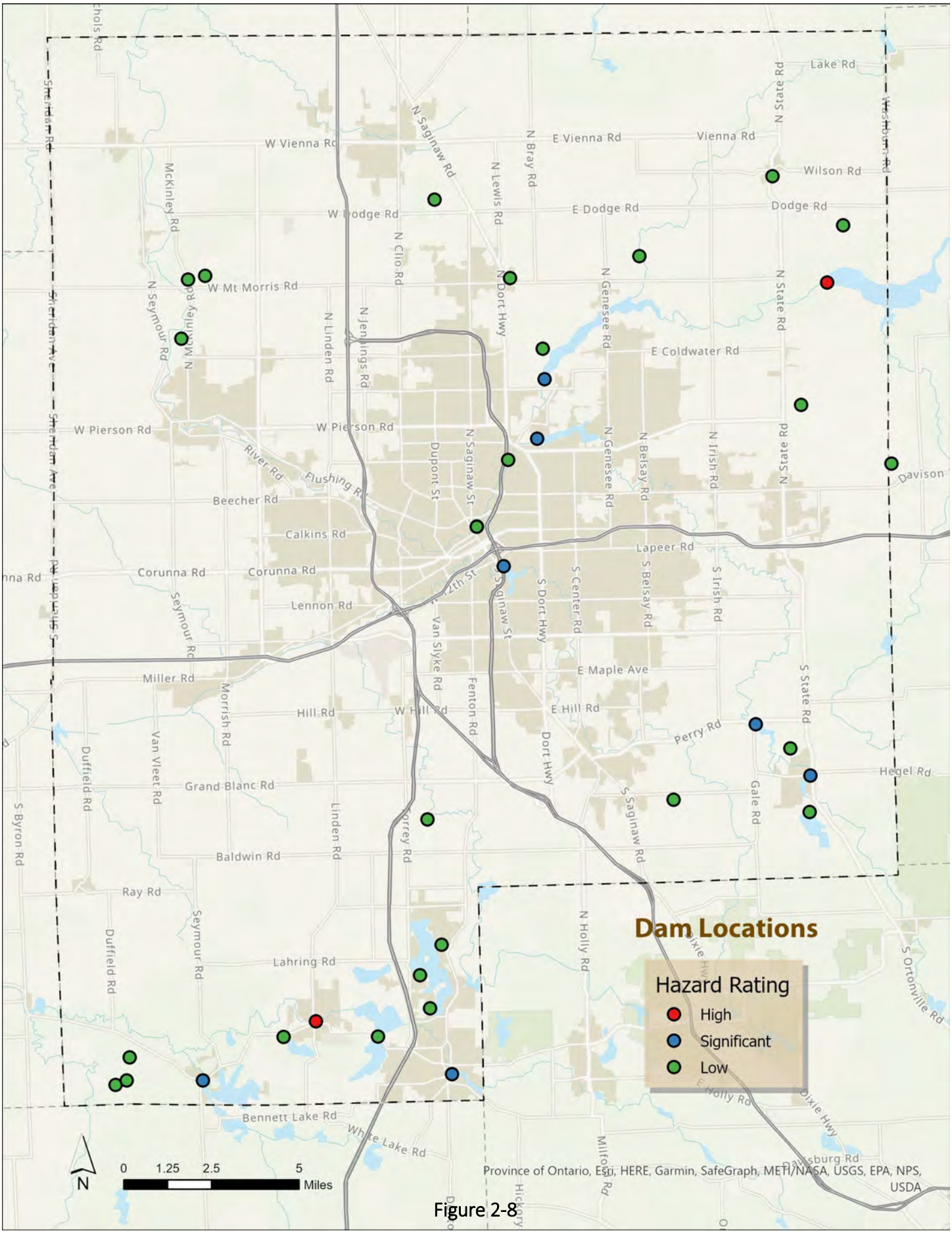


Figure 2-8

Source: Genesee County GIS

with evacuation in the event of floods or dam failure within the village of Goodrich. Proposed timeframe for implementation: 1-5 years. Budget: $5,000.00. Update: Project is still ongoing - cost of boat has increased from $9,000 from $5,000. Still looking to do project when funding becomes available.

City of Flint

Project: Hamilton Dam. Project description: The project includes removal and replacement of Hamilton Dam. Estimated costs reflect engineering, construction, removal, and construction inspection. Budget: $8,000,000. Update: The Hamilton Dam superstructure has been removed and repairs to the substructure were made. The Dam will not be replaced.

Project: Thread Dam. Project description: The project includes the removal of Thread Dam which is in a state of failure. Estimated costs reflect completing engineering, construction, removal, and construction inspection. Budget: $2,100,000. Update: Instead of Thread Dam being removed, it was repaired in 2018.

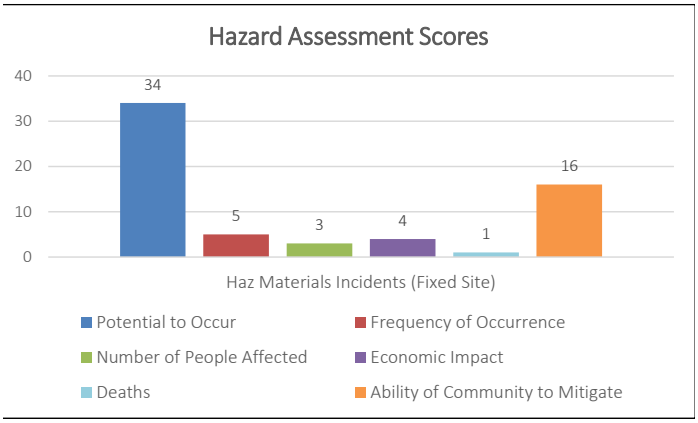
Village of Goodrich

Project: Goodrich Dam. Project description: The project includes work on the Goodrich Dam relating to floodgates, stabilization, spillway-wing walls, etc. Budget: Not provided. Project update: Improvements have been made to the Goodrich/Mill Pond Dam. Two additional gates were altered to allow them to open but only under special situations. Update: Improvements have been made to the Goodrich/Mill Pond Dam. Two additional gates were altered to allow them to open but only under special situations.

University of Michigan Flint

Project: Flood Mitigation Plan. Project description: Provide the funding to develop a Flood Mitigation Plan. This plan will address ongoing mitigation needs such as installing USGS constructing berms/physical barriers that can resist the elevation associated with overflow of the Flint River. Proposed timeframe for implementation: 1-5 years. Budget: $50,000. Update: Not provided.

#11 - Hazardous Materials Incidents (Fixed Sites)



Hazardous Materials Incidents (Fixed Sites)

Hazardous materials incidents at a fixed site is an uncontrolled release of hazardous materials from a fixed location capable of posing risk to life, health, safety, property, or the environment.

Hazard Description

Hazardous materials incidents at fixed sites are ranked as the number eleven hazard in Genesee County. Over the past few decades, new technologies have developed at a stunning pace. As a result, hazardous materials are present in quantities of concern in business and industry, agriculture, universities, hospitals, utilities, and other facilities in our communities. Hazardous materials are materials or substances which, because of their chemical, physical, or biological nature, pose a potential risk to life, health, property, or the environment if they are released.

Examples of hazardous materials include corrosives, explosives, flammable materials, radioactive materials, poisons, oxidizers, and dangerous gas. Hazardous materials are highly regulated by federal and state agencies to reduce risk to the general public and the environment. Despite precautions taken to ensure careful handling during the manufacture, transport, storage, use, and disposal of these materials, accidental releases do occur. Often, these releases can cause severe harm to people or the environment if proper mitigative action is not immediately taken. Most releases are the result of human error. Occasionally, releases can be attributed to natural causes, such as a flood that washes away barrels of chemicals stored at a site. However, those situations are the exception rather than the rule.

In 1986, the President signed into law the Superfund Amendments and Reauthorization Act (SARA). Included under Title III of SARA was the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), commonly known as SARA Title III. SARA Title III is meant to encourage and support emergency planning efforts at the State and local levels and to provide the public and local units of government with information concerning potential chemical hazards present in their communities.

Determining if a facility is subject to emergency planning requirements is straightforward. The Environmental Protection Agency (EPA) publishes a list of Extremely Hazardous Substances (EHS). For each EHS, the list identifies and describes the chemical, and includes a number called a Threshold Planning Quantity (TPQ). The TPQ, expressed in pounds, is the key number. If a facility has within its boundaries an amount of an EHS equal to or in excess of its TPQ, then Section 302 of SARA Title III requires that the facility is subject to emergency planning requirements and must notify both the State Emergency Response Commission (SERC) and the Local Emergency Management Office of this fact. The facility must also identify an emergency response coordinator who works with the Local Emergency Management Office on developing and implementing the local emergency plan at the facility. This regulation applies even if the chemical is on site for only a day. There are no exemptions for emergency planning notification.

Genesee County Perspective and Vulnerability

As of March 2019, there are 58 facilities in Genesee County that meet the above emergency planning requirements regarding the hazardous materials at their sites. These facilities are designated as SARA Title III, Section 302 sites, or "302 sites" for short. See **Figure 2-9** for a map of the 58 "302 sites" in Genesee County. This map includes a one-mile buffer zone around each "302 site". According to the Genesee County Emergency Management Department, there have been no significant hazardous materials incidents at fixed sites in the last 10 years. However, there are 160,590 residents who live within a one-

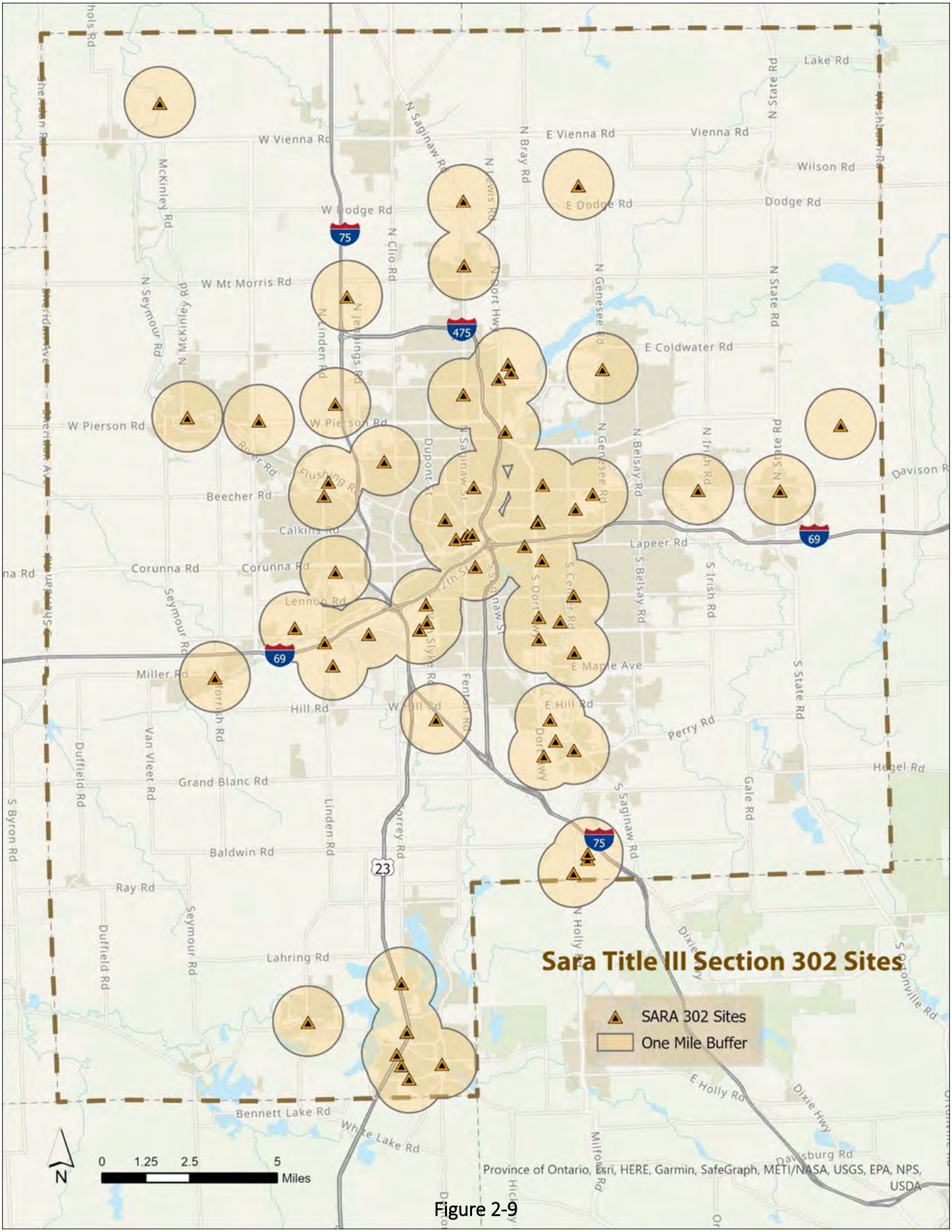


Figure 2-9

Source: Michigan Department of Environment, Great Lakes, and Energy and Genesee County GIS

mile buffer around the facilities so it is critical that these sites are monitored for potential incidents.

Since no notable fixed-site hazardous material incidents have occurred in Genesee County in recent years, staff used transportation related hazardous material releases as they have a similar effect on the surrounding community, to assess the potential impact from a fixed site release. Historic transportation related hazardous material releases in Genesee County, as recorded by the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, have the potential to cause the evacuation of 200 to 2,000 people. Over a six year period (2014-2019), the events caused a total of at least $66,252 in damages (damages less than $500 were not recorded.) Similar damages can be assumed for fixed site incidents. The events listed below are included from the previous plan update:

- On July 16, 2003, at least 200 gallons of an antifreeze, ethylene glycol, spilled from a cooling tower at PPG Industries in Flint. The chemical leaked into a storm sewer that flows to the Flint River.

- On January 21, 1998, nine employees of a Flint trucking company were treated for respiratory distress after a container of acid ruptured, sending clouds of toxic smoke through the business.

Mitigation Strategies for Hazardous Materials Incidents (Fixed Sites)

The following strategies are suggested to minimize the effects of Genesee County's number eleven hazard, hazardous materials incidents at fixed sites:

- Emergency generators
- Warning sirens
- Continued training for Hazardous Materials Response Team and fire department personnel
- Adoption of Hazardous Spills Expense Recovery Ordinance
- Public education
- Update Disaster Response Plan if necessary
- Update hazardous materials inventory
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Grand Blanc

Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

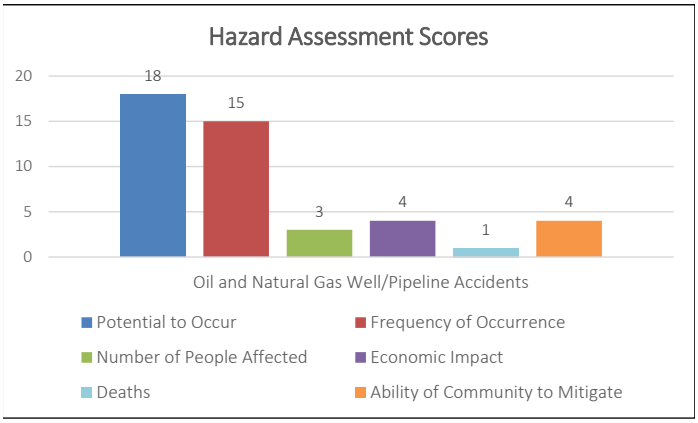
Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

None

#12 - Oil and Natural Gas Well/Pipeline Accidents



Oil and Natural Gas Well/Pipeline Accidents

Oil and natural gas well/pipeline accidents is an uncontrolled release of oil or natural gas, or the poisonous by-product hydrogen sulfide, form production wells or pipelines.

Hazard Description

Accidents from oil and natural gas wells and pipelines are ranked as the number twelve hazard in Genesee County. Oil and natural gas are produced from fields scattered across 61 counties in the Lower Peninsula. Since 1925, over 41,000 oil and natural gas wells have been drilled in Michigan, of which roughly half have produced oil and gas. To date, Michigan wells have produced approximately 1.2 billion barrels of crude oil and 3.6 trillion cubic feet of gas. The petroleum and natural gas industry is highly regulated and has a reputable safety record, but the threat of accidental releases, fires and explosions still exists.

Michigan is both a major consumer and producer of natural gas and petroleum products. According to the Michigan Public Service Commission (MPSC), approximately 25% of the natural gas consumed in Michigan is produced within the state. The remaining 75% is imported by five interstate pipeline companies that have access to the major natural gas producing regions in North America. Michigan cycles more natural gas through its storage system than any other state. Michigan ranks 11th in the nation in production of natural gas and ranks 6th in consumption at 937.2 billion cubic feet. Michigan's petroleum product consumption in 1997 was 189 million barrels, ranking it 10th nationally.

These figures underscore the fact that vast quantities of petroleum and natural gas are extracted from, transported through, and stored in the state, making many areas vulnerable to petroleum and natural gas emergencies. Michigan's gas and petroleum networks are highly developed and extensive, representing every sector of the two industries – from wells and production facilities, to cross-country transmission pipelines that bring the products to market, to storage facilities, and finally to local distribution systems. Even though pipelines are by far the safest form of transportation for these products, the threat of fires, explosions, ruptures, and spills nevertheless exists.

Petroleum and natural gas pipelines can leak or erupt and cause property damage, environmental contamination, injuries, and even loss of life. Many pipeline accidents that occur in Michigan are caused by third party damage to the pipeline, often due to construction or some other activity that involves trenching or digging operations.

In addition to these hazards, many of Michigan's oil and gas wells contain extremely poisonous hydrogen sulfide (H2S) gas. Hydrogen sulfide is a naturally occurring gas mixed with natural gas or dissolved in the oil or brine and released upon exposure to atmospheric conditions. Over 1,300 wells in Michigan have been identified as having H2S levels exceeding 300 parts per million (ppm).

At concentrations of 700 ppm, as little as one breath of hydrogen sulfide can be deadly as seen in **Table 2-28**. Although hydrogen sulfide can be detected by a "rotten egg" odor in concentrations from .03 ppm to 150 ppm, larger concentrations paralyze a person's olfactory nerves so that odor is no longer an indicator of the hazard. Within humans, small concentrations can cause coughing, nausea, severe headaches, irritation of mucous membranes, vertigo, and loss of consciousness.

Hydrogen sulfide forms explosive mixtures with air at temperatures of 500 degrees Fahrenheit or above and is dangerously reactive with powerful oxidizing materials. Hydrogen sulfide can also cause the fail-

Table 2-28 Physiological Responses to Hydrogen Sulfide (H2S)	
10 ppm	Beginning eye irritation
50-100 ppm	Slight conjunctivitis and respiratory tract irritation after 1 hour of exposure
100 ppm	Coughing, eye irritation, loss of sense of smell after 2-15 minutes. Altered respiration, pain in the eyes and drowsiness after 15-30 minutes followed by throat irritation after 1 hour. Several hours of exposure results in gradual increase in severity of these symptoms and death may occur within the next 48 hours.
200-300 ppm	Marked conjunctivitis and respiratory tract irritation after 1 hour of exposure.
500-700 ppm	Loss of consciousness and possibly death in 30 minutes to 1 hour
700-1000 ppm	Rapid unconsciousness, cessation of respiration and death.
1000-2000 ppm	Unconsciousness at once, with early cessation of respiration and death in a few minutes. Death may occur even if the individual is removed to fresh air at once.

Source: American National Standards Institute, Standard: 237.2-1972

ure of high-strength steels and other metals. This requires that all company and government responders be familiar not only with emergency procedures for the well site, but also with the kinds of materials that are safe for use in sour gas well response.

Genesee County Perspective and Vulnerability

In Genesee County, there are 3 gas wells, of which only one is currently producing. There are also 41 oil wells with only 13 currently producing (United States Geological Survey GIS Data); see **Figure 2-10** for a map of all existing oil and gas wells in Genesee County. This is a relatively small quantity when compared to the State leader, Otsego County, with over 6,200 drilled wells of which 1,900 are active (Shale XP Online Oil and Gas Research and Visualization Tool). When drilling for gas or oil in certain geologic formations, a saltwater solution becomes mixed with the gas or oil. This saltwater, or brine, must be separated out from the gas or oil. After the brine is pumped out from the gas or oil, it can be used for dust control on dirt roads if it meets a certain chemical composition. Otherwise, the brine is disposed of by injecting it into a non-productive well. This well is then referred to as a brine disposal well. According to the US Department of Transportation Pipeline and Hazardous Materials Safety Administration, there have been 7 oil and natural gas well/pipeline incidents in the past 10 years. Of these events, there were 3 deaths, 3 injuries, and $1,360,145 in damages. This assumes that roughly $136,000 in damages may occur on an annual basis due to oil and gas well/pipeline incidents. The incidents listed below are included from the previous plan update:

- On July 8, 2004, a lightning strike hit a tree and traveled down to the root system. It ignited a steel gas line in a nearby subdivision in Flint Township. The tree caused the gas line to explode from below the ground.

- On May 25, 2004, lightning struck an abandoned oil well storage tank in Otter Lake. It caused a valve rupture and fire, which was put out by a blanket-type foam.

- On August 27, 2003, a backhoe operator digging a utility line at a busy intersection in the City of Burton ruptured a gas main. The gas line erupted into flames and set the backhoe on fire. The operator was not injured, but flames were visibly shooting out of a large hole near a shopping center.

- On July 3, 2001 a small explosion occurred when construction workers struck gas and electrical lines in a Flint Township subdivision.

Mitigation Strategies for Oil and Natural Gas Well/ Pipeline Accidents

The following strategies are suggested to minimize the effects of Genesee County's number twelve hazard, oil and natural gas well/pipeline accidents:

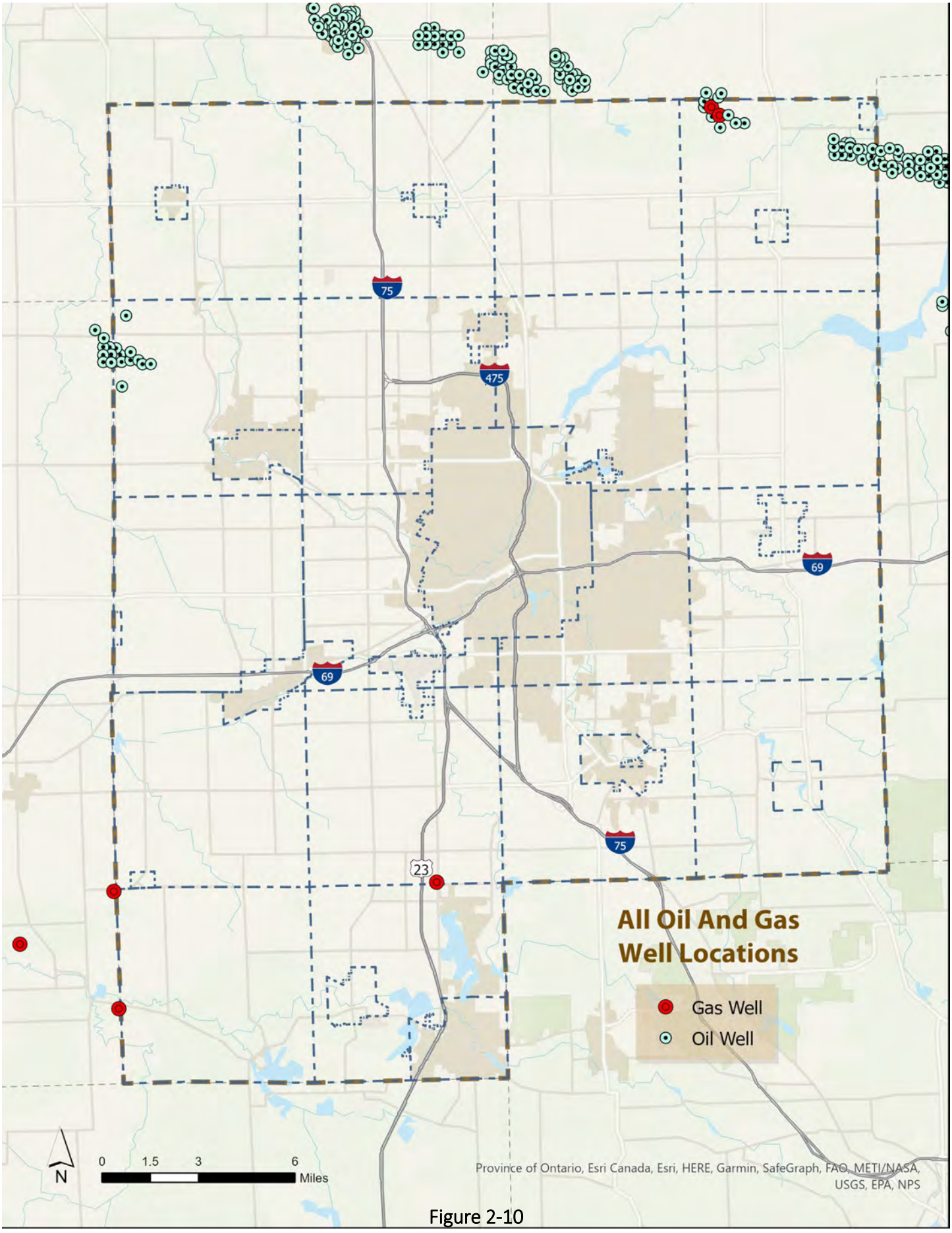


Figure 2-10

Source: US Geological Survey Data

- Continued training for Hazardous Materials Response Team
- Upgrade response team equipment as needed
- Continued training for police and fire personnel and first responders
- Public education
- Update oil/gas inventory
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Grand Blanc

Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

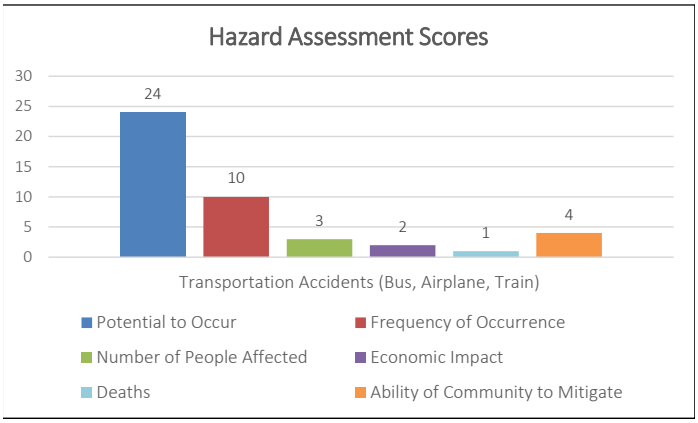
Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

None

#13 - Transportation Accidents (Bus, Airplane, Train)



Transportation Accidents (Bus, Airplane, Train)

A transportation accident is a crash or accident involving an air, land or water-based commercial passenger carrier resulting in death or serious injury.

Hazard Description

Transportation accidents are ranked as the number 13 hazard in Genesee County. In terms of commercial passenger transportation service, Michigan has approximately: 1) 19 airports that offer commercial air passenger service; 2) 130 certified intercity passenger bus carriers providing service to 220 communities; 3) 72 local bus transit systems serving 85 million passengers; 4) 19 marine passenger ferry services; and 5) 3 intercity rail passenger routes operating on 568 miles of track, along 3 corridors, serving 22 communities.

Air Transportation Accidents

There are four circumstances that can result in an air transportation accident: 1) an airliner colliding with another aircraft in the air; 2) an airliner crashing while in the cruise phase of a flight due to mechanical problems, sabotage, or other cause; 3) an airliner crashing while in the takeoff or landing phase of a flight; or 4) two or more airlines colliding with one another on the ground during staging or taxi operations. When responding to any of these types of air transportation accidents, emergency personnel may be confronted with a number of problems, such as: 1) suppressing fires; 2) rescuing and providing emergency first aid for survivors; 3) establishing mortuary facilities for victims; 4) detecting the presence of explosive or radioactive materials; 5) providing crash site security, crowd and traffic control, and protection of evidence.

Land Transportation Accidents

A land transportation accident in Michigan could involve a commercial intercity passenger bus, a local public transit bus, a school bus, or an intercity passenger train. Although these modes of land transportation have a good safety record, accidents do occur. Typically, bus accidents are caused by the bus slipping off the roadway in inclement weather or colliding with another vehicle. Intercity passenger train accidents usually involve a collision with a vehicle attempting to cross the railroad tracks before the train arrives at the crossing. Unless the train accident results in a major derailment, serious injuries are usually kept to a minimum. Bus accidents, on the other hand, can be quite serious, especially if the bus has tipped over. Numerous injuries are a very real possibility in these types of situations.

Genesee County Perspective and Vulnerability

Genesee County is equipped with air, rail, and intercity bus passenger transportation facilities. Bishop International Airport (BIA) had 301,534 passengers and 24 million pounds of cargo in 2019. The facility is currently served by four different airlines and is the third largest airport in Michigan behind Detroit and Grand Rapids. The Flint Amtrak Terminal had 27,881 passengers for 2019. MDOT has partnered with Amtrak to improve local rail travel options. The Blue Water route, which makes stops in Flint, enables Genesee County residents to travel within the state, make day trips to Chicago, or connect with long-distance trains.

The Mass Transportation Authority (MTA) had 4,719,739 passengers in 2019. The MTA offers many transportation options, such as thirteen primary bus routes, the personalized Your Ride service for those unable to use the fixed routes, regional bus transportation to Oakland and Livingston Counties, and specialized services for the elderly, disabled, and veterans. In addition, several intercity bus lines operate out of the MTA's Transportation Complex in downtown Flint and provide out-of-town bus services. In the past, there have been transportation accidents that have occurred in the County, and the chance of accidents occurring again is high.

None

In the last 10 years, there have been 474 crashes that involved a school bus. Of these crashes, 100 resulted in injuries and one resulted in a death. Over this same period, there have been 3,833 crashes that involved a truck or bus. Nearly 900 of these crashes resulted in an injury while 37 resulted in a death. There were 13 train accidents since 2010 that involved a train with two injuries and no deaths reported (Michigan Crash Facts).

Mitigation Strategies for Transportation Accidents (Bus, Airplane, Train)

The following strategies are suggested to minimize the effects of Genesee County's number thirteen hazard, transportation accidents (bus, airplane, train):

- Continued training for first responders
- Enforce safety regulations
- Public education
- Safety training for transit, airplane, train operators
- Update Disaster Response Plan if needed
- Regular simulated response exercises covering all three modes

New Mitigation Projects

City of Grand Blanc

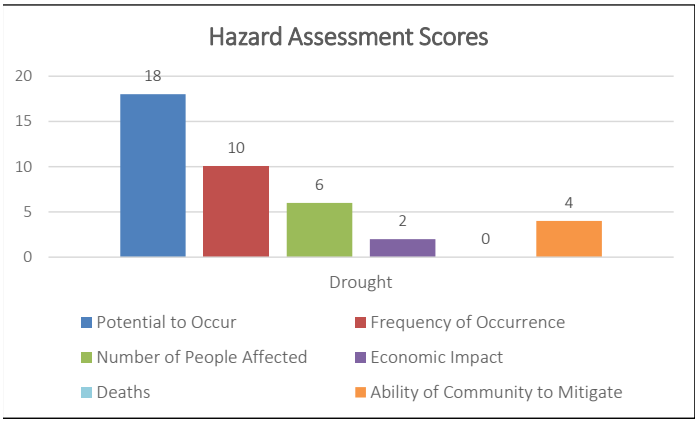
Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

#14 - Drought



Drought

Drought is a water shortage caused by a deficiency of rainfall, generally lasting for an extended period of time.

Hazard Description

Drought is ranked as the number fourteen hazard in Genesee County. Drought is a normal part of the climate of Michigan and of virtually all other climates around the world including areas with high and low average rainfall. Drought differs from normal arid conditions found in low rainfall areas in that aridity is a permanent characteristic of that climate.

Drought is the consequence of a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. The severity of a drought depends not only on its location, duration, and geography, but also on the water supply demands made by human activities and vegetation. This multi-faceted nature of the hazard makes it difficult to define a drought and assess when and where one is likely to occur.

Drought differs from other natural hazards in several ways. First, it is difficult to determine the exact beginning and end of a drought, since its effects may accumulate slowly and linger even after the event is generally thought of as being over. Second, the lack of a clear-cut definition of drought often makes it difficult to determine whether one actually exists, and if it does, its degree of severity. Third, drought impacts are often less obvious than other natural hazards, and they are typically spread over a much larger geographic area. Fourth, due primarily to the aforementioned reasons, most communities do not have in place any contingency plans for addressing drought. This lack of pre-planning can greatly hinder a community's response capability when a drought does occur.

Droughts can cause severe impacts on communities and regions, including: 1) water shortages for human consumption, industrial, business and agricultural uses, power generation, recreation and navigation; 2) a drop in the quantity and quality of agricultural crops; 3) decline of water quality in lakes, streams and other natural bodies of water; 4) malnourishment of wildlife and livestock; 5) increase in wildfires and wildfire-related losses to timber, homes and other property; 6) declines in tourism in areas dependent on water-related activities; 7) declines in land values due to physical damage from the drought conditions and/or decreased economic or functional use of the property; 8) reduced tax revenue due to income losses in agriculture, retail, tourism and other economic sectors; 9) increases in insect infestations, plant disease, and wind erosion; and 10) possible loss of human life due to food shortages, extreme heat, fire, and other health-related problems such as diminished sewage flows and increased pollutant concentrations in water.

Despite thousands of miles of rivers and streams and its surrounding Great Lakes, Michigan can still experience occasional drought conditions. Most common are agricultural droughts, with severe soil-moisture deficits, which have serious consequences for crop production, particularly when coupled with extreme summer temperatures. Also, various water bodies, both inland lakes and the Great Lakes, cyclically go through periods of low-water levels. Michigan emerged from its latest such period of low-water levels in 2017 and is now experiencing high water levels.

Genesee County Perspective and Vulnerability

Droughts occur regularly in Michigan and Genesee County is no exception. See **Table 2-29** for a list of recent droughts in Genesee County. Drought has a wide range of serious implications for Genesee County farmers and those who rely on them. As of the 2017 Agricultural Census, there are over 1,050 farms in the county, with the average farm size be-

ing 136 acres. There are 56 nursery and greenhouse crop farms located in the county, along with over 30 orchards and 50 vegetable farms. Genesee County farms raised more than 274,000 bushels of wheat and over 4.4 million bushels of corn in 2017. The drought of 2001 drastically affected first-year Christmas tree seedlings which cause a reduced crop of Christmas trees 10 years later. Nursery owners had to replant their Christmas trees because of all the destroyed seedlings. Drought also stunts the growth of produce and is responsible for plants getting sunburned. Average crop yields are greatly reduced during a drought, and drought-damaged produce is not always good to use as livestock feed. For example, if dairy cows are given drought-damaged corn, they will not eat as much and will therefore produce less milk. Poor quality feed can also cause stomach and foot problems for the animals. According to the National Oceanic and Atmospheric database, there have not been any significant drought events in the past 10 years. The events listed below were included in the previous plan update.

Table 2-29 Genesee County Droughts

Date	Crop Damage
7/1/2001	$150,000,000
9/1/2002	$0

Source: National Oceanic and Atmospheric Administration

- In November of 2002, the United States Department of Agriculture issued a Weather Disaster that included Genesee County because of heavy crop losses due to drought.

- In September of 2001, Governor John M. Engler requested and received federal disaster help for 73 of Michigan's 83 counties because of drought. Michigan farmers experienced a 50% crop loss for 2001. The U.S. Department of Agriculture (USDA) granted Michigan's request to have most of the state's counties declared eligible for low-interest emergency farm loans through the USDA Farm Service Agency.

The U.S. Drought Monitor (National Drought Mitigation Center) uses four classifications of severity, from least intense category (D1) to the most intense (D4), with an additional (D0) category used to designate a drought watch area in which long-term conditions such as low reservoir levels are probably present. According to this tool, during the warmer spring and summer months, Genesee County can sometimes range from the D0 category (abnormally dry) to the D2 category (severe drought) of intensity. Overall, the severity and likelihood of droughts in Genesee County is generally minimal. However, according to the 2019 Michigan Hazard Analysis, Michigan's Climate Division 10, which Genesee County is included in, has experienced 9 lengthy drought events over the past 125 years. The most extreme drought was in August 1931 when the palmer index hit a record low of -6.98. From 1895 to 2018, 54% of these years experienced no drought months while 46% percent of the years experienced drought months with at least a -2.0 (moderate drought, D1 category) or worse drought based on the palmer index.

If a drought were to occur, all communities are vulnerable to drought effects including low water supplies in groundwater and drinking wells. It is important for communities in Genesee County to be aware of this potential threat due to the widespread severity of its impacts.

Mitigation Strategies for Drought

The following strategies are suggested to minimize the effects of Genesee County's number fourteen hazard, drought.

- Procure additional water supply
- Water rationing if necessary
- Public education on water conservation

New Mitigation Projects

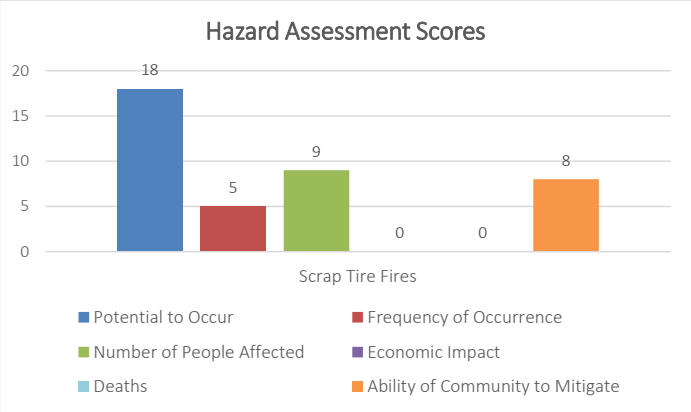
None

Previously Included Mitigation Projects

Atlas Township

Project: High pressure 10 inch water wells (electric). Project Description: To be used by the Fire Department to fight fires in various Township locations. Township would like eight wells. Proposed timeframe for implementation: 1-5 years. Budget: Approximately $36,000 per well. Update: Project is ongoing - cost for the high pressure 10-inch water wells has risen to $36,000 from $28,000.

#14 - Scrap Tire Fires



Scrap Tire Fires

A scrap tire fire is a large fire that burns scrap tires which are being stored for recycling or re-use.

Hazard Description

Scrap tire fires are ranked the number fourteen hazard in Genesee County. With the disposal of an estimated 290 million vehicle tires annually in the United States, management of scrap tires has become a major economic and environmental issue. Michigan generates ten million scrap tires each year. Although responsible means of disposal have become more common, tire dumps of the last forty years present environmental and safety hazards that will last into the foreseeable future. According to EGLE, as of August 2018, it is estimated there are 94,500 scrap tires around Genesee County and over 1.2 million scrap tires in regulated/registered scrap tire collection sites across the state. Issues pertaining to the management of scrap tire disposal sites are difficult and diverse. Whole tires are difficult to landfill because they tend to float to the surface and are banned by many licensed landfills due to associated problems. In addition, scrap tires are breeding grounds for mosquitoes, which can reproduce at 4,000 times their natural rate in a scrap tire disposal site. From an emergency management perspective, the most serious problem that scrap tire disposal sites pose is that they can be a tremendous fire hazard if not properly designed and managed.

Genesee County Perspective and Vulnerability

With almost 100,000 scrap tires reported in scrap tire collection sites in Genesee County, a fire would be extremely dangerous and difficult to put out. Genesee County is the sixth largest scrap tire disposal site in the state, and a scrap tire fire could occur at any time. However, there have been no reported significant scrap tire fires in the county over the past 10 years. See **Figure 2-11** below for a map of scrap tire inventory across the state of Michigan. See **Table 2-30** for a list of these sites.

Mitigation Strategies for Scrap Tire Fires

The following strategies are suggested to minimize the effects of Genesee County's number fourteen hazard, scrap tire fires:

- Enforce "no dumping" regulations
- Clean up abandoned lots
- Public education on tire recycling
- Continued training for first responders
- Inventory scrap tire sites

New Mitigation Projects

City of Grand Blanc

Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

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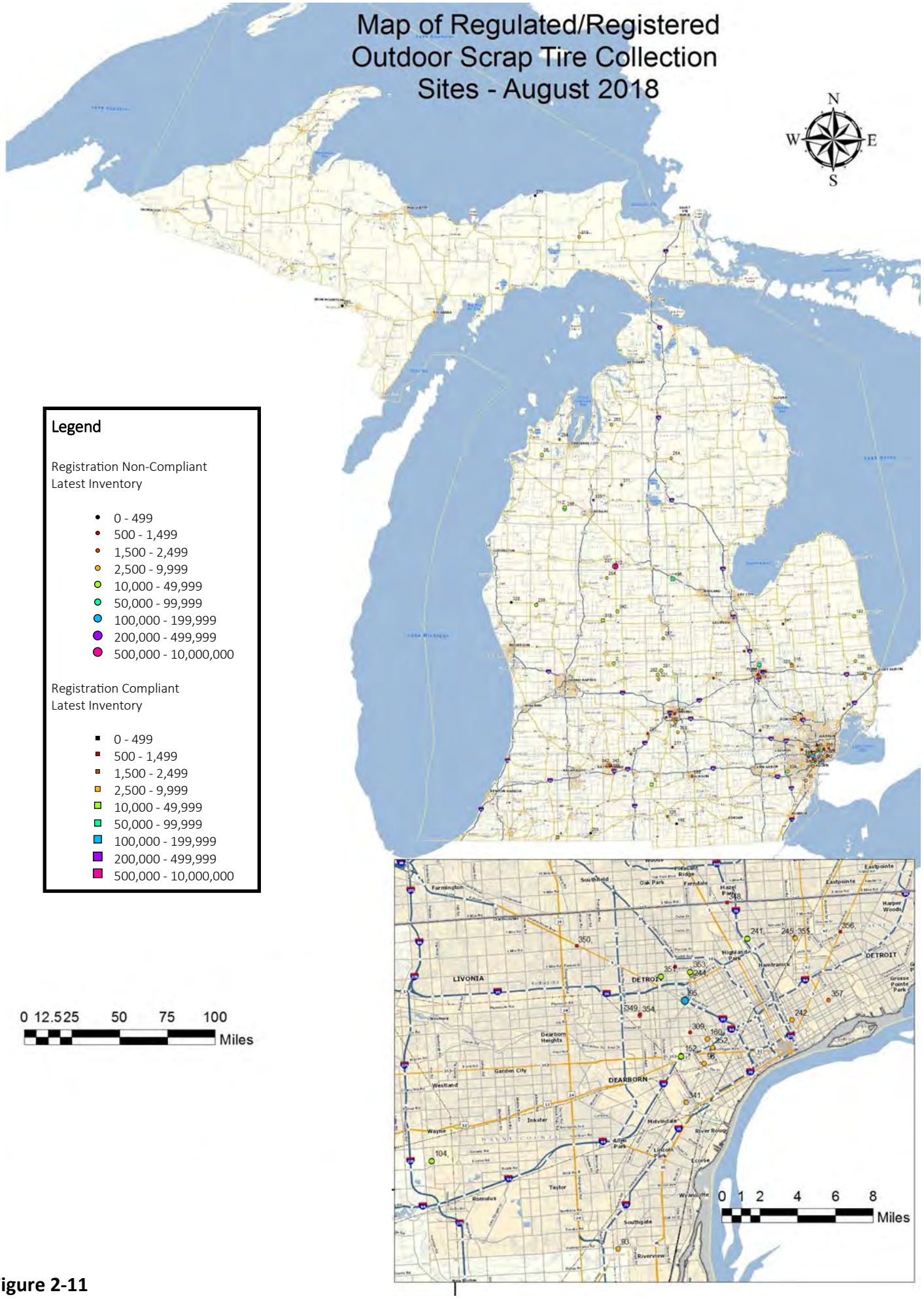


Figure 2-11

Source: Michigan Department of Environment, Great Lakes, and Energy

Table 2-30 Scrap Tire Collection/Processing Sites				
ID	Name	City	District	Inventory
4	Entech, Inc.	White Pigeon	Kalamazoo	3,000
5	Huffman Rubber	Homer	Kalamazoo	40,000
7	Environmental Rubber Recycling	Flint	Lansing	80,000
8	First Class Tire Shredders	Clio	Lansing	500
10	Wingfoot Commercial Tire Sys LLC	Lansing	Lansing	500
24	Warehouse Tire	Pontiac	SE MI	6,900
175	GM-Milford Proving Grounds	Milford	Lansing	1,000
176	Quality Dairy Company (Discount Tire Company)	Lansing	Lansing	500
186	CM Rubber Technologies	Coleman	Saginaw Bay	64,080
198	Jefferson Township Transfer Station	Osseo	Jackson	499
253	Great American Environmental Services	Kingsford	Marquette	317
269	Cobalt Holddings LLC	Sturgis	Kalamazoo	1
270	Monache Construction and Sanitation	Grand Marais	Marquette	450
315	Larry's Tire, Inc.	Lakeview	Grand Rapids	22,300
323	Lapeer County Road Commission	Lapeer	Lansing	200
328	Oceana County Transfer Station	Shelby	Grand Rapids	1
339	Saddler Road Property	Luther	Cadillac	600
345	KJB Ventures	Holt	Lansing	3,500
346	Mikhos Auto Sales	Lansing	Lansing	2,000
347	Tire Maxx	Livonia	SE MI	1,270
348	JR Auto Sales Inc DBA A1 Kelly Tire	Detroit	SE MI	1,194
349	Bills Tire & Rims Inc	Detroit	SE MI	704
350	National Tire Express, Inc.	Detroit	SE MI	931
356	Leevs A-1 Tires, Inc.	Detroit	SE MI	1,499

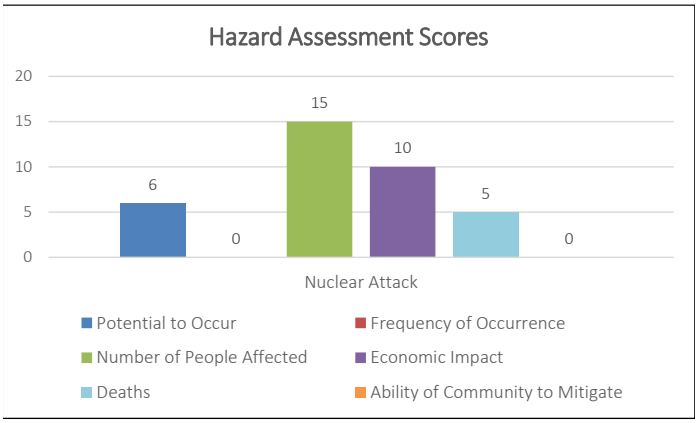
Scrap Tire Collection Sites				
ID	Name	City	District	Inventory
2	Pitsch Recycling & Disposal, Inc.	Belding	Grand Rapids	10,000
6	Trading Dutchman	Bellevue	Kalamazoo	2,400
25	669 Salvage	Interlochen	Cadillac	10,000
93	Big 4 Auto Parts	Riverview	SE MI	5,000
94	Boss Technologies	New Haven	SE MI	1,000
95	Techno Rubber	Detroit	SE MI	112,885
96	Heavy T's Auto	Detroit	SE MI	4,000
99	Lewis Family Tires	Goodells	SE MI	3,500
102	Norman Rusch	Smiths Creek	SE MI	4,000
104	William Connolly	Romulus	SE MI	10,500
112	William Loudin Property	Harrietta	Cadillac	10,000
152	Warholak Tire Service	Detroit	SE MI	11,660
160	Stramaglia World Trade Center	Detroit	SE MI	9,500
183	Carsonville Salvage	Carsonville	Sagianw Bay	15,000
199	Huco, Inc.	Jackson	Jackson	2,000
239	Lowell Webster	Fremont	Grand Rapids	20,798
241	McCormick Auto Parts	Detroit	SE MI	15,000
242	Long & Sons Auto Wrecking	Detroit	SE MI	5,200
244	Intervale Excavating & Demolition	Detroit	SE MI	3,000
245	McNichols Scrap Iron and Metal	Detroit	SE MI	500
257	Clifford Wetzel Property	Ithaca	Lansing	2,500
263	Swain's Junk Yard	Mancelona	Gaylord	3,500
264	William's Junk Yard	Grayling	Gaylord	3,000
277	Howard Hector	Eaton Rapids	Lansing	800
281	Rich Ro Farms (Colony)	Saint Johns	Lansing	30,000
282	Rich Ro Farms (Wacousta Rd.)	Saint Johns	Lansing	30,000
283	Charlotte Iron and Metal	Charlotte	Lansing	800
284	Karry Moline	Evart	Grand Rapids	5,000
287	Schumacher Salvage	Sears	Cadillac	500,000
289	Ultimate Tires & Auto Repair, Inc.	Detroit	SE MI	530
294	Michael Williams	Cedar	Cadillac	2,000

Source: Michigan Department of Environment, Great Lakes, and Energy

Scrap Tire Collection Sites (Continued)				
ID	Name	City	District	Inventory
296	John Tripp, Jr.	Harrietta	Cadillac	50,000
309	Omni Warehousing, LLC	Detroit	SE MI	1,000
311	VanBrooklin Auto Salvage	Lake City	Cadillac	2,000
312	Don Ruegsegger	Sears	Cadillac	1,500
313	Richard Brow & Sons Property	Newberry	Marquette	3,000
316	Lapeer County Road Commission	Lapeer	Lansing	200
317	Specialty Salvage	Owosso	Lansing	1,300
318	Juanita Hawkins	Mason	Lansing	8,000
319	Warehouse (Brandon Tire Site)	Flint	Lansing	2,000
320	Warehouse 2 (Brandon Tire Site)	Flint	Lansing	800
321	Berlyn Acres	Fowler	Lansing	8,000
326	A Used Tire Specialist	Hillsdale	Jackson	2,000
333	Brandon Tire (Sam's Scrap Tire)	Flint	Lansing	3,200
336	Renos	Flint	Lansing	8,000
338	Corey Bouyer	Battle Creek	Kalamazoo	1,300
340	F & R Tires LLC	Blanchard	Grand Rapids	20,000
341	Vulcan Masters	Detroit	Detroit	3,500
342	Terry Murhpy	Springfield	Kalamazoo	8,000
343	Springfield Tyre	Battle Creek	Kalamazoo	3,400
351	Intervale Real Estate, Inc.	Detroit	SE MI	32,000
352	Livernois New and Used Tire Services	Detroit	SE MI	4,141
353	Modern Soluttions LLC	Detroit	SE MI	15,853
354	Used Tire Warehouse Inc.	Detroit	SE MI	1,672
355	Selman Transportation, Inc.	Hamtramck	SE MI	4,500
357	F&S Tire Service	Detroit	SE MI	1,706

Source: Michigan Department of Environment, Great Lakes, and Energy

#15 - Nuclear Attack



Nuclear Attack

A nuclear attack is any large-scale hostile action taken against the United States which involves nuclear weapons and results in destruction of military and/or civilian targets.

Hazard Description

Nuclear attack is ranked the number fifteen hazard in Genesee County. The United States is vulnerable to several national security threats from external, hostile forces. National security threats include nuclear attack, chemical and biological warfare, and terrorism. The potential for damage resulting from a national security emergency ranges from the relatively localized damage caused by a terrorist attack using weapons of mass destruction, to the catastrophic devastation that could be expected following a full-scale nuclear attack. This section focuses on the nuclear attack threat. Information on terrorism and other hostile acts of destruction are addressed in this document under the hazard "Terrorism".

World events in recent years have greatly changed the nature of the nuclear attack threat against the United States. The breakup and establishment of democratic forms of government in the former Soviet Union and other Soviet-Bloc nations in Eastern Europe has essentially ended the "Cold War" that shaped and influenced world politics since the late 1940s. That tremendous turn of events has, for all intents and purposes, reduced the need for the United States and former Soviet states to maintain huge stockpiles of nuclear weapons. The reduction in nuclear weapons stockpiles that has occurred over the past few years in both countries has diminished the threat of a full-scale, massive nuclear attack that would threaten the very existence of the world as we know it.

However, while the threat of attack has diminished, it is still a possibility due to the large number of nuclear weapons still in existence in present-day Russia and throughout the rest of the world. Even though an International Nuclear Non-Proliferation Treaty is in place, several countries are thought to be actively pursuing the development of nuclear weapons. In addition, internal instability and strife within Russia and some of its neighboring countries could cause the region to fall back under its previous form of government, which could potentially revive a larger-scale nuclear attack threat. Both Russia and U.S. nuclear weapons systems remain on high alert, which increases the risk of an accidental nuclear launch that could spawn a nuclear counterattack. Given the state of Russia's aging nuclear technical systems, that scenario is not out of the realm of possibility.

Although the nature and scope of an attack at this time would likely be reduced from previous possibilities, the potential impact on the country would still be devastating. Despite the fact that it is based on a fully-armed and functional Soviet Union as an adversary, the Federal Emergency Management Agency (FEMA) attack planning guidance provided in the document "Nuclear Attack Planning Base 1990" (NAPB-90) remains the basis for the population protection strategy adopted for Michigan.

This strategy is incorporated in the Michigan Emergency Management Plan (MEMP) and most local Emergency Operations Plans (EOP). The NAPB report identifies potential aiming points or target areas throughout the United States. These targets were categorized into seven classifications: 1) commercial power plants; 2) chemical facilities; 3) counterforce military installations; 4) other military bases; 5) military support industries; 6) refineries; and 7) political targets. The potential size, or yield, and the height of burst were postulated for each target. The State of Michigan has 25 target areas. In addition, four target areas near the Ohio and Indiana borders directly affect Michigan jurisdictions. The NAPB report

was an attempt by FEMA to develop a risk assessment of a potential attack upon the United States.

Targets are identified using specific criteria, part of which involved the target's importance to counter-attack measures. For this reason, not all chemical facilities, for example, are included. Further, designation as a target area does not imply that all targets will be affected equally. The NAPB-90 planning base is, by design, a worse case nuclear scenario. Even though the situation in the former Soviet Union and its neighboring countries has changed dramatically, the NAPB report still contains some valid assumptions about a potential nuclear attack upon the United States.

Genesee County Perspective and Vulnerability

Although an unlikely hazard to occur in Genesee County, potential nuclear attacks cannot be overlooked. Russia still maintains a fully capable nuclear arsenal and many smaller nations (some not friendly to the United States) are working towards a nuclear capability. A single weapon could cause death and destruction on a massive scale. Nuclear weapons inflict damage over a wide area and through a variety of effects. Thus, it makes sense to continue to prepare for a nuclear attack hazard as part of an overall emergency management strategy.

Mitigation Strategies for Nuclear Attack

The following strategies are suggested to minimize the effects of Genesee County's number fifteen hazard, nuclear attack:

- Warning sirens
- Continued training for first responders, and fire and police personnel
- Continued training for Hazardous Materials Response Team
- Update Disaster Response Plan
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

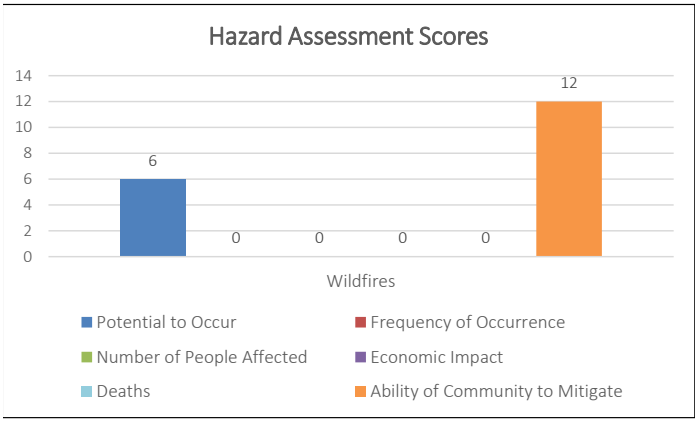
New Mitigation Projects

None

Previously Included Mitigation Projects

None

#16 - Wildfires



Wildfires

A wildfire is an uncontrolled fire in grasslands, brush lands or forested areas.

Hazard Description

Wildfires are ranked as the number 16 hazard in Genesee County. Forests cover approximately 49 percent (18.2 million acres) of Michigan's total land base. These vast forests provide Michigan with the largest state-owned forest system in the United States. In addition, Michigan has the 5th largest timberland acreage, with 4.2 million acres of softwoods and 13.1 million acres of hardwoods. That vast forest cover is an asset for both industry and recreation. However, it also makes many areas of Michigan highly vulnerable to wildfires. Although Michigan's landscape has been shaped by wildfire, the nature and scope of the wildfire threat has changed. Since Michigan's landscape has changed substantially over the last several decades due to wild land development, the potential danger from wildfires has become more severe.

Increased development in and around rural forested areas (a 63 percent increase in the number of rural homes during the 1980s) has increased the potential for loss of life and property from wildfires. There are simply not enough fire suppression forces available in rural areas to protect every structure from wildfire. Contrary to popular belief, lightning strikes are not the primary cause of wildfires in Michigan. Today, only about 2% of all wildfires in Michigan are caused by lightning strikes; the rest are caused by human activity. Outdoor burning is the leading cause of wildfires in Michigan. Most Michigan wildfires occur close to where people live and recreate, which puts both people and property at risk. The immediate danger from wildfires is the destruction of timber, property, wildlife, and injury or loss of life to persons who live in the affected area or who are using recreational facilities in the area.

Genesee County Perspective and Vulnerability

Wildfires have the potential to occur in Genesee County due to the substantial amount of outdoor activities that include burning of various materials. According to the Michigan Department of Natural Resources' (MDNR) wildfire database, there have been no significant wildfires in Genesee County over the last 10 years. However, each year there are several small fires which are so minor that the MDNR is not called to assist. Though it is important to know that given the appropriate weather, fuels, and topography, any small fire can quickly develop into a significant wildfire. Statewide, there is an expected loss of $1.1 million to wildfires annually (Michigan Hazard Mitigation Plan).

Mitigation Strategies for Wildfires

The following strategies are suggested to minimize the effects of Genesee County's number sixteen hazard, wildfires:

- Continued training for fire department personnel
- Upgrade firefighting equipment as needed
- Public education about wildfires
- Restrict outdoor burning
- Update Disaster Response Plan if necessary
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

City of Grand Blanc

Project: Portable radios. Project description: Purchase of 30 Motorola portable radios, APX6000 XE for each firefighter. Proposed timeframe for implementation: 1 - 5 years. Budget: $75,873.75. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Deadfall tree removal. Project description: A

recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. This amount of deadfall poses a significant wildfire and flooding risk in the area. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I-75. The project would pay for removal of downfall and hazardous stands. Proposed timeframe for implementation: 1 - 5 years. Budget: $80,000. Update: None, this is a newly submitted project.

Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

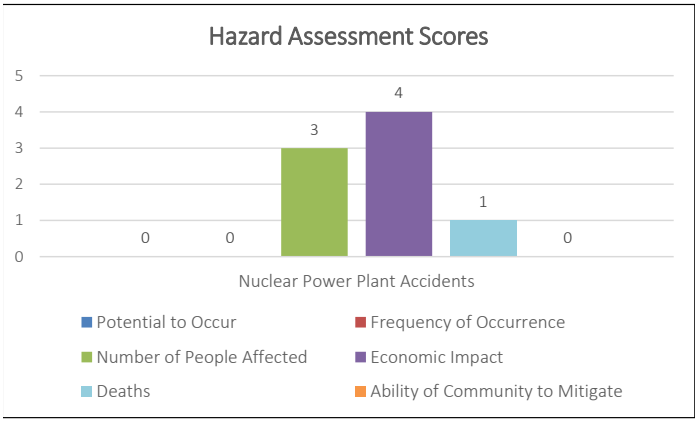
Previously Included Mitigation Projects

Atlas Township

Project: High pressure 10 inch water wells (electric). Project Description: To be used by the Fire Department to fight fires in various Township locations. Township would like eight wells. Proposed timeframe for implementation: 1-5 years. Budget: Approximately $36,000 per well. Update: Project is ongoing - cost for the high pressure 10-inch water wells has risen to $36,000 from $28,000.

Project: Dead Ash tree removal. Project Description: Dead ash trees affect road safety throughout the entire township, along various roads, streets, and neighborhoods. Budget: $80,000: Update: Project is still ongoing.

#17 - Nuclear Power Plant Accidents



Nuclear Power Plant Accidents

A nuclear power plant accident is an actual or potential release of radioactive material at a commercial nuclear power plant or other nuclear facility, in sufficient quantity to constitute a threat to the health and safety of the off-site population.

Hazard Description

Nuclear power plant accidents are ranked as the number 17 hazard in Genesee County. Though the construction and operation of nuclear power plants, these sites are closely monitored and regulated by the Nuclear Regulatory Commission (NRC). Accidents at these plants are considered a possibility and appropriate on-site and off-site emergency planning is conducted. An accident could result in the release of potentially dangerous levels of radioactive materials into the environment that could affect the health and safety of the public living near the nuclear power plant. A nuclear power plant accident might involve both a release of air borne radioactive materials and radioactive contaminate of the environment around the plant. The degree and area of environmental contamination could vary greatly depending on the type and amount of radioactivity and weather conditions. Response to a nuclear power plant accident requires specialized personnel who have been trained to handle radioactive materials safely, who have specialized equipment to detect and monitor radiation, and who are trained in personal radiation exposure control.

Genesee County Perspective and Vulnerability

Nuclear power plant accidents are not considered a threat in Genesee County since none are located in the County. The closest one is about 95 miles away from Flint. It is the Fermi 2 Nuclear Power Station located in Newport, Michigan. There are also two other nuclear power plant facilities operating in Michigan. These are the Cook Nuclear Plant, which is located north of Bridgman along Lake Michigan, and the Palisades Nuclear Plant near South Haven. The Cook facility is about 165 miles from Flint, and the Palisades facility is about 140 miles from Flint. Michigan's fourth nuclear facility, Big Rock Point, was located near Charlevoix, but stopped generating electricity in 1997. The facility was scheduled to be turned into a "Greenfield" area in 2004.

Mitigation Strategies for Nuclear Power Plant Accidents

The following strategies are suggested to minimize the effects of Genesee County's number seventeen hazard, nuclear power plant accidents:

- Continued training for Hazardous Materials Response Team
- Continued training for first responders, fire, and police personnel
- Public education
- Updated Disaster Response Plan if necessary
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing

shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

Grand Blanc Township

Project: Standby generator. Project description: Well sites at Knollwood and Stockbridge are not served by any onsite, back-up power source. The Township is in the process of installing onsite generators at each well house. These generators will have the capacity to power each well pump at maximum production rates at the same time to sustain water supply in an emergency situation. Proposed timeframe for implementation: 1 - 5 years. Budget: $280,204.77. Update: None, this is a newly submitted project.

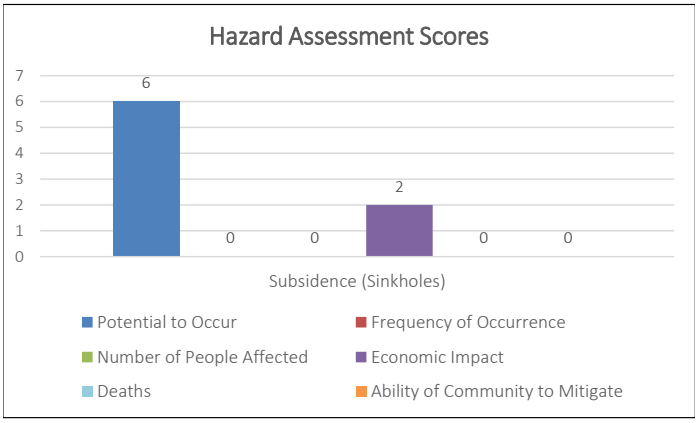
Mundy Township

Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

None

#18 - Subsidence (Sinkholes)



Subsidence (Sinkholes)

Subsidence is the lowering or collapse of the land surface caused by natural or human-induced activities that erode or remove subsurface support.

Hazard Description

Subsidence is ranked as the number 18 hazard in Genesee County. Subsidence can be caused by a variety of natural or human-induced activities. Natural subsidence occurs when the ground collapses into underground cavities produced by the solution of limestone or other soluble materials by groundwater. Human-induced subsidence is caused principally by groundwater withdrawal, drainage of organic soils, and underground mining.

In the United States, these activities have caused more than 17,000 square miles of surface subsidence, with groundwater withdrawal (more than 80% of subsidence) being the primary culprit. In addition, approximately 18% of the Unites States land surface is underlain by cavernous limestone, gypsum, salt, or marble, making the surface of these areas susceptible to sinkholes. Generally, subsidence poses a greater risk to property than to life. FEMA (1997) conservatively estimated losses to all types of ground subsidence, including karst, to be at least $125 million per year in the U.S., a very low figure according to USGS. Sparse and incomplete data show that the average cost of karst-related damages in the United States over the last 15 years is estimated to be at least $300 million per year and the actual total is probably much higher. The National Research Council estimates of annual damage from various types of subsidence is outlined in **Table 2-31**.

Table 2-31 Land Subsidence: Estimated Annual National Damage

Type of Subsidence	Annual Damage
Drainage of organic soils	$40,000,000
Underground fluid withdrawal	$35,000,000
Underground mining	$30,000,000
Natural compaction	$10,000,000
Sinkholes	$10,000,000
Hydro compaction (collapsible soils)	N/A
Total:	$125,000,000

Source: National Research Council

In Michigan, the primary cause of subsidence is underground mining. Although mine subsidence is not as significant a hazard in Michigan as in other parts of the country, many areas in Michigan are potentially vulnerable to mine subsidence hazards. Mine subsidence is a geologic hazard that can strike with little or no warning and can result in very costly damage. Mine subsidence occurs when the ground surface collapses into underground mined areas. In addition, the collapse of improperly stabilized mine openings is also a form of subsidence. Mine subsidence generally affects very few people, unlike other natural hazards that may impact many people.

Mine subsidence can cause damage to buildings, disrupt underground utilities, and be a potential threat to human life. In extreme cases, mine subsidence can literally swallow whole buildings or sections of ground into sinkholes, endangering anyone that may be present at that site. Mine subsidence may take years to manifest. Examples of collapses occurring 100 years after mines were abandoned have been documented in several areas of the country.

Genesee County Perspective and Vulnerability

Although subsidence cannot be entirely discounted, it is not considered a serious threat in Genesee County due to our stable bedrock and distance from susceptible areas. However, there have been a few recent incidents of small-scale sinkholes caused by the aging infrastructure.

The Goodrich Dam in the Village of Goodrich has had several small sinkholes that have started to grow, causing the dam to weaken further. The City of Flint, the City of Burton, and Grand Blanc Township have had sinkholes in roads and residential yards from drainpipe and construction issues.

In January of 2020, a rather large sinkhole formed under northbound I-75 in Grand Blanc. The sinkhole caused a section of the highway to be closed for two days so damage could be assessed and the highway repaired. It is believed that the sinkhole was caused by a plugged drain that caused roadway erosion following heavy rain.

Although the sinkholes that Genesee County experiences are not developing through natural causes, they are becoming a growing issue as the infrastructure continues to age without the funds to make the proper improvements.

Mitigation Strategies for Subsidence (Sinkholes)

The following strategies are suggested to minimize the effects of Genesee County's number eighteen hazard, subsidence:

- Identify possible subsidence locations such as old mines
- Restrict building in possible subsidence location

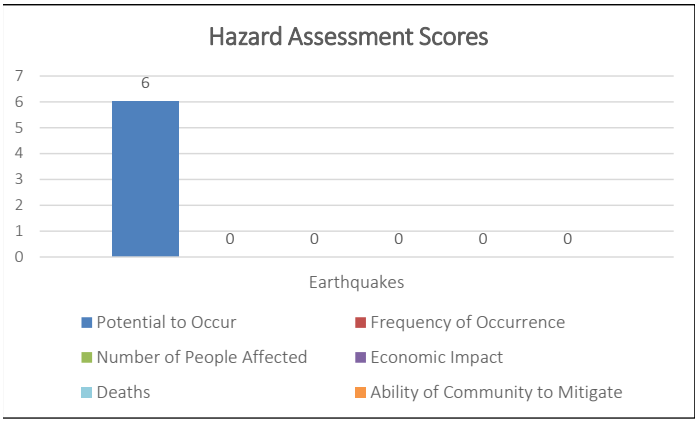
New Mitigation Projects

None

Previously Included Mitigation Projects

None

#19 - Earthquakes



Earthquakes

An earthquake is a shaking or trembling of the crust of the earth caused by the breaking and shifting of rock beneath the surface.

Hazard Description

Earthquakes are ranked as the number 19 hazard in Genesee County. Earthquakes range in intensity from slight tremors to great shocks. They may last a few seconds to several minutes or come as a series of tremors over a period of several days. The energy of an earthquake is released in seismic waves. Earthquakes usually occur without warning. In some instances, advance warnings of unusual geophysical events may be issued. However, scientists cannot yet predict exactly when or where an earthquake will occur. Earthquakes tend to strike repeatedly along fault lines, which are formed where large plates of the earth's crust below the surface constantly push and move against one another. Risk maps have been produced which show areas where an earthquake is more likely to occur. Earthquake monitoring is conducted by the United States Geological Survey (USGS), the National Oceanic and Atmospheric Administration (NOAA), and universities throughout the country.

The actual movement of the ground in an earthquake is seldom the direct cause of injury or death. Most casualties result from falling objects and debris. Disruption of communication systems and damage to electric power lines, gas, sewer and water mains can be expected. Water supplies can become contaminated by seepage around water mains. Damage to roadways and other transportation systems may create food and other resource shortages if transportation is interrupted. In addition, earthquakes may trigger other emergency situations such as fires and hazardous material spills, thereby compounding the situation.

Genesee County Perspective and Vulnerability

Earthquakes are not considered a threat because the nearest recorded fault line is no closer than the lower third of the state, and there is no record of an earthquake in Genesee County. Also, Michigan has only experienced 6 earthquakes since 1947 with none of these occurring in or near Genesee County according to the U.S. Geological Survey. However, it is worth mentioning that on August 9, 1947, an earthquake did hit a large area of south-central Michigan, affecting a total area of about 50,000 square miles, including points north to Muskegon and Saginaw. This is the closest recorded earthquake incident to Genesee County. According to the U.S. Geological Survey, National Seismic Hazard Mapping Project map, **Figure 2-12**, illustrated below, there is a very low probability of a significant earthquake in Genesee County. For this reason, earthquakes are not considered a serious hazard in Genesee County.

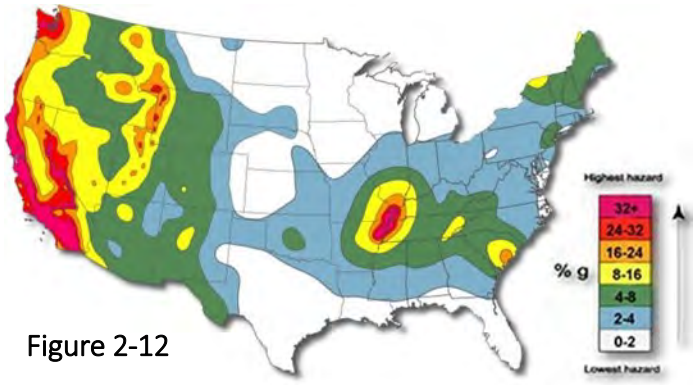


Figure 2-12

Source: US Geological Survey

Mitigation Strategies for Earthquakes

The following strategies are suggested to minimize the effects of Genesee County's number 19 hazard, earthquakes:

- Emergency generators
- Building code enforcement
- Update Disaster Response Plan if necessary
- Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger

New Mitigation Projects

Village of Goodrich

Project: Natural gas backup generator. Project description: Generator for Village of Goodrich office/ hall and the DPW building. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation: 1 - 5 years. Budget: $20,000. Have currently received a quote from one contractor. Update: None, this is a newly submitted project.

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Project: Backup Generator. Project description: Rewiring of facility and installation of replacement/ upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/ staging, and community shelter in the event of a prolonged power outage. Proposed timeframe for implementation: 1 - 5 years. Budget: $27,000. Update: None, this is a newly submitted project.

Previously Included Mitigation Projects

None

Action Plan and Plan Maintenance

Action Plan

As part of the development of this plan, staff requested that local units of governments submit hazard mitigation projects for their municipality. Staff evaluated these projects and included them in the plan for hazards they will help mitigate along with projects listed in previous plan updates. Staff reached out to agencies who previously submitted hazard mitigation projects to request an update on past projects.

Staff also used project information to develop mitigation strategies (actions) that can be implemented to help mitigate hazards. The list of mitigation actions included in this section and projects was developed during previous Hazard Mitigation Plan updates and reviewed during this update process. The charts, which start on the 3rd page of this section, identify specific mitigation actions for each hazard, their implementing agency, a proposed timeline for implementation, and relative priority level. Included in the considerations were the cost of the projects compared with past events.

In addition to mitigation project types, an evaluation and summary of hazard-related actions that local communities have taken for improving the general well-being and future mitigation efforts were also completed.

Focus on the Expansion of Existing Authorities, Policies, Programs, and Resources

As part of the implementation and updating of the plan, during the five-year plan period, the Emergency Management Department will evaluate and hold discussions on current activities and projects being undertaken. An assessment regarding future projects needed in each community and county-wide will also be considered.

The goal of hazard mitigation is to reduce future impacts to property and residents, and lessen disruption to local services. Mitigation efforts should be ongoing in order to adapt to the needs of the communities and residents. In addition, efforts should include efficiencies in which residents can benefit during times of emergency. The majority of local units in Genesee County feel that the best ways to expand existing authorities, policies, programs and resources are through coordination with other agencies and local units, along with educating the public. For information on existing authorities, policies, programs, and resources for individual communities, as well as how they can be expanded upon, please see the Community Profiles section of the plan.

The local units placed a high importance on working with other local governments as well as the State in order to improve upon and expand the current policies, programs, activities, and resources. The State mirrors this sentiment in their Plan in section 4a "Mitigation Tools and Measures":

> "Successful implementation of a program to reduce vulnerability to hazards must, out of necessity, be a joint cooperative effort between the State and local governments. State government provides the means (i.e. enabling laws and local governing authority) for regulating land development, and local governments put that means to use and actually make land use development decisions."
>
> "For land use/development decision-making to be effective in limiting or eliminating hazard risk and vulnerability, local and state actions must be carefully coordinated. The State must ensure, through appropriate legislation and rules/regulations, that local governments have the necessary means to effectively guide and manage land use change and development."
>
> "Local governments, in turn, must make good land use decisions and exercise prudent stewardship of the land development process within their communities. Adequate guidance, oversight, and enforcement at the local level are critically important to successfully mitigating hazard risk and vulnerability" (Mitigation Tools and

Measures, Page 545 and 546).

Coordination between neighboring local governments and the State is perhaps the most effective way for communities to improve and expand each jurisdiction's existing authorities, policies, programs, and resources.

The State of Michigan's Plan also acknowledges some of the challenges in implementing effective hazard mitigation techniques:

> "Political, social and economic pressure at the local level often leads to approval of land uses and developments that may not be appropriate for a particular site or area. In some instances, code enforcement may be a problem. In others, adequate funding may not be available to support planning or regulatory activities, or there may be a lack of community support for such activities. The end result is that local communities may not be able to effectively utilize the measures they have at their disposal" (Mitigation Tools and Measures, Page 546).

The local jurisdictions in Genesee County feel that their biggest set-back is the lack of available funding for large-scale hazard mitigation projects and for educating and training the public.

Relative Priority Levels

Each mitigation action has been assigned a priority level that indicates its importance relative to the hazard the action is mitigating. See below for an explanation of each priority level.

Top: Mitigation actions for hazards that pose the greatest threat and likelihood of affecting the community and which are eligible for federal FEMA Hazard Mitigation funding.

High: Mitigation actions for hazards that pose the greatest threat and likelihood of affecting the community.

Medium: Mitigation actions for hazards that pose a moderate threat and likelihood of affecting the community.

Low: Mitigation actions for hazards that pose the least threat and likelihood of affecting a community.

Implementing Agency Codes

The agency codes defined below are listed for each mitigation action, identifying the various agencies that should be involved with each action.

- Agencies in bold are the lead agencies
- *Indicates the agency has a project listed
- Local refers to the local unit of government
- Local ERA refers to local emergency response agencies such as police, fire, and medical
- County refers to county agencies such as the Road Commission, Office of Emergency Management, and Drain Commission
- State refers to various state agencies such as MDOT and the DNR
- Federal refers to federal agencies
- Utilities refers to private utilities such as power and phone companies
- Private refers to businesses and associations such as television and radio stations, scrap yards and trailer park associations
- Transport agency refers to transport truck shipping companies
- Transit agency refers to public and private agencies involved with mass transit including schools

Potential Funding Source

The funding sources listed below identify where implementing agencies could secure funding for each mitigation action.

- HMGP: Hazard Mitigation Grant Program
- FMAP: Flood Mitigation Assistance Program
- BRIC: Building Resilient Infrastructure and Communities
- HHPD: High Hazard-Potential Dams

Genesee County Mitigation Projects

For detailed information about newly submitted Genesee County Mitigation Projects and funding sources, see project application forms in Appendix C.

Goals and Objectives

This section displays which goals and objectives are achieved by each mitigation action. For reference, the goals and objectives are provided in the Genesee County Hazards Summary Section.

#1 - Infrastructure Failure					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Emergency Generators	**Genesee County Emergency Management**, Local *, Local DPW, and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 4 O - 4
Community Shelters	**Local** and Local ERA	1 to 10 years, as needed	Top	HMGP	G - 1, 2, 6, 7 O - 6
Analysis of Infrastructure	**Local**, Local DPW, County and Utility	Ongoing	Top	HMGP	G - 1, 4 O - 2
Repair of Critical Infrastructure	**Local ***, Local DPW, County and Utility	1 to 10 years, as needed	Top	HMGP, FMAP	G - 1, 4, 6 O - 2, 4
Public Education for Disaster Preparedness	**Genesee County Emergency Management**, Local, Local ERA, and Utility	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9
Infrastructure Maintenance Program	**Local**, Local DPW, County and Utility	Ongoing	High		G - 1, 4, 6 O - 2, 4
Tree Trimming Program	**Genesee County Road Commission**, Local DPW*, Utility	Ongoing	High		G - 4, 6 O - 2, 4
Updated Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Elderly Assistance Programs	**Genesee County Emergency Management**, Local, and State	Ongoing	High		G - 1, 5, 6, 7 O - 4, 5, 9

#2 - Riverine Flooding					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Join FEMA Flood Insurance Program – Map The Flood Plain	**Local**	1 to 5 years, as needed	Top	HMGP	G - 2, 7, 8 O - 1
Mitigation Assistance Program For Structures In The Flood Plain	**Genesee County Emergency Management *** and Local	1 to 10 years, as needed	Top	HMGP, FMAP, BRIC	G - 1, 7, 8 O - 1, 7
Identify Structures In The Flood Plain	**Local**	1 to 5 years, as needed	Top	HMGP	G - 1, 7, 8 O - 1,7
River Flood Control Measures	**Genesee County Emergency Management** and Local*	1 to 10 years, as needed	Top	HMGP, FMAP	G - 1, 6, 7, 8 O - 4
Emergency Generators	**Genesee County Emergency Management**, Local *, Local DPW, and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 4 O - 4
Public Education for Disaster Preparedness	**Genesee County Emergency Management**, Local, Local ERA, and Utility	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9
Enforce Zoning Regulations Regarding The Flood Plain	**Local**	Ongoing	High		G - 1, 6, 8 O - 1, 7
Amend Zoning Regulations To Prohibit New Development In The Flood Plain	**Local**	1 to 5 years, as needed	High		G - 1, 6, 8 O - 1, 7
Update Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Will Consider Hazard Mitigation in Future Master Plan Updates	**Local** (see Incorporating Recommendations into Community Plans section)	According to Master Plan update schedule	High		G - All O - All

#2 - Terrorism					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Prepare Vulnerability Studies for Critical Infrastructure including cyber security	**Local**, Local DPW, County, State, and Utility	1 to 5 years, as needed	High		G - 1, 4 O - 2
Training For Responders	**Local** ERA	Ongoing	High		G - 1, 2, 6, 7 O - 2
Enforce Homeland Security Directives	**Local**, Local ERA, County, State, Federal, and Utility	Ongoing	High		G - 1, 2, 7 O - 2
Updated Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Training For Critical Infrastructure Employees	**Local**, Local ERA, Local DPW, County, State, Federal, and Utility	Ongoing	High		G - 1, 4, 6, 7 O - 2, 4

#3 - Structure Fires					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Enhance Emergency Response System	**Genesee County Emergency Management**, Local, and Local ERA	1 to 10 years, as needed	Top	HMGP	G - 1, 2, 6, 7 O - 2
Update Fire Fighting Equipment	**Local*** and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 2,6, 7 O - 4
Public Education on Fire Safety	**Genesee County Emergency Management**, Local, and Local ERA	Ongoing	High		G - 5 O - 5, 8, 9
Maintain Mutual Aid Agreements	**Genesee County Emergency Management**, Local, and Local ERA	Ongoing	High		G - 2, 4, 6 O - 2, 4
Enforce Fire Code	**Genesee County Emergency Management** and Local ERA	Ongoing	High		G - 1, 6 O - 2
Arson Education	**Genesee County Emergency Management**, Local, and Local ERA	Ongoing	High		G - 1, 5, 6, 7 O - 5, 8, 9
Training For Responders	**Local ERA**	Ongoing	High		G - 1, 2, 6, 7 O - 2
Demolitions	**Local** and GC Land Bank	Ongoing	High		G - 6 O - 4
Local Building Official Training	**GC Emergency Management**	Ongoing	High		G - 5 O - 5, 7, 9

#4 - Inclement Weather					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Enhance Storm Warning System	**Genesee County Emergency Management ***, Local *, Local ERA and Private *	1 to 10 years, as needed	Top	HMGP	G - 1, 3, 5, 7 O - 3, 5, 8, 9
Emergency Generators	**Genesee County Emergency Management,** Local *, Local DPW and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 4 O - 4
Storm Shelters	**Genesee County Emergency Management ***, Local ERA , and Private	1 to 10 years, as needed	Top	HMGP	G - 1, 6, 7 O - 6
Distribution of NOAA Radios	**Genesee County Emergency Management** and Local	Ongoing	Top	HMGP	G - 2, 3, 6, 7 O - 2, 3
Elderly Assistance Programs	**Genesee County Emergency Management**, Local and State	Ongoing	High		G - 1, 5, 6, 7 O - 4, 5, 9
Weather Spotter Training	**Genesee County Emergency Management** and Local ERA	Ongoing	High		G - 1, 3, 6, 7 O - 2, 8, 9
Updated Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Tree trimming Program	**Genesee County Road Commission**, Local DPW*, and Utility	Ongoing	High		G - 4, 6 O - 2, 4
Public Education for Disaster Preparedness	**Genesee County Emergency Management, Local ERA**, Local, Local DPW, and Utility	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9
Winter Weather Awareness Training	**Genesee County Emergency Management**	Ongoing	High		G - 1, 3, 5, 6 O - 5, 8, 9
SKYWARN Training	**Genesee County Emergency Management**	Ongoing	High		G - 1, 3, 5, 6 O - 5, 8, 9
Mass Notification System	**Genesee County Emergency Management**	Ongoing	High		G - 1, 3, 5, 6 O - 3, 5, 8, 9
NFIP	**Local**	Ongoing	High		G - 2, 6 O - 4

#5 - Extreme Temperatures					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Emergency Generators	**Genesee County Emergency Management**, Local *, Local DPW, and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 4 O - 4
Community Shelters	**Local** and Local ERA	1 to 10 years, as needed	Top	HMGP	G - 1, 2, 6, 7 O - 6
Distribution of NOAA Radios	**Genesee County Emergency Management** and Local	Ongoing	Top	HMGP	G - 2, 3, 6, 7 O - 2, 3
Public Education for Disaster Preparedness	**Genesee County Emergency Management**, Local, Local ERA, and Utility	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9
Elderly Assistance Programs	**Genesee County Emergency Management**, Local, and State	Ongoing	High		G - 1, 5, 6, 7 O - 4, 5, 9

#5 - Hazardous Materials Incidents (Transportation)					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Repair of Critical Infrastructure	**Genesee County Road Commission** , Local DPW, and State	1 to 10 years, as needed	Top	HMGP	G - 1, 4, 6 O - 2, 4
Update Response Equipment	**Local ERA***	1 to 5 years, as needed	Top	HMGP	G - 1, 2,6, 7 O - 4
Updated Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Safety Training For Transport Operators	**Transport Agency**	Ongoing	High		G - 1, 6, 9
Training For Responders	**Local ERA**	Ongoing	High		G - 1, 2, 6, 7 O - 2
Public Education	**Genesee County Emergency Management,** Local DPW, State, and Transport Agency	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#6 - Snow and Ice Storms					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Enhance Storm Warning System	**Genesee County Emergency Management *** , Local *, Local ERA and Private *	1 to 10 years, as needed	Top	HMGP	G - 1, 3, 5, 7 O - 3, 5, 8, 9
Emergency Generators	**Genesee County Emergency Management,** Local *, Local DPW and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 4 O - 4
Storm Shelters	**Genesee County Emergency Management *** , Local ERA , and Private	1 to 10 years, as needed	Top	HMGP	G - 1, 6, 7 O - 6
Distribution of NOAA Radios	**Genesee County Emergency Management** and Local	Ongoing	Top	HMGP	G - 2, 3, 6, 7 O - 2, 3
Elderly Assistance Programs	**Genesee County Emergency Management**, Local and State	Ongoing	High		G - 1, 5, 6, 7 O - 4, 5, 9
Weather Spotter Training	**Genesee County Emergency Management** and Local ERA	Ongoing	High		G - 1, 3, 6, 7 O - 2, 8, 9
Updated Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Tree trimming Program	**Genesee County Road Commission**, Local DPW, and Utility	Ongoing	High		G - 4, 6 O - 2, 4
Public Education for Disaster Preparedness	**Genesee County Emergency Management, Local ERA**, Local, Local DPW, and Utility	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#7 - Public Health Emergencies					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Immunization Programs	**Local**, Local ERA, State, and Federal	Ongoing	Top	HMGP	G - 1, 6, 7 O - 2, 4
Training For Responders	**Genesee County Emergency Management** and Local ERA	Ongoing	High		G - 1, 2, 6, 7 O - 2
Public Education for Disaster Preparedness	**Local**, Local ERA, State, and Federal	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#8 - Tornadoes					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Enhance Storm Warning System	**Genesee County Emergency Management ***, Local *, Local ERA and Private *	1 to 10 years, as needed	Top	HMGP	G - 1, 3, 5, 7 O - 3, 5, 8, 9
Emergency Generators	**Genesee County Emergency Management,** Local *, Local DPW and Local ERA	1 to 5 years, as needed	Top	HMGP	G - 1, 4 O - 4
Storm Shelters	**Genesee County Emergency Management ***, Local ERA , and Private	1 to 10 years, as needed	Top	HMGP	G - 1, 6, 7 O - 6
Distribution of NOAA Radios	**Genesee County Emergency Management** and Local	Ongoing	Top	HMGP	G - 2, 3, 6, 7 O - 2, 3
Elderly Assistance Programs	**Genesee County Emergency Management**, Local and State	Ongoing	High		G - 1, 5, 6, 7 O - 4, 5, 9
Weather Spotter Training	**Genesee County Emergency Management** and Local ERA	Ongoing	High		G - 1, 3, 6, 7 O - 2, 8, 9
Updated Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	High		G - All O - All
Tree trimming Program	**Genesee County Road Commission**, Local DPW*, and Utility	Ongoing	High		G - 4, 6 O - 2, 4
Public Education for Disaster Preparedness	**Genesee County Emergency Management, Local ERA**, Local, Local DPW, and Utility	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#9 - Civil Disturbance					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Update Response Equipment	**Local ERA***	1 to 5 years, as needed	Top	HMGP	G - 1, 2,6, 7 O - 4
Training for Responders	**Local ERA**	Ongoing	High		G - 1, 2, 6, 7 O - 2
Public Education	**Genesee County Emergency Management,** Local DPW, State, and Transport Agency	Ongoing	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9
Mass Notification System	**Genesee County Emergency Management**	Ongoing	High		G - 1, 3, 5, 6 O - 3, 5, 8, 9

#10 - Dam Failure					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Assess Dam Integrity	**Local,** County, State	1 to 5 years, as needed	Top	HMGP	G - 1, 7, 8 O - 2, 4
Repair of Critical Dams	**Local *,** County, State	1 to 10 years, as needed	Top	HMGP	G - 1, 6, 7, 8 O - 2, 4
Identify Area Potentially Affected By Hazard	**Local,** County, State	1 to 5 years, as needed	Top	HMGP	G - 1, 6, 7, 8 O - 2, 4
Public Education	**Genesee County Emergency Management**, State, and Local	1 to 5 years, as needed	High		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#11 - Hazardous Materials Incidents (Fixed Sites)					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Public Education for Disaster Preparedness	**County**, Local, and Local ERA	Ongoing	Medium	HMGP	G - 1, 2, 5, 7 O - 2, 5, 8, 9
Update Hazardous Material Inventory	**Local**, Local ERA, and State	Ongoing	Medium	HMGP	G - 2, 6, 9 O - 2, 4
Training for Responders	**Local ERA**	Ongoing	Medium		G - 1, 2, 6, 7 O - 2
Update Disaster Response Plan	**County** and Local ERA	1 to 5 years, as needed	Medium		G - All O - All

#12 - Oil and Natural Gas Well/Pipeline Accidents					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Update Inventory Of Oil and Natural Gas Well	**County**, State, and Local	1 to 5 years, as needed	Medium	HMGP	G - 2, 4, 6, 9 O - 2, 4
Update Response Equipment	**Local** ERA*	1 to 10 years, as needed	Medium	HMGP	G - 1, 2,6, 7 O - 4
Training for Responders	**Local ERA**	Ongoing	Medium		G - 1, 2, 6, 7 O - 2

#13 - Transportation Accidents (Bus, Airplane, Train)					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Enhance Warning System	**Private** *	1 to 5 years	Top	HMGP	G - 1, 3, 5, 7 O - 3, 5, 8, 9
Training For Responders	Local **ERA**	Ongoing	Medium		G - 1, 2, 6, 7 O - 2
Simulated Response Exercise	Genesee County **Emergency Management** and Local ERA	Ongoing	Medium		G - 1, 2, 6, 7 O - 2
Update Disaster Response Plan	Genesee County **Emergency Management** and Local ERA	1 to 5 years, as needed	Medium		G - All O - All
Safety Training for Transit Operators	Transit **Agency**	Ongoing	Medium		G - 1, 6, 9
Public Education	Genesee County **Emergency Management**, Local, Local ERA and Transit	Ongoing	Medium		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#14 - Drought					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Water Ration Program For Drought Conditions	**Local**	Ongoing	Medium		G - 4, 6, 8 O - 4
Water Conservation Program	**Local**	Ongoing	Medium		G - 4, 6, 8 O - 4
Public Education for Disaster Preparedness	Local, Local DPW, and **County**	Ongoing	Medium		G - 1, 2, 5, 7 O - 2, 5, 8, 9

#14 - Scrap Tire Fires					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Inventory Scrap Tire Storage Facilities	Local, County, and **State**	1 to 5 years, as needed	Low		G - 2, 6, 8 O - 2
Training For Responders	**Local ERA**	Ongoing	Low		G - 1, 2, 6, 7 O - 2
Proper Disposal Education and Enforcement	Local, **County**, State, and Private	1 to 5 years, as needed	Low		G - 5, 6 O - 5, 8

#15 - Nuclear Attack					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Enhance Warning System	Local, Local ERA, **Genesee County Emergency Management** , Federal, and Private	1 to 10 years, as needed	Low	HMGP	G - 1, 3, 5, 7 O - 3, 5, 8, 9
Updated Disaster Response Plan	Local, Local ERA, and **Genesee County Emergency Management**	1 to 5 years, as needed	Low		G - All O - All
Training For Responders	**Genesee County Emergency Management** and Local ERA	Ongoing	Low		G - 1, 2, 6, 7 O - 2

#16 - Wildfires					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Public Education for Disaster Preparedness	**Genesee County Emergency Management** , State, and Local	Ongoing	Low		G - 1, 2, 5, 7 O - 2, 5, 8, 9
Update Disaster Response Plan	**Genesee County Emergency Management** and Local ERA	1 to 5 years, as needed	Low		G - All O - All
Training For Responders	**Genesee County Emergency Management** and Local ERA	Ongoing	Low		G - 1, 2, 6, 7 O - 2
Update Fire Fighting Equipment	**Local and** Local ERA*	1 to 10 years, as needed	Low		G - 1, 2,6, 7 O - 4
Ban Open Burning	County, State, and **Local**	1 to 5 years, as needed	Low		G - 1, 6, 7, 8 O - 2

#17 - Nuclear Power Plant Accidents					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Emergency Generators	**Genesee County Emergency Management** , Local*, Local DPW, and Local ERA	1 to 10 years, as needed	Low	HMGP	G - 1, 4 O - 4
Updated Disaster Response Plan	Local, Local ERA, and **Genesee County Emergency Management**	1 to 5 years, as needed	Low		G - All O - All
Training For Responders	**Genesee County Emergency Management** and Local ERA	Ongoing	Low		G - 1, 2, 6, 7 O - 2

#18 - Subsidence (Sinkholes)					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Identify Potential Subsidence Locations	Local and **Genesee County Emergency Management**	1 to 5 years, as needed	Low		G - 2, 6, 7, 8 O - 2, 4
Restrict Development In Potential Subsidence Locations	**Local**	Ongoing	Low		G - 1, 6, 7 O - 2, 4

#19 - Earthquakes					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
Emergency Generators	**Genesee County Emergency Management** , Local*, Local DPW, and Local ERA	1 to 10 years, as needed	Low	HMGP	G - 1, 4 O - 4
Updated Disaster Response Plan	Local, Local ERA, and **Genesee County Emergency Management**	1 to 5 years, as needed	Low		G - All O - All
Enforce Building Codes	**Local**	Ongoing	Low		G - 1, 6, 7 O - 2, 4

All Hazards					
Mitigating Action	Implementing Agency	Proposed Implementation Timeline	Relative Priority Level	Potential Funding Source	Goals & Objectives Achieved
County Hazard Mitigation Project Manager	**Genesee County Emergency Management**	1 to 5 years	Low		G - All O - All
Increase Morgue Capacity	**Genesee County Emergency Management**	1 to 5 years	Low		G - 2, 6 O - 2, 4

While this plan was developed as a multi-jurisdictional document, local units of government are individually responsible for submitting project applications to FEMA, providing the local match for projects, and implementing the Hazard Mitigation strategies and projects.

Table 3-3 Specific Hazard Mitigation Projects (From Previous Plan Update)	~~Atlas Township - Natural Gas Backup Generators (Removed)~~	Atlas Township - Dead Ash Tree Removal	Atlas Township - Drainage Improvements	Atlas Township - Boat for Water or Ice Rescue	Atlas Township - High Pressure Water Wells	Atlas Township - Emergency Warning Sirens	Bendle Public Schools - Equipment	~~Bishop Airport - Weather Computer (Removed)~~	Davison Township - Warning Sirens	Fenton Township - Emergency Shelter	City of Flint - Stand-by Power (Cedar St Pump)	City of Flint - Stand-by Power (Westside Pump)	City of Flint - Stand-by Power (Torrey Rd Pump)	City of Flint - Stand-by Power (Flint Water Plant)	~~City of Flint - Hamilton Dam (Removed)~~	~~City of Flint - Thread Dam (Removed)~~	Flushing Township - Back-up Generator	Flushing Township - Dredge Brent Creek	Flushing Township - Warning Sirens	Forest Township - Warning Sirens	Gaines Township - Warning Sirens	Genesee Co. Emergency Mgmt. - Tornado Shelters	Genesee Co. Emergency Mgmt. - Warning Sirens	Genesee Co. Emergency Mgmt. - Home Relocation	GISD - Back-up Generator	GISD - Structural Improvements	Goodrich Area Schools - Equipment	~~Village of Goodrich - Goodrich Dam (Removed)~~	~~Grand Blanc Township - Warning Sirens (Removed)~~	Village of Lennon - Repair Sirens	Village of Lennon - Back-up Generator (Police Dept.)	Village of Lennon - Back-up Generator (Village Hall)	~~City of Linden - Generator (Removed)~~	UM-Flint - Enhance First Street Residence Hall	UM-Flint - Flood Mitigation Plan	UM-Flint - Upgrading UM-Flint EOC
1. Infrastructure Failure	T	H		H			T				T	T	T	T	T	T	T							T		T	T			T	T		T		T
2. Riverine Flooding	T		T	H			T										T	T					T	T		T				T	T	T			T
2. Terrorism	T						T										T							T		T				T	T	T	T		T
3. Structure Fires					T																														
4. Inclement Weather	T	H				T	T	T	T	T	T						T		T	T	T	T	T	T		T	T	T		T	T	T	T		T
5. Extreme Temperatures	T						T										T									T		T			T	T				
5. Hazardous Materials Incidents (Transportation)	T					T			T										T														T	T		T
6. Snow and Ice Storms	T	H															T																T	T		
7. Public Health Emergencies							H				H	H	H	H												H		H			H	H				
8. Tornadoes						T			T	T	T						T		T	T													T	T		T
9. Civil Disturbance	H																																			
10. Dam Failure				H											T	T													T						T	
11. Hazardous Materials Incidents (Fixed Sites)																																				
12. Oil and Natural Gas Well/Pipeline Accidents																																				
13. Transportation Accidents (Bus, Airplane, Train)								M																												
14. Drought					M																															
14. Scrap Tire Fires					L																															
15. Nuclear Attack							L																			L		L				L	L			
16. Wildfires		L			L																															
17. Nuclear Power Plant Accidents							L																			L		L				L	L			
18. Subsidence (Sinkholes)																																				
19. Earthquakes							L																			L		L				L	L			

Priority Level Top = T High = H Medium = M Low = L

Table 3-2 Specific Hazard Mitigation Projects (New)	City of Burton - Drainage - Bellingham Court	City of Burton - Drainage - Bristol Road	Village of Goodrich - Natural Gas Backup Generator	City of Grand Blanc - Portable Radios	Grand Blanc Township - Standby Generator	Grand Blanc Township - Deadfall Tree Removal	Mundy Township - Backup Generator	Mundy Township - Emergency Warning Sirens
1. Infrastructure Failure	T	T	T		T	H	T	
2. Riverine Flooding	T	T	T		T	H	T	
2. Terrorism								
3. Structure Fires				T			T	
4. Inclement Weather	H	H	T		T	H	T	T
5. Extreme Temperatures			T		T		T	
5. Hazardous Materials Incidents (Transportation)				T			T	
6. Snow and Ice Storms	H	H	T		T	H	T	T
7. Public Health Emergencies								
8. Tornadoes			T		T	H	T	T
9. Civil Disturbance				T				
10. Dam Failure								
11. Hazardous Materials Incidents (Fixed Sites)				M			M	
12. Oil and Natural Gas Well/Pipeline Accidents				M			M	
13. Transportation Accidents (Bus, Airplane, Train)				M			M	
14. Drought								
14. Scrap Tire Fires				L			L	
15. Nuclear Attack								
16. Wildfires				L		L	L	
17. Nuclear Power Plant Accidents			L		L		L	
18. Subsidence (Sinkholes)								
19. Earthquakes			L		L		L	

Priority Level

Top = T

High = H

Medium = M

Low = L

Table 3-3 Specific Hazard Mitigation Projects (From Previous Plan Update)	Atlas Township - Natural Gas Backup Generators	Atlas Township - Dead Ash Tree Removal	Atlas Township - Drainage Improvements	Atlas Township - Boat for Water or Ice Rescue	Atlas Township - High Pressure Water Wells	Atlas Township - Emergency Warning Sirens	Bendle Public Schools - Equipment	Bishop Airport - Weather Computer	Davison Township - Warning Sirens	Fenton Township - Emergency Shelter	City of Flint - Stand-by Power (Cedar St Pump)	City of Flint - Stand-by Power (Westside Pump)	City of Flint - Stand-by Power (Torrey Rd Pump)	City of Flint - Stand-by Power (Flint Water Plant)	City of Flint - Hamilton Dam	City of Flint - Thread Dam	Flushing Township - Back-up Generator	Flushing Township - Dredge Brent Creek	Flushing Township - Warning Sirens	Forest Township - Warning Sirens	Gaines Township - Warning Sirens	Genesee Co. Emergency Mgmt. - Tornado Shelters	Genesee Co. Emergency Mgmt. - Warning Sirens	Genesee Co. Emergency Mgmt. - Home Relocation	GISD - Back-up Generator	GISD - Structural Improvements	Goodrich Area Schools - Equipment	Village of Goodrich - Goodrich Dam	Grand Blanc Township - Warning Sirens	Village of Lennon - Repair Sirens	Village of Lennon - Back-up Generator (Police Dept.)	Village of Lennon - Back-up Generator (Village Hall)	City of Linden - Generator	UM-Flint - Enhance First Street Residence Hall	UM-Flint - Flood Mitigation Plan	UM-Flint - Upgrading UM-Flint EOC
1. Infrastructure Failure	T	H		H			T				T	T	T	T	T	T	T								T		T	T			T	T			T
2. Riverine Flooding	T		T	H			T										T	T						T	T		T				T	T	T			T
2. Terrorism	T						T										T								T		T				T	T	T	T		T
3. Structure Fires					T																															
4. Inclement Weather	T	H				T	T	T	T	T	T						T		T	T	T	T	T		T	T	T		T	T	T	T	T		T
5. Extreme Temperatures	T						T										T								T		T				T	T				
5. Hazardous Materials Incidents (Transportation)	T					T			T										T														T	T		T
6. Snow and Ice Storms	T	H															T																T	T		
7. Public Health Emergencies							H				H	H	H	H											H		H				H	H				
8. Tornadoes						T			T	T	T						T		T	T													T	T		T
9. Civil Disturbance	H																																			
10. Dam Failure				H											T	T												T							T	
11. Hazardous Materials Incidents (Fixed Sites)																																				
12. Oil and Natural Gas Well/Pipeline Accidents																																				
13. Transportation Accidents (Bus, Airplane, Train)								M																												
14. Drought					M																															
14. Scrap Tire Fires					L																															
15. Nuclear Attack							L																		L		L				L	L				
16. Wildfires		L			L																															
17. Nuclear Power Plant Accidents							L																		L		L				L	L				
18. Subsidence (Sinkholes)																																				
19. Earthquakes							L																		L		L				L	L				

Priority Level Top = T High = H Medium = M Low = L

Plan Maintenance

This plan is a dynamic document that may need to be amended as needs arise (new funding becomes available or a change in hazard priority due to a hazard event). The Genesee County Emergency Management and Homeland Security Office is the agency responsible for monitoring, evaluating, and updating the plan. An annual notice will be posted on the county's website and will also be sent to all local units of government requesting comment on plan contents and projects to be amended into the plan. Staff will conduct a review of the plan as needed. The review will be specific to the goals and objectives section, the hazard assessment and mitigation section, and any comments and projects that have been received. This review process will help staff determine if the plan needs to be amended. If necessary, staff will prepare amendments to the plan for review and approval at a meeting of the Genesee County Hazard Mitigation Plan Review Committee. The proposed amendments will be posted on the plan's website for public view and comment. The public will have an additional opportunity to comment on the plan and plan amendments at the committee meeting prior to approval.

Once every five years, staff must submit an updated plan to FEMA. In the fall of the fourth year of the plan, a notice will be posted on the plan's website and will be sent to all local units of government requesting comment on plan contents and projects to be amended into the plan. Staff will conduct a review of the plan. The review will be specific to the goals and objectives section, the hazard assessment and mitigation section, and any comments and projects that have been received. This review process will help staff determine if the plan needs to be amended or have a major update. If staff determines that the plan only needs to be amended, staff will prepare the amendments to the plan for review and approval at a meeting of the Genesee County Hazard Mitigation Advisory Committee. The proposed amendments will be posted on the plan's website for public review and comment. The public will have an additional opportunity to comment on the plan and plan amendments at the committee meeting prior to approval. At this meeting, staff will involve the public and will ask for public input. A copy of the amended plan will be sent to FEMA for review and approval.

If the plan requires a major revision, staff will follow similar procedures as used in the development of this plan (Please see the "Plan Development Work Items and Meetings" section in the Introduction Chapter of this plan). This process will include the development of goals and objectives for the plan, hazard identification, hazard prioritization, vulnerability determination, identification of mitigating actions, and public involvement at key points of plan development. The updated plan will be reviewed and approved at a meeting of the Genesee County Hazard Mitigation Advisory Committee. The public will have an additional opportunity to comment on the plan update at the committee meeting prior to approval. At this meeting, staff will involve the public and will ask for public input. A copy of the updated plan will be sent to FEMA for review and approval.

Incorporating Recommendations into Community Plans

The Genesee County Hazard Mitigation Plan includes eleven cities, seventeen townships, and five villages (see list in Introduction section). During the development of the hazard mitigation plan update, staff reached out to each local unit of government and asked if they would consider including recommendations from the Genesee County Hazard Mitigation Plan into the next update of their master and zoning plans. Many of the local units of government in Genesee County agreed to consider this request via a survey that was submitted to local officials; note that staff did not receive completed surveys from some LUGs. Table 3-4 lists these local units of government along with information on the updates of their master and zoning plans. See Appendix B for copies of the surveys that local officials completed. Also see Appendix C for hazard mitigation project forms that were submitted by local units of government. An assessment of the implementation of the recommendations of the Hazard Mitigation Plan into their master plans and zoning plans was conducted by staff as part of the update. According to survey re-

sponses, many local units of government mentioned that they have incorporated elements from the previous Hazard Mitigation Plan update into their local planning documents. Additionally, local municipalities have set forth projects, policies, and programs that are relevant to previously established hazard mitigation goals and strategies such as developing or updating local emergency response plans for their community. Local units of government are also required to notify surrounding units of government and entities that have requested notification when they are beginning their master plan review process. The Genesee County Emergency Management and Homeland Security Office will submit a request to each local unit covered by this plan to be notified when the local unit begins their review process. Staff will review the local units' master plans and recommend the incorporation of hazard mitigation plan recommendations.

Table 3-4 Genesee County LUGs Master Plans and Zoning Ordinances

	Master Plan	Zoning Ordinance
Argentine Township	Currently updating	2011 update; amended as needed
Atlas Township	2009 update*	1993 adopted; amended as needed
City of Burton	2017 update*	2020 update; amended as needed
Clayton Township	Currently updating*	1997 adopted; amended as needed
City of Clio	2017 update*	Currently updating; amended as needed
City of Davison	2015 update*	2020 update; amended as needed
Davison Township	2017 update*	2018 update; amended as needed
City of Fenton	2008 update*	2008 update; amended as needed
Fenton Township	2018 update*	2002 adopted; amended as needed
City of Flint	2013 update	2016 update; amended as needed
Flint Township	2020 update	1995 adopted; amended as needed
City of Flushing	2008 update*	2012 update; amended as needed
Flushing Township	2020 update*	2014 update; amended as needed
Forest Township	2002 adopted	2007 adopted; amended as needed
Gaines Township	2017 update	2020 update; amended as needed
Village of Gaines	1996 adopted	2007 adopted; amended as needed
Genesee Township	2001 adopted*	2019 update; amended as needed
Village of Goodrich	2008 update	2009 update; amended as needed
City of Grand Blanc	2017 update*	2007 update; amended as needed
Grand Blanc Township	2013 update*	2008 update; amended as needed
Village of Lennon	2013 update	2018 update; amended as needed
City of Linden	2010 update	2008 update; amended as needed
City of Montrose	2013 update	2016 update; amended as needed
Montrose Township	Currently updating	2019 update; amended as needed
City of Mt. Morris	Currently updating	2012 update; amended as needed
Mt. Morris Township	2021 update	2020 update; amended as needed
Mundy Township	2010 update*	2019 update; amended as needed
Village of Otisville	2017 update*	2009 update; amended as needed
Village of Otter Lake	2009 update	2010 adopted; amended as needed
Richfield Township	2004 adopted	2007 update; amended as needed
City of Swartz Creek	2016 update*	2006 update; amended as needed
Thetford Township	N/A*	2011 update; amended as needed
Vienna Township	Currently updating	2005 update; amended as needed

* Denotes that the LUG indicated on a survey that they are willing to incorporate hazard mitigation into future community plans

Table 3-5 Genesee County Local Units of Government Projects (New)	Continue Floodplain Management through NFIP	Incorporate Hazard Mitigation into Master Planning	City of Burton - Drainage - Bellingham Court	City of Burton - Drainage - Bristol Road	Village of Goodrich - Natural Gas Backup Generator	City of Grand Blanc - Portable Radios	Grand Blanc Township - Standby Generator	Grand Blanc Township - Deadfall Tree Removal	Mundy Township - Backup Generator	Mundy Township - Emergency Warning Sirens
Argentine Township	X	X								
Atlas Township	X	X								
City of Burton	X	X	X	X						
Clayton Township	X	X								
City of Clio	X	X								
City of Davison	X	X								
Davison Township	X	X								
City of Fenton	X	X								
Fenton Township	X	X								
City of Flint	X	X								
Flint Township	X	X								
City of Flushing	X	X								
Flushing Township	X	X								
Forest Township	X	X								
Gaines Township	X	X								
Village of Gaines	X	X								
Genesee Township	X	X								
Village of Goodrich	X	X			X					
City of Grand Blanc	X	X				X				
Grand Blanc Township	X	X					X	X		
Village of Lennon	X	X								
City of Linden	X	X								
City of Montrose	X	X								
Montrose Township	X	X								
City of Mt. Morris	X	X								
Mt. Morris Township	X	X								
Mundy Township	X	X							X	X
Village of Otisville	X	X								
Village of Otter Lake	X	X								
Richfield Township	X	X								
City of Swartz Creek	X	X								
Thetford Township	X	X								
Vienna Township	X	X								

Table 3-6 Genesee County Local Units of Government Projects (From Previous Plan Update)

	~~Atlas Township - Natural Gas Backup Generators (Remo~~	Atlas Township - Dead Ash Tree Removal	Atlas Township - Drainage Improvements	Atlas Township - Boat for Water or Ice Rescue	Atlas Township - High Pressure Water Wells	Atlas Township - Emergency Warning Sirens	Bendle Public Schools - Equipment	~~Bishop Airport - Weather Computer (Removed)~~	Davison Township - Warning Sirens	Fenton Township - Emergency Shelter	City of Flint - Stand-by Power (Cedar St Pump)	City of Flint - Stand-by Power (Westside Pump)	City of Flint - Stand-by Power (Torrey Rd Pump)	City of Flint - Stand-by Power (Flint Water Plant)	~~City of Flint - Hamilton Dam (Removed)~~	~~City of Flint - Thread Dam (Removed)~~	Flushing Township - Back-up Generator	Flushing Township - Dredge Brent Creek	Flushing Township - Warning Sirens	Forest Township - Warning Sirens	Gaines Township - Warning Sirens	Genesee Co. Emergency Mgmt. - Tornado Shelters	Genesee Co. Emergency Mgmt. - Warning Sirens	Genesee Co. Emergency Mgmt. - Home Relocation	GISD - Back-up Generator	GISD - Structural Improvements	Goodrich Area Schools - Equipment	~~Village of Goodrich - Goodrich Dam (Removed)~~	~~Grand Blanc Township - Warning Sirens (Removed)~~	Village of Lennon - Repair Sirens	Village of Lennon - Back-up Generator (Police Dept.)	Village of Lennon - Back-up Generator (Village Hall)	~~City of Linden - Generator (Removed)~~	UM-Flint - Enhance First Street Residence Hall	UM-Flint - Flood Mitigation Plan	UM-Flint - Upgrading UM-Flint EOC
Argentine Township																																					
Atlas Township	X	X	X	X	X	X																															
City of Burton																																					
Clayton Township																																					
City of Clio																																					
City of Davison																																					
Davison Township									X																												
City of Fenton																																					
Fenton Township										X																											
City of Flint											X	X	X	X	X	X																					
Flint Township																																					
City of Flushing																																					
Flushing Township											X	X	X				X	X	X																		
Forest Township																				X																	
Gaines Township																					X																
Village of Gaines																																					
Genesee Township																																					
Village of Goodrich																						X															
City of Grand Blanc																																					
Grand Blanc Township																							X														
Village of Lennon																								X	X	X											
City of Linden																											X										
City of Montrose																																					
Montrose Township																																					
City of Mt. Morris																																					
Mt. Morris Township																																					
Mundy Township																																					
Village of Otisville																																					
Village of Otter Lake																																					
Richfield Township																																					
City of Swartz Creek																																					
Thetford Township																																					
Vienna Township																																					

References

Below is a list of existing plans, documents, studies, and other references that were used to develop the Genesee County Hazard Mitigation Plan update.

Federal Emergency Management Agency
- Disaster declarations
- Benefit-Cost Analysis 2020
- Fire data and information
- Flood insurance analytics and data, flood risk and cost, floodplains
- National fire incident reporting system
- National flood insurance program
- National risk index

Federal Railroad Administration
- Railroad traffic volumes

Federation of American Scientists
- Nuclear attacks data and information

Flint and Genesee Chamber of Commerce
- Entertainment, recreation, and tourism activities

Genesee County Emergency Management
- Emergency facilities

Genesee County GIS Department
- Bridge locations
- COVID-19 data
- Dam locations
- Floodplain locations and structures
- Land use and development data
- Oil and gas well/pipelines locations
- Transportation facility locations and data
- Utilities data

Genesee County Health Department
- Public health emergencies data and information

Genesee County Metropolitan Planning Commission
- Genesee: Our County, Our Future 2020
- Genesee County Hazard Assessments
- Land use and development data
- LUG Master Plans and Zoning Ordinances
- Solid Waste Management Plan
- Transportation accidents (Bishop Airport, Flint MTA, Roadsoft, Michigan Traffic Crash Facts)

Genesee Intermediate School District
- School district data

Michigan Department of Environment, Great Lakes, and Energy
- Dam safety
- Nuclear power plants
- SARA Title III Section 302 Sites
- Scrap tire locations and data

Michigan Department of Health and Human Services
- Public health emergencies data and information

Michigan Department of Licensing and Regulatory Affairs
- Structure fire incidents data

Michigan Department of Natural Resources
- Wildfire data

Michigan Department of Transportation
- Traffic volumes data

Michigan State Police - Emergency Management and Homeland Security Division
- Michigan Hazard Analysis 2019
- Michigan Hazard Mitigation Plan 2019

National Drought Mitigation Center
- U.S. Drought Monitor Tool

National Fire Protection Association - Fire Analysis and Research Division
- Lightning Fires and Lightning Strikes 2013

National Oceanic and Atmospheric Administration - National Centers for Environmental Information & National Weather Service
- Climate and severe weather data inventory

National Research Council
- Subsidence data and information

U.S. Census Bureau
- Agricultural data
- Economic data
- Housing data
- Population data

U.S. Department of Transportation - Pipeline and Hazardous Materials Safety Administration
- Hazardous materials transportation data

U.S. Environmental Protection Agency
- Climate change indicators

U.S. Geological Survey
- Earthquake data
- Oil and gas well locations

Appendix A

Meeting Information

Genesee-Lapeer-Shiawassee Region V Planning and Development Commission

ROOM 111 – 1101 BEACH STREET FLINT, MICHIGAN 48502-1470
TELEPHONE (810) 257-3010 FAX (810) 257-3185

DEREK BRADSHAW
FISCAL OFFICER

GENESEE COUNTY HAZARD MITIGATION PLAN REVIEW COMMITTEE
Thursday, November 12, 2020
1:30 P.M.

Zoom Meeting
Dial-in Number: (312) 626-6799
Participant Code: 938 3002 6146#

AGENDA

I. Welcome/Introductions

II. Committee Election of Officers

III. Overview of Hazard Mitigation Plan Update Process (Presentation)

IV. Other Business

V. Next Meeting – February 11, 2021 @ 1:30 P.M.

GENESEE COUNTY HAZARD MITIGATION PLAN REVIEW COMMITTEE
Thursday, November 12, 2020, 1:30 p.m.

MINUTES

The Genesee County Hazard Mitigation Plan Review Committee met at 1:30 p.m. on Thursday, November 12, 2020, in a Zoom meeting conference call format due to Coronavirus concerns.

I. WELCOME/INTRODUCTIONS

Jeff Wilson opened the meeting at 1:31 p.m.

Jeff Wilson thanked everyone for attending and thanked Cody for all that he's done to get the Hazard Mitigation Plan Review going.

Cody Roblyer started everyone off in introducing themselves.

Jeff Wilson introduced himself and stated he has had the opportunity to work with the majority of everyone on this committee at some time or another.

Present: David Benn, Ed Blight, Robert Burdette, Suzanne Cupal, Carrie Edwards-Clemons, Melissa Hayduk, Chris Metropoulos, Sheila Taylor, Dave Thibeault, Bruce Trevithick, Mike Vogt, Ron Wiles, and Jeff Wilson.

Absent/Excused: Megan Siemiantkowski, John Stewart, and Spring Tremaine.

Others present: Katie Mehl, Cody Roblyer, and Debby Compton.

II. COMMITTEE ELECTION OF OFFICERS

Jeff Wilson advised that he reached out to committee members regarding Election of Officers. Mike Vogt accepted the nomination of Chairperson and Jeff stated he will be vice-chair when Mike is not able to attend the meetings.
Motion: Action: Approved, Moved by Sheila Taylor, Supported by Ed Blight, to approve Mike Vogt as Chairperson and Jeff Wilson as the Vice-Chair.

Motion carried unanimously.

III. OVERVIEW OF HAZARD MITIGATION PLAN UPDATE PROCESS

Cody Roblyer discussed why everyone is here, what the Hazard Mitigation Plan process is and what the committee members role will be in updating this plan.

Cody Roblyer and Katie Mehl presented a PowerPoint to the committee at this time.

Cody Roblyer discussed what Hazard Mitigation is, the Purpose of the Hazard Mitigation Plan, the Plan Update, the Timeline, and the Hazard Mitigation Goals.

Katie Mehl discussed what a Hazard Analysis is, why we do a Hazard Analysis, the Hazard Mitigation Matrix, Vulnerability Assessment, Mitigation Strategies, and Final Steps.

Important to Note: The Plan must be re-adopted by all local units of government (LUGs) to be eligible for federal mitigation funding.

Katie Mehl explained what each committee members role will be in updating this plan.

- Participating in the Hazard Ranking for all potential hazards that occur in Genesee County and also provide input on the Mitigation Strategies
- Encouraging the public to attend and participate in the Public Involvement opportunities
- Provide feedback on the data that is going to be incorporated into this plan
- To assist with gaining local approval of the final plan

Upcoming Public Involvement:

- Survey to Local Units of Government to gain some input from them
- Survey to residents that is tailored for input from them
- Open House to introduce Update Process to the public (virtual)

The Public Involvement steps will be completed before the next committee meeting.

Suzanne Cupal, Genesee County Health Department, mentioned that the Health Department has a regular standing committee called "Our Health Threat Preparedness" that consists of community leaders from Law Enforcement, Hospital Systems as well as other participants that staff can use to get input from. This committee has done the Hazard Mitigation process before, so they are familiar with it.
(Email list can be provided to staff)

David Benn, McLaren-Flint, inquired if staff had access to qualitative assessment tools instead of the quantitative ones?

Cody Roblyer advised that if anyone has data that could be beneficial or important to this plan it would be helpful if they can to send it to staff.

Discussion ensued on what the committee's involvement will be between now and the next meeting.

Sheila Taylor advised that participating in the survey's, getting the public to attend the open house, and providing feedback to staff are things the committee will be involved in before the next meeting.

Bruce Trevithick, Genesee County Medical Control Authority, stated that he has been through a lot of these reviews in the past and this one seems very well laid out and organized. Staff is doing a great job.

IV. OTHER BUSINESS

None.

Dave Thibeault, Genesee County Water and Waste, inquired if someone can speak as to some of the mitigation that arose out of other assessments.

Cody Roblyer advised that it is those projects that purchased generators for the community, warning sirens, and changing of building codes. Staff is looking at past plans of what worked and what didn't work and what data we need.

Sheila Taylor stated that part of the survey to the LUGs is so they can provide updates to us to let us know if they have done any type of mitigation measures that we should be aware of.

Jeff Wilson inquired about efforts for all the different communities within the county to do a presentation of what is going on in their community and to present their needs.

Cody Roblyer stated that the Open House is for the communities to attend and get information and talk about things. Staff will be in contact with the communities through the surveys.

Sheila Taylor explained to the committee that the LUGs had to submit a letter of interest before this process began so they are aware of this.

Cody Roblyer stated that the plan is to have a profile for each LUG in the county that will include their social economic data as well as their needs.

Katie Mehl stated that in reviewing the last plan almost every community submitted multiple mitigation strategies and information, so that shows the surveys do their job in getting information out of everyone.

V. NEXT METTING – FEBRUARY 11, 2021 @ 1:30 P.M.
Debby will send the committee member contact list to the group.

Jeff Wilson adjourned the meeting at 2:04 p.m.

Respectfully submitted,
Debby Compton, Secretary
Genesee County Metropolitan Planning Commission

Genesee-Lapeer-Shiawassee Region V Planning and Development Commission

ROOM 111 – 1101 BEACH STREET FLINT, MICHIGAN 48502-1470
TELEPHONE (810) 257-3010 FAX (810) 257-3185

DEREK BRADSHAW
FISCAL OFFICER

GENESEE COUNTY HAZARD MITIGATION PLAN REVIEW COMMITTEE
Thursday, February 11, 2021
1:30 P.M.

Zoom Meeting
Dial-in Number: (312) 626-6799
Participant Code: 938 3002 6146#

AGENDA

I. Rollcall

II. Goals and Objectives

III. Survey Results

IV. Hazard Ranking Assessment

V. Other Business
   a. Project Request Form

VI. Next Meeting – June 10, 2021 1:30 P.M.

GENESEE COUNTY HAZARD MITIGATION PLAN REVIEW COMMITTEE
Thursday, February 11, 2021, 1:30 p.m.

MINUTES

The Genesee County Hazard Mitigation Plan Review Committee met at 1:30 p.m. on Thursday, February 11, 2021, in a Zoom meeting conference call format due to Coronavirus concerns.

Chairperson Vogt called the meeting to order at 1:36 p.m.

I. ROLL CALL

Present: David Benn (Flint-Genesee County), Carrie Edwards-Clemons (Flint-Genesee County), Melissa Hayduk (Flint-Genesee County), Chris Metropoulos (Flint-Genesee County), Sheila Taylor (Flint-Genesee County), Spring Tremaine (Fenton Twp.-Genesee County), Bruce Trevithick (Flint-Genesee County), and Mike Vogt (City of Burton-Genesee County).

Absent/Excused: Ed Blight, Robert Burdette, Suzanne Cupal, Megan Siemiantkowski, John Stewart, Dave Thibeault, Ron Wiles, and Jeff Wilson.

Others Present: Cody Roblyer (Flint-Genesee County), and Debby Compton (Flint-Genesee County).

II. GOALS AND OBJECTIVES

Cody Roblyer advised that the goals and objectives that are currently in the Hazard Mitigation Plan were originally developed in 2006 during the creation of Genesee County's first Hazard Mitigation Plan and they are basically developed based on federal and state guidelines as well as input from the public and key stakeholders at that time. During the last plan update that took place in 2014 these same goals and objectives were reviewed and reaffirmed during that update process. Once again, staff is recommending the committee reaffirm the existing goals and objectives since they continue to align with the scope of Genesee County's Hazard Mitigation Plan as well as federal and state guidelines.

Motion: Action: Approve, Moved by Bruce Trevithick, Supported by Sheila Taylor, to reaffirm the existing goals and objectives as presented.

Motion carried unanimously

III. SURVEY RESULTS

Cody Roblyer stated that in January staff conducted two separate surveys to collect input from both the public and local officials. Staff received sixty-one responses from the public surveys. At the time of sending out this memo staff had twenty-six responses from the local units, since then staff has received a few more. Overall, the public and local officials had similar thoughts about the hazards that have the potential to affect Genesee County. The top five hazards were reviewed with the committee as well as a Hazard Mitigation survey results graph. Discussion ensued.

IV. HAZARD RANKING ASSESSMENT

Cody Roblyer advised that this is one of the main reasons we are meeting today. Mr. Roblyer explained the hazard ranking matrix that the committee will complete together. Each hazard will be scored on a scale of 1 to 5 based on the six variables noted below. Once the hazard ranking assessment is complete, staff will then calculate the new hazards based on the committee's input. The committee will then need to take action to approve the new hazard rankings to be included in the Hazard Mitigation Plan update.

The Hazard Ranking Assessment follows:

Civil Disturbance
Potential to Occur: 4
Frequency of Occurrence: 4
Ability of Community to Mitigate: 2
Number of People Affected: 2
Economic Impact: 3
Deaths: 2

Dam Failure
Potential to Occur: 5
Frequency of Occurrence: 0
Ability of Community to Mitigate: 2
Number of People Affected: 4
Economic Impact: 4
Deaths: 1

Drought
Potential to Occur: 3
Frequency of Occurrence: 2
Ability of the Community to Mitigate: 1
Number of People Affected: 2
Economic Impact: 1
Deaths: 0

Earthquakes
Potential to Occur: 0
Frequency of Occurrence: 0
Ability of Community to Mitigate: 0
Number of People Affected: 0
Economic Impact: 0
Deaths: 0

Extreme Temps
Potential to Occur: 5
Frequency of Occurrence: 3
Ability of Community to Mitigate: 3
Number of People Affected: 4
Economic Impact: 2
Deaths: 1

Haz Materials Incidents (Fixed Site)
Potential to Occur: 4
Frequency of Occurrence: 1
Ability of Community to Mitigate: 4
Number of People Affected: 1
Economic Impact: 2
Deaths: 1

Haz Materials Incidents (Transportation)
Potential to Occur: 5
Frequency of Occurrence: 4
Ability of Community to Mitigate: 4
Number of People Affected: 1
Economic Impact: 2
Deaths: 1

Inclement Weather
Potential to Occur: 5
Frequency of Occurrence: 5
Ability of Community to Mitigate: 3
Number of People Affected: 2
Economic Impact: 1
Deaths: 1

Infrastructure Failure
Potential to Occur: 5
Frequency of Occurrence: 4
Ability of Community to Mitigate: 4
Number of People Affected: 4
Economic Impact: 5
Deaths: 2

Nuclear Attack
Potential to Occur: 1
Frequency of Occurrence: 0
Ability of Community to Mitigate: 0
Number of People Affected: 5
Economic Impact: 5
Deaths: 5

Nuclear Power Plant Accidents
Potential to Occur: 0
Frequency of Occurrence: 0
Ability of Community to Mitigate: 0
Number of People Affected: 1
Economic Impact: 2
Deaths: 1

Public Health Emergency
Potential to Occur: 5
Frequency of Occurrence: 2
Ability of Community to Mitigate: 1
Number of People Affected: 5
Economic Impact: 4
Deaths: 2

Scrape Tire Fires
Potential to Occur: 3
Frequency of Occurrence: 1
Ability of Community to Mitigate: 2
Number of People Affected: 3
Economic Impact: 0
Deaths: 0

Structure Fires
Potential to Occur: 5
Frequency of Occurrence: 5
Ability of Community to Mitigate: 4
Number of People Affected: 1
Economic Impact: 2
Deaths: 2

*Terrorism/Cyber Attack *
Potential to Occur: 5
Frequency of Occurrence: 4
Ability of Community to Mitigate: 3
Number of People Affected: 4
Economic Impact: 4
Deaths: 1

Transportation Accidents
Potential to Occur: 4
Frequency of Occurrence: 2
Ability of Community to Mitigate: 1
Number of People Affected: 1
Economic Impact: 1
Deaths: 1

Oil/Natural Gas Lines
Potential to Occur: 3
Frequency of Occurrence: 3
Ability of Community to Mitigate: 1
Number of People Affected: 1
Economic Impact: 2
Deaths: 1

Flooding
Potential to Occur: 5
Frequency of Occurrence: 4
Ability of Community to Mitigate: 3
Number of People Affected: 4
Economic Impact: 4
Deaths: 1

Snow/Ice Storms
Potential to Occur: 5
Frequency of Occurrence: 4
Ability of Community to Mitigate: 2
Number of People Affected: 4
Economic Impact: 1
Deaths: 1

Subsidence (Sinkholes)
Potential to Occur: 1
Frequency of Occurrence: 0
Ability of Community to Mitigate: 0
Number of People Affected: 0
Economic Impact: 1
Deaths: 0

Tornadoes
Potential to Occur: 5
Frequency of Occurrence: 4
Ability of Community to Mitigate: 1
Number of People Affected: 3
Economic Impact: 3
Deaths: 1

Wildfires
Potential to Occur: 1
Frequency of Occurrence: 0
Ability of Community to Mitigate: 3
Number of People Affected: 0
Economic Impact: 0
Deaths: 0

Final Hazard Rankings	
Hazard	Final Ranking
Infrastructure Failure	1
Riverine Flooding	2
Terrorism	2
Structure Fire	3
Inclement Weather	4
Extreme Temperatures	5
Hazardous Materials Incidents (Transportation)	5
Snow and Ice Storms	6
Public Health Emergencies	7
Tornadoes	8
Civil Disturbances	9
Dam Failure	10
Hazardous Materials Incidents (Fixed Sites)	11
Oil or Natural Gas Well/Pipeline Accidents	12
Transportation Accidents (Bus, Plane, Train)	13
Drought	14
Scrap Tire Fires	14
Nuclear Attack	15
Wildfires	16
Nuclear Power Plant Accidents	17
Subsidence (Sinkholes)	18
Earthquakes	19

Motion: Action: Approve, Moved by David Benn, Supported by Chris Metropoulos, to approve the new Hazard Ranking Assessments.

Motion carried unanimously

V. OTHER BUINESS

a. PROJECT REQUEST FORM

Cody Roblyer advised that the Project Request Form will go out to the local units of government to be filled out regarding any potential hazard mitigation related projects that they are wanting to do over the next five years.

VI. NEXT MEETING – JUNE 10, 2021 @ 1:30 P.M.

Cody Roblyer stated that the date for the next meeting was pushed back a month so staff would have time to finish the draft and have public comment period. Staff plans to send the draft in May to the committee to review and provide comment and approval.

Motion: Action: Approve, Moved by Sheila Taylor, Supported by David Benn, to approve the adjournment of this meeting.

Chairperson Vogt adjourned the meeting at 3:01 p.m.

Respectfully submitted,
Debby Compton, Secretary
Genesee County Metropolitan Planning Commission

Genesee-Lapeer-Shiawassee
Region V Planning and Development Commission
Room 111– 1101 Beach Street
Flint, Michigan 48502-1470
(810) 257-3010

DEREK BRADSHAW
FISCAL OFFICER

GENESEE COUNTY HAZARD MITIGATION PLAN REVIEW COMMITTEE
Thursday, June 10, 2021
1:30 P.M.

Zoom Meeting

https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09
Dial-in Number: (312) 626-6799
Participant Code: 938 3002 6146#

AGENDA

I. Roll Call

II. Draft Plan Presentation and Approval

III. Next Steps

GENESEE COUNTY HAZARD MITIGATION PLAN REVIEW COMMITTEE
Thursday, June 10, 2021, 1:30 p.m.

MINUTES

The Genesee County Hazard Mitigation Plan Review Committee met at 1:30 p.m. on Thursday, June 10, 2021, in a Zoom meeting conference call format due to Coronavirus concerns.

Acting Chairperson Chris Metropoulos called the meeting to order at 1:30 p.m.

I. ROLL CALL

Present: Ed Blight (Mundy Twp-Genesee County), Robert Burdette (Grand Blanc Twp-Genesee County), Carrie Edwards-Clemons (Flint-Genesee County), Chris Metropoulos (Flint-Genesee County), Sheila Taylor (Flint-Genesee County), Spring Tremaine (Flint Twp-Genesee County), and Bruce Trevithick (Flint-Genesee County).

Absent/Excused: David Benn, Suzanne Cupal, Melissa Hayduk, Megan Siemiantkowski, John Stewart, Dave Thibeault, Mike Vogt, Ron Wiles, and Jeff Wilson.

Others Present: Cody Roblyer (Flint-Genesee County).

II. DRAFT PLAN PRESENTATION AND APPROVAL

Cody Roblyer gave a presentation summarizing the purpose and process for updating the Genesee County Hazard Mitigation Plan. A Hazard Mitigation Plan must be in place and adopted by local units of government in order to receive funding from FEMA for hazard mitigation projects. Staff performed an extensive update of the previous plan, which included incorporating current data, requesting input from local officials and the public, and gathering updated mitigation projects from municipalities. The plan's goals and objectives were reviewed and reaffirmed, all hazards were re-ranked, and the action plan was updated with revised mitigation strategies and new mitigation projects. Staff received some minor comments regarding the draft plan, which were data updates or grammatical corrections. Although the public comment period ends July 18th, staff does not anticipate receiving a comment that would result in a substantial change to the document. In that situation, a special meeting of this committee would be called.

Motion: Action: Approve, Moved by Ed Blight, Supported by Robert Burdette, to approve the draft Genesee County Hazard Mitigation Plan Update.

Motion carried unanimously.

III. NEXT STEPS

Cody Roblyer explained that once the public comment period ends on June 18th, the plan will be finalized and sent to the Michigan State Police (MSP) for review and feedback, followed by submission to FEMA for review and approval. Next, the plan will be provided the County Board and all Genesee County local units for adoption. Local units must adopt the plan to be eligible to receive FEMA funding. The last step will be incorporating the local approvals into the plan and providing copies to the State and FEMA. Sheila Taylor stated that staff contacted other counties and regions to get feedback on the comments they had received from FEMA and addressed those items while preparing our plan. Staff does not anticipate that FEMA will request a substantial change, but if so, then this committee will be reconvened.

Sheila Taylor stated that Cody will continue to work with Lapeer County on their plan update, which will go through public comment next month. Sheila Taylor thanked the Committee members for their participation.

Acting Chairperson Chris Metropoulos adjourned the meeting at 1:55 p.m.

Respectfully submitted,
Nichole Odette, Program Services Specialist
Genesee County Metropolitan Planning Commission

Improving Communities/Housing
Environmental
Transportation
Documents & Public Notices
Document Library
Public Notices
Reports & Data
County Long Range Plan

CONTACT OUR STAFF

OUR STAFF

QUICK LINK

COMMITTEE MEETINGS

REPORTS & DATA

PUBLIC NOTICES

11
Jan

Genesee and Lapeer Counties are updating their Hazard Mitigation Plans and would like the input of citizens and community organizations in this process. The plan identifies potential disasters that could impact your community. The goal of this survey is to determine what is important to each community and to get the public's perspective on hazard mitigation. The responses will be compiled and included in the community portion of the plan updates. To take the survey online, go to: https://www.surveymonkey.com/r/HazMitPublicSurvey. Please complete the survey by 5PM on Wednesday, January 27th.

If you would like a paper copy of the survey, please send a request to Debby Compton at dcompton@geneseecountymi.gov or by calling 810-257-3010.

A virtual open house will also be held on Tuesday, January 26th from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about hazards in Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom Meeting on Tuesday, January 26th from 11:30AM – 12:30PM
https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

GLS Region V will furnish reasonable auxiliary aids and services to individuals with disabilities upon request. Individuals with disabilities requiring auxiliary aids for services should contact Debby Compton using the information provided below or by calling the Michigan Relay Center: 1-800-649-3777 or 711.

Debby Compton, Secretary
Genesee County Metropolitan Planning Commission
1101 Beach Street, Room 111
Flint, MI 48502
(810) 257-3010
dcompton@geneseecountymi.gov
"An Equal Opportunity Organization"

SITE MAP

11
Jan

GENESEE & LAPEER COUNTIES HAZARD MITIGATION PUBLIC SURVEY AND VIRTUAL OPEN HOUSE

Genesee and Lapeer Counties are updating their Hazard Mitigation Plans and would like the input of citizens and community organizations in this process. The plan identifies potential disasters that could impact your community. The goal of this survey is to determine what is important to each community and to get the public's perspective on hazard [...]

January 11, 2021

Read More >

STATE OF MICHIGAN)
County of Genesee ss Dawn Suttorp

Being duly sworn deposes and say he/she is Principal Clerk of

THE FLINT JOURNAL
DAILY EDITION

a newspaper published and circulated in the County of Genesee and otherwise qualified according to Supreme Court Rule; and that the annexed notice, taken from said paper, has been duly published in said paper on the following day(days)

January 17 A.D. 20 21

Sworn to and subscribed before me this 19th day of January 20 21

Teasha R. Payne

TEASHA R. PAYNE
NOTARY PUBLIC, STATE OF MI
COUNTY OF MECOSTA
COMMISSION EXP FEB 24 2026
ACTING IN COUNTY OF Kent

Virtual Public Meeting Announcement for Genesee and Lapeer County Residents

The GLS Region V Planning and Development Commission, in cooperation with the Offices of the Genesee County Sheriff's Emergency Management and Homeland Security Division and the Lapeer County Department of Emergency Management, is developing an updated version of its Hazard Mitigation Plans for Genesee and Lapeer Counties. Each county must have an approved hazard mitigation plan to be eligible for federal hazard mitigation project funding.

A virtual open house will be held on Tuesday, January 26, 2021 from 11:30 a.m. to 12:30 p.m. which will provide an opportunity to share your thoughts and receive answers to your questions about hazards in Genesee and Lapeer Counties. A quick survey is also available to the public to provide input if unable to attend the virtual meeting. To join the virtual public meeting or to share your thoughts through a survey, please contact:

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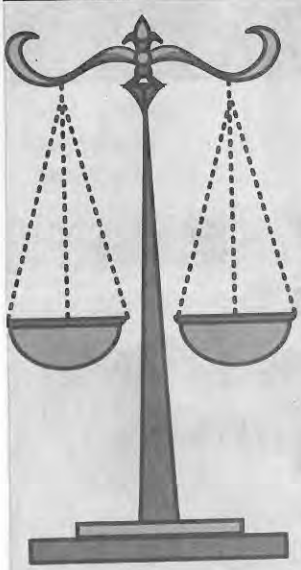
RECEIVED
GENESEE COUNTY
JAN 22 2021
METROPOLITAN
PLANNING COMMISSION

UBLICATION OF NOTICE OF EARING
ILE NO. 21-054304-NC(M)
TATE OF MICHIGAN, PROBATE OURT, COUNTY OF LAPEER
the matter of the name change f Herbert Oliver Raby
O ALL PERSON, including: whose ddress is unknown and whose nterest in the matter may be arred or affected by the following: AKE NOTICE: A hearing will be held n February 23, 2021 at 9:00am y Zoom before Judge Hodges for he following purpose:the name hange of Herbert Oliver Raby to lerbert Oliver Stables

lerbert Oliver Raby, Petioner, 1783 North Branch Rd, North ranch, MI 48461 810-441-4091



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LAPEER COUNTY DRAIN COMMISSIONER
BURKE DRAIN
NOTICE OF LETTING

lanuary 20, 2021

rkhill.zoom.us/j/99255043057
d2VXIFM2VvbVQxdz09
9
7 (if required)
uired)
1

will be held remotely
2020.

Drain Commissioner, will the Burke Drain at the above-ation. Bids will then be opened construction of said Drain, the er of work will be required, and

trol Measures as needed, DPE pipe with 12" concrete end ish and install MH#1, Furnish

an appointment for a specific time on the Day of Review. The computation of costs for the Drain will also be available at the Day of Review. Drain assessments are collected in the same manner as property taxes and will appear on your winter tax bill. If drain assessments are being collected for more than one (1) year, you may pay the assessment in full with any interest to date at any time and avoid further interest charges.

Persons with disabilities needing accommodations for effective participation in the Day of Review should contact the Drain Commissioner's Office at the phone number listed above (voice) or through the Michigan Relay Center at 7-1-1 (TDD) at least 24 hours in advance of the Day of Review to request mobility, visual, hearing or other assistance.

You may appeal the Drain Commissioner's decision to revise the district boundary to the Lapeer County Circuit Court within ten (10) days, and you may also appeal the determination of apportionments to the Lapeer County Probate Court within ten (10) days.

The following is a description of the several tracts or parcels of lands constituting the proposed revised Special Assessment

Post Engagements ▲119%

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Finish setting up your Page so people on Facebook know you're a credible business.

10 of 13 steps completed

COMPLETED
Establish Your Page's Identity

2 STEPS LEFT
Provide Info and Preferences

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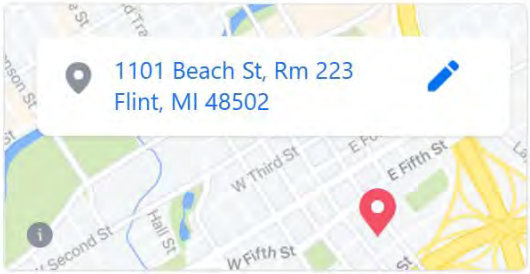
Introduce Your Page

About



Promote your business locally to lead

Genesee County Metropolitan Planning Commission
Published by David Yeoman · 17m ·

Although the past year has been filled with many unexpected events, you can help Genesee and Lapeer Counties develop a plan to prepare for future natural and man-made disasters by taking our quick 5-minute survey: https://www.surveymonkey.com/r/HazMitPublicSurvey.

A virtual open house will also be held on Tuesday, January 26th from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about hazards in Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom Meeting on Tuesday, January 26th from 11:30AM – 12:30PM
https://geneseecountymi.zoom.us/j/93830026146...

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

Hazard Mitigation Virtual Open House Attendee List – January 26, 2021

Chad Young – Mundy Township – Township Manager)

Chris Metropoulos – Genesee County Sheriff Department/Emergency Management

Cody Roblyer – Genesee County Metropolitan Planning Commission

Dan Eashoo – Genesee Township (Supervisor)

Debby Compton – Genesee County Metropolitan Planning Commision

Ed Blight – Mundy Township (Fire Chief)

Jeff Wilson – Genesee County Sheriff Department/Emergency Management (Emergency Manager)

Mark Adas – City of Flint (City Engineer)

Mary Piorunek – Lapeer County Emergency Management (Emergency Manager)

Mellissa Hayduk – Genesee County Equalization (Director)

Michael Bryant – Member of the public

Sheila Taylor – Genesee County Metropolitan Planning Commission

Thomas Spillane – Clayton Township (Supervisor)

Tonya Ketzler – Mundy Township (Supervisor)

Travis Howell – Member of the public

Welcome!

VIRTUAL OPEN HOUSE: GENESEE AND LAPEER COUNTY HAZARD MITIGATION PLANS

Please put comments or questions in the chat box at the bottom! We will address them one at a time.

Or take our quick survey
https://www.surveymonkey.com/r/HazMitPublicSurvey
(link also in the chat box).

Thank you!

Hazard Mitigation Goals & Objectives for Genesee County

Goals

- Prevent loss of life
- Improve response and recovery for man-made and natural disasters
- Enhance early warning systems
- Maintain essential public services
- Enhance public awareness
- Protect public health, welfare, and safety
- Reduce losses from man-made and natural disasters
- Protect the environment
- Provide resources for effective mitigation of hazardous materials incidents

Objectives

- Amend zoning to limit new development in flood plains
- Enhance coordination between response agencies
- Increase warning siren coverage and weather radio
- Provide resources to ensure provision of essential services
- Provide opportunity for public education
- Provide additional storm shelters
- Moving existing homes
- Enhance early warning systems and education for all hazards
- Enhance warning systems and notifications for special populations

Hazard Mitigation Goals & Objectives for Lapeer County

Goals

- Reduce losses from man-made and natural disasters
- Improve response to and recovery from man-made and natural hazards
- Enhance early warning notification system (i.e. Nixle/Alert Lapeer County)
- Promote additional alert and notification systems (i.e. American Red Cross tornado app)
- Maintain essential public services during and after a disaster
- Enhance public education/awareness with an emphasis on natural disasters (i.e. flooding and severe weather)
- Protect public health, welfare, and safety

Objectives

- Amend zoning to limit new development in flood plains
- Increase warning siren coverage and NOAA Radio use
- Provide resources to ensure provision of essential services
- Provide opportunity for public education

Hazards Ranking for Genesee County

(to be updated 2-11-21)

Ranking (Most Severe to Least Severe)

1. Inclement Weather (Thunderstorms, Hail, Lighting, and Severe Winds) – Rank 1
2. Structural Fires – Rank 2
3. Riverine Flooding (Watershed, Reivers, Creeks, etc.) – Rank 3
4. Extreme Temperatures (Hot and Cold) – Rank 4
5. Hazardous Materials Incidents (Transportation) – Rank 4
6. Public Health Emergencies – Rank 5
7. Dam Failure – Rank 6
8. Tornadoes – Rank 7
9. Terrorism – Rank 7
10. Hazardous Materials Incidents (Fixed Site) – Rank 8
11. Civil Disturbances – Rank 9
12. Infrastructure Failure – Rank 9
13. Oil or Natural Gas Well Accidents – Rank 10
14. Snow and Ice Storms – Rank 11
15. Major Transportation Accidents (Bus, Airplane, and Trains) – Rank 12
16. Drought – Rank 13
17. Nuclear Attack – Rank 14
18. Scrap Tire Fires – Rank 15
19. Wildfires – Rank 16
20. Earthquakes – Rank 17
21. Nuclear Power Plant Accidents – Rank 18
22. Subsidence (Sinkholes) – Rank 19

Hazards Ranking for Lapeer County

(updated 1-13-21)

Ranking (Most Severe to Least Severe)

1. Snow and Ice Storms – Rank 1
2. Structural Fires – Rank 2
3. Infrastructure Failure – Rank 3
4. Riverine Flooding (Watershed, Reivers, Creeks, etc.) – Rank 3
5. Tornadoes – Rank 4
6. Inclement Weather (Thunderstorms, Hail, Lighting, and Severe Winds) – Rank 5
7. Public Health Emergencies – Rank 6
8. Major Transportation Accidents (Bus, Airplane, and Trains) – Rank 7
9. Extreme Temperatures (Hot and Cold) – Rank 8
10. Hazardous Materials Incidents (Transportation) – Rank 9
11. Hazardous Materials Incidents (Fixed Site) – Rank 10
12. Dam Failure – Rank 11
13. Wildfires (includes grass fires) – Rank 11
14. Civil Disturbances – Rank 12
15. Oil or Natural Gas Well Accidents – Rank 13
16. Drought – Rank 14
17. Terrorism – Rank 14
18. Nuclear Attack – Rank 15
19. Scrap Tire Fires – Rank 16
20. Subsidence (Sinkholes) – Rank 17
21. Earthquakes – Rank 18
22. Nuclear Power Plant Accidents – Rank 19

Snow and Ice Storms

Genesee County (Rank 11)

- Average annual snowfall: 37 inches
- Average Snow/Ice Storms per year: 2.6
- Average cost per storm: $16.6 million

Lapeer County (Rank 1)

- Average annual snowfall: 40 inches
- Average Snow/Ice Storms per year: 2.3
- Average cost per storm: $4.2 million

Mitigation Strategies:

- Increased weather radio coverage
- Emergency generators for police and fire departments
- Enhance public awareness of correct safety procedures
- Shelters for mobile home communities
- Wireless emergency alerts
- Stand-by power for water plants and pump stations
- Update disaster response plan

Inclement Weather (Thunderstorms, lighting, and hail)

Genesee County (Rank 1)

- 16 thunderstorms per year
- Thunderstorms and high winds have caused about $2 million of damage annually

Lapeer County (Rank 6)

- 7.5 thunderstorms per year
- Thunderstorms and high winds have caused about $229,552 of damage annually

Mitigation Strategies:

- Increased weather radio coverage
- Emergency generators for police and fire departments
- Enhance public awareness of correct safety procedures
- Shelters for mobile home communities
- Wireless emergency alerts
- Stand-by power for water plants and pump stations
- Update disaster response plan
- Utility tree trimming program

Structural Fires

Genesee County (Rank 2)

- Over a four-year period, averaged 597 fires per year and $26.6 million worth of damage annually
- Each structure fire costs about $44,651

Lapeer County (Rank 2)

- Over a four-year period, averaged 221 fires per year and $3.5 million worth of damage annually
- Each structure fire costs about $15,793

Mitigation Strategies:

- Fire department training
- First responder training
- Update fire department equipment
- Public education on fire safety
- Enforce fire codes
- Continue mutual aid agreement

Infrastructure Failures

Genesee County (Rank 9)

- Flint Water Crisis – 9,000 children supplied lead contaminated water; 30,000 pipes contaminated
- Most common infrastructure failure is power outages

Lapeer County (Rank 3)

- Lead contamination found in some homes within local jurisdiction – lead service lines to be replaced
- Also commonly experience power outages
- Cell phone tower caught fire

Mitigation Strategies:

- Emergency generators
- Shelters
- Emergency water supply
- Public education
- Maintain trimmed trees near power lines
- Identify deficiencies in infrastructure
- Maintain/repair infrastructure
- Update disaster response plan
- Wireless emergency alerts

Extreme Temperatures

Genesee County (Rank 4)

- Record low temp: -14ºF (January 2019)
- Record high temp: 111ºF (July 1936)
- 27 extreme temperature events over past 25 years – 14 cold and 13 heat

Lapeer County (Rank 9)

- Record low temp: -26ºF (January 1984)
- Record high temp: 100ºF (June/July 1988)
- 14 extreme temperature events over past 25 years – 9 cold and 5 heat

Mitigation Strategies:

- Emergency generators
- Community shelters
- Public education
- Wireless emergency alerts

Riverine Flooding

Genesee County (Rank 3)

- 2,118 structures in floodplain
- 46 flood events since 1996
- 1.9 flood events per year
- Flood event could cause $44 million in damage

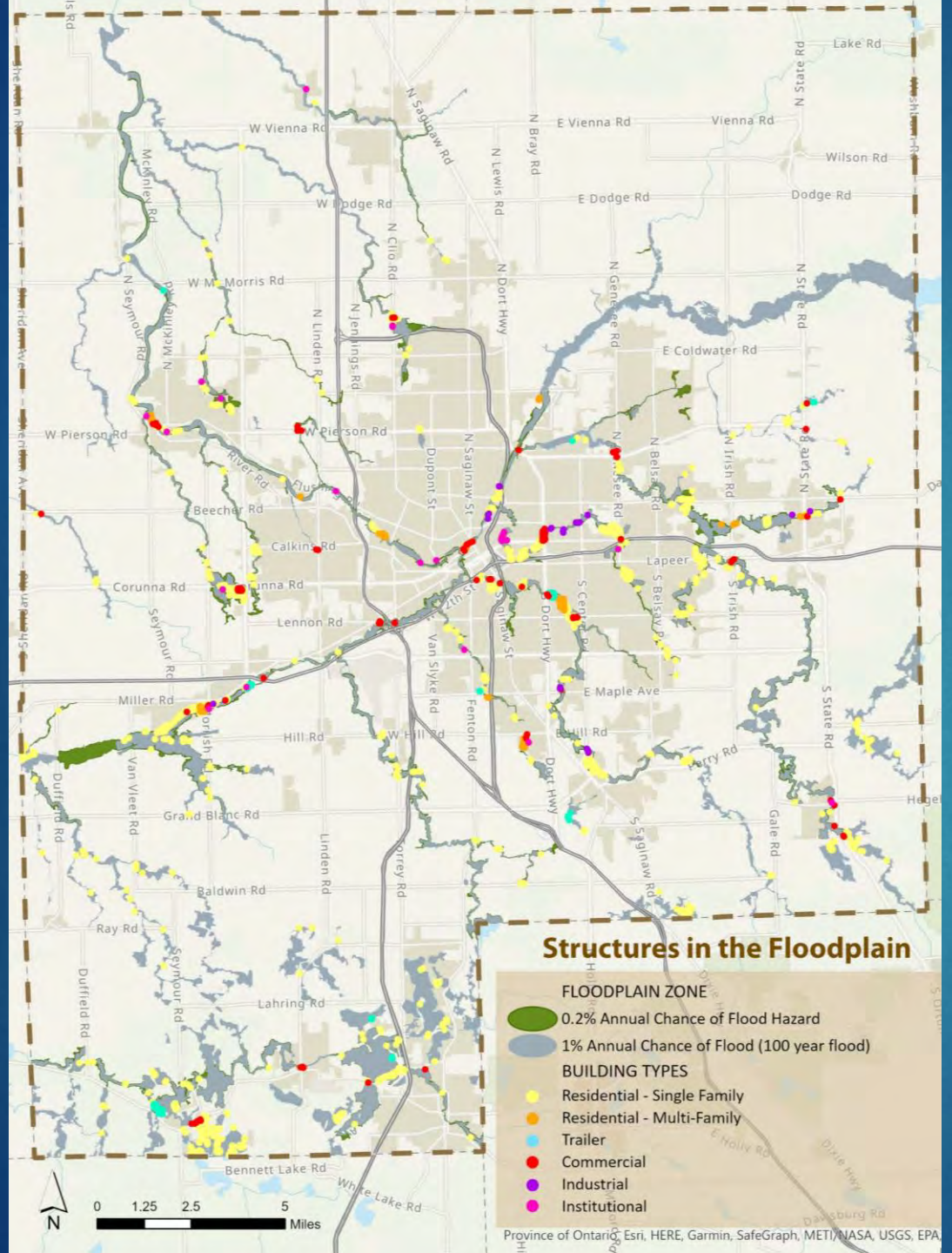
Lapeer County (Rank 4)

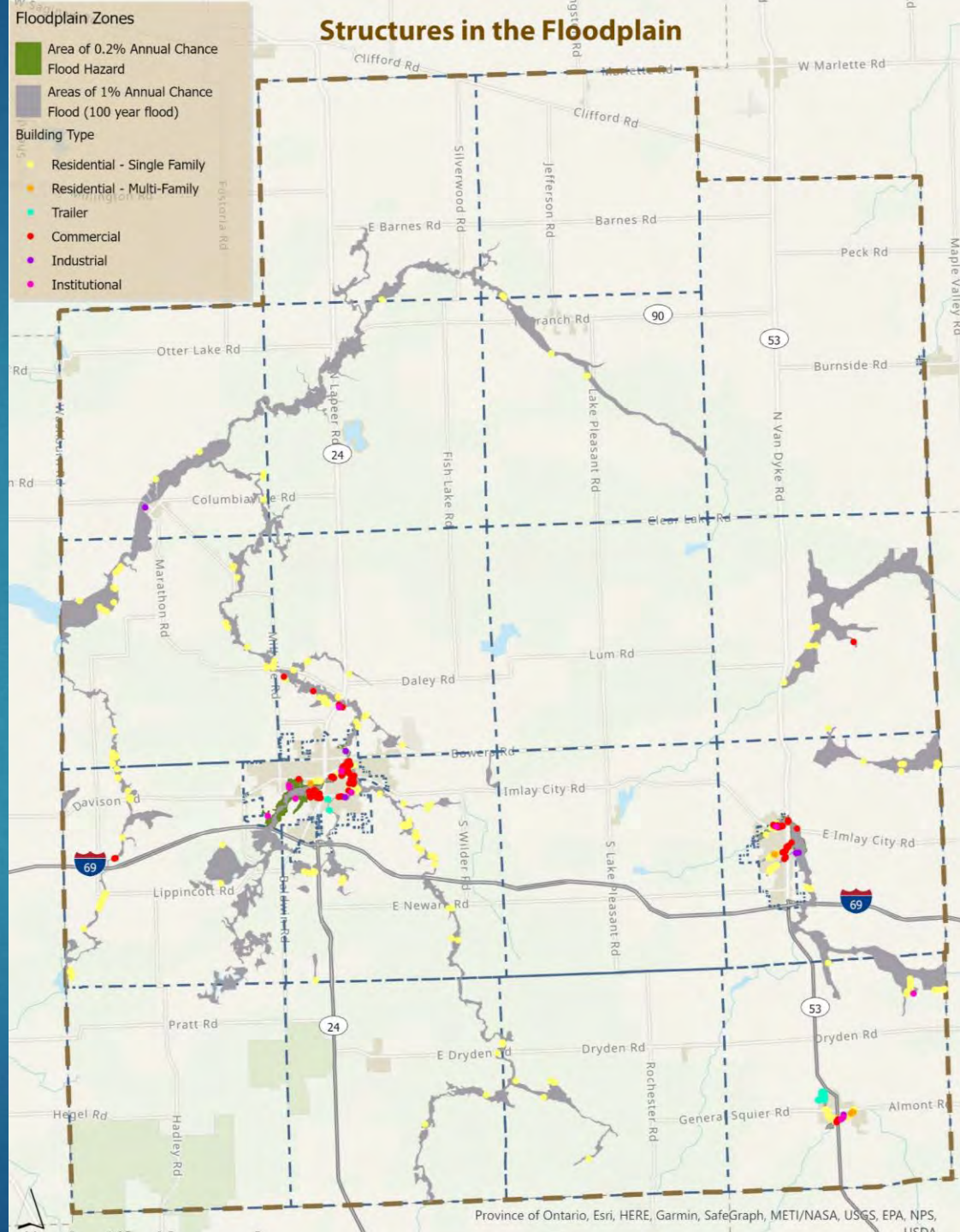
- 643 structures in floodplain
- 16 flood events since 1996
- 0.7 flood events per year
- Flood events could cause $601,250 in damage

Mitigation Strategies:

- Map floodplains
- Identify structure in the floodplain
- Enforce/adopt land use regulations
- Move mobile homes from floodplain
- Promote hazard mitigation grant opportunities to local governments
- Emergency generators
- Public education
- Update disaster response plan
- Wireless emergency alerts

Structures in the Floodplain





Hazardous Materials Incidents (Fixed Sites)

Genesee County (Rank 8)

- 56 Section 302 sites (handle hazardous materials)
- 160,590 people within 1-mile radius of sites

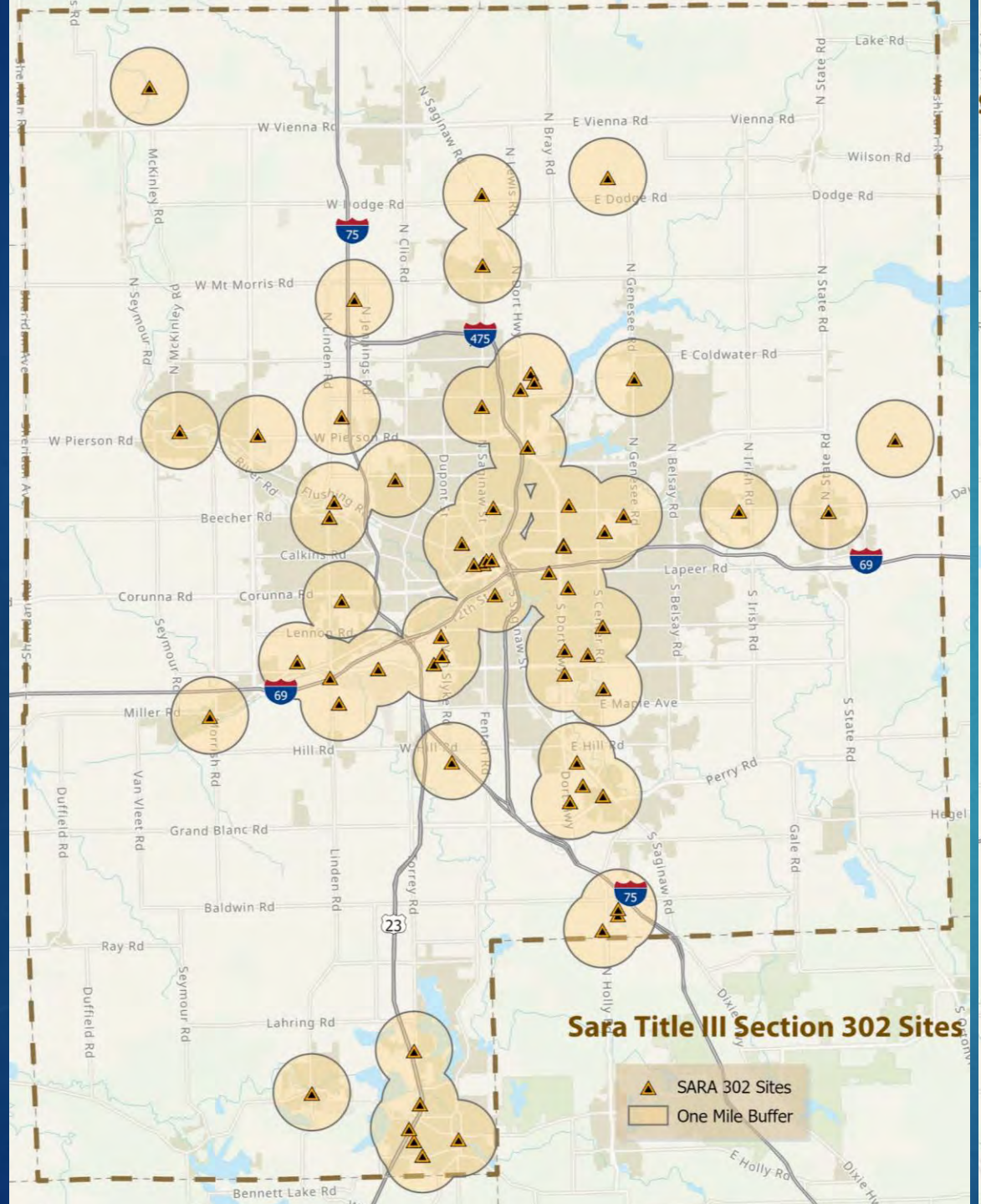
Lapeer County (Rank 10)

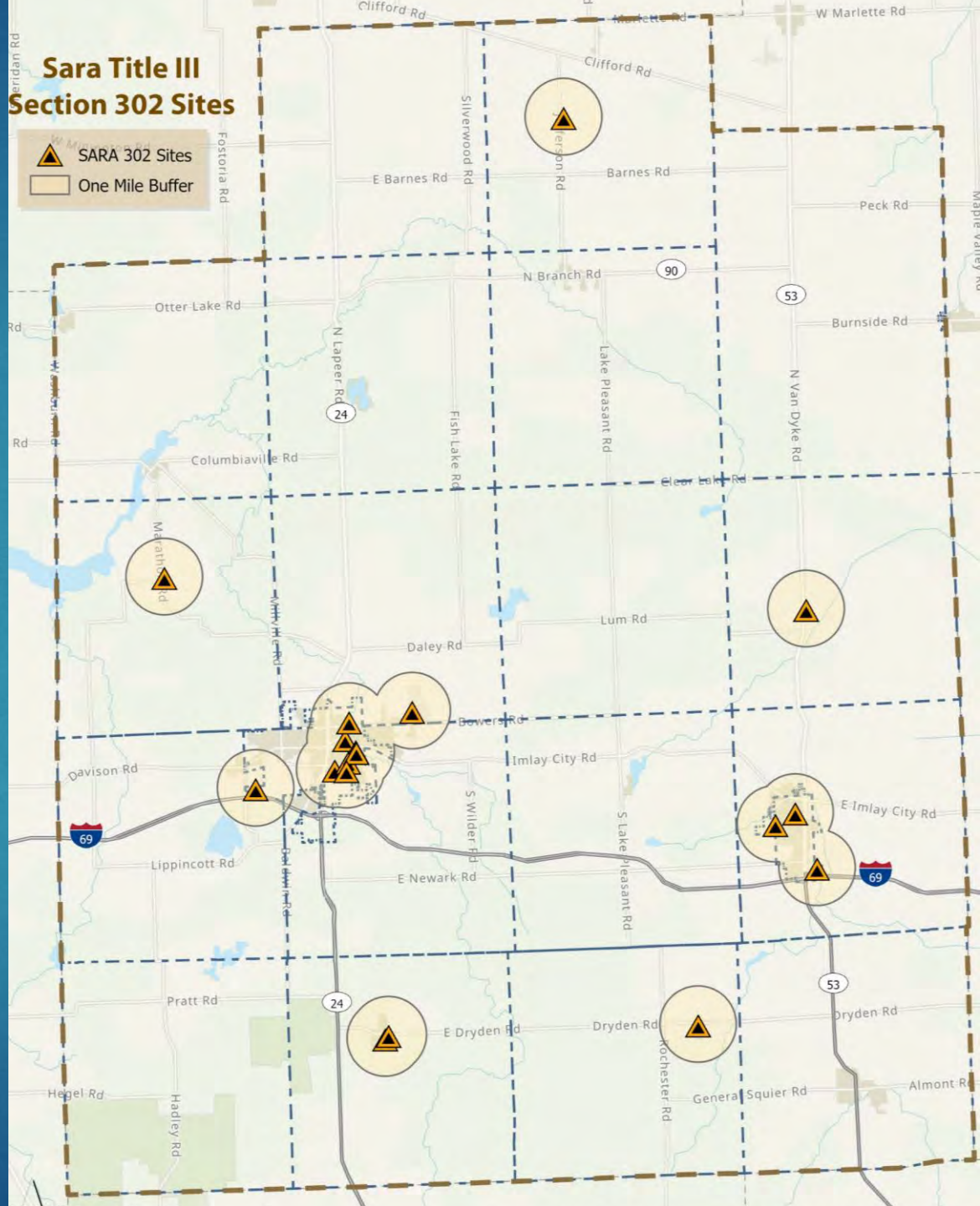
- 18 Section 302 sites (handle hazardous materials)
- 15,100 people within 1-mile radius of sites

Mitigation Strategies:

- Emergency generators
- Warning sirens
- Training for materials response team
- Adoption of hazardous spill expense recovery ordinance
- Public education
- Update disaster response plan
- Update hazardous materials inventory
- Wireless emergency alerts

Hazardous Materials Sites





Tornadoes

Genesee County (Rank 7)

- 46 tornado events since 1953
- Annual damage: $637,051
- Annual occurrence: 70%
- 118 warning sirens; 72% coverage

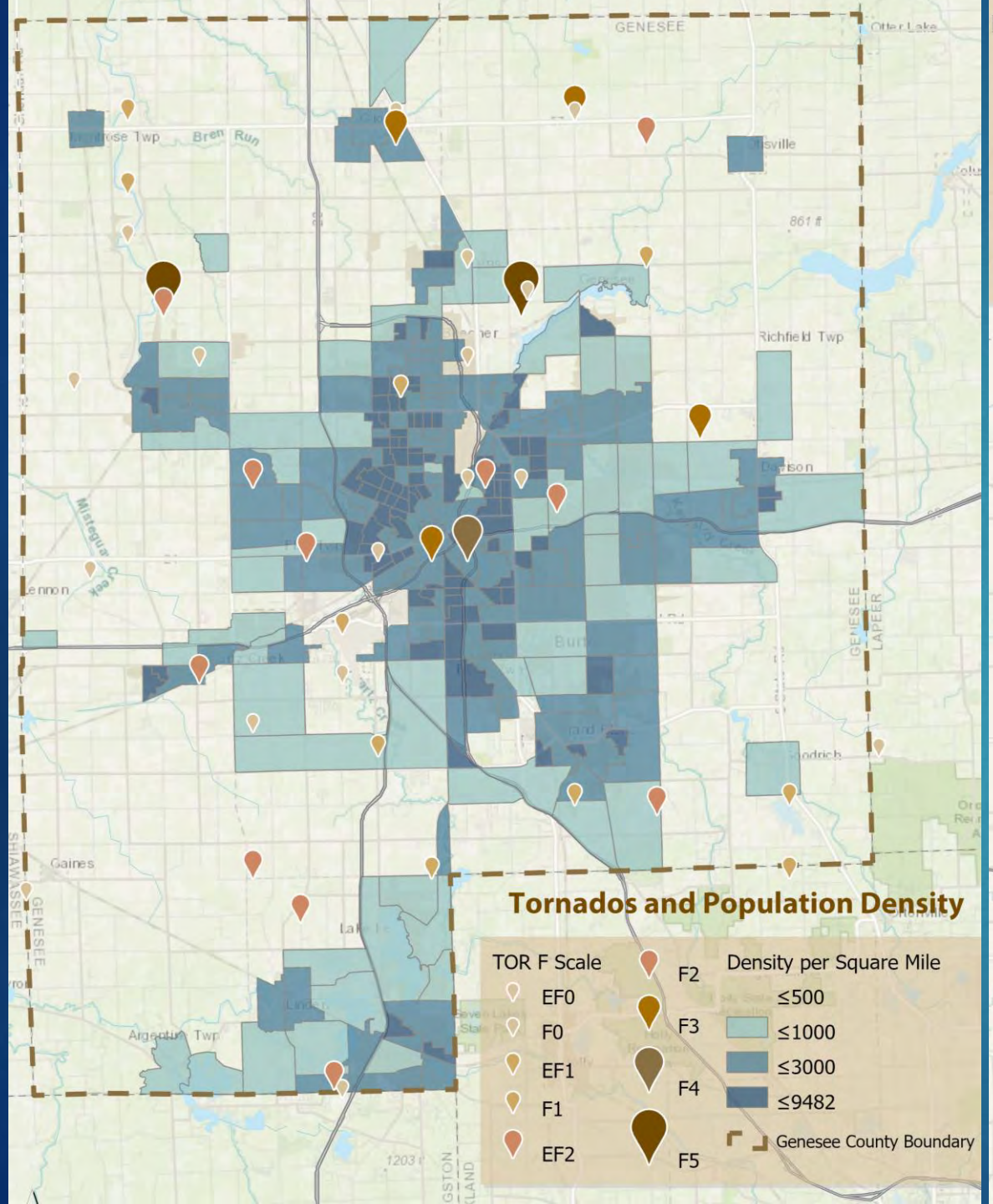
Lapeer County (Rank 4)

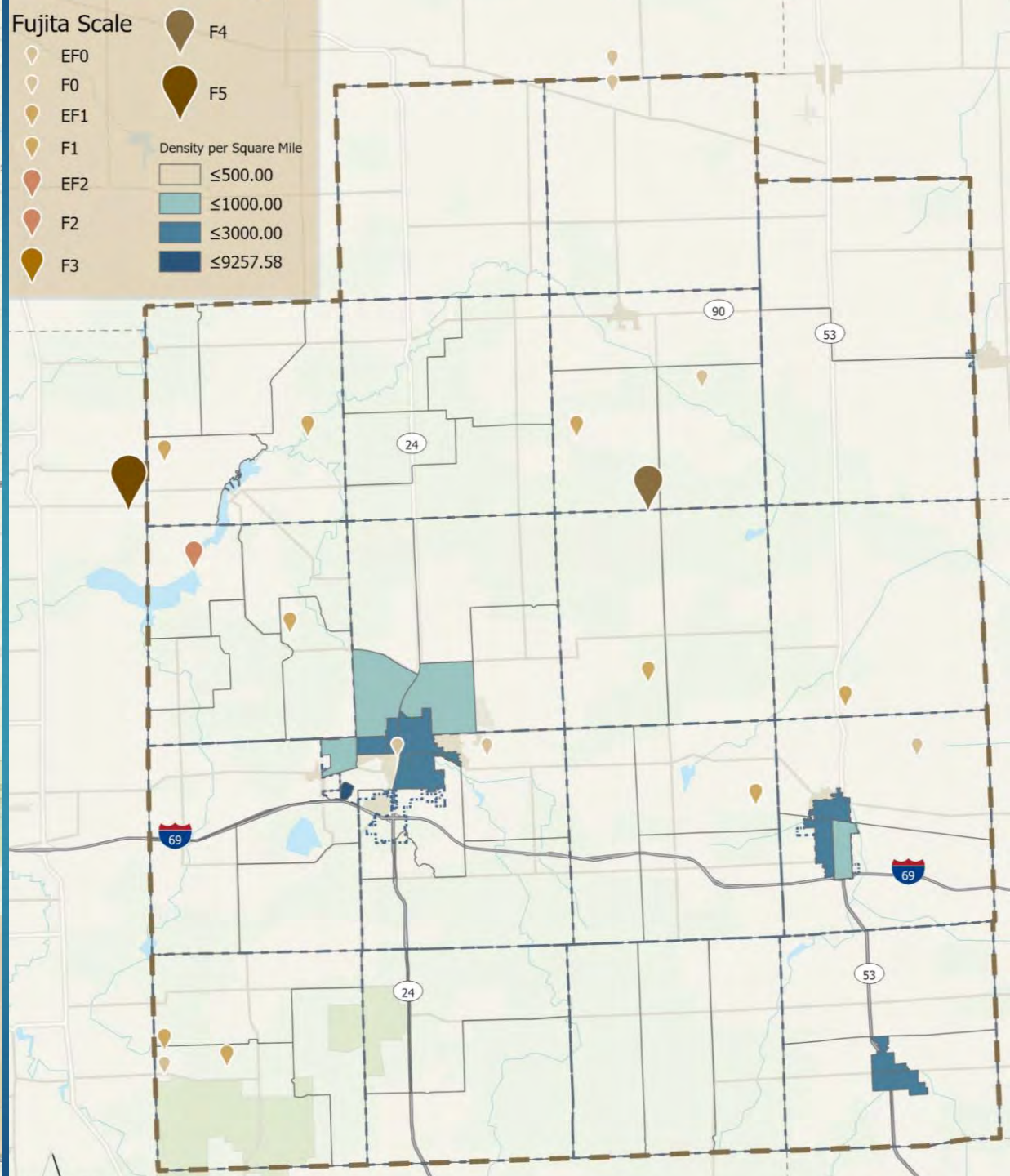
- 18 tornado events since 1951
- Annual damage: $195,538
- Annual occurrence: 26%
- 39 warning sirens; 39% coverage

Mitigation Strategies:

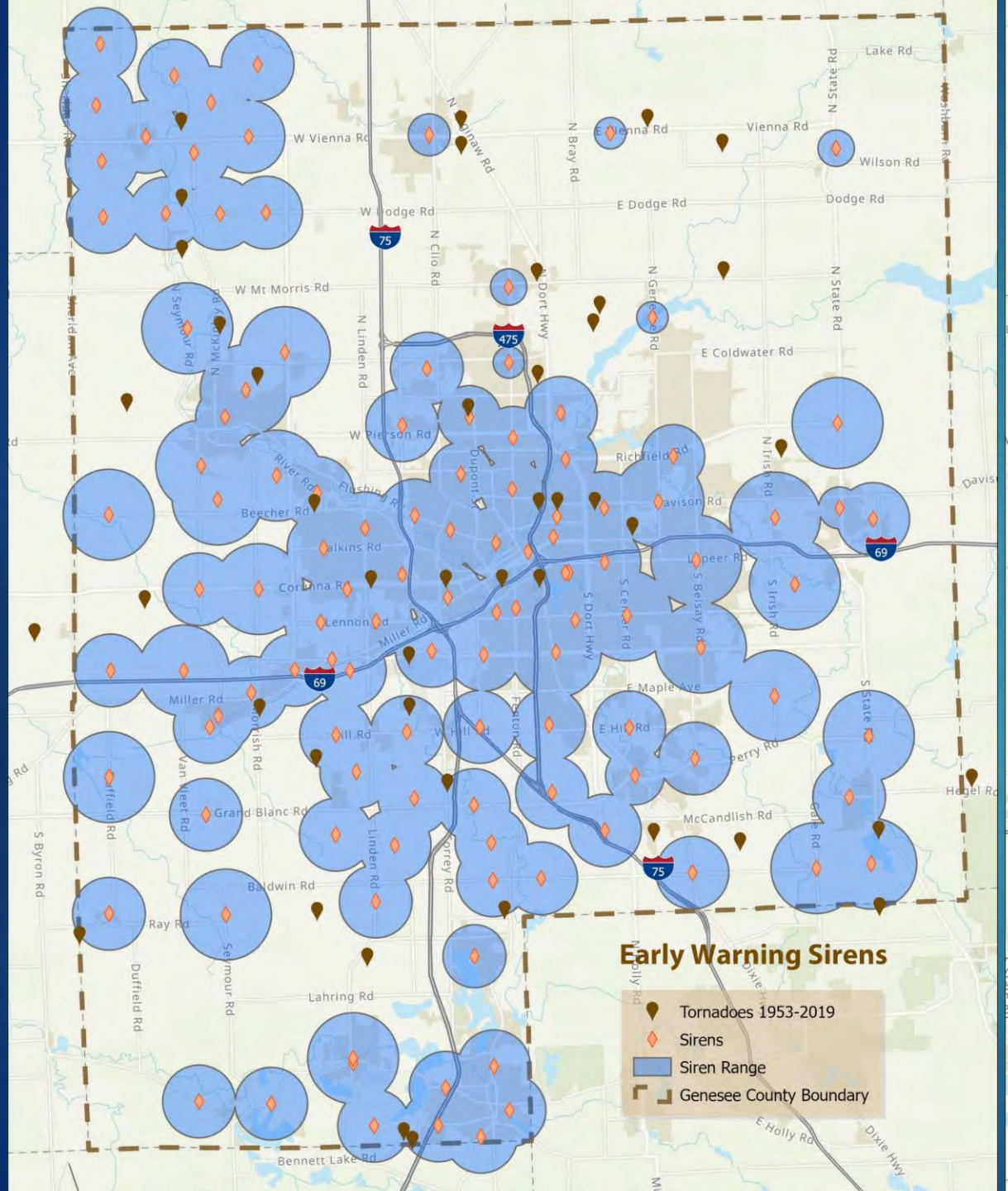
- Warning sirens for complete coverage
- Increased weather radio coverage
- Emergency generators for police/fire
- Shelters
- Enhanced public awareness about safety
- Wireless emergency alerts
- Update disaster response plan
- Stand-by power for water plants and pump stations

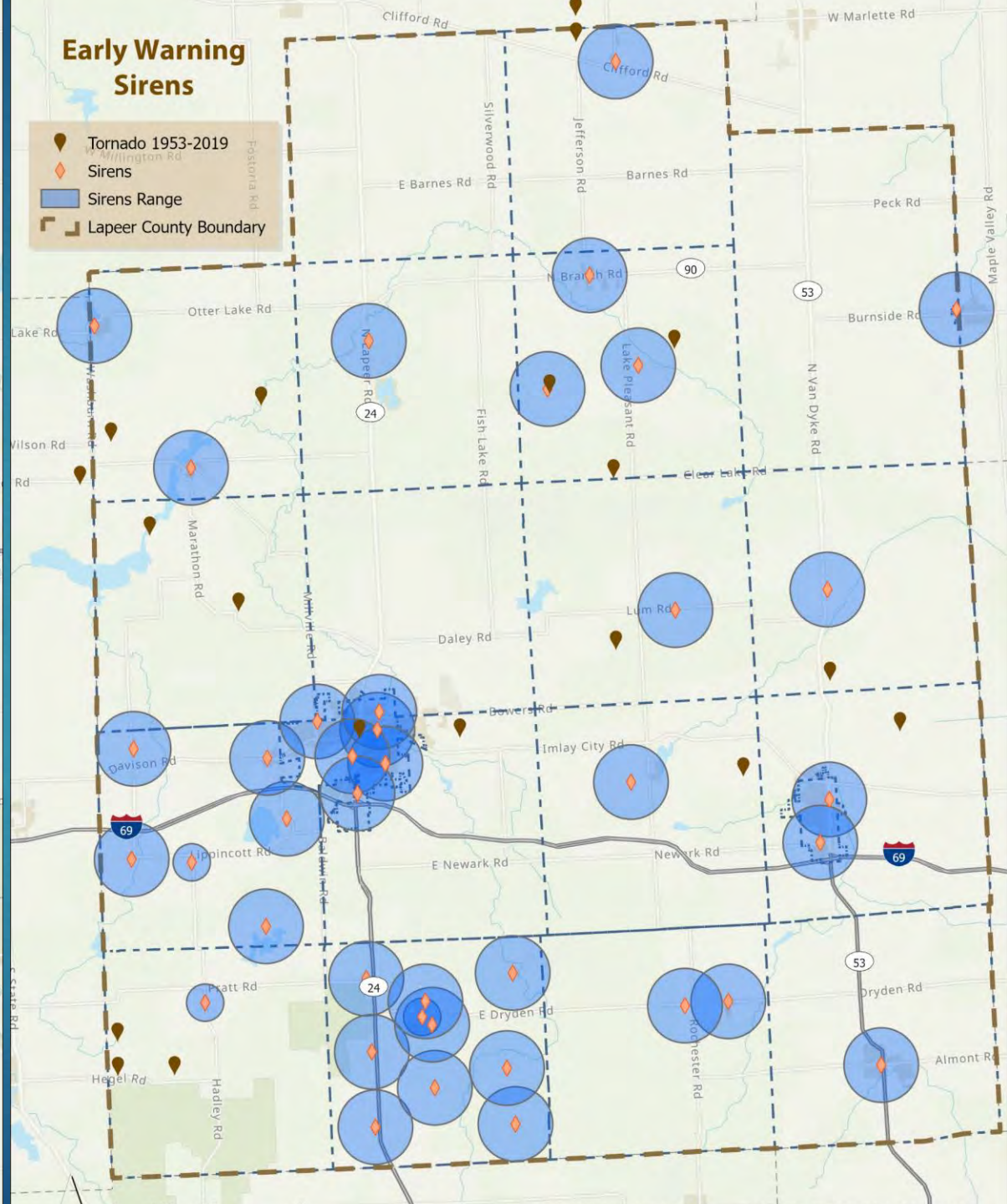
Tornadoes


GENESEE
Otter Lake
Richfield Twp
Gaines
Argentine Twp
Tornados and Population Density
TOR F Scale
EF0
F0
EF1
F1
EF2
F2
F3
F4
F5
Density per Square Mile
≤500
≤1000
≤3000
≤9482
Genesee County Boundary


Fujita Scale
EF0
F0
EF1
F1
EF2
F2
F3
F4
F5
Density per Square Mile
≤500.00
≤1000.00
≤3000.00
≤9257.58
90
53
24
69

Warning Sirens





Transportation Accidents (Bus, train, and plane)

Genesee County (Rank 12)

- 474 crashes involving a school bus over last 10 years; 100 injuries and 1 death
- 3,833 crashes involving a truck or bus over last 10 years; 900 injuries and 37 deaths
- 13 crashes involving a train over last 10 years

Lapeer County (Rank 7)

- 110 crashes involving a school bus over last 10 years; 21 injuries and 1 death
- 885 crashes involving a truck or bus over last 10 years; 65 injuries and 6 deaths
- 4 crashes involving a train over last 10 years

Mitigation Strategies:

- Training for first responders
- Enforce safety regulations
- Public education
- Safety training for drivers
- Update disaster response plan
- Regular simulated response exercises covering bus, trains and plane accidents

Hazardous Materials Incidents (Transportation)

Genesee County (Rank 4)

- 1,685 trucks transport hazardous materials daily
- 4 trains transporting hazardous materials daily
- 61% of people live within a 1-mile radius of the truck routes and railroads

Lapeer County (Rank 9)

- 750 trucks transporting hazardous materials daily (I-69 international thoroughfare)
- 2 trains transporting hazardous materials daily
- 37% of people live within a 1-mile radius of the truck routes and railroads

Mitigation Strategies:

- Warning sirens
- Emergency generators
- Training for hazardous materials response team
- Upgrade hazardous materials response equipment
- Safety training for hazardous materials transporters
- Public education
- Adoption of hazardous spill expense recovery ordinance
- Update disaster response plan
- Wireless emergency alerts

Dam Failures

Genesee County (Rank 6)

- 34 dams
- 24 have low hazard, 7 have significant hazard, 3 have high hazard potential

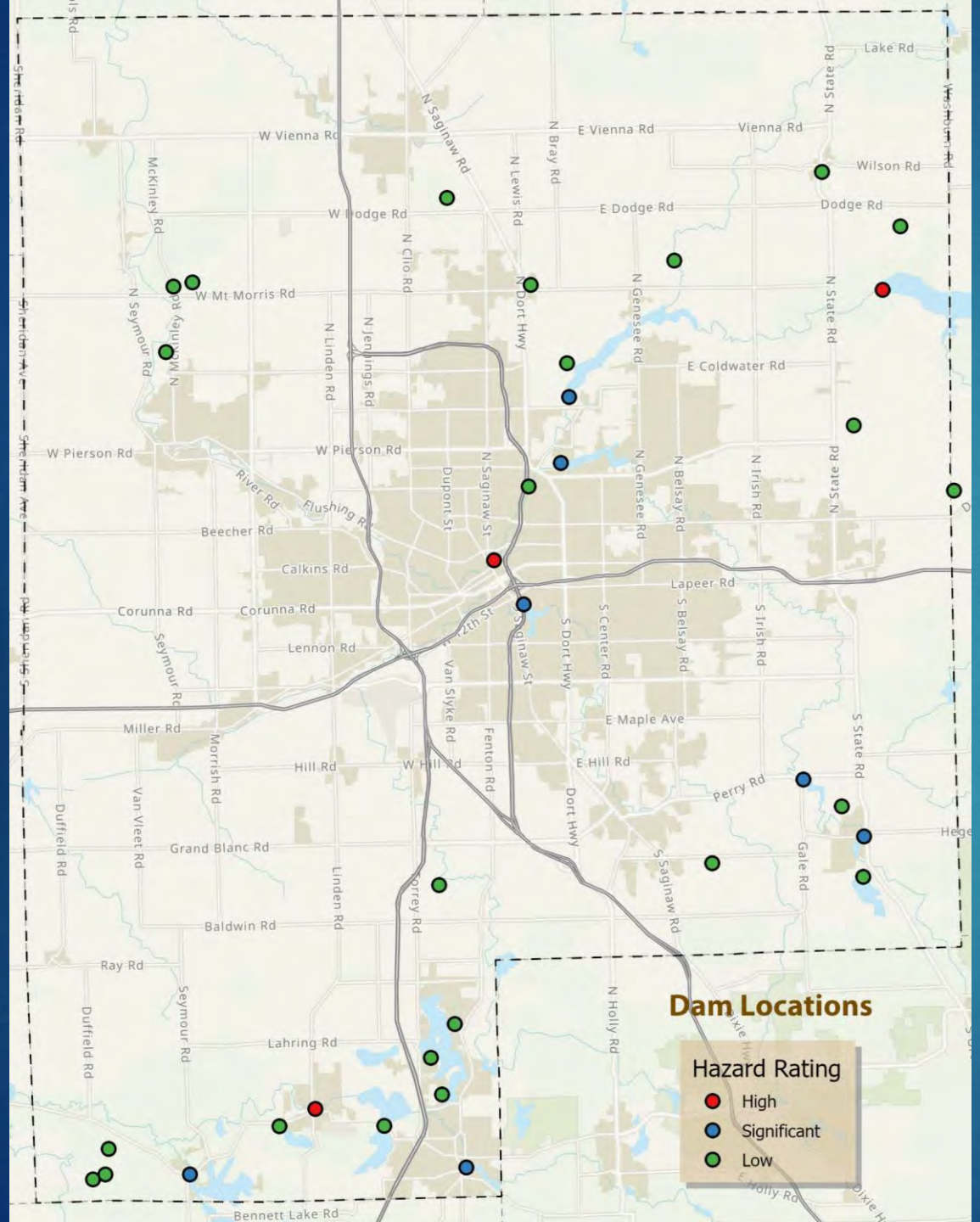
Lapeer County (Rank 11)

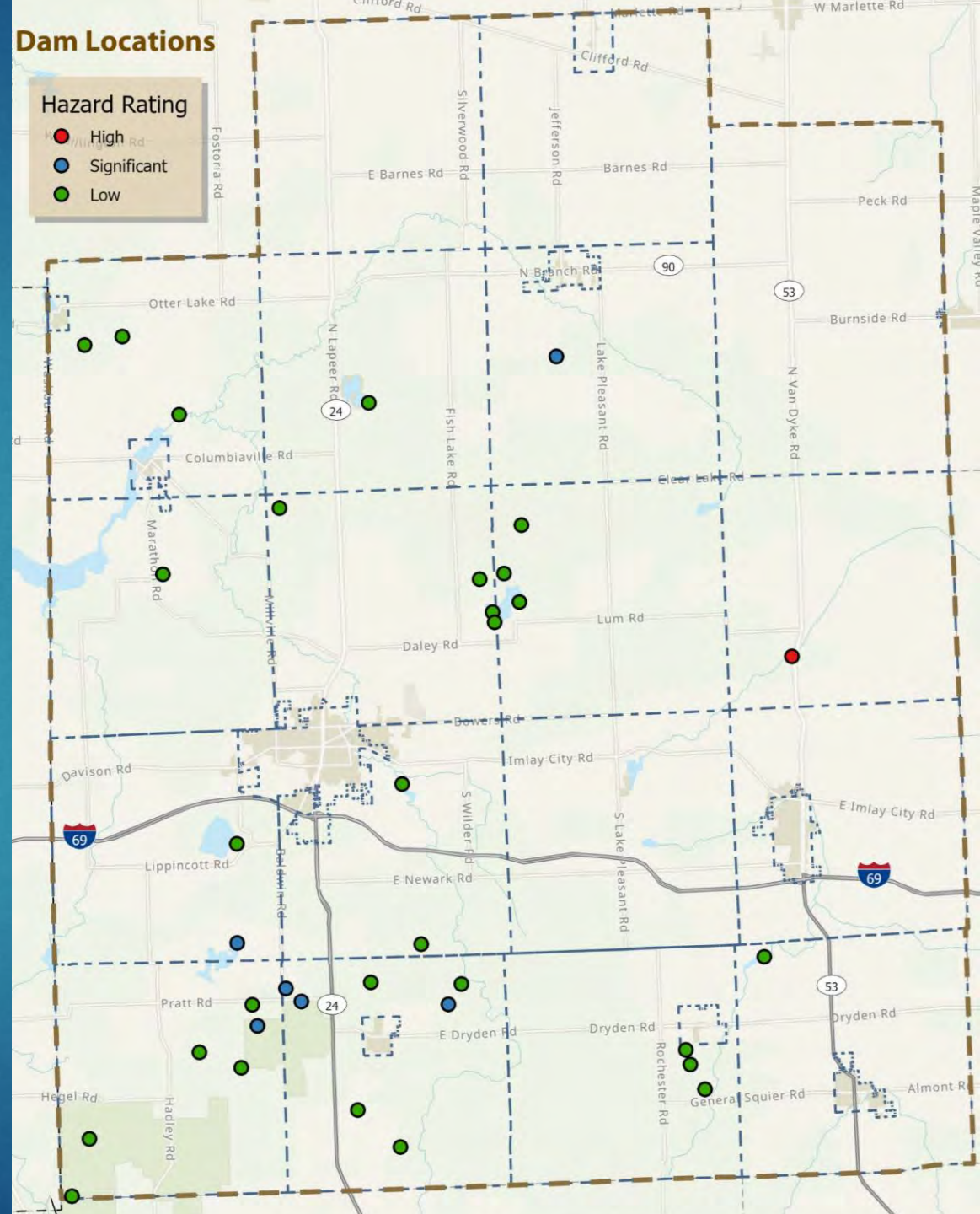
- 35 dams
- 28 have low hazard, 6 have significant hazard, 1 has high hazard potential

Mitigation Strategies:

- Regular dam inspection
- Repairs done as recommended by state inspection reports
- Removal of dams that meet removal criteria
- Public education
- Evacuation plan
- Improvements to dams and spillways
- Update disaster response plan
- Wireless emergency alerts

Dam Locations





Wildfires (includes grassfires)

Genesee County (Rank 16)

- No wildfires reported over past 10 years
- $1.1 million annual damage from wildfires statewide

Lapeer County (Rank 11)

- 11 wildfires/grassfires reported over past 10 years
- $1.1 million annual damage from wildfires statewide

Mitigation Strategies:

- Training for fire department
- Upgrade fire equipment
- Public education
- Restrict outdoor burning
- Update disaster response plan
- Wireless emergency alerts

Civil Disturbances

Genesee County (Rank 9)

- No large-scale civil disturbances in recent years
- Peaceful Black Lives Matter assembly May 2020
- 2019 UAW Strike at GM Plant

Lapeer County (Rank 12)

- No large-scale civil disturbances in recent years
- Peaceful Black Lives Matter assembly June 2020

Mitigation Strategies:

- Training for first responders
- Wireless emergency alerts

Oil and Natural Gas Wells Incidents

Genesee County (Rank 10)

- 41 oil wells and 3 natural gas wells
- No reported incidents in last 10 years

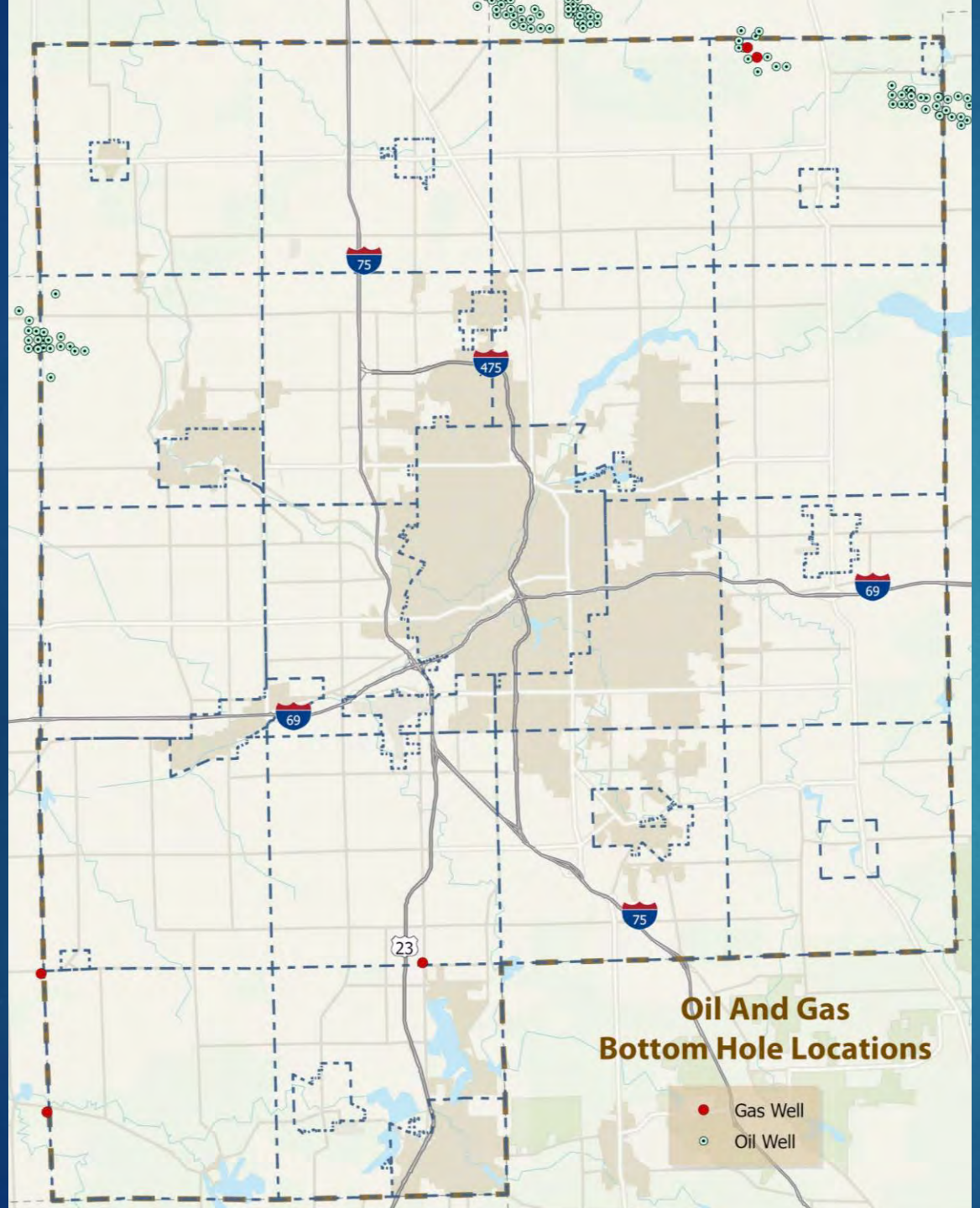
Lapeer County (Rank 13)

- 82 oil wells and 11 natural gas wells
- No reported incidents in last 10 years

Mitigation Strategies:

- Training for hazardous materials response team
- Upgrade response team equipment
- Training for first responders
- Public Education
- Update oil/gas inventory
- Wireless emergency alerts

Oil and Gas Well Locations



Public Health Emergencies

Genesee County (Rank 5)

- Foodborne illness, measles, influenza
- Eastern Equine Encephalitis (EEE) outbreak across Michigan in 2019
- City of Flint Water Crisis
- COVID-19: 23,981 cases, 704 deaths (Jan 2021)

Lapeer County (Rank 6)

- Foodborne illness, measles, influenza
- Eastern Equine Encephalitis (EEE) outbreak across Michigan in 2019
- Local community had a water advisory in 2019
- COVID-19: 4,984 cases, 121 deaths (Jan 2021)

Mitigation Strategies:

- Treat known breeding grounds for disease carrying insects
- Offer vaccinations when appropriate
- Public education
- Health and safety training for first responders
- Wireless emergency alerts

Terrorism

Genesee County (Rank 7)

- No large-scale acts of terrorism reported
- County has several government buildings, churches, stadiums, and highways
- 2019 ransomware attack on Genesee County offices

Lapeer County (Rank 14)

- No large-scale acts of terrorism reported
- County has a major north/south gas line as well as water line that travels east/west
- County has several government buildings, churches, stadiums, and highways including I-69 which is an international thoroughfare

Mitigation Strategies:

- Training for first responders
- Riot gear for police
- Public education about homeland security
- Update disaster response plan
- Identify critical infrastructure

Drought

Genesee County (Rank 13)

Lapeer County (Rank 14)

- Two major drought events in Genesee and Lapeer Counties in the past 20 years
- July 2001 – there was only 0.32 inches of rainfall over a five-week period (10th driest month in Flint area). This causes $150 million in damages for the region
- September 2002 – there was only 0.29 inches of rainfall for the month (driest September on record for Flint area)

Mitigation Strategies:

- Procure additional water supply
- Water rationing if necessary
- Public education

Scrap Tire Fires

Genesee County (Rank 15)

- 100,000 scrap tires estimated in the County
- 2 scrap tire processers/collection sites – Environmental Rubber in Flint, First Class Tire Shredders in Clio
- No major incidents involving scrap tires in recent years

Lapeer County (Rank 16)

- 17,000 scrap tires estimated in the County
- No scrap tire processers/collection sites
- No major incidents involving scrap tires in recent years

Mitigation Strategies:

- Enforcing no dumping regulations
- Clean up abandoned lots
- Public education
- Training for first responders
- Inventory scrap tire sites

Nuclear Attack

Genesee County (Rank 14)

Lapeer County (Rank 15)

- Unlikely to occur in Genesee and Lapeer Counties
- However, nuclear attacks should not be overlooked – Russia maintains a fully capable nuclear arsenal and many smaller nations are working towards a nuclear capability

Mitigation Strategies:

- Warning sirens
- Training for first responders
- Training for hazardous materials response team
- Update disaster response plan
- Wireless emergency alerts

Nuclear Power Plant Accidents

Genesee County (Rank 18)

- Not considered a threat in the County
- Closest nuclear power plant is 95 miles from Flint – Fermi 2 Nuclear Power Station in Newport, MI

Lapeer County (Rank 19)

- Not considered a threat in the County
- Closest nuclear power plant is 75 miles from Lapeer – Fermi 2 Nuclear Power Station in Newport, MI

Mitigation Strategies:

- Training for hazardous materials response team
- Training for first responders
- Public education
- Update disaster response plan
- Wireless emergency alerts

Subsidence (Sinkholes)

Genesee County (Rank 19)

- Goodrich Dam – small sinkholes causing dam to weaken
- City of Flint, City of Burton, Grand Blanc Township have had small sinkholes in roads and residential yards from drainpipe issues
- January 2020 – large sinkhole under NB I-75 in Grand Blanc caused by plugged drain

Lapeer County (Rank 17)

- No sinkholes reported recently in Lapeer County
- Not considered a serious threat at this time, though it cannot be discounted

Mitigation Strategies:

- Identify possible subsidence locations such as old mines
- Restrict building in possible subsidence locations
- Update disaster response plan
- Wireless emergency alerts

Earthquakes

Genesee County (Rank 17)

Lapeer County (Rank 18)

- Very low probability of a significant earthquake in Genesee and Lapeer Counties
- Only 6 earthquakes have occurred in Michigan since 1947, none affected Genesee or Lapeer Counties
- Earthquakes are not considered a likely hazard in both Counties

Mitigation Strategies:

- Emergency generators
- Building code enforcement
- Public Education
- Update disaster response plan
- Wireless emergency alerts

Thank you for attending!

Don't forget to take our survey:

https://www.surveymonkey.com/r/HazMitPublicSurvey

(link also in the chat box)

SITE MAP

- Improving Communities/Housing
- Environmental
  - Recycling Education
  - Solid Waste
  - Recycle Day
  - Drop-Off Center Directory
  - Curbside Programs
  - County Long Range Plan
- Transportation
- Documents & Public Notices

CONTACT OUR STAFF

14
May

NOTICE OF GENESEE AND LAPEER COUNTY HAZARD MITIGATION PLAN UPDATES PUBLIC COMMENT PERIOD

NOTICE OF GENESEE AND LAPEER COUNTY HAZARD MITIGATION PLAN UPDATES PUBLIC COMMENT PERIOD The Genesee-Lapeer-Shiawassee Region V Planning and Development Commission (GLS Region V), in collaboration with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division and Lapeer County Office of Emergency Management, has developed hazard mitigation plan updates for Genesee [...]

May 14, 2021

Read More >

SITE MAP

- Improving Communities/Housing
  - Looking for a House?
  - Need Housing Repairs?
  - Community Development Programs
  - Fair Housing Information
  - Plans and Reports
  - County Long Range Plan
- Environmental
- Transportation
- Documents & Public Notices

CONTACT OUR STAFF

OUR STAFF

QUICK LINK

COMMITTEE MEETINGS

REPORTS & DATA

PUBLIC NOTICES

14
May

The Genesee-Lapeer-Shiawassee Region V Planning and Development Commission (GLS Region V), in collaboration with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division and Lapeer County Office of Emergency Management, has developed hazard mitigation plan updates for Genesee and Lapeer Counties. The plans identify natural and man-made hazards in Genesee and Lapeer Counties and provide local community information/projects about how to address those hazards.

The draft documents will be available for public review and comment from May 17, 2021 through June 18, 2021. To review and comment on the draft documents, please see the links to the updated plan documents below. Comments can be submitted to Cody Roblyer, Planning Specialist at croblyer@geneseecountymi.gov or by calling (810) 766-6570, or in writing to GCMPC, 1101 Beach Street, Room 111, Flint, MI 48502.

Click here to view the Genesee County Hazard Mitigation Plan Update
Click here to view the Lapeer County Hazard Mitigation Plan Update

A virtual open house will also be held on Thursday, June 3rd from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about the draft hazard mitigation plan for Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom meeting on Thursday, June 3rd from 11:30AM – 12:30PM:
https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYmo2N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

Individuals requiring auxiliary aids may contact GLS Region V at (810) 257-3010, fax (810) 257-3185 or e-mail croblyer@geneseecountymi.gov.

Cody Roblyer
Planning Specialist
Genesee County Metropolitan Planning Commission
1101 Beach Street, Room 111
Flint MI 48502-1470
(810) 257-3010
croblyer@geneseecountymi.gov

LAPEER COUNTY

Lapeer County Complex

Search ...

FREQUENTLY REQUESTED

ELECTION RESULTS

Accountability and Transparency

CPL Information

Public Information Documents

Fingerprinting

FOIA Documents

Delinquent Tax Information

Order a Birth,Death or Marriage Certificate

Animal Control Web Portal

Health Department

County Directory

County Holidays

Lapeer Development Corporation

2021 Board of Commissioners Meeting Schedule

Accessibility

WELCOME TO LAPEER COUNTY

Lapeer County Hazard Mitigation Plan (Draft)

Meeting Notice

25 May 2021n 09:00AM - 05:00PMn Day of Review- S Branch Cass River

25 May 2021n 09:00AM - 05:00PMn Drain Board Day of Review- N. Branch Flint River

26 May 2021n 09:00AM - 05:00PMn Drain Board Day of Review- Plumb Creek

27 May 2021n 09:00AM - n Board of Commissioners- Committee of the Whole

03 Jun 2021n 09:00AM - n Board of Commisioners- Regular Board Meeting

10 Jun 2021n 09:00AM - n Board of Commissioners- Committee of the Whole

17 Jun 2021n 09:00AM - n Board of Commissioners- Regular Board Meeting

Historic County Courthouse

- Historic County Courthouse

Quick Links

Employment Opportunities

Bid Opportunities (RFP)

STATE OF MICHIGAN)
County of Genesee ss Dawn Suttorp

Being duly sworn deposes and say he/she is Principal Clerk of

THE FLINT JOURNAL
DAILY EDITION

a newspaper published and circulated in the County of Genesee and otherwise qualified according to Supreme Court Rule; and that the annexed notice, taken from said paper, has been duly published in said paper on the following day(days)

May 11th A.D. 20 21

Sworn to and subscribed before me this 17th day of May 20 21

Teasha R. Payne
TEASHA R. PAYNE
NOTARY PUBLIC, STATE OF MI
COUNTY OF MECOSTA
COMMISSION EXP FEB 24 2026
ACTING IN COUNTY OF Kent

Virtual Public Meeting Announcement for Genesee and Lapeer County Residents

The GLS Region V Planning and Development Commission, in cooperation with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division and the Lapeer County Office of Emergency Management, have updated the Hazard Mitigation Plans for Genesee and Lapeer Counties.

Each county must have an approved Hazard Mitigation Plan to be eligible for Federal Hazard Mitigation Project funding.

A virtual open house regarding the update to the Genesee and Lapeer County Hazard Mitigation Plans will be held on Thursday June 3, 2021 from 11:30 a.m. to 12:30 p.m. via Zoom. The open house is an opportunity for the public to comment and ask questions about the draft updates. Copies of the draft plans will be made available at the Genesee County Metropolitan Planning Commission, Room 111, 1101 Beach Street, Flint, MI. Copies will also be available at all local municipal offices and online at www.gcmpc.org. The 30-day public comment period for the draft Genesee and Lapeer County Hazard Mitigation Plans will begin May 17, 2021 and end June 18, 2021.

To join the virtual open house or to receive a copy of the draft plans via email, please contact:

Cody Roblyer,
Planning Specialist
Genesee County Metropolitan Planning Commission
1101 Beach Street, Room 111
Flint, MI 48502
(810) 257-3010
croblyer@geneseecountymi.gov

GLS Region V will furnish reasonable auxiliary aids and services to individuals with disabilities upon request. Individuals with disabilities requiring auxiliary aids for services should contact Cody Roblyer using the information provided above or by calling the Michigan Relay Center: 1-800-649-3777 or 711.

"An Equal Opportunity Organization"

AFFIDAVIT OF PUBLICATION

STATE OF MICHIGAN } SS
COUNTY OF LAPEER

Elaine Smith, being first duly sworn, says that (s)he is the Circulation Assistant of County Press Sunday, a newspaper published in the English language for the dissemination of local or transmitted news and intelligence of a general character and legal news, which is a duly qualified paper, and that annexed hereto is a copy of a certain order taken from said newspaper, in which the order was published

5/16/21 [signature]

KASEY E TYSICK
Notary Public, State of Michigan
County of Lapeer
My Commission Expires 08-27-2027
Acting in the County of Lapeer

Subscribed and sworn to before me this 17th

day of May, 20 21

Kasey E Tysick
Notary Public, _____ County, Michigan

My commission expires _____

Prepared by County Press Sunday
1521 Imlay City Rd
PO Box 220
Lapeer, MI 48446

6-2783
edemption period shall be 6
ns from the date of such sale,
s determined abandoned in
dance with MCL 600.3241a;
the subject real property is
for agricultural purposes as
ed by MCL 600.3240(16).
property is sold at foreclo-
sale under Chapter 32 of the
ed Judicature Act of 1961,
ant to MCL 600.3278 the
ver will be held responsible
person who buys the prop-
it the mortgage foreclosure
or to the mortgage holder for
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y service member on active
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oncluded less than 90 days
or if you have been ordered
ive duty, please contact the
ey for the party foreclosing
nortgage at the telephone
er stated in this notice.
otice is from a debt collector.
of notice: May 9, 2021
aw, PC.
) Northwestern Hwy, Suite

ngton Hills, MI 48334
642-2515

918
))(05-30)

Make a Difference RECYCLE

Virtual Public Meeting Announcement for Genesee and Lapeer County Residents

The GLS Region V Planning and Development Commission, in cooperation with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division and the Lapeer County Office of Emergency Management, have updated the Hazard Mitigation Plans for Genesee and Lapeer Counties. Each county must have an approved Hazard Mitigation Plan to be eligible for Federal Hazard Mitigation Project funding.

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To join the virtual open house or to receive a copy of the draft plans via email, please contact:

Cody Roblyer, Planning Specialist
Genesee County Metropolitan Planning Commission
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"An Equal Opportunity Organization"

Notice is hereby given that KAPPEN SPECIALITY SERVICE, LLC (License.# 790010) will be doing vegetation management under contract with ITC on their utility lines beginning June 1, 2021 through October 30, 2021 foliar applications.

The herbicide mix to be applied will be a mixture of some of the following:

Escort (AI: Metsulfuron methyl), Garlon 3A (AI: Triclopyr), Method (AI: Aminocylclopyrachlor), Milestone: (AI: Aminopyralid, Isopropanolammonium), Arsenal (AI: Imazapyr), and Thinvert.

Spraying will be applied to the right-of-ways of the power lines and will include small trees and brush treatment within that area via use of backpack sprayer, and ATV wide broadcast.

Lapeer County will be covered during this application.

Questions or concerns should be directed to KAPPEN TREE SERVICE, LLC at 989-673-5313 or 800-322-5684.

Burnside Township Notice of Public Hearing

Notice is hereby given that a public hearing will be held by the Burnside Township Planning Commission on Monday, June 7, 2021 at 7:00 P.M., at the Burnside Township Hall located at 7045 Burnside Road, Brown City, Michigan 48416 to consider a review of a mini-storage facility expansion site plan on the subject property owned by Liebler Realty LLC:

Property described as parcel number 44-005-013-010-10, commonly known as 8802 Burnside Road, Brown City, Michigan 48416.

Persons interested are requested to be present. Pertinent information relative to this site plan review is on file at the Burnside Township Hall and may be examined during the Township's regular business hours. Persons interested may visit the Township Hall, contact the Township Hall during the Township's regular business hours at (810) 346-3559 or attend the Public Hearing on the date specified. Written comments are also welcome at the address above. Individuals with disabilities who require auxiliary aids or services should contact the Township Clerk at least 5 days before the hearing.

Genesee County Metropolitan Planning Commission

Published by David Yeoman · Just now ·

Notice: Public Comment Period for Genesee and Lapeer County Hazard Mitigation Plan Updates

The Genesee-Lapeer-Shiawassee Region V Planning and Development Commission (GLS Region V), in collaboration with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division and Lapeer County Office of Emergency Management, has developed hazard mitigation plan updates for Genesee and Lapeer Counties. The plans identify natural and man-made hazards in G... See More

GCMPC.ORG

NOTICE OF GENESEE AND LAPEER COUNTY HAZARD MITIGATION PLAN UPDATES PUBLIC COMMENT PERIOD -...

The Genesee-Lapeer-Shiawassee Region V Planning and Development Commission (GLS Region V), in collaboration with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division...

0
People Reached

0
Engagements

Boost Post

Like Comment Share

Comment as Genesee County Metropolitan Planning Commission

Genesee-Lapeer-Shiawassee
Region V Planning and Development Commission
Room 111– 1101 Beach Street
Flint, Michigan 48502-1470
(810) 257-3010

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Citizens of Genesee and Lapeer Counties and Community Organizations

FROM: Cody Roblyer, Planning Specialist
GLS Region V Planning and Development Commission

DATE: May 15, 2021

SUBJECT: Genesee County Hazard Mitigation Plan Update – Public Comment Period

The Genesee-Lapeer-Shiawassee Region V Planning and Development Commission (GLS Region V), in collaboration with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division and Lapeer County Office of Emergency Management, has developed hazard mitigation plan updates for Genesee and Lapeer Counties. The plans identify natural and man-made hazards in Genesee and Lapeer Counties and provide local community information/projects about how to address those hazards.

The draft documents will be available for public review and comment from May 17, 2021 through June 18, 2021. To review and comment on the draft documents, please visit our website at www.gcmpc.org or request a copy from the contact provided below. Comments can be submitted to Cody Roblyer, Planning Specialist at croblyer@geneseecountymi.gov or by calling (810) 766-6570, or in writing to GCMPC, 1101 Beach Street, Room 111, Flint, MI 48502.

A virtual open house will also be held on Thursday, June 3rd from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about the draft hazard mitigation plan for Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom meeting on Thursday, June 3rd from 11:30AM – 12:30PM:
https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

Individuals requiring auxiliary aids may contact GLS Region V at (810) 257-3010, fax (810) 257-3185 or e-mail croblyer@geneseecountymi.gov.

Genesee-Lapeer-Shiawassee
Region V Planning and Development Commission
Room 111– 1101 Beach Street
Flint, Michigan 48502-1470
(810) 257-3010

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Genesee County Local Units of Government and Genesee County Hazard Mitigation Plan Review Committee Members

FROM: Cody Roblyer, Planning Specialist
GLS Region V Planning and Development Commission

DATE: May 15, 2021

SUBJECT: Genesee County Hazard Mitigation Plan Update – Public Comment Period

GLS Region V Planning and Development Commission staff has partnered with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division to complete an update to the Genesee County Hazard Mitigation Plan. This Plan will meet the Federal Emergency Management Administration's (FEMA) required criteria for a multi-jurisdictional hazard mitigation plan. This Plan makes it possible for local units of government to apply for funding to carry out mitigation activities that may lessen or prevent damage or loss of life if a hazard were to occur in your community.

The Draft Hazard Mitigation Plan is complete. We are asking for your assistance in making the draft document available to your residents from May 17, 2021 through June 18, 2021. Please provide access to a hard copy at your front counter, as well as include the attached web link (www.gcmpc.org) on your community website and/or Facebook page. A comment sheet is attached, and citizens can mail comments to the above address, submit them directly through our website, or by email to the address provided below.

For further details, please contact Cody Roblyer at croblyer@geneseecountymi.gov or (810) 766-6570.

A virtual open house will also be held on Thursday, June 3rd from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about the draft hazard mitigation plan for Genesee County. Please join us by using the link below.

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https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

Genesee-Lapeer-Shiawassee
Region V Planning and Development Commission
Room 111– 1101 Beach Street
Flint, Michigan 48502-1470
(810) 257-3010

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Lapeer, Livingston, Oakland, Saginaw, Shiawassee, and Tuscola County Clerks

FROM: Cody Roblyer, Planning Specialist
GLS Region V Planning and Development Commission

DATE: May 15, 2021

SUBJECT: Genesee County Hazard Mitigation Plan Update – Public Comment Period

GLS Region V Planning and Development Commission staff has partnered with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division to complete an update to the Genesee County Hazard Mitigation Plan.

As part of the public input process, a copy is being provided to all counties that border Genesee County. Please make the plan available or display in your office for public review from May 17, 2021 through June 18, 2021. A comment sheet is attached, and citizens can mail comments to the above address, submit them directly through our website (www.gcmpc.org) or by email to the address provided below.

For further details, please contact Cody Roblyer at croblyer@geneseecountymi.gov or (810) 766-6570.

A virtual open house will also be held on Thursday, June 3rd from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about the draft hazard mitigation plan for Genesee County. Please join us by using the link below.

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https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

Genesee-Lapeer-Shiawassee
Region V Planning and Development Commission
Room 111– 1101 Beach Street
Flint, Michigan 48502-1470
(810) 257-3010

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Scott Stockert, Hazard Mitigation Analyst
Michigan State Police

FROM: Cody Roblyer, Planning Specialist
GLS Region V Planning and Development Commission

DATE: May 15, 2021

SUBJECT: Submission of Hazard Mitigation Plan Update for Review

GLS Region V Planning and Development Commission staff has partnered with the Office of the Genesee County Sheriff's Emergency Management and Homeland Security Division to complete an update to the Genesee County Hazard Mitigation Plan. Included is a draft copy of the Genesee County Hazard Mitigation Plan Update. The document is currently in the public comment period. We are providing you a copy to begin reviewing. Staff will send the final version with any changes upon completion.

If you have any questions or concerns, please contact Cody Roblyer at croblyer@geneseecountymi.gov or (810) 766-6570.

Hazard Mitigation Virtual Open House Attendee List – January 26, 2021

Cody Roblyer – Genesee County Metropolitan Planning Commission

Dawn Sawicki-Franz – City of Imlay City (Clerk)

David Benn – McLaren Hospital

Jeff Wilson – Genesee County Sheriff Department/Emergency Management (Emergency Manager)

Mary Piorunek – Lapeer County Emergency Management (Emergency Manager)

Phil Kaatz – MSU Extension

Sheila Taylor – Genesee County Metropolitan Planning Commission

Welcome!

VIRTUAL OPEN HOUSE: GENESEE AND LAPEER COUNTY HAZARD MITIGATION PLANS

Please put comments or questions in the chat box at the bottom. We will address them one at a time.

Copies of the Hazard Mitigation Plan Update Drafts can be viewed at http://gcmpc.org/ under public notices.

Thank you!

What is Hazard Mitigation?

- Any sustained action taken to reduce or eliminate long-term risk to life and property from a hazardous event

- Mitigation planning allows for communities to identify policies, activities, and tools to implement mitigation actions

Purpose of a Hazard Mitigation Plan

- Save lives and protect property
- Preserve and protect an area's environment and economy
- Preserve and maintain an area's essential services and quality of life
- Provide info to citizens, businesses, and elected officials
- Guide project implementation and funding of projects
- Allow local communities to receiving funding for hazard mitigation projects

Plan Updates

- Community Profiles updated with current data and input from local officials and the public
- Goals and objective reviewed and reaffirmed
- Hazards ranked by committees
- Hazard information and vulnerability updated based on new data gathered
- Action plan updated with revised mitigation strategies and new/updated mitigation projects from local officials
- All information incorporated into planning documents

Hazard Mitigation Goals & Objectives for Genesee County

Goals

- Prevent loss of life
- Improve response and recovery for man-made and natural disasters
- Enhance early warning systems
- Maintain essential public services
- Enhance public awareness
- Protect public health, welfare, and safety
- Reduce losses from man-made and natural disasters
- Protect the environment
- Provide resources for effective mitigation of hazardous materials incidents

Objectives

- Amend zoning to limit new development in floodplains
- Enhance coordination between response agencies
- Increase warning siren coverage and weather radio
- Provide resources to ensure provision of essential services
- Provide opportunity for public education
- Provide additional storm shelters
- Moving existing homes that are in a floodplain
- Enhance early warning systems and education for all hazards
- Enhance warning systems and notifications for special populations

Hazard Mitigation Goals & Objectives for Lapeer County

Goals

- Reduce losses from man-made and natural disasters
- Improve response to and recovery from man-made and natural hazards
- Enhance early warning notification systems (i.e. Nixle/Alert Lapeer County)
- Promote additional alert and notification systems (i.e. American Red Cross tornado app)
- Maintain essential public services during and after a disaster
- Enhance public education/awareness with an emphasis on natural disasters (i.e. flooding and severe weather)
- Protect public health, welfare, and safety

Objectives

- Amend zoning to limit new development in flood plains
- Increase warning siren coverage and wireless emergency alerts use
- Provide resources to ensure provision of essential services
- Provide opportunity for public education

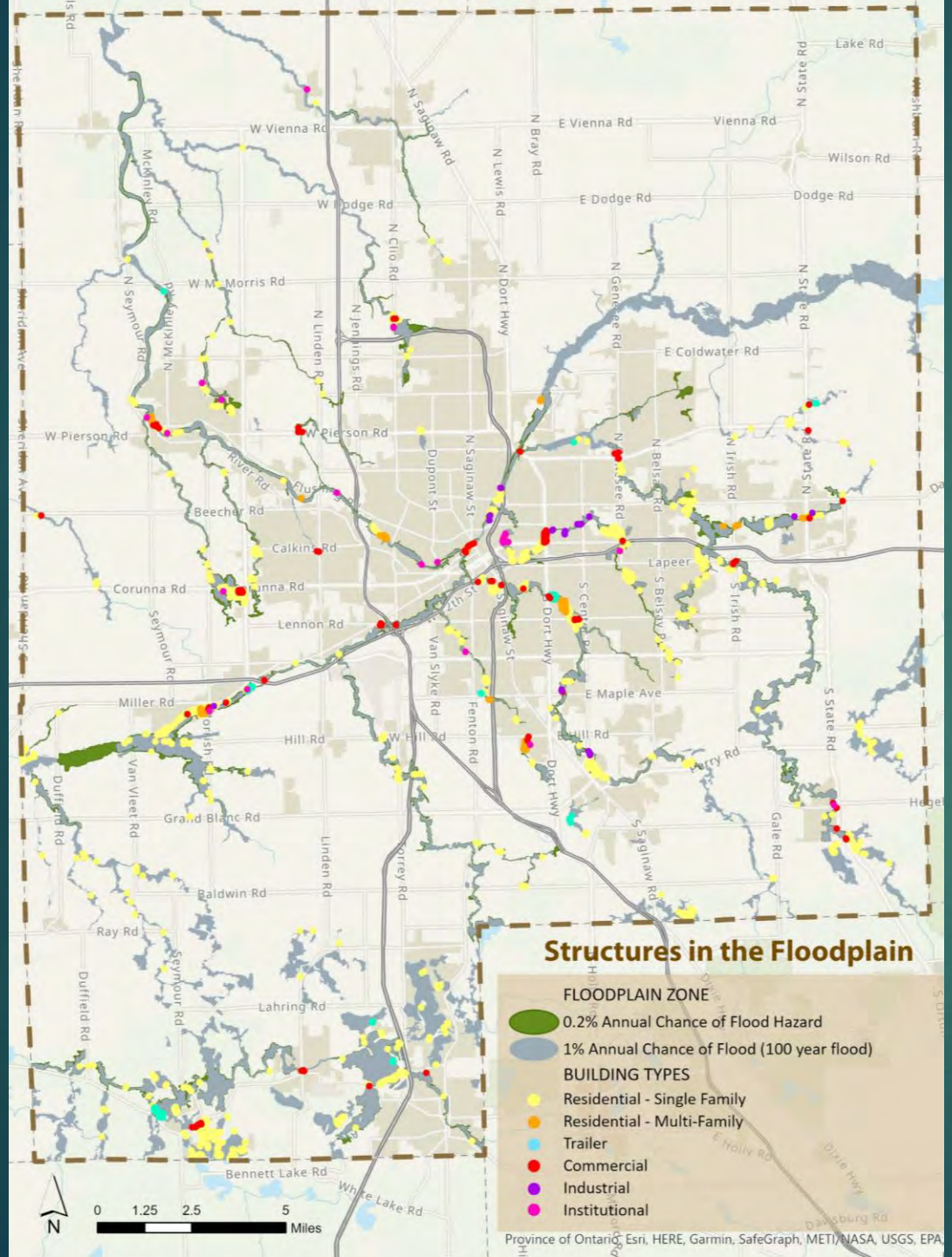
Hazard Rankings for Genesee County

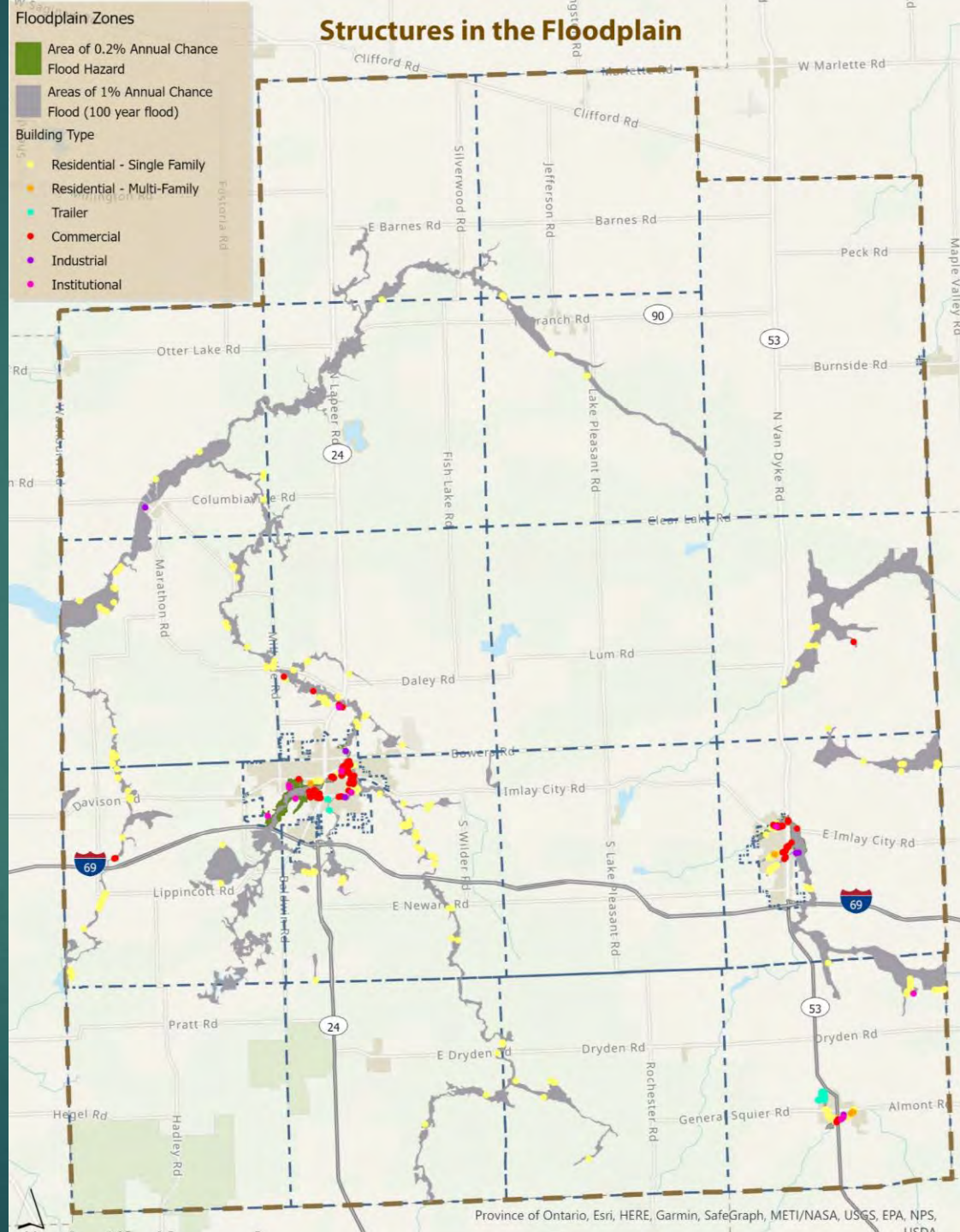
1. Infrastructure Failure
2. Riverine Flooding
2. Terrorism
3. Structure Fire
4. Inclement Weather
5. Extreme Temperatures
5. Hazardous Materials Incidents (Transportation)
6. Snow and Ice Storms
7. Public Health Emergencies
8. Tornadoes
9. Civil Disturbances
10. Dam Failure
11. Hazardous Materials Incidents (Fixed Sites)
12. Oil or Natural Gas Well/Pipeline Accidents
13. Transportation Accidents (Bus, Plane, Train)
14. Drought
14. Scrap Tire Fires
15. Nuclear Attack
16. Wildfires
17. Nuclear Power Plant Accidents
18. Subsidence (Sinkholes)
19. Earthquakes

Hazard Rankings for Lapeer County

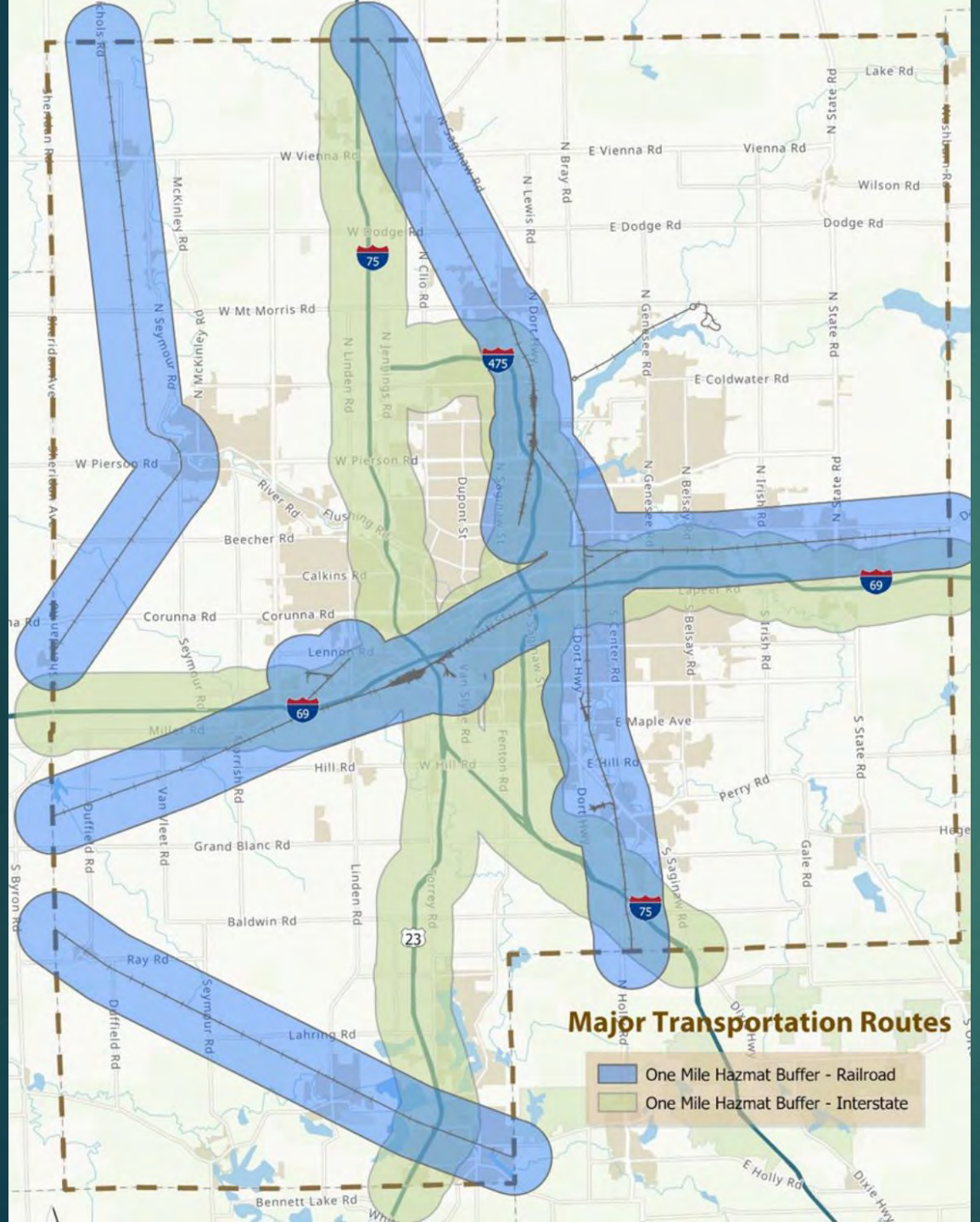
1. Snow and Ice Storms
2. Structure Fire
3. Infrastructure Failure
3. Riverine Flooding
4. Tornadoes
5. Inclement Weather
6. Public Health Emergencies
7. Transportation Accidents (Bus, Plane, Train)
8. Extreme Temperatures
9. Hazardous Materials Incidents (Transportation)
10. Hazardous Materials Incidents (Fixed Sites)
11. Dam Failure
11. Wildfires
12. Civil Disturbances
13. Oil or Natural Gas Well/Pipeline Accidents
14. Drought
14. Terrorism
15. Nuclear Attack
16. Scrap Tire Fires
17. Subsidence (Sinkholes)
18. Earthquakes
19. Nuclear Power Plant Accidents

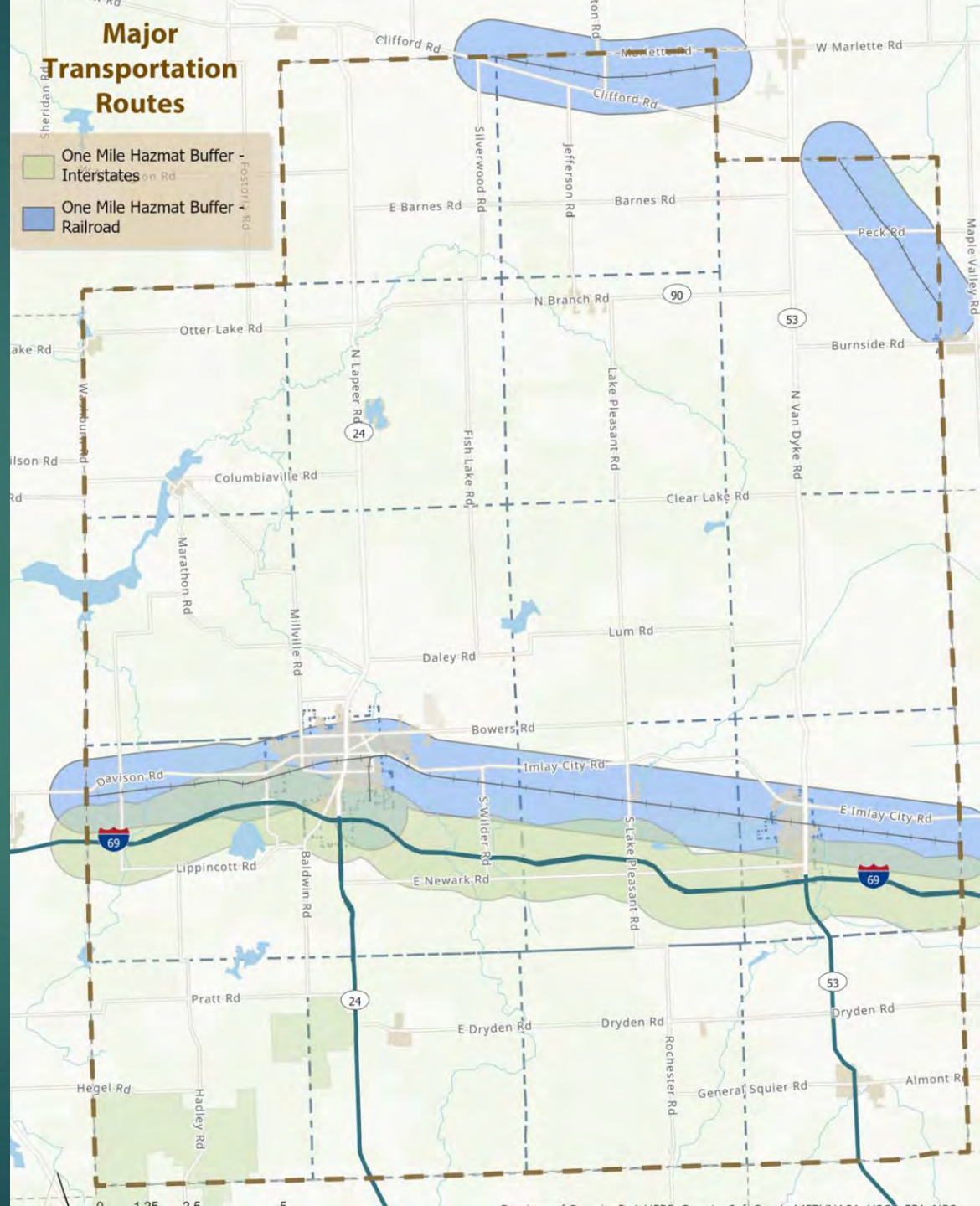
Structures in the Floodplain



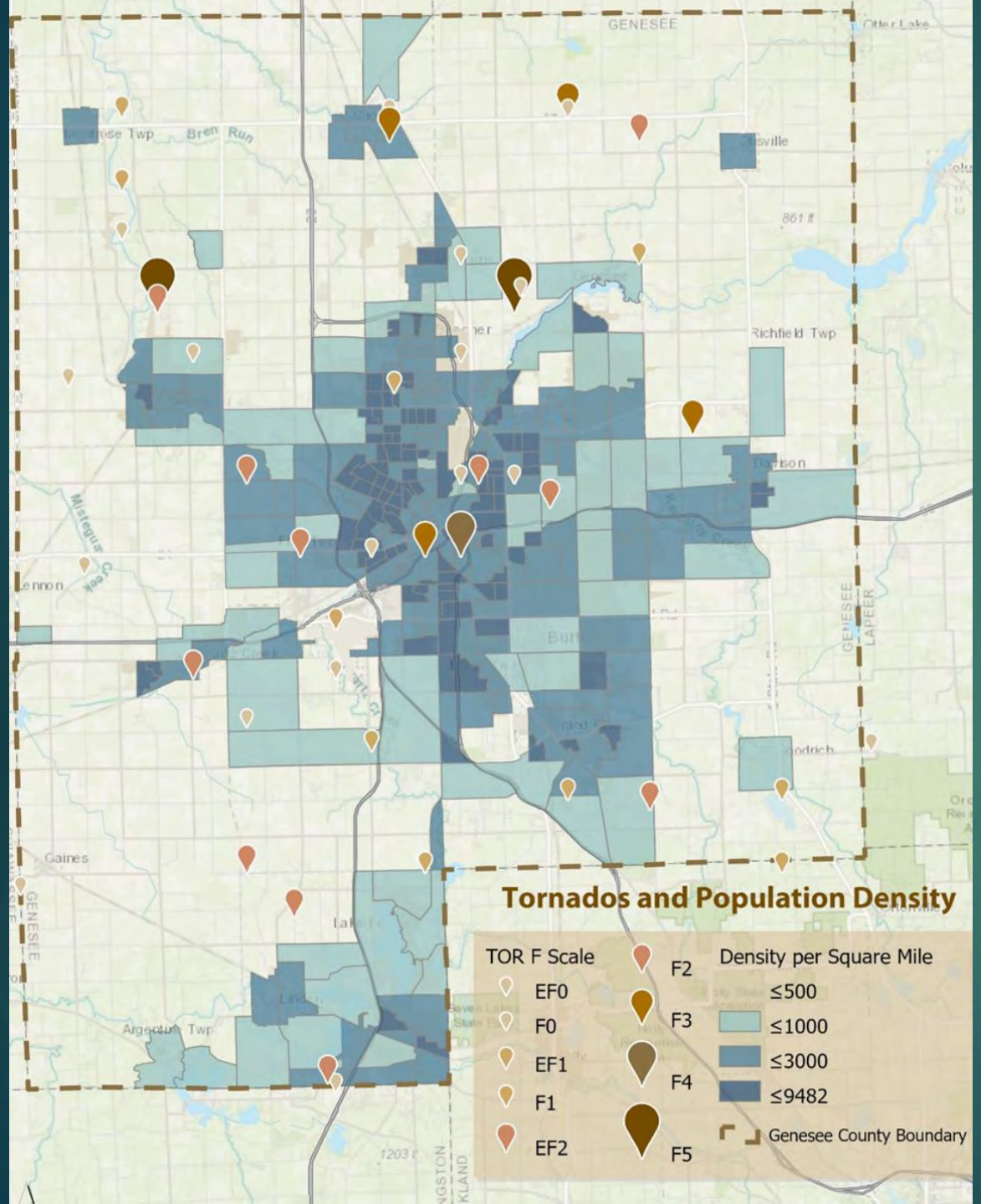


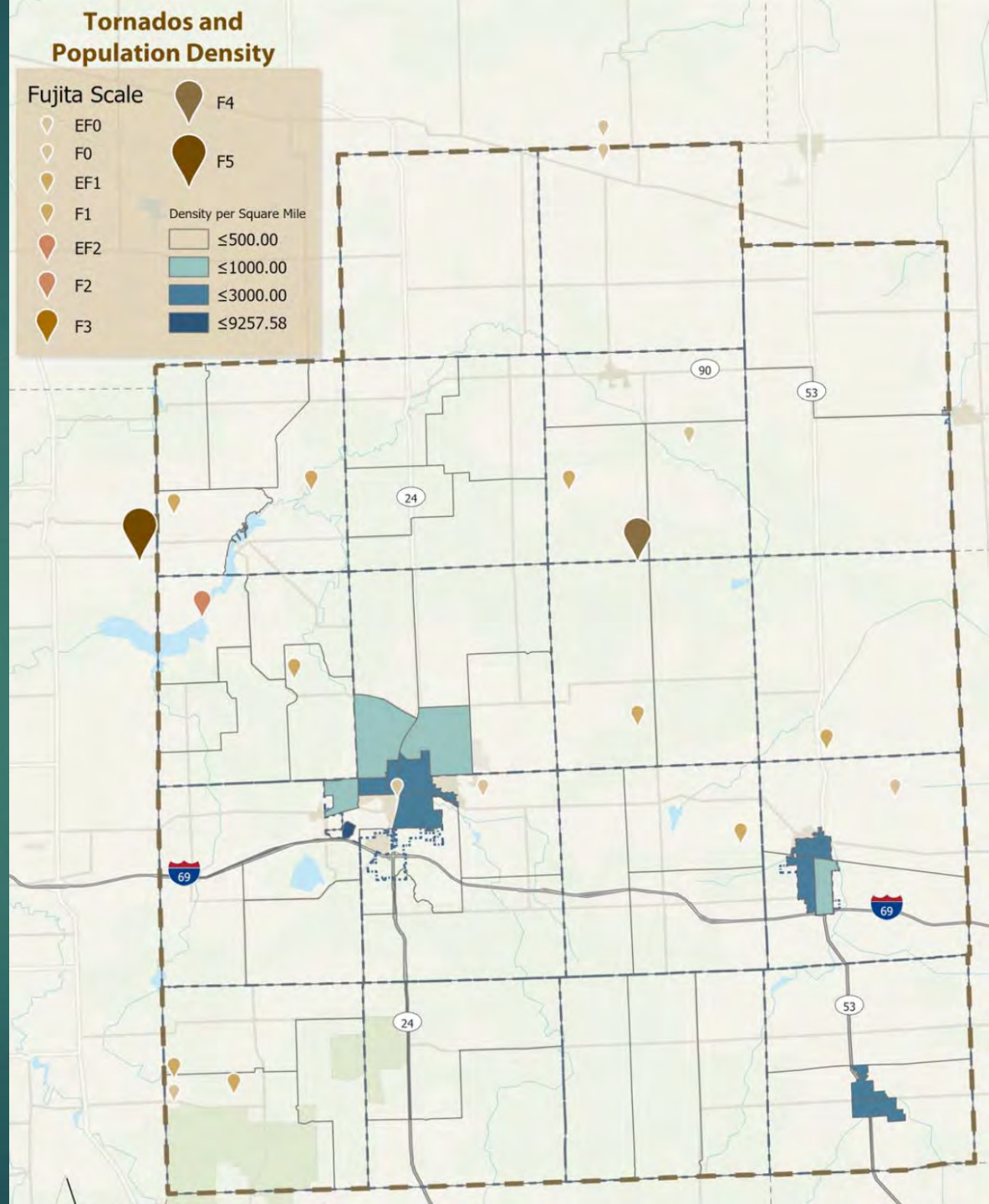
Hazardous Materials Transportation



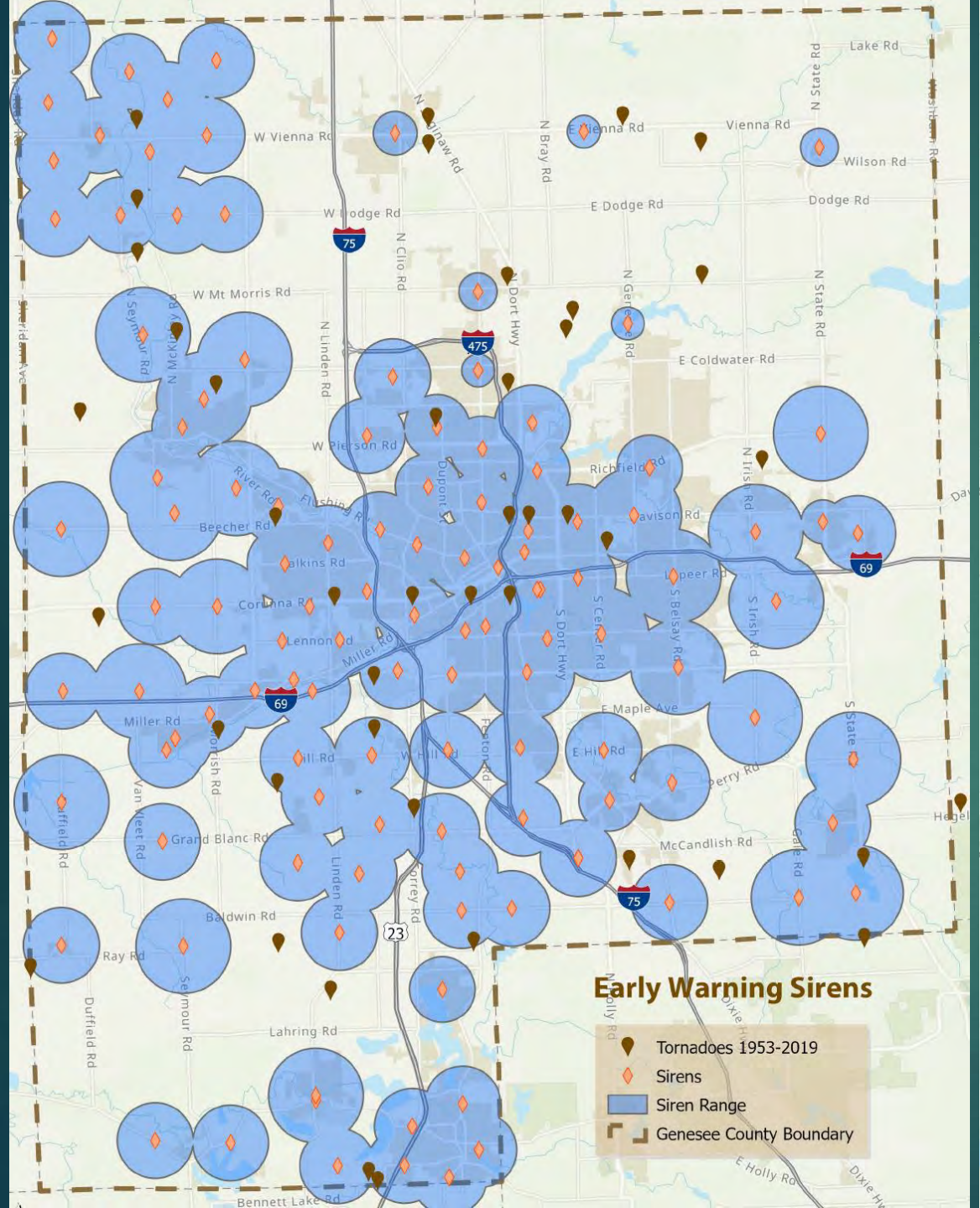


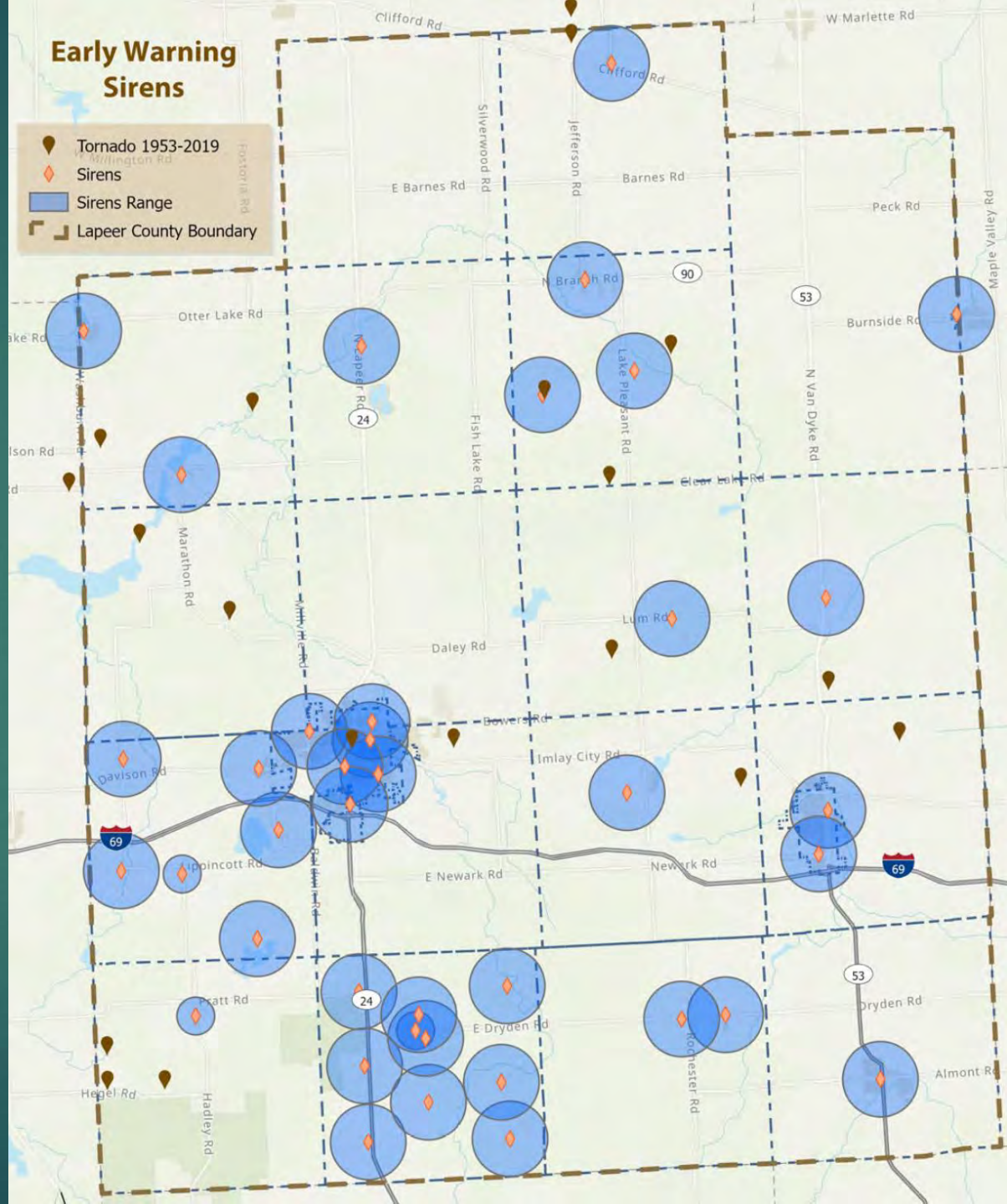
Tornadoes and Population



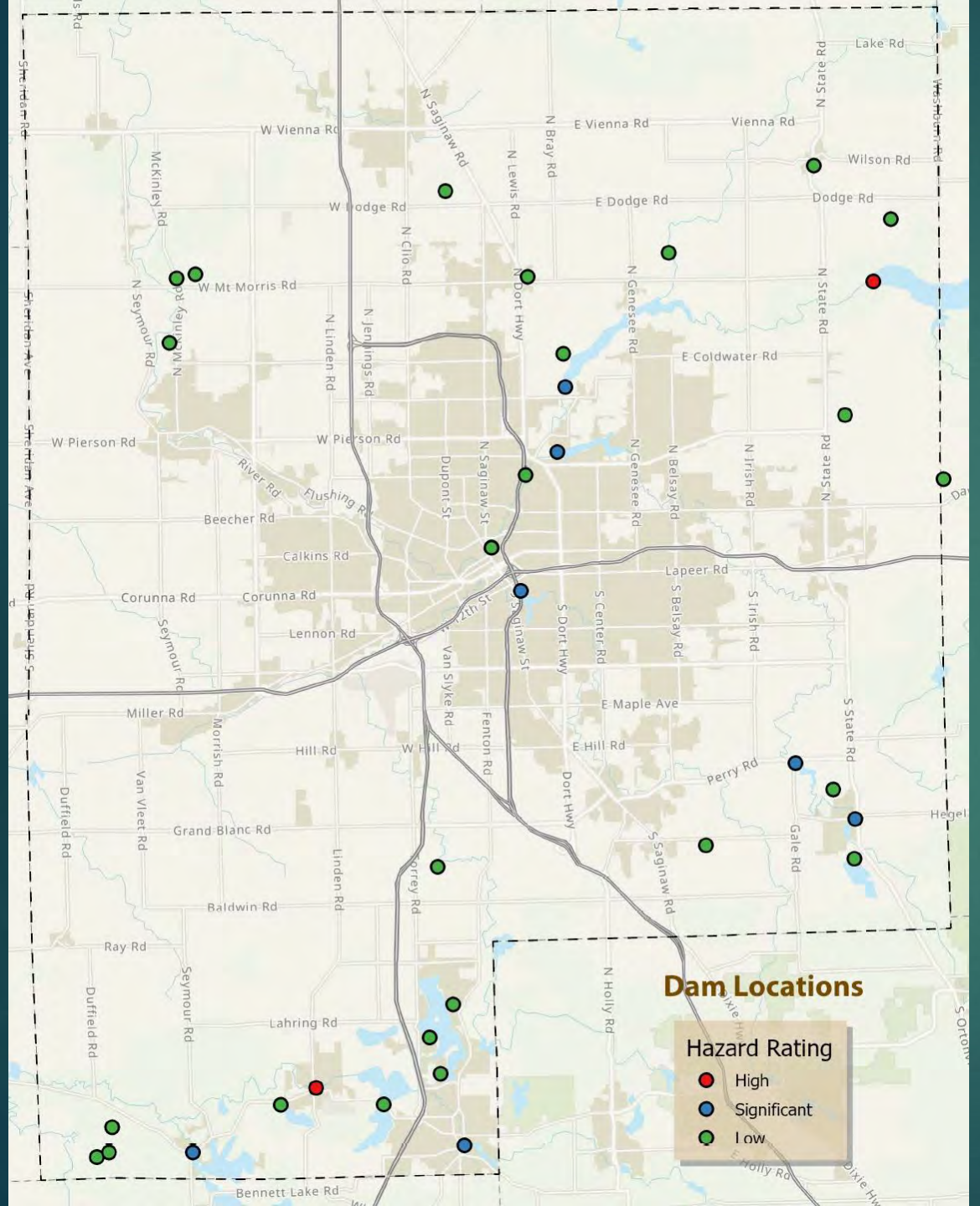


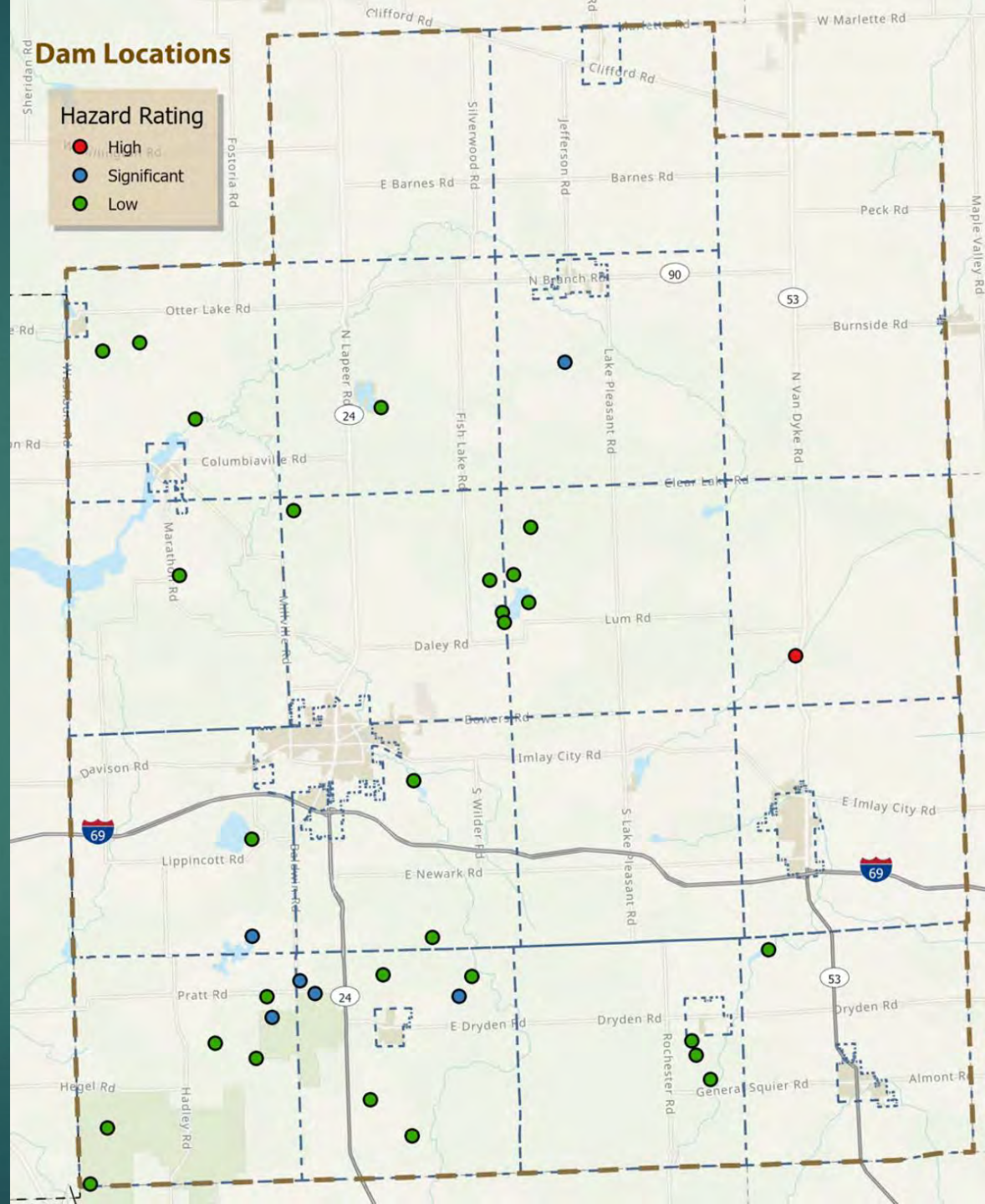
Warning Sirens



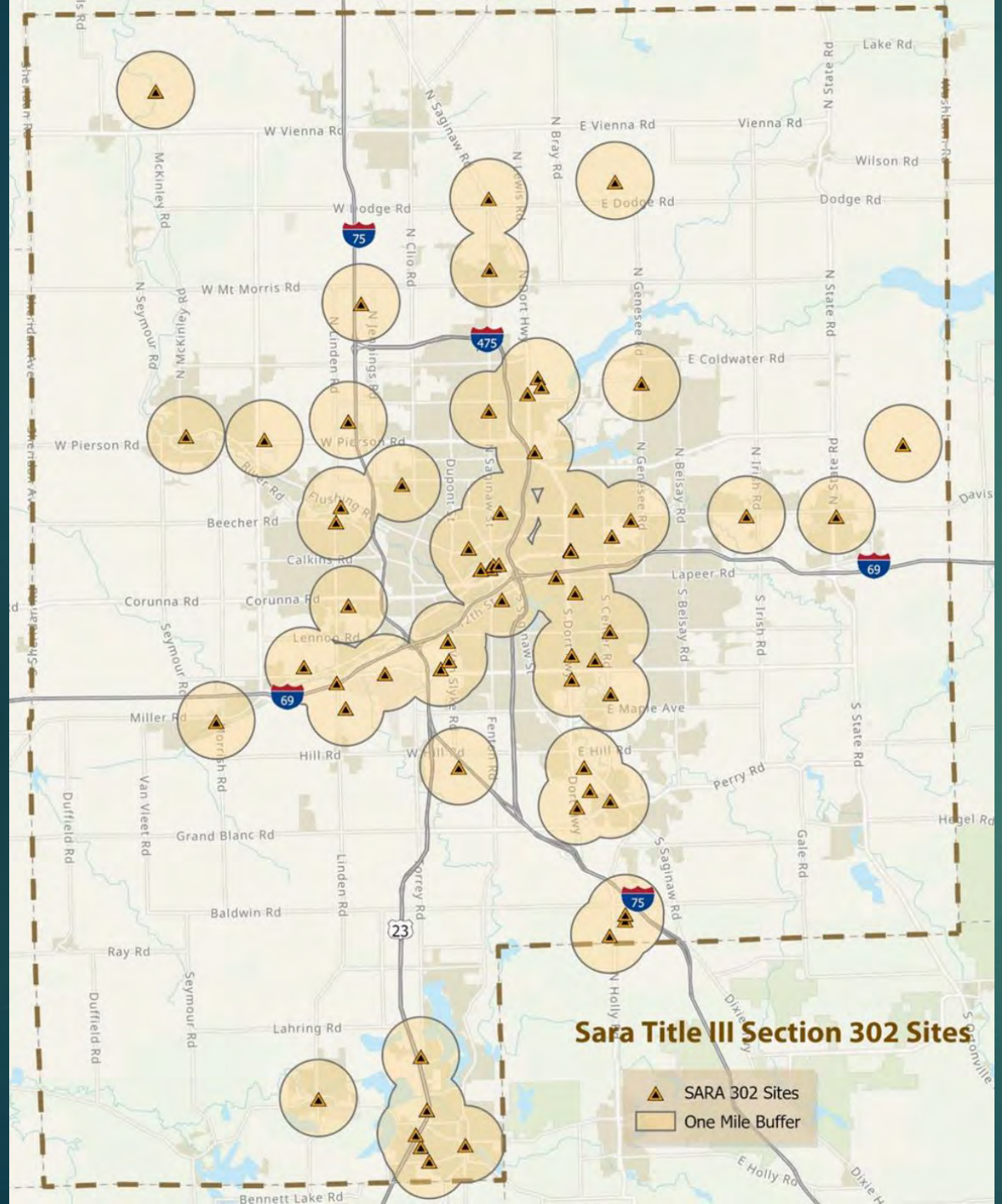


Dam Locations





Hazardous Facilities



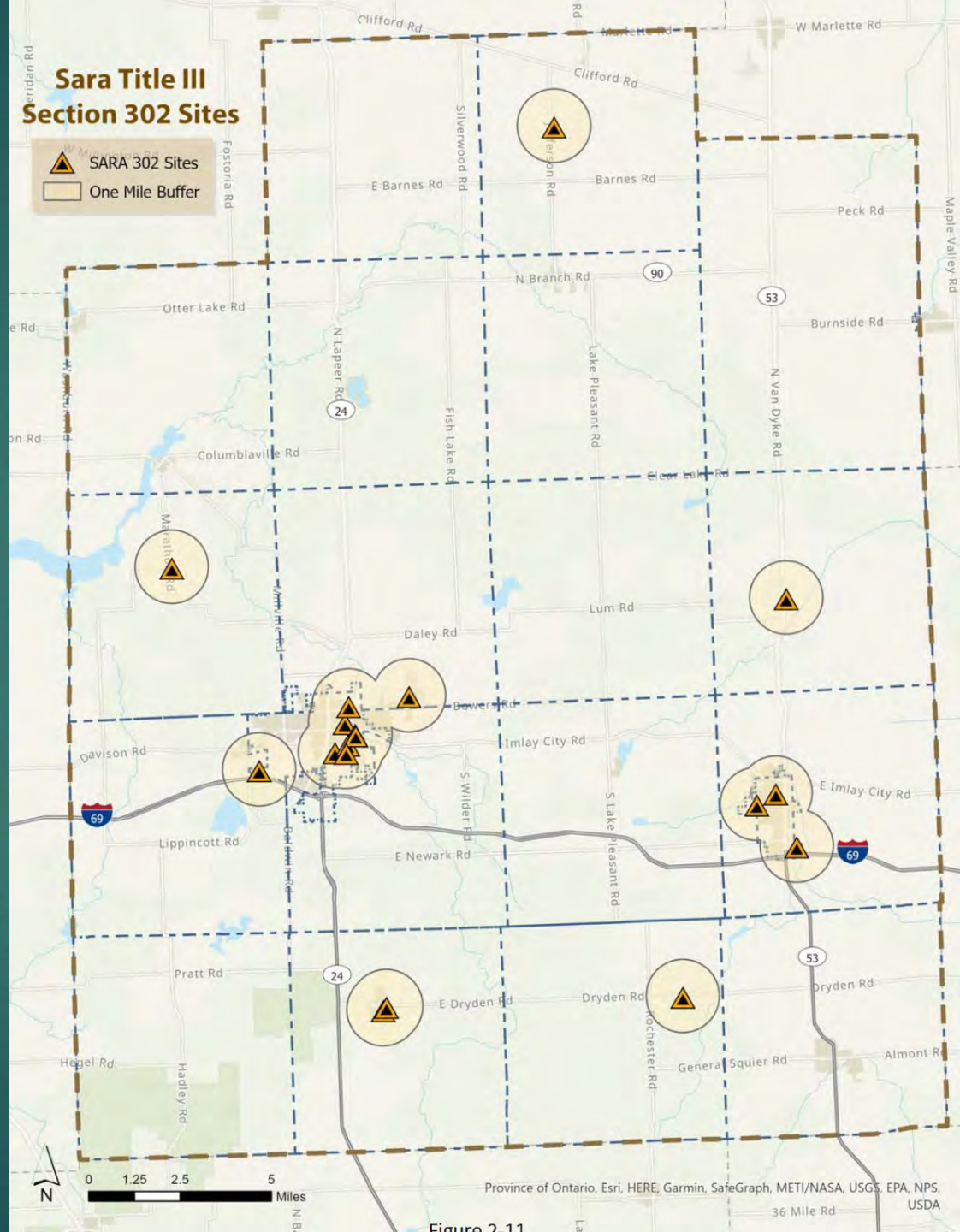


Figure 2-11

Oil and Gas Well Locations

Genesee County Mitigation Actions

Table 3-1 General Hazard Mitigation Actions	100% Area FEMA Flood Insurance Program	Acquire and Update Equipment	Arson Education	Ban Open Burning	Community Shelters	Consider Hazard Mitigation in Future Plans	County Hazard Mitigation Project Manager	Demolitions	Distribute NOAA Radios	Elderly Assistance Programs	Emergency Generators	Enforce Fire/Zoning/Building Codes	Enforce Homeland Security Directives	Enhance Emergency Response System	Enhance Warning System	Further Study of Hazard	Immunization Programs	Increase Morgue Capacity	Maintain Mutual Aid Agreements	Maintenance and Repair Program	Mass Notification System	Mitigate Floodplain Structures	National Flood Insurance Program	Public Education Program	Repair of Critical Infrastructure/Dams	Restrict Development in Hazard Area	River Flood Control Measures	Safety Training Transit Operator	Simulated Hazard Response Exercises	Training Critical Infrastructure Employees	Training for Responders/Officials/Residents	Tree Trimming Program	Updated Disaster Response Plan	Water Conservation Program	Water Ration Program in Droughts	Weather Spotter Training
1. Infrastructure Failure					T		L			H	T					H		L		H				H	T							H	H			
2. Riverine Flooding	T					H	L				T	H				T		L				T		H		H	T						H			
2. Terrorism							L						H			H		L												H	H		H			
3. Structure Fires		T	H				L	H				H		T				L	H					H							H					
4. Inclement Weather					T		L		T	H	T				T			L			H		H	H							H	H	H			H
5. Extreme Temperatures					T		L		T	H	T							L						H												
5. Hazardous Materials Incidents (Transportation)		T					L											L						H	T			H			H		H			
6. Snow and Ice Storms					T		L		T	H	T				T			L						H								H	H			H
7. Public Health Emergencies							L										T	L						H							H					
8. Tornadoes					T		L		T	H	T				T			L						H								H	H			H
9. Civil Disturbance		T					L											L			H			H							H					
10. Dam Failure							L									T		L						H	T											
11. Hazardous Materials Incidents (Fixed Sites)							L									M		L						M							M		M			
12. Oil and Natural Gas Well/Pipeline Accidents		M					L									M		L													M					
13. Transportation Accidents (Bus, Airplane, Train)							L								T			L						M				M	M		M		M			
14. Drought							L											L						M										M	M	
14. Scrap Tire Fires							L									L		L						L							L					
15. Nuclear Attack							L								L			L													L		L			
16. Wildfires		L					L					L						L						L							L		L			
17. Nuclear Power Plant Accidents							L				L							L													L		L			
18. Subsidence (Sinkholes)							L					L				L		L																		
19. Earthquakes							L				L	L						L															L			

Priority Level Top = T High = H Medium = M Low = L

Lapeer County Mitigation Actions

Table 3-1 General Hazard Mitigation Actions	Acquire and Update Equipment	Arson Education	Ban Open Burning	Community Shelters	Consider Hazard Mitigation in Future Plans	County Hazard Mitigation Project Manager	Elderly Assistance Programs	Emergency Generators	Enforce Fire/Zoning/Building Codes	Enforce Homeland Security Directives	Enhance Emergency Response System	Enhance Warning System	Further Study of Hazard	Immunization Programs	Increase Morgue Capacity	Maintain Mutual Aid Agreements	Maintenance and Repair Program	Mitigate Floodplain Structures	National Flood Insurance Program	Public Education Program	Repair of Critical Infrastructure/Dams	Restrict Development in Hazard Area	River Flood Control Measures	Safety Training Transit Operator	Simulated Hazard Response Exercises	Training Critical Infrastructure Employees	Training for Responders/Officials/Residents	Tree Trimming Program	Updated Disaster Response Plan	Utilize Wireless Emergency Alerts	Water Conservation Program	Water Ration Program in Droughts	Weather Spotter Training
1. Snow and Ice Storms				T		L	H	T				T			L					H							H	H	T				
2. Structure Fires	T	H				L			H		T				L	H				H							H						
3. Infrastructure Failure				T		L	H	T					H		L		H			H	T							H	H				
3. Riverine Flooding					H	L		T	H				T		L			T	T	H		H	T						H				
4. Tornadoes				T		L		T	H			T			L					H								H	H	T			H
5. Inclement Weather				T		L	H	T				T			L					H								H	H	T			H
6. Public Health Emergencies						L								T	L					H							H						
7. Transportation Accidents (Bus, Airplane, Train)						L									L					H				H	H		H		H				
8. Extreme Temperatures				T		L	H	T							L					H										T			
9. Hazardous Materials Incidents (Transportation)	T					L									L					H	T			H			H		H				
10. Hazardous Materials Incidents (Fixed Sites)						L							H		L					H							H		H				
11. Dam Failure						L							T		L					H	T												
11. Wildfires	M		M			L									L					M							M		M				
12. Civil Disturbance	M					L									L					M							M			M			
13. Oil and Natural Gas Well/Pipeline Accidents	M					L							M		L												M						
14. Drought						L									L					M											M	M	
14. Terrorism						L		M		M			M		L											M	M		M				
15. Nuclear Attack						L						L			L												L		L				
16. Scrap Tire Fires						L							L		L					L							L						
17. Subsidence (Sinkholes)						L							L		L							L											
18. Earthquakes						L		L	L						L					L									L				
19. Nuclear Power Plant Accidents						L		L							L												L		L				

Priority Level Top = T High = H Medium = M Low = L

Genesee County New Mitigation Projects

Table 3-2 Specific Hazard Mitigation Projects (New)	City of Burton - Drainage - Bellingham Court	City of Burton - Drainage - Bristol Road	Village of Goodrich - Natural Gas Backup Generator	City of Grand Blanc - Portable Radios	Grand Blanc Township - Standby Generator	Grand Blanc Township - Deadfall Tree Removal	Mundy Township - Backup Generator	Mundy Township - Emergency Warning Sirens
1. Infrastructure Failure	T	T	T		T	H	T	
2. Riverine Flooding	T	T	T		T	H	T	
2. Terrorism								
3. Structure Fires				T			T	
4. Inclement Weather	H	H	T		T	H	T	T
5. Extreme Temperatures			T		T		T	
5. Hazardous Materials Incidents (Transportation)				T			T	
6. Snow and Ice Storms	H	H	T		T	H	T	T
7. Public Health Emergencies								
8. Tornadoes			T		T	H	T	T
9. Civil Disturbance				T				
10. Dam Failure								
11. Hazardous Materials Incidents (Fixed Sites)				M			M	
12. Oil and Natural Gas Well/Pipeline Accidents				M			M	
13. Transportation Accidents (Bus, Airplane, Train)				M			M	
14. Drought								
14. Scrap Tire Fires				L			L	
15. Nuclear Attack								
16. Wildfires				L		L	L	
17. Nuclear Power Plant Accidents			L		L		L	
18. Subsidence (Sinkholes)								
19. Earthquakes			L		L		L	

Priority Level

Top = T

High = H

Medium = M

Low = L

Lapeer County New Mitigation Projects

Table 3-2 Specific Hazard Mitigation Projects (New Projects)	Almont Township - Warning Sirens	Imlay City - Infrastructure Improvements	City of Lapeer - Drain Repair and Expansion	Village of North Branch - Lining Sewer Main	Village of North Branc - Pump Station Upgrade
1. Snow and Ice Storms	T				
2. Structure Fires					
3. Infrastructure Failure		T	T	T	T
3. Riverine Flooding			T	T	T
4. Tornadoes	T				
5. Inclement Weather	T				
6. Public Health Emergencies					
7. Transportation Accidents (Bus, Airplane, Train)		H			
8. Extreme Temperatures					
9. Hazardous Materials Incidents (Transportation)		T			
10. Hazardous Materials Incidents (Fixed Sites)					
11. Dam Failure					
11. Wildfires					
12. Civil Disturbance					
13. Oil and Natural Gas Well/Pipeline Accidents					
14. Drought					
14. Terrorism					
15. Nuclear Attack	L				
16. Scrap Tire Fires					
17. Subsidence (Sinkholes)				L	
18. Earthquakes					
19. Nuclear Power Plant Accidents					

Priority Level

Top = T
High = H
Medium = M
Low = L

Genesee County Previously Included Mitigation Projects

Table 3-3 Specific Hazard Mitigation Projects (From Previous Plan Update)

	1. Infrastructure Failure	2. Riverine Flooding	2. Terrorism	3. Structure Fires	4. Inclement Weather	5. Extreme Temperatures	5. Hazardous Materials Incidents (Transportation)	6. Snow and Ice Storms	7. Public Health Emergencies	8. Tornadoes	9. Civil Disturbance	10. Dam Failure	11. Hazardous Materials Incidents (Fixed Sites)	12. Oil and Natural Gas Well/Pipeline Accidents	13. Transportation Accidents (Bus, Airplane, Train)	14. Drought	14. Scrap Tire Fires	15. Nuclear Attack	16. Wildfires	17. Nuclear Power Plant Accidents	18. Subsidence (Sinkholes)	19. Earthquakes
~~Atlas Township - Natural Gas Backup Generators (Removed)~~	T	T	T		T	T	T	T			H											
Atlas Township - Dead Ash Tree Removal	H				H			H											L			
Atlas Township - Drainage Improvements		T										H										
Atlas Township - Boat for Water or Ice Rescue	H	H														M	L		L			
Atlas Township - High Pressure Water Wells				T																		
Atlas Township - Emergency Warning Sirens					T		T			T												
Bendle Public Schools - Equipment	T	T	T		T	T			H									L		L		L
~~Bishop Airport - Weather Computer (Removed)~~					T										M							
Davison Township - Warning Sirens					T		T			T												
Fenton Township - Emergency Shelter					T					T												
City of Flint - Stand-by Power (Cedar St Pump)	T				T				H	T												
City of Flint - Stand-by Power (Westside Pump)	T								H													
City of Flint - Stand-by Power (Torrey Rd Pump)	T								H													
City of Flint - Stand-by Power (Flint Water Plant)	T								H													
~~City of Flint - Hamilton Dam (Removed)~~	T											T										
~~City of Flint - Thread Dam (Removed)~~	T											T										
Flushing Township - Back-up Generator	T	T	T		T	T		T		T												
Flushing Township - Dredge Brent Creek		T																				
Flushing Township - Warning Sirens					T		T			T												
Forest Township - Warning Sirens					T					T												
Gaines Township - Warning Sirens					T																	
Genesee Co. Emergency Mgmt. - Tornado Shelters					T																	
Genesee Co. Emergency Mgmt. - Warning Sirens					T																	
Genesee Co. Emergency Mgmt. - Home Relocation		T																				
GISD - Back-up Generator	T	T	T		T	T			H									L		L		L
GISD - Structural Improvements		T			T																	
Goodrich Area Schools - Equipment	T	T	T		T	T			H									L		L		L
~~Village of Goodrich - Goodrich Dam (Removed)~~	T											T										
~~Grand Blanc Township - Warning Sirens (Removed)~~					T																	
Village of Lennon - Repair Sirens					T																	
Village of Lennon - Back-up Generator (Police Dept.)	T	T	T		T	T			H									L		L		L
Village of Lennon - Back-up Generator (Village Hall)	T	T	T		T	T			H									L		L		L
~~City of Linden - Generator (Removed)~~		T	T		T		T	T		T												
UM-Flint - Enhance First Street Residence Hall	T		T		T		T	T		T												
UM-Flint - Flood Mitigation Plan												T										
UM-Flint - Upgrading UM-Flint EOC	T	T	T		T		T			T												

Priority Level

Top = T

High = H

Medium = M

Low = L

Lapeer County Previously Included Mitigation Projects

Table 3-3 Specific Hazard Mitigation Projects (From Previous Plan Update)	1. Snow and Ice Storms	2. Structure Fires	3. Infrastructure Failure	4. Riverine Flooding	5. Tornadoes	6. Inclement Weather	7. Public Health Emergencies	8. Transportation Accidents (Bus, Airplane, Train)	9. Extreme Temperatures	10. Hazardous Materials Incidents (Transportation)	11. Hazardous Materials Incidents (Fixed Sites)	12. Dam Failure	13. Civil Disturbance	14. Oil and Natural Gas Well/Pipeline Accidents	15. Drought	16. Terrorism	17. Nuclear Attack	18. Scrap Tire Fires	19. Subsidence (Sinkholes)	20. Earthquakes	21. Nuclear Power Plant Accidents
Village of Almont - Warning Sirens					T	T															
Village of Almont - Infrastructure Improvements			T																		
Village of Almont - Soil Stabilization				T																	
Village of Almont - Culvert Improvements				T																	
Village of Almont - Shelter					T																
Attica Township - Backup Generator	T		T	T	T	T			T							M				L	L
Attica Township - Warning Sirens					T	T															
Elba Township - Shelter					T	T															
Imlay City - Infrastructure Improvements			T																		
Imlay City - Bell River Restoration				T																	
Imlay City and Township - Warning Sirens					T	T															
City of Lapeer - Backup Generator	T		T	T	T	T			T							M				L	L
City of Lapeer - Warning Sirens					T	T															
~~City of Lapeer - Shelter (Removed)~~					T	T															
~~City of Lapeer - Commercial/Industrial Inspections (Removed)~~		H																			
City of Lapeer - Floodplain Maps				T																	
Village of Otter Lake - Backup Generator	T		T	T	T	T			T							M				L	L
Village of Otter Lake - Warning Siren					T	T															
~~Lapeer Conservation District - Tree Program (Removed)~~	H	H	H		H	H															
Lapeer County - Floodplain Maps				T																	

Priority Level

Top = T

High = H

Medium = M

Low = L

Next Steps

- Receive public comments through June 18th
- Receive committee approval for each plan
- Submit to the Michigan State Police for review/feedback
- MSP submits plans to FEMA
- FEMA reviews plans and provides feedback
- FEMA approves plans
- Local units of government adopt plan for their county
- Send final copy of plan with resolutions to MSP/FEMA

Thank you for attending!

Don't forget to review the Hazard Mitigation Plan Update Drafts at http://gcmpc.org/ under public notices.
The comment period closes June 18th

Appendix B

Surveys

Genesee-Lapeer-Shiawassee Region V Planning and Development Commission

ROOM 223 – 1101 BEACH STREET FLINT, MICHIGAN 48502-1470
TELEPHONE (810) 257-3010 FAX (810) 257-3185

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Citizens of Genesee and Lapeer Counties and Community Organizations

FROM: Cody Roblyer, Planning Specialist
Genesee County Metropolitan Planning Commission

DATE: January 19, 2021

SUBJECT: Request for Hazard Mitigation Survey Participation

Genesee and Lapeer Counties are updating their Hazard Mitigation Plans and would like the input of citizens and community organizations in this process. The plan identifies potential disasters that could impact your community. The goal of this survey is to determine what is important to each community and to get the public's perspective on hazard mitigation. The responses will be compiled and included in the community portion of the plan updates. To take the survey online, go to: https://www.surveymonkey.com/r/HazMitPublicSurvey. Please complete the survey by 5PM on Wednesday, January 27th. If you have already completed the survey, please disregard this notice.

If you would like a paper copy of the survey, please send a request to Debby Compton at dcompton@geneseecountymi.gov or by calling 810-257-3010.

A virtual open house will also be held on Tuesday, January 26th from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about hazards in Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom Meeting on Tuesday, January 26th from 11:30AM – 12:30PM
https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

Post Engagements ▲119%

Page Likes 19 ▲27%

Set Your Page up for Success

Finish setting up your Page so people on Facebook know you're a credible business.

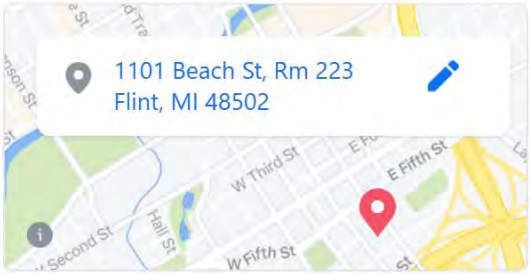
10 of 13 steps completed

COMPLETED
Establish Your Page's Identity

2 STEPS LEFT
Provide Info and Preferences

1 STEP LEFT
Introduce Your Page

About



Promote your business locally to lead

Genesee County Metropolitan Planning Commission
Published by David Yeoman · 17m ·

Although the past year has been filled with many unexpected events, you can help Genesee and Lapeer Counties develop a plan to prepare for future natural and man-made disasters by taking our quick 5-minute survey: https://www.surveymonkey.com/r/HazMitPublicSurvey.

A virtual open house will also be held on Tuesday, January 26th from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about hazards in Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom Meeting on Tuesday, January 26th from 11:30AM – 12:30PM
https://geneseecountymi.zoom.us/j/93830026146...

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#
Passcode: 899417

#1

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 11:26:25 AM
Last Modified:	Monday, January 11, 2021 11:29:40 AM
Time Spent:	00:03:14
IP Address:	66.227.143.211

Page 2

Q2

Which city, township, or village are you from?

Fenton City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
COVID-19

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Public Health Emergencies,

Riverine Flooding,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

The City should monitor the hazards that could potentially affect our community and have projects in place to lessen the impact of those hazards

#2

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 12:48:25 PM
Last Modified:	Monday, January 11, 2021 12:51:00 PM
Time Spent:	00:02:35
IP Address:	146.88.225.64

Page 2

Q2

Which city, township, or village are you from?

Grand Blanc Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Consumers Energy

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Flint Water Crisis, wind storms & ice storm

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Public Health Emergencies,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Training, standardized excavation processes such as Gold Shovel, communication about plans and preparation with stakeholders

#3

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 3:13:40 PM
Last Modified:	Monday, January 11, 2021 3:14:54 PM
Time Spent:	00:01:13
IP Address:	24.127.210.137

Page 2

Q2

Which city, township, or village are you from?

Genesee Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Inclement Weather,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#4

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 3:18:31 PM
Last Modified:	Monday, January 11, 2021 3:19:52 PM
Time Spent:	00:01:21
IP Address:	107.5.248.127

Page 2

Q2

Which city, township, or village are you from?

Burton City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Structure Fires,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#5

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 4:41:59 PM
Last Modified:	Monday, January 11, 2021 4:46:34 PM
Time Spent:	00:04:34
IP Address:	50.36.184.142

Page 2

Q2

Which city, township, or village are you from?

Forest Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Weather alerts

#6

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 5:49:18 PM
Last Modified:	Monday, January 11, 2021 5:52:15 PM
Time Spent:	00:02:57
IP Address:	68.48.141.96

Page 2

Q2

Which city, township, or village are you from?

Mt. Morris Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Hazardous Materials Incidents (Fixed Site),

Infrastructure Failure

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#7

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 6:51:02 AM
Last Modified:	Tuesday, January 12, 2021 6:52:32 AM
Time Spent:	00:01:29
IP Address:	129.9.75.196

Page 2

Q2

Which city, township, or village are you from?

Richfield Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#8

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 8:03:07 AM
Last Modified:	Tuesday, January 12, 2021 8:07:58 AM
Time Spent:	00:04:51
IP Address:	12.51.171.150

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Flint Water Crisis

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Fixed Site),

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Resolve problem areas

#9

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 10:05:58 AM
Last Modified:	Tuesday, January 12, 2021 10:07:25 AM
Time Spent:	00:01:27
IP Address:	162.17.131.1

Page 2

Q2

Which city, township, or village are you from?

Burton City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#10

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 1:48:29 PM
Last Modified:	Tuesday, January 12, 2021 1:51:39 PM
Time Spent:	00:03:10
IP Address:	12.168.1.250

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Snow and Ice Storms,

Structure Fires

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

More training and funding for police and fire departments.

#11

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 1:48:41 PM
Last Modified:	Tuesday, January 12, 2021 1:53:29 PM
Time Spent:	00:04:47
IP Address:	68.56.111.35

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Clio Cast & Crew

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Coronavirus, has impacted our theater program. Cancellation of Shows and educational program's

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Extreme Temperatures,

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Mandatory mask wearing.

#12

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 3:09:24 PM
Last Modified:	Tuesday, January 12, 2021 3:10:38 PM
Time Spent:	00:01:13
IP Address:	68.55.48.229

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

Yes

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Public Health Emergencies,

Terrorism

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

more information

#13

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 5:29:03 PM
Last Modified:	Tuesday, January 12, 2021 5:31:18 PM
Time Spent:	00:02:15
IP Address:	107.4.76.112

Page 2

Q2

Which city, township, or village are you from?

Clio City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation),

Public Health Emergencies,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#14

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 5:43:32 PM
Last Modified:	Tuesday, January 12, 2021 5:45:49 PM
Time Spent:	00:02:17
IP Address:	107.5.31.208

Page 2

Q2

Which city, township, or village are you from?

Clio City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation)

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Engine breaking on semi's should be stopped

#15

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 7:14:11 PM
Last Modified:	Tuesday, January 12, 2021 7:16:50 PM
Time Spent:	00:02:39
IP Address:	68.61.56.135

Page 2

Q2

Which city, township, or village are you from?

Mt. Morris Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Tornadoes,

Drought

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Better weather sirens

#16

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 10:09:48 PM
Last Modified:	Tuesday, January 12, 2021 10:15:22 PM
Time Spent:	00:05:33
IP Address:	68.3.145.165

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
WVUM

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Security & prevenative maintenance.

#17

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 13, 2021 9:55:26 AM
Last Modified:	Wednesday, January 13, 2021 9:57:06 AM
Time Spent:	00:01:40
IP Address:	192.135.206.201

Page 2

Q2

Which city, township, or village are you from?

Grand Blanc Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Extreme Temperatures,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Planning is the best and likely only step that can be taken with the threats identified.

#18

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 13, 2021 3:12:19 PM
Last Modified:	Wednesday, January 13, 2021 3:16:48 PM
Time Spent:	00:04:28
IP Address:	198.109.173.41

Page 2

Q2

Which city, township, or village are you from?

Davison City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Michigan House Representative, 48th District American Legion Post #267

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation),

Inclement Weather,

Infrastructure Failure

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

First Responder training and exercises
Seasonal equipment maintained and in place
Emergency Operation Plans written and exercised

#19

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, January 14, 2021 11:11:43 AM
Last Modified:	Thursday, January 14, 2021 11:15:14 AM
Time Spent:	00:03:30
IP Address:	209.177.8.161

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
MTA -Flint

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

With all of our fixed route buses being fueled by CNG, a natural gas outage would stop our services within a day.

#20

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, January 14, 2021 11:49:50 AM
Last Modified:	Thursday, January 14, 2021 11:52:27 AM
Time Spent:	00:02:37
IP Address:	24.231.179.184

Page 2

Q2

Which city, township, or village are you from?

Davison Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Davison-Richfield Senior Citizens Activity Center

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Inclement Weather

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Educate the public

#21

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 15, 2021 5:05:52 PM
Last Modified:	Friday, January 15, 2021 5:07:06 PM
Time Spent:	00:01:13
IP Address:	206.201.156.20

Page 2

Q2

Which city, township, or village are you from?

Clio City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#22

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 15, 2021 9:16:29 PM
Last Modified:	Friday, January 15, 2021 9:17:33 PM
Time Spent:	00:01:04
IP Address:	67.177.139.10

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#23

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 18, 2021 11:27:09 AM
Last Modified:	Monday, January 18, 2021 11:28:09 AM
Time Spent:	00:00:59
IP Address:	68.34.67.78

Page 2

Q2

Which city, township, or village are you from?

Mundy Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Hazardous Materials Incidents (Transportation),

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#24

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 19, 2021 9:40:08 AM
Last Modified:	Tuesday, January 19, 2021 9:41:24 AM
Time Spent:	00:01:15
IP Address:	68.48.85.244

Page 2

Q2

Which city, township, or village are you from?

Grand Blanc Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Structure Fires,

Subsidence (Sinkholes)

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#25

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 20, 2021 11:11:06 PM
Last Modified:	Wednesday, January 20, 2021 11:17:46 PM
Time Spent:	00:06:39
IP Address:	184.53.0.169

Page 2

Q2

Which city, township, or village are you from?

Richfield Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
COVID

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation),

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Knowledge of hazardous materials being transported via rail so appropriate response can be planned.

#26

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 22, 2021 2:36:56 PM
Last Modified:	Friday, January 22, 2021 2:39:21 PM
Time Spent:	00:02:24
IP Address:	15.222.241.64

Page 2

Q2

Which city, township, or village are you from?

Linden City

Q3

Are you a member of a community organization?

Yes

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Structure Fires,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#27

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 22, 2021 3:08:01 PM
Last Modified:	Friday, January 22, 2021 3:13:16 PM
Time Spent:	00:05:15
IP Address:	69.39.82.10

Page 2

Q2

Which city, township, or village are you from?

Argentine Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Riverine Flooding,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Infrastructure upgrades. In our area we have lost power for days at a time. Also there is no natural gas availability within miles of my home.

#28

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 22, 2021 3:41:01 PM
Last Modified:	Friday, January 22, 2021 3:43:19 PM
Time Spent:	00:02:17
IP Address:	65.155.81.122

Page 2

Q2

Which city, township, or village are you from?

Genesee Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Advance planning, communication and training

#29

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 22, 2021 4:11:06 PM
Last Modified:	Friday, January 22, 2021 5:17:01 PM
Time Spent:	01:05:54
IP Address:	68.188.161.189

Page 2

Q2

Which city, township, or village are you from?

Davison Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Davison Odd Fellows, Davison Historical Society, Genesee County Metropolitan Alliance Board,

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Major Transportation Accidents,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Education of the public on action taken to keep the community safe

#30

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 22, 2021 6:26:56 PM
Last Modified:	Friday, January 22, 2021 6:29:53 PM
Time Spent:	00:02:57
IP Address:	174.25.177.109

Page 2

Q2

Which city, township, or village are you from?

Atlas Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Atlas fire department

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#31

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 8:34:58 AM
Last Modified:	Monday, January 25, 2021 8:38:02 AM
Time Spent:	00:03:04
IP Address:	173.13.2.210

Page 2

Q2

Which city, township, or village are you from?

Burton City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Snow and Ice Storms,

Structure Fires

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Try to be informed.

#32

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 9:51:43 AM
Last Modified:	Monday, January 25, 2021 9:57:03 AM
Time Spent:	00:05:19
IP Address:	173.162.45.45

Page 2

Q2

Which city, township, or village are you from?

Mundy Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Mundy Township fire Department

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
First Responder/ Genesee County Haz-Mat Team

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Fixed Site),

Hazardous Materials Incidents (Transportation),

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Pre Planning

#33

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 9:57:15 AM
Last Modified:	Monday, January 25, 2021 10:04:27 AM
Time Spent:	00:07:11
IP Address:	50.77.231.9

Page 2

Q2

Which city, township, or village are you from?

Burton City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Fixed Site),

Inclement Weather,

Subsidence (Sinkholes)

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Better communication with the private sector, more site inspections.

#34

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 10:44:57 AM
Last Modified:	Monday, January 25, 2021 10:46:35 AM
Time Spent:	00:01:38
IP Address:	173.167.6.193

Page 2

Q2

Which city, township, or village are you from?

Swartz Creek City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Fixed Site),

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#35

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, January 25, 2021 12:27:25 PM
Last Modified: Monday, January 25, 2021 12:31:02 PM
Time Spent: 00:03:37
IP Address: 198.0.102.153

Page 2

Q2

Which city, township, or village are you from?

Flint Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
West Flint Business Association, Swartz Creek Chamber, Flint and Genesee Chamber, I-69 International Trade Corridor

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Flood

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Riverine Flooding

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Better stormwater drainage

#36

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 9:35:25 AM
Last Modified:	Tuesday, January 26, 2021 9:36:25 AM
Time Spent:	00:00:59
IP Address:	71.13.56.81

Page 2

Q2

Which city, township, or village are you from?

Atlas Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Hazardous Materials Incidents (Transportation),

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#37

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 10:24:58 AM
Last Modified:	Tuesday, January 26, 2021 10:26:17 AM
Time Spent:	00:01:18
IP Address:	206.201.156.20

Page 2

Q2

Which city, township, or village are you from?

Mundy Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#38

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, January 26, 2021 10:37:26 AM
Last Modified: Tuesday, January 26, 2021 10:38:59 AM
Time Spent: 00:01:33
IP Address: 71.13.88.90

Page 2

Q2

Which city, township, or village are you from?

Davison Township

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Davison Township Board

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

None at this time

#39

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 10:37:47 AM
Last Modified:	Tuesday, January 26, 2021 10:39:06 AM
Time Spent:	00:01:19
IP Address:	206.201.156.20

Page 2

Q2

Which city, township, or village are you from?

Flint Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Public Health Emergencies,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

.

#40

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 10:38:58 AM
Last Modified:	Tuesday, January 26, 2021 10:40:47 AM
Time Spent:	00:01:48
IP Address:	24.180.178.205

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
YWCA Greater Flint

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No,
If yes, please explain::
water lead poisoning COVID 19 pandemic

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#41

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 10:42:04 AM
Last Modified:	Tuesday, January 26, 2021 10:46:29 AM
Time Spent:	00:04:25
IP Address:	206.201.156.20

Page 2

Q2

Which city, township, or village are you from?

Clio City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Infrastructure Failure,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Repair/maintain/replace sewer and water infrastructure; invest in additional snow remediation equipment and/or hire additional crews

#42

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 11:20:05 AM
Last Modified:	Tuesday, January 26, 2021 11:21:38 AM
Time Spent:	00:01:32
IP Address:	50.77.234.137

Page 2

Q2

Which city, township, or village are you from?

Genesee Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Scrap Tire Fires,

Structure Fires,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#43

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 11:25:38 AM
Last Modified:	Tuesday, January 26, 2021 11:28:37 AM
Time Spent:	00:02:59
IP Address:	136.228.52.30

Page 2

Q2

Which city, township, or village are you from?

Mundy Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Public Health Emergencies,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Since all concerns are essentially dur to Mother Nature I am not sure how we coul dbe proactive in preventing these accourances.

#44

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, January 26, 2021 11:35:10 AM
Last Modified: Tuesday, January 26, 2021 11:37:36 AM
Time Spent: 00:02:26
IP Address: 71.90.148.64

Page 2

Q2

Which city, township, or village are you from?

Argentine Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#45

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 11:33:56 AM
Last Modified:	Tuesday, January 26, 2021 11:37:42 AM
Time Spent:	00:03:46
IP Address:	75.151.21.153

Page 2

Q2

Which city, township, or village are you from?

Mundy Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Coordinated plans for the entire county, not just individual communities

#46

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, January 26, 2021 11:58:05 AM
Last Modified: Tuesday, January 26, 2021 11:59:10 AM
Time Spent: 00:01:05
IP Address: 206.201.156.20

Page 2

Q2

Which city, township, or village are you from?

Genesee Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#47

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 12:04:26 PM
Last Modified:	Tuesday, January 26, 2021 12:09:06 PM
Time Spent:	00:04:40
IP Address:	107.77.193.42

Page 2

Q2

Which city, township, or village are you from?

Burton City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Genesee County CoC and My Brother's Keeper

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Flint water crisis, COVID-19 and lack of affordable housing stock for the community. Especially the homeless community that needs endless support to remain housed.

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Public Health Emergencies,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Constant communication

#48

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 12:28:01 PM
Last Modified:	Tuesday, January 26, 2021 12:29:23 PM
Time Spent:	00:01:22
IP Address:	68.62.10.215

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Extreme Temperatures,

Tornadoes,

Drought

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Ensure warning systems up to
Date.

#49

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 12:35:45 PM
Last Modified:	Tuesday, January 26, 2021 12:38:04 PM
Time Spent:	00:02:18
IP Address:	96.70.119.73

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Shelter of Flint

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Poisoned water, COVID

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Public Health Emergencies,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

A serious investment in infrastructure

#50

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 1:10:22 PM
Last Modified:	Tuesday, January 26, 2021 1:15:02 PM
Time Spent:	00:04:39
IP Address:	98.243.67.24

Page 2

Q2

Which city, township, or village are you from?

Mt. Morris City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Inclement Weather,

Major Transportation Accidents

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Having a plan in place in case something comes up

#51

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 1:21:21 PM
Last Modified:	Tuesday, January 26, 2021 1:26:00 PM
Time Spent:	00:04:39
IP Address:	70.88.124.254

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Genesee County Habitat for Humanity

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
water crisis, COVID

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Infrastructure Failure,

Public Health Emergencies

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Investing in infrastructure, education, housing and nutrition

#52

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 1:43:34 PM
Last Modified:	Tuesday, January 26, 2021 1:48:15 PM
Time Spent:	00:04:40
IP Address:	12.51.171.150

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
City of Flint

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Water Crisis, Dam Issues

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Infrastructure Failure,

Riverine Flooding

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Fix excessing infrastructure prepare better.

#53

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, January 26, 2021 2:40:29 PM
Last Modified: Tuesday, January 26, 2021 2:43:44 PM
Time Spent: 00:03:14
IP Address: 174.84.72.13

Page 2

Q2

Which city, township, or village are you from?

Swartz Creek City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Swartz Creek Senior Center

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances,

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Not sure

#54

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 5:59:45 PM
Last Modified:	Tuesday, January 26, 2021 6:08:10 PM
Time Spent:	00:08:25
IP Address:	136.228.52.1

Page 2

Q2

Which city, township, or village are you from?

Montrose City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Montrose Community Schools

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Fixed Site),

Hazardous Materials Incidents (Transportation)

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Continued monitoring of potential areas that could cause these problems.

#55

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 27, 2021 9:12:32 AM
Last Modified:	Wednesday, January 27, 2021 9:14:56 AM
Time Spent:	00:02:24
IP Address:	24.128.233.90

Page 2

Q2 Which city, township, or village are you from?	**Vienna Township**
Q3 Are you a member of a community organization?	**No**
Q4 In the past five years, has your community been impacted by a natural or man-made disaster?	**No**
Q5 How concerned are you about the possibility of your community being impacted by a disaster?	**Not Concerned**
Q6 What hazards do you feel could most impact your community? (Choose Three)	**Hazardous Materials Incidents (Transportation),** **Structure Fires,** **Tornadoes**
Q7 What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?	**Respondent skipped this question**

#56

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 27, 2021 11:01:32 AM
Last Modified:	Wednesday, January 27, 2021 11:04:06 AM
Time Spent:	00:02:34
IP Address:	206.201.156.20

Page 2

Q2

Which city, township, or village are you from?

Atlas Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
cyber intrusion, pandemic COVID,

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure,

Public Health Emergencies,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

More funding for Emergency Management staff.

#57

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, January 27, 2021 12:33:16 PM
Last Modified: Wednesday, January 27, 2021 12:38:24 PM
Time Spent: 00:05:08
IP Address: 71.13.88.90

Page 2

Q2

Which city, township, or village are you from?

Davison Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation),

Oil or Natural Gas Well Accidents,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Maintain open communication with MDOT, C&N railway, and gas pipeline operators to prevent and prepare for hazards/disasters.

#58

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, January 27, 2021 1:14:12 PM
Last Modified: Wednesday, January 27, 2021 1:17:23 PM
Time Spent: 00:03:10
IP Address: 68.42.150.30

Page 2

Q2

Which city, township, or village are you from?

Flushing City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure,

Public Health Emergencies,

Riverine Flooding

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Maintain emergency response plan

#59

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 27, 2021 2:00:46 PM
Last Modified:	Wednesday, January 27, 2021 2:02:24 PM
Time Spent:	00:01:38
IP Address:	12.51.171.150

Page 2

Q2

Which city, township, or village are you from?

Flint City

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Flint Water Crisis

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Public Health Emergencies,

Snow and Ice Storms

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#60

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, January 27, 2021 5:23:59 PM
Last Modified: Wednesday, January 27, 2021 5:54:21 PM
Time Spent: 00:30:22
IP Address: 75.134.219.54

Page 2

Q2

Which city, township, or village are you from?

Goodrich Village

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
Village of Goodrich Council member, Appointed Street Administrator, Parks, and Rec. Committee Genesee County Metropolitan Committee appointed elected official, a Lifetime Member of the Goodrich/Altlas Historical Society.

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Farmers drain that was not maintained for over 100 years. They continued to build there for causing flooding to many properties and homes in the village.

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Dam Failure

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

The Dam needs to be addressed as soon as possible because all of the sediment in the Goodrich Mill Pond is very toxic. They had the Goodrich hospital many years ago and the tannery in Ortonville that use to go into the pond. If that dam breaks it's going to affect the whole village and surrounding lakes. Also, Ortonville does not have sewers so their waste comes our way that is not right.

#61

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Sunday, January 31, 2021 12:42:18 AM
Last Modified:	Sunday, January 31, 2021 12:45:37 AM
Time Spent:	00:03:19
IP Address:	174.25.177.227

Page 2

Q2

Which city, township, or village are you from?

Montrose City

Q3

Are you a member of a community organization?

Yes,
If yes, which organizations?:
City Counsel

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
COVID-19

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents,

Drought

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Maintain the rail system, maintain the roads.

#62

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 04, 2021 11:50:27 AM
Last Modified:	Thursday, February 04, 2021 11:51:51 AM
Time Spent:	00:01:23
IP Address:	107.4.76.208

Page 2

Q2

Which city, township, or village are you from?

Vienna Township

Q3

Are you a member of a community organization?

No

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Respondent skipped this question

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#63

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, February 09, 2021 8:10:14 PM
Last Modified: Tuesday, February 09, 2021 8:11:13 PM
Time Spent: 00:00:59
IP Address: 68.55.48.229

Page 2

Q2

Which city, township, or village are you from?

Otter Lake Village

Q3

Are you a member of a community organization?

Yes

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Three)

Inclement Weather,

Snow and Ice Storms,

Tornadoes

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#64

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 25, 2021 9:35:57 PM
Last Modified:	Thursday, February 25, 2021 9:37:20 PM
Time Spent:	00:01:22
IP Address:	69.196.88.243

Page 2

Q2

Which city, township, or village are you from?

Respondent skipped this question

Q3

Are you a member of a community organization?

Respondent skipped this question

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Respondent skipped this question

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Respondent skipped this question

Q6

What hazards do you feel could most impact your community? (Choose Three)

Civil Disturbances

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

#65

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, February 25, 2021 9:37:24 PM
Last Modified: Thursday, February 25, 2021 10:00:12 PM
Time Spent: 00:22:48
IP Address: 69.196.88.243

Page 2

Q2

Which city, township, or village are you from?

Respondent skipped this question

Q3

Are you a member of a community organization?

Respondent skipped this question

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Respondent skipped this question

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Respondent skipped this question

Q6

What hazards do you feel could most impact your community? (Choose Three)

Infrastructure Failure

Q7

What steps could be taken to reduce or eliminate the risk of future hazard damages in your community?

Respondent skipped this question

Genesee-Lapeer-Shiawassee Region V Planning and Development Commission

ROOM 223 – 1101 BEACH STREET FLINT, MICHIGAN 48502-1470
TELEPHONE (810) 257-3010 FAX (810) 257-3185

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Local Government Officials

FROM: Cody Roblyer, Planning Specialist
Genesee County Metropolitan Planning Commission

DATE: January 19, 2021

SUBJECT: Request for Hazard Mitigation Survey Participation

The GLS Region V Planning and Development Commission staff is requesting your participation in the enclosed survey as part of the process for updating Genesee and Lapeer Counties multijurisdictional Hazard Mitigation Plans. The goal of this survey is to determine what is important to each specific municipality and to understand the steps that are being taken to prevent or mitigate hazards in the community. The responses will be compiled and included in the Community Profile section of the updated plan. To take the survey online, go to: https://www.surveymonkey.com/r/HazMitGovernmentSurvey. Please complete the survey by 5PM on Wednesday, January 27th. If you have already completed the survey, please disregard this notice.

If you would like a paper copy of the survey, please send a request to Debby Compton at dcompton@geneseecountymi.gov or by calling 810-257-3010.

A virtual open house will also be held on Tuesday, January 26th from 11:30AM – 12:30PM which will provide an opportunity to share your thoughts and receive answers to your questions about hazards in Genesee and Lapeer Counties. Please join us by using the link below.

Join Zoom Meeting on Tuesday, January 26th from 11:30AM – 12:30PM
https://geneseecountymi.zoom.us/j/93830026146?pwd=aXVjMDVqYm02N2ozdzlUNlUwQWNpZz09

Or Dial:
(312) 626-6799
Meeting ID: 938 3002 6146#

#1

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 12:46:33 PM
Last Modified:	Monday, January 11, 2021 12:53:30 PM
Time Spent:	00:06:56
IP Address:	173.167.6.193

Page 2

Q2

What is your name and title?

Adam Zettel
City Manager

Q3

Which city, township, or village do you represent?

Swartz Creek City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Civil Disturbances,

Inclement Weather,

Riverine Flooding,

Snow and Ice Storms

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Water system investment. Drainage and sewage capacity improvement.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:
Generator purchases. Lift station upgrades and removal (gravity alternates). Inflow/infiltration mitigation for sanitary sewer. Shelter requirement for new homes.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Regional training exercises.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Drain dredging with county.

Q12

Do you have any additional comments?

Respondent skipped this question

#2

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 4:55:21 PM
Last Modified:	Monday, January 11, 2021 5:06:14 PM
Time Spent:	00:10:53
IP Address:	24.127.214.149

Page 2

Q2

What is your name and title?

Eric Wiederhold, City Administrator

Q3

Which city, township, or village do you represent?

Clio City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
COVID-19 pandemic, miscellaneous storm events (branches down), flooding of low lying areas (Pine Run floodplain).

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Infrastructure Failure,

Snow and Ice Storms

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Completed significant potable water distribution system improvements (USDA financed), planning significant sanitary sewer collection system improvements (self-financed and USDA financed), continue to make street surface improvements, adopted a storm water (NPDES) program.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Storm water (NPDES) program.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Incorporate, or at least consider, hazard mitigation in hard construction projects; communication with residents/ property owners; communication with other jurisdictions and levels of government.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Provide basic and essential services and meet existing obligations (infrastructure and services) to mitigate hazards.

Q12

Do you have any additional comments?

Respondent skipped this question

#3

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 11, 2021 4:35:37 PM
Last Modified:	Monday, January 11, 2021 5:12:04 PM
Time Spent:	00:36:27
IP Address:	66.188.27.122

Page 2

Q2

What is your name and title?

Daniel Campbell
Asst. Superintendent

Q3

Which city, township, or village do you represent?

Otisville Village

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
COVID-19

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Infrastructure Failure,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Retention basins at new construction.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

ERP

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Training & Funding.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

update ERP.

Q12

Do you have any additional comments?

Not at this time.

#4

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 2:12:59 PM
Last Modified:	Tuesday, January 12, 2021 2:17:20 PM
Time Spent:	00:04:20
IP Address:	208.83.66.178

Page 2

Q2

What is your name and title?

Wendy Jean-Buhrer, City Manager

Q3

Which city, township, or village do you represent?

Grand Blanc City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
COVID-19

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

The City has updated our Emergency Plan and reviews it annual.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Again, the City updates our Emergency Plan and reviews it annual.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

The City could provide better communication through the many social media venues.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Update Emergency Plan, Update Communication Plan

Q12

Do you have any additional comments?

Respondent skipped this question

#5

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 3:44:45 PM
Last Modified:	Tuesday, January 12, 2021 3:47:27 PM
Time Spent:	00:02:41
IP Address:	47.50.2.170

Page 2

Q2

What is your name and title?

Robert Cairnduff- Fire Chief

Q3

Which city, township, or village do you represent?

Fenton City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Dam Failure,

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

We updated our Emergency Operations Support plan. We had an assessment of our Dam completed.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#6

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 3:40:23 PM
Last Modified:	Tuesday, January 12, 2021 3:57:12 PM
Time Spent:	00:16:48
IP Address:	69.136.133.8

Page 2

Q2

What is your name and title?

Ellen Ellenburg Genesee County Commissioner

Q3

Which city, township, or village do you represent?

Burton City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
I also represent City of Flint, the water issue

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Extreme Temperatures,

Inclement Weather,

Infrastructure Failure,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Cooling centers, fixing roads and bridges, setting up Mobil sites for testing and flu shots. Helping with payments of heating bills through GCARD.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Using social media to get the word out the things we have in place.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Starting with infrastructure of older buildings. Safety of road hazards.

Q12

Do you have any additional comments?

Respondent skipped this question

#7

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 4:05:58 PM
Last Modified:	Tuesday, January 12, 2021 4:13:28 PM
Time Spent:	00:07:29
IP Address:	50.77.240.10

Page 2

Q2

What is your name and title?

Kirk Wilkinson - Fire Chief

Q3

Which city, township, or village do you represent?

Burton City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

We have upgraded our existing tornado sirens and continue to add a new one each year. It is anticipated that in 2022 we will install our 9th and final siren.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,
If yes, what were they?:
All major city building now have back up generators some of which were installed in the last 5 years. Some property in a flood plain was also deemed unbuildable and unable to be sold to the public.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Out reach and educational opportunities as well as additional training for police/fire/ DPW employees

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Completion of our siren project.

Q12

Do you have any additional comments?

No

#8

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 4:13:47 PM
Last Modified:	Tuesday, January 12, 2021 4:23:07 PM
Time Spent:	00:09:20
IP Address:	24.236.166.50

Page 2

Q2

What is your name and title?

Ryan Volz, Fire Chief

Q3

Which city, township, or village do you represent?

Fenton Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents,

Snow and Ice Storms,

Structure Fires

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Train our D.P.W. workers for emergency operation in the event of a disaster. Work with our building department on plan reviews to catch problems before they happen.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Back up generators Fixed generators at busy sewer lift stations

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Train our D.P.W. to work hand and hand with the Fire Department

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Up dates need to be added annually

Q12

Do you have any additional comments?

Respondent skipped this question

#9

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 4:29:05 PM
Last Modified:	Tuesday, January 12, 2021 4:43:05 PM
Time Spent:	00:14:00
IP Address:	207.74.114.50

Page 2

Q2

What is your name and title?

Mark Hoornstra, Police Chief

Q3

Which city, township, or village do you represent?

Flushing City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Civil Disturbances,

Hazardous Materials Incidents (Transportation),

Inclement Weather,

Structure Fires

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

N/A

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

We have installed a generator at city hall that provides power to the police department and city administration.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

The police departments would benefit from coordinated training for civil disturbances.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

We have floodplain maps and updated our hazard plan a few years ago.

Q12

Do you have any additional comments?

Respondent skipped this question

#10

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 4:53:25 PM
Last Modified:	Tuesday, January 12, 2021 5:03:38 PM
Time Spent:	00:10:12
IP Address:	198.208.47.85

Page 2

Q2

What is your name and title?

Tina Burry

Q3

Which city, township, or village do you represent?

Flint City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
The community was impacted by the Flint Water Crisis and COVID-19 pandemic

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Inclement Weather,

Infrastructure Failure,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Investment in replacing lead service lines, removal of the Hamilton dam,

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#11

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 5:57:56 PM
Last Modified:	Tuesday, January 12, 2021 6:41:25 PM
Time Spent:	00:43:28
IP Address:	68.43.202.102

Page 2

Q2

What is your name and title?

Rae Lynn Hicks, Councilmember

Q3

Which city, township, or village do you represent?

Swartz Creek City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Pandemic Public Health

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Infrastructure Failure,

Public Health Emergencies,

Snow and Ice Storms

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Replace water mains. Road improvements.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Back up generator at Fire Station. Money to replace roads. Lift station replaced. Fire equipment replaced/repaired.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Education for citizens. For themselves and their families and what government has in place. Community leaders also. Table top exercises.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Infrastructure improvement.

Q12

Do you have any additional comments?

Require local elected officials to attend basic emergency response education class. What is a PIO? Who is in command during an emergency? Where do I go to get up to date information during an emergency?

#12

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 12, 2021 11:21:19 PM
Last Modified:	Tuesday, January 12, 2021 11:24:42 PM
Time Spent:	00:03:23
IP Address:	174.81.211.0

Page 2

Q2

What is your name and title?

Supervisor Rachel Stanke

Q3

Which city, township, or village do you represent?

Thetford Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Respondent skipped this question

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Additional training, preparation

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Emergency Response Plan

Q12

Do you have any additional comments?

Respondent skipped this question

#13

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 13, 2021 1:19:47 PM
Last Modified:	Wednesday, January 13, 2021 2:07:47 PM
Time Spent:	00:48:00
IP Address:	104.9.183.156

Page 2

Q2

What is your name and title?

Spring Tremaine, Director of Genesee County 9-1-1

Q3

Which city, township, or village do you represent?

Respondent skipped this question

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
The tornado in March 2019 affecting 6+ of our townships and villages in Genesee County.

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Infrastructure Failure,

Terrorism,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Genesee County 911 has implement redundancy in our technology to withstand failures, storage in the cloud and remote dispatching and back up technologies.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,
If yes, what were they?:
Many things we cannot control but can control their impact. Recently purchased virtual servers, back up servers, cloud storage and cloud retrieval systems. Next generation 911 is in place so we have the highest quality 9-1-1 system in place. Recently, sought to purchase disaster remote phone system to operate off site.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

I think the plans are in place but not so much a coordinated effort by all the groups to include their neighbors. The airport does a great job of including all communities when holding table top exercises for disasters etc. We are ready independently but not so much together.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

The operate off Genesee Counties Emergency Response Plan through emergency management and do not have our own independent one.

Q12

Do you have any additional comments?

I think all this is useful as disasters cannot be predicted and Covid has taught us, just when you thought you were ready you were not.

#14

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 13, 2021 2:31:35 PM
Last Modified:	Wednesday, January 13, 2021 2:36:28 PM
Time Spent:	00:04:52
IP Address:	173.14.59.177

Page 2

Q2

What is your name and title?

Tim Jones, Deputy Director
Genesee County 9-1-1 Authority

Q3

Which city, township, or village do you represent?

Respondent skipped this question

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Major Transportation Accidents,

Public Health Emergencies,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Maintain communications for all communities

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

coordination of efforts and open dialog.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

maintain emergency contact information

Q12

Do you have any additional comments?

no

#15

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 13, 2021 3:15:11 PM
Last Modified:	Wednesday, January 13, 2021 3:51:51 PM
Time Spent:	00:36:39
IP Address:	50.216.124.18

Page 2

Q2

What is your name and title?

Robert Burdette Fire Chief

Q3

Which city, township, or village do you represent?

Grand Blanc Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
snow, ice and strong wind storms

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Snow and Ice Storms,

Structure Fires,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Ongoing sewer system preventative maintenance.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

The fire service is inspecting establishments that are considered high hazards annually, with those classified as a low hazards inspected every three years.

Q12

Do you have any additional comments?

Respondent skipped this question

#16

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, January 13, 2021 7:38:56 PM
Last Modified:	Wednesday, January 13, 2021 7:50:29 PM
Time Spent:	00:11:32
IP Address:	68.42.122.188

Page 2

Q2

What is your name and title?

Michelle King, Clerk

Q3

Which city, township, or village do you represent?

Flushing City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Covid-19

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Infrastructure Failure,

Public Health Emergencies,

Riverine Flooding,

Snow and Ice Storms

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Water/Sewer line upgrades; DPW equipment upgrades

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#17

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, January 22, 2021 5:02:23 PM
Last Modified:	Friday, January 22, 2021 5:17:55 PM
Time Spent:	00:15:31
IP Address:	50.77.234.137

Page 2

Q2

What is your name and title?

Daniel Eashoo
Supervisor

Q3

Which city, township, or village do you represent?

Genesee Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

I am a new Township Supervisor as of November 20,2020

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

I presume at the County level there are flood plan plans, I have not came across any on the Township level

Q12

Do you have any additional comments?

non at this time

#18

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 1:30:41 PM
Last Modified:	Monday, January 25, 2021 1:32:42 PM
Time Spent:	00:02:00
IP Address:	96.88.152.197

Page 2

Q2

What is your name and title?

Supervisor Tonya Ketzler

Q3

Which city, township, or village do you represent?

Mundy Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Respondent skipped this question

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#19

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 2:01:46 PM
Last Modified:	Monday, January 25, 2021 2:15:19 PM
Time Spent:	00:13:33
IP Address:	66.188.28.2

Page 2

Q2

What is your name and title?

Thomas Spillane Supervisor

Q3

Which city, township, or village do you represent?

Clayton Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Nothing

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Back up generators for police and fire dept

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

work with police, fire and EMS to coordinate services and training with neighboring communities

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

???

Q12

Do you have any additional comments?

???

#20

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, January 25, 2021 2:35:13 PM
Last Modified:	Monday, January 25, 2021 2:44:22 PM
Time Spent:	00:09:09
IP Address:	24.231.173.66

Page 2

Q2

What is your name and title?

Katie Vick, Clerk

Q3

Which city, township, or village do you represent?

Atlas Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Dam Failure,

Inclement Weather,

Oil or Natural Gas Well Accidents,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

added sirens

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Coordinate efforts between communities and improve outreach and preparedness with citizens.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

I'm not really aware of a prioritized strategies list.

Q12

Do you have any additional comments?

We've worked hard to be fiscally responsible and consistent, we really need to develop and implement plans for "what if" scenarios to truly be a reliable leader for our community.

#21

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 9:19:44 AM
Last Modified:	Tuesday, January 26, 2021 9:25:04 AM
Time Spent:	00:05:19
IP Address:	24.236.166.50

Page 2

Q2

What is your name and title?

Thomas Broecker, Operations Manager

Q3

Which city, township, or village do you represent?

Fenton Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Infrastructure Failure,

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Upgraded sewer pump stations to reduce risk of backups and overflows.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

The project to upgrade the sewer pump stations took three years and two bond issues to complete. Total investment was $3 million.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Community education on emergency preparedness.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

To use social media to provide access to emergency preparedness and safety information.

Q12

Do you have any additional comments?

Not at this time.

#22

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 10:48:40 AM
Last Modified:	Tuesday, January 26, 2021 11:10:18 AM
Time Spent:	00:21:38
IP Address:	96.76.242.173

Page 2

Q2

What is your name and title?

Wendy D. Meinburg
Flushing Township Clerk

Q3

Which city, township, or village do you represent?

Flint Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Covid

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Major Transportation Accidents,

Public Health Emergencies,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

installed 4 tornado sirens. we have mitigated to help prevent health risks.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

put developed a hazard mitigation policy. We have one generator but in the process of acquiring a larger one.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

additional training and community outreach(training for the community)

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

develop or update emergency response plan and map of floodplains

Q12

Do you have any additional comments?

Respondent skipped this question

#23

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 11:07:26 AM
Last Modified:	Tuesday, January 26, 2021 11:14:11 AM
Time Spent:	00:06:44
IP Address:	208.83.66.178

Page 2

Q2

What is your name and title?

Wendy Jean-Buhrer, City Manager

Q3

Which city, township, or village do you represent?

Grand Blanc City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Public Health Emergencies,

Structure Fires,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

The City has updated our Emergency Management Plan in 2019, just in time for Covid-19.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

The City has purchased DPW, police and fire supplies to mitigate future supplies.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Our policies and programs can always be improved with different eyes on the plan.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

We plan to continually update our emergency plan.

Q12

Do you have any additional comments?

Respondent skipped this question

#24

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 11:48:53 AM
Last Modified:	Tuesday, January 26, 2021 11:51:55 AM
Time Spent:	00:03:01
IP Address:	71.13.88.90

Page 2

Q2

What is your name and title?

Jim Slezak
Supervisor

Q3

Which city, township, or village do you represent?

Davison Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Civil Disturbances,

Inclement Weather,

Infrastructure Failure,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Respondent skipped this question

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Respondent skipped this question

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Better communication with residents.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#25

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Tuesday, January 26, 2021 12:40:00 PM
Last Modified:	Tuesday, January 26, 2021 12:46:03 PM
Time Spent:	00:06:02
IP Address:	24.180.79.130

Page 2

Q2

What is your name and title?

Andrea Schroeder, City Manager

Q3

Which city, township, or village do you represent?

Davison City

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Inclement Weather,

Infrastructure Failure,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

We are part of the MI-Warn system, drainage improvements, equipment and pumps

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Infrastructure improvements, and equipment replacement

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Emergency and contingency plans for utilities, updated building codes, and map of floodplains.

Q12

Do you have any additional comments?

Respondent skipped this question

#26

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, February 01, 2021 1:14:22 PM
Last Modified: Monday, February 01, 2021 1:26:44 PM
Time Spent: 00:12:21
IP Address: 174.245.19.109

Page 2

Q2

What is your name and title?

Jim Slezak
Supervisor

Q3

Which city, township, or village do you represent?

Davison Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Inclement Weather,

Infrastructure Failure,

Public Health Emergencies,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Respondent skipped this question

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Respondent skipped this question

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#27

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 03, 2021 11:26:51 AM
Last Modified:	Wednesday, February 03, 2021 11:35:52 AM
Time Spent:	00:09:00
IP Address:	173.162.45.45

Page 2

Q2

What is your name and title?

Edward Blight
Fire Chief

Q3

Which city, township, or village do you represent?

Mundy Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Flooding

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Fixed Site),

Hazardous Materials Incidents (Transportation),

Public Health Emergencies,

Riverine Flooding

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Drainage improvements

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Hazard Mitigation Plan

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Additional Training

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Enforcement of Building Codes

Q12

Do you have any additional comments?

No

#28

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 04, 2021 10:52:48 AM
Last Modified:	Thursday, February 04, 2021 11:07:32 AM
Time Spent:	00:14:43
IP Address:	66.188.28.2

Page 2

Q2

What is your name and title?

Tom Spillane Supervisor Clayton Township

Q3

Which city, township, or village do you represent?

Clayton Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Tornado touched down Calkins -Morrish Rd area

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Snow and Ice Storms,

Structure Fires,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

none

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Generators police and fire department

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Respondent skipped this question

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

flood plains are mapped,building codes are updated based on changes in regulations.

Q12

Do you have any additional comments?

Respondent skipped this question

#29

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Monday, February 08, 2021 3:37:36 PM
Last Modified:	Monday, February 08, 2021 3:51:59 PM
Time Spent:	00:14:22
IP Address:	98.243.64.77

Page 2

Q2

What is your name and title?

Rick Johnson, Fire Chief

Q3

Which city, township, or village do you represent?

Mt. Morris Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Extremely Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Public Health Emergencies,

Snow and Ice Storms,

Structure Fires,

Terrorism

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Alot of ditching to try to combat residential flooding. We take a very pro-active stance with Fire and Police to try to train for the "what can happen scenario".

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No,
If yes, what were they?:
If there was I was not aware. I am new doing this assessment.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

In the fire service we work with neighboring cities and Townships to know what each has to offer in different emergency situations.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Over the last 2 years we have been more aggressive in building codes and inspections.

Q12

Do you have any additional comments?

Not at this time but I'm sure I'll be thinking about this.

#30

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 11:50:12 AM
Last Modified:	Wednesday, February 10, 2021 12:17:39 PM
Time Spent:	00:27:26
IP Address:	97.85.46.177

Page 2

Q2

What is your name and title?

Vicky Sandlin, Village of Gaines Clerk

Q3

Which city, township, or village do you represent?

Gaines Village

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No,
If yes, please explain::
N/A

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Infrastructure Failure,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Nothing

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No,

If yes, what were they?:

N/A

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Continue to keep & develop good communication with Gaines Township which provides our coverage.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Focus attention on the rental property inspection program.

Q12

Do you have any additional comments?

No

#31

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 12:24:44 PM
Last Modified:	Wednesday, February 10, 2021 12:58:18 PM
Time Spent:	00:33:34
IP Address:	204.38.40.130

Page 2

Q2

What is your name and title?

Steven Schlicht
Township Clerk

Q3

Which city, township, or village do you represent?

Montrose Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Earthquakes,

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Have installed Tornado Sirens in the past

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

I know the Public Safety Building has backup generators - if this is what you are asking - installed with the new building

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

You can coordinate efforts between communities,

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

NO

#32

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 1:39:27 PM
Last Modified:	Wednesday, February 10, 2021 1:47:17 PM
Time Spent:	00:07:50
IP Address:	66.187.22.210

Page 2

Q2

What is your name and title?

Gerry Terry, Clerk

Q3

Which city, township, or village do you represent?

Lennon Village

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Nothing

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Purchase backup generators

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Village is under the umbrella of the Shiawassee County Emergency Management team

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

building/zoning codes updated

Q12

Do you have any additional comments?

No

#33

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 3:44:11 PM
Last Modified:	Wednesday, February 10, 2021 3:53:37 PM
Time Spent:	00:09:25
IP Address:	24.180.243.34

Page 2

Q2

What is your name and title?

Mary Ann Price
Township Supervisor

Q3

Which city, township, or village do you represent?

Forest Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Extreme Temperatures,

Hazardous Materials Incidents (Fixed Site),

Inclement Weather,

Snow and Ice Storms

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

none at this time

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Coordinate with Otisville Village

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Update emergency response plan

Q12

Do you have any additional comments?

Respondent skipped this question

#34

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 3:53:37 PM
Last Modified:	Wednesday, February 10, 2021 3:56:31 PM
Time Spent:	00:02:54
IP Address:	70.91.227.17

Page 2

Q2

What is your name and title?

Cynthia Bryan, Township Clerk

Q3

Which city, township, or village do you represent?

Vienna Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Infrastructure Failure,

Public Health Emergencies,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Respondent skipped this question

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Respondent skipped this question

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Respondent skipped this question

Q12

Do you have any additional comments?

Respondent skipped this question

#35

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 4:49:08 PM
Last Modified:	Wednesday, February 10, 2021 4:53:17 PM
Time Spent:	00:04:08
IP Address:	70.91.227.17

Page 2

Q2

What is your name and title?

Pam Faris - Treasurer

Q3

Which city, township, or village do you represent?

Vienna Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Hazardous Materials Incidents (Transportation),

Major Transportation Accidents,

Snow and Ice Storms,

Structure Fires

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Nothing I am aware of but I have only been here a year and half.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Sewage pumping stations to prevent back ups and floods.

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

All of the above examples.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

?

Q12

Do you have any additional comments?

No

#36

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 5:15:38 PM
Last Modified:	Wednesday, February 10, 2021 5:42:22 PM
Time Spent:	00:26:44
IP Address:	174.230.9.12

Page 2

Q2

What is your name and title?

Brian Saad, Supervisor

Q3

Which city, township, or village do you represent?

Argentine Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

Yes,
If yes, please explain::
Large draw bridge placed and removed on Lobdell Lake

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Dam Failure,

Hazardous Materials Incidents (Transportation),

Infrastructure Failure,

Structure Fires

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Review public safety response and preparedness. Update DAM #117 EAP. Still waiting on 2020 DEQ summary review from Luke Trumble. Consult with Fire Professional to improve readiness and response. Collaborate daily with Personell and residents to improve safety operations capabilities.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

Yes,

If yes, what were they?:

Ordinance review, denials to build, approvals new public safety policies and trainings

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

What does that outreach look like and who pays for and executes the content Delivery?

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

All of the above and phone / electronic based community social media apps

Q12

Do you have any additional comments?

No

#37

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Wednesday, February 10, 2021 5:25:32 PM
Last Modified:	Wednesday, February 10, 2021 5:43:51 PM
Time Spent:	00:18:19
IP Address:	24.231.173.2

Page 2

Q2

What is your name and title?

Beth Luke, Office Manager

Q3

Which city, township, or village do you represent?

Gaines Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Civil Disturbances,

Hazardous Materials Incidents (Transportation),

Inclement Weather,

Public Health Emergencies

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

We acquired supplies from the 10-33 program to house the public in the event of an emergency, drain improvements are made each year.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Additional training for emergency response team, i.e. fire & police, use the Future Use Site Plan in zoning ordinance to limit sites with use of hazardous materials.

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Work with Genesee County Surface Water to identify sources with hazardous materials.

Q12

Do you have any additional comments?

No

#38

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 11, 2021 11:13:47 AM
Last Modified:	Thursday, February 11, 2021 11:20:53 AM
Time Spent:	00:07:05
IP Address:	24.231.173.38

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Q2

What is your name and title?

Keith Pyles deputy supervisor and trustee

Q3

Which city, township, or village do you represent?

Richfield Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Dam Failure,

Inclement Weather,

Public Health Emergencies,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

worked on drains and our police sets on aboard for evacution if damn breaks

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

more easily accessible to public

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

work with the state to keep all floodplain info updated

Q12

Do you have any additional comments?

no

#39

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Thursday, February 11, 2021 12:42:43 PM
Last Modified:	Thursday, February 11, 2021 12:53:09 PM
Time Spent:	00:10:26
IP Address:	96.40.93.117

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Q2

What is your name and title?

Sheri Wilkerson, CMC
Administrator/Clerk

Q3

Which city, township, or village do you represent?

Goodrich Village

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Moderately Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Dam Failure,

Inclement Weather,

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

Created a committee to monitor the Dam and contracted with an engineering firm to guide us.
Keep our residents informed via Facebook and our website on issues concerning their health and safety.

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

Training

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Map Floodplains.
Update Building Codes (Committee created to review the current ordinances on the books)

Q12

Do you have any additional comments?

Not at this time.

#40

COMPLETE

Collector:	Web Link 1 (Web Link)
Started:	Friday, February 12, 2021 11:33:40 AM
Last Modified:	Friday, February 12, 2021 11:43:19 AM
Time Spent:	00:09:38
IP Address:	24.231.173.38

Page 2

Q2

What is your name and title?

Joseph M. Madore
Richfield Township Supervisor

Q3

Which city, township, or village do you represent?

Richfield Township

Q4

In the past five years, has your community been impacted by a natural or man-made disaster?

No

Q5

How concerned are you about the possibility of your community being impacted by a disaster?

Not Concerned

Q6

What hazards do you feel could most impact your community? (Choose Four)

Snow and Ice Storms,

Tornadoes

Q7

What has your community done in the last five years to prevent or mitigate hazards? (for example: built a tornado shelter, drainage improvements, implemented Hazard Mitigation policy, etc.)

We have installed an emergency warning siren at Richfield just west of M-15

Q8

Have there been any policies or projects put into place to prevent or mitigate future hazards? (for example: moving structure out of floodplain, infrastructure improvements, purchase backup generators, etc.)

No

Q9

Are you willing to incorporate Hazard Mitigation into future community plans?

Yes

Q10

How can existing community policies or programs be improved to accomplish hazard mitigation? (for example: provide outreach to improve preparedness of citizens, coordinate efforts between communities, additional training for emergency response teams, etc.)

P.S.A.'s

Q11

What are your community's prioritized hazard mitigation strategies? (for example: map floodplains, develop or update emergency response plan, update building codes, etc.)

Floodplains are shown on our area of Pictometry

Q12

Do you have any additional comments?

None

Appendix C

Project Applications

SITE MAP

- Improving Communities/Housing
- Environmental
- Transportation
- Documents & Public Notices
  - Document Library
  - Public Notices
  - Reports & Data
  - County Long Range Plan

CONTACT OUR STAFF

OUR STAFF

11
Mar

HAZARD MITIGATION PLAN PROJECT REQUESTS FOR GENESEE AND LAPEER COUNTIES

MEMORANDUM TO: Local Officials/Agencies FROM: Cody Roblyer, Planning Specialist Genesee County Metropolitan Planning Commission DATE: March 12, 2021 SUBJECT: Hazard Mitigation Project Requests GLS Region V Planning and Development Commission has applied for Federal Emergency Management Agency (FEMA) funding to complete an update to the Hazard Mitigation Plans for Genesee and Lapeer Counties. The Hazard [...]

March 11, 2021

Read More >

SITE MAP

- Improving Communities/Housing
- Environmental
  - Recycling Education
  - Solid Waste
  - Recycle Day
  - Drop-Off Center Directory
  - Curbside Programs
  - County Long Range Plan
- Transportation
- Documents & Public Notices

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OUR STAFF

QUICK LINK

COMMITTEE MEETINGS

REPORTS & DATA

PUBLIC NOTICES

12
Mar

MEMORANDUM

TO: Local Officials/Agencies
FROM: Cody Roblyer, Planning Specialist
Genesee County Metropolitan Planning Commission
DATE: March 12, 2021

SUBJECT: Hazard Mitigation Project Requests

GLS Region V Planning and Development Commission has applied for Federal Emergency Management Agency (FEMA) funding to complete an update to the Hazard Mitigation Plans for Genesee and Lapeer Counties. The Hazard Mitigation Plans outline hazards that each county may experience, along with actions and projects to prevent or recover from each hazard.

Staff has included a list of hazard mitigation projects that were included in the previous hazard mitigation plan updates. Please review these lists of projects and provide a brief update on any projects that were submitted by your agency. Providing an update on previously included projects is a requirement by FEMA.

As part of the update process, staff is also requesting new hazard mitigation projects to be included in the plan so that FEMA will know what the priorities of each community are if funding becomes available. Each community that seeks to gain grant eligibility for hazard mitigation projects must have participated in the plan's development. Throughout the update process, there will be opportunities for input that meet the requirements. Eligible project submittals will be incorporated into the plan update document. When submitting your project, please make sure to include:

- Relative Priority Level
- Project Timeline
- Costs
- Name of the agency that will be implementing the project

The completed form for new projects and updates on previously included projects must be returned to the Region V Planning and Development Commission by 5 PM on Friday, March 26, 2021. Please send to Cody Roblyer, Planning Specialist at croblyer@geneseecountymi.gov.

Enclosed is a list of projects included in the previous hazard mitigation plan update, a copy of the new project submittal form, hazard listings, and FEMA project eligibility information.
For questions, please contact Cody Roblyer, Planning Specialist, at (810)766-6570 or croblyer@geneseecountymi.gov.

Click here to view the Genesee County Hazard Mitigation Project Request Document

Click here to view the Lapeer County Hazard Mitigation Project Request Document

Genesee-Lapeer-Shiawassee Region V Planning and Development Commission

ROOM 223 – 1101 BEACH STREET FLINT, MICHIGAN 48502-1470
TELEPHONE (810) 257-3010 FAX (810) 257-3185

DEREK BRADSHAW
FISCAL OFFICER

MEMORANDUM

TO: Local Officials/Agencies

FROM: Cody Roblyer, Planning Specialist
Genesee County Metropolitan Planning Commission

DATE: March 12, 2021

SUBJECT: Hazard Mitigation Project Requests

GLS Region V Planning and Development Commission has applied for Federal Emergency Management Agency (FEMA) funding to complete an update to the Hazard Mitigation Plan for Genesee County. The Hazard Mitigation Plan outlines hazards that the county may experience, along with actions and projects to prevent or recover from each hazard.

Staff has included a list of hazard mitigation projects that were included in the previous hazard mitigation plan update. Please review this list of projects and provide a brief update on any projects that were submitted by your agency. Providing an update on previously included projects is a requirement by FEMA.

As part of the update process, staff is also requesting new hazard mitigation projects to be included in the plan so that FEMA will know what the priorities of each community are if funding becomes available. Each community that seeks to gain grant eligibility for hazard mitigation projects must have participated in the plan's development. Throughout the update process, there will be opportunities for input that meet the requirements. Eligible project submittals will be incorporated into the plan update document. When submitting your project, please make sure to include:

- Relative Priority Level
- Project Timeline
- Costs
- Name of the agency that will be implementing the project

The completed form for new projects and updates on previously included projects must be returned to the Region V Planning and Development Commission by 5 PM on Friday, March 26, 2021. Please send to Cody Roblyer, Planning Specialist at croblyer@geneseecountymi.gov.

Enclosed is a list of projects included in the previous hazard mitigation plan update, a copy of the new project submittal form, Genesee County hazard listing, and FEMA project eligibility information.

For questions, please contact Cody Roblyer, Planning Specialist, at (810)766-6570 or croblyer@geneseecountymi.gov.

Genesee County Hazard Mitigation List of Projects included in the previous Hazard Mitigation Plan Update

Please review the project list below. If there is a project listed for your agency, provide a brief update on the project. If the project has not been completed, just let us know that the project is still ongoing. If the project is no longer relevant, let us know that the project has been cancelled.

Atlas Township

1. Project: Natural gas backup generators for Atlas Township Office/Hall which also serves as a Community Room and sub-station for the Genesee County Sheriff Department. Project description: To allow use as a safe haven room year-round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeline for implementation: 1-5 years. Budget: $31,000 (Have currently received quote from Consumers Energy- waiting for quotes from 2 private contractors).

2. Project: Dead Ash tree removal. Project description: Dead ash trees affect road safety throughout the entire township, along various roads, streets, and neighborhoods. Budget: $80,000.

3. Project: Drainage improvements to reduce risk of flooding to residential structures. Project description: Catherwood/Farnsworth, Hill Road, Washburn Road between County Line (Ray Road) and Kipp Road. Proposed timeframe for implementation: 1-5 years. Budget: $500,000.

4. Project: Boat for water or ice rescue. Project description: For Fire Department to help with evacuation in the event of floods or dam failure within the Village of Goodrich. Proposed timeframe for implementation: 1-5 years. Budget: $5,000.

5. Project: High Pressure 10-inch water wells (electric). Project description: To be used by the Fire Department to fight fires in various Township locations. Township would like eight wells. Proposed timeframe for implementation: 1-5 years. Budget: approximately $28,000 per well.

6. Project: Emergency warning sirens. Project description: Emergency warning sirens placed in various locations within Atlas Township to be audible by all residents in all sections. Township would like eight sirens. Proposed timeframe for implementation: 1-5 years. Budget: Approximately $25,000 per siren.

Bendle Public Schools

1. Project: Equipment. Project description: The project includes two generators, emergency lighting, back-up air compressor, emergency radios, portable lighting, and caution tape. Budget: $5,000 - $8,000.

Bishop International Airport

1. Project: Weather computer. Project description: This project includes a weather computer to help forecast snow, thunderstorms, and high winds; lightning warning systems for the airfield, and a direct phone line form the FAA Control Tower to the Airport Fire Department, Airport Police, and the security checkpoint. Budget: Not provided.

Davison Township

1. Project: Warning sirens. Project description: The purchase and installation of three advance warning sirens within Davison Township. Proposed timeframe for implementation: 1-5 years. Budget: $60,000.

Fenton Township

1. Project: Emergency shelter. Project description: The project would involve renovations to the Township Hall basement to make it suitable as an emergency shelter for residents, including the addition of a back-up generator. Budget: Unknown.

Forest Township

1. Project: Warning sirens. Project description: The purchase and installation of three warning sirens throughout Forest Township. Budget: Unknown.

City of Flint

1. Project: Stand-by power. Project description: The project includes stand-by power (for the Cedar Street pump station and reservoir) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include construction of a building, equipment, engineering, and engineering inspection. Budget: $1,000,000.

2. Project: Stand-by power. Project description: The project includes stand-by power (for the Westside pump station) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include engineering, construction, and construction inspection. Budget: $500,000.

3. Project: Stand-by power. Project description: The project includes stand-by power (for the Torrey Road booster pumping station) to ensure that water main pressure remains a constant for a high-elevation water district during an emergency. A preliminary engineering cost estimate was generated that reflects design engineering, construction, and construction inspection. Budget: $100,000.

4. Project: Stand-by power. Project description: The project includes stand-by power (for the Flint Water Plant) to ensure that the Flint water supply would not be interrupted during an emergency. Estimated costs include engineering, construction, and construction inspection. Budget: $1,800,000.

5. Project: Hamilton Dam. Project description: The project includes removal and replacement of Hamilton Dam. Estimated costs reflect engineering, construction, removal, and construction inspection. Budget: $8,000,000.

6. Project: Thread Dam. Project description: The project includes the removal of Thread Dam which is in a state of failure. Estimated costs reflect completing engineering, construction, removal, and construction inspection. Budget: $2,100,000.

Flushing Township

1. Project: Back-up generator. Project description: Install a back-up generator in the Township Hall. Proposed timeframe for implementation: 1-5 years. Budget: $80,000.

2. Project: Dredge Brent Creek and Cole Creek. Project description: Dredge creeks to prevent the flooding of roads caused by heavy rainfall. Proposed timeframe for implementation: 1-5 years. Budget: $10,000-$30,000.

3. Project: Warning sirens. Project description: Install tornado warning sirens in the Charter Township of Flushing. Proposed timeframe of implementation: 1-5 years. Budget $10,000 - $30,000.

Gaines Township

1. Project: Warning sirens. Project description: The purchase and installation warning sirens. Budget: $80,000.

Genesee County Emergency Management

1. Project: Tornado shelters for mobile home parks. Budget: $16,000,000.

2. Project: Warning Sirens. Project description: The project includes a minimum of 100 storm warning sirens. Budget: $1,700,000.

3. Project: Relocation of homes. Project description: This project includes relocation of mobile home parks in flood-prone areas. Budget: $4,000,000.

Genesee Intermediate School District

1. Project: Back-up generator. Project description: The project includes a portable diesel-powered generator to provide back-up power to three separate locations that service special needs students, many with multiple impairments that prevent physical evacuation of the buildings. Budget: $500,000.

2. Project: Structural Improvements. Project description: The project includes structural reinforcement for the walls and roof of the gyms and multi-purpose rooms (open-space areas) at three separate locations that serve special-needs students, many with multiple impairments that prevent physical evacuation of the buildings. Budget: Not provided.

Goodrich Area Schools

1. Project: Equipment. Project description: The project includes two generators, emergency lighting, back-up air compressor, emergency radios, portable lighting, and caution tape. Budget: $5,000 - $8,000.

Village of Goodrich

1. Project: Goodrich Dam. Project description: The project includes work on the Goodrich Dam relating to floodgates, stabilization, spillway-wing walls, etc. Budget: Not provided. Project update: Improvements have been made to the Goodrich/Mill Pond Dam. Two additional gates were altered to allow them to open but only under special situations.

Grand Blanc Township

1. Project: Warning sirens. Project description: The purchase and installation warning sirens. Budget: $48,000.

Village of Lennon

1. Project: Repair sirens. Project description: The project includes repair of broken weather siren. Budget: $1,000 - $16,000. Project update: Completed in 2011.

2. Project Back-up generator. Project description: The project includes a back-up generator for the Police Department. Budget: $3,000. Project update: This project was tabled due to cost.

3. Project: Back-up generator. Project description: The project includes a back-up generator for the Village Hall. Budget: $3,000. Project update. This project was tabled due to cost.

City of Linden

1. Project: Stand-alone generator for City Hall. Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being turned on and emergency personnel would not be able to operate. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000.

University of Michigan Flint

1. Project: Enhance First Street Residence Hall evacuation and sheltering. Project description: To include developing plans and specifications for construction of a storm shelter to house over 300 residents. Also, develop a strategy that can be used to integrate plans for a shelter into any expansion of the residence hall. In addition, install two outdoor warning sirens to alert students/residents of severe weather. Following development of drawings for a shelter, construct a shelter to house residents. Proposed timeframe for implementation: 1-5 years. Budget: $550,000.

2. Project: Flood Mitigation Plan. Project description: Provide the funding to develop a Flood Mitigation Plan. This plan will address ongoing mitigation needs such as installing USGS constructing berms/physical barriers that can resist the elevation associated with overflow of the Flint River. Proposed timeframe for implementation: 1-5 years. Budget: $50,000.

3. Project: Upgrading and improving the UofM Flint EOC and Department of Public Safety. Project description: Upgrading and providing improvements to the UofM Flint EOC and Department of Public Safety operations. This includes moving the dispatch center and adding additional equipment to the center and EOC. Proposed timeframe for implementation: 1-5 years. Budget: $500,000.

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: _____

Contact Person: _____

Title: _____

Project Description

Please attach additional pages if necessary.

Estimated Project Cost:

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Project Alternatives

Project Alternative 1:

Estimated Project Cost:

Please attach a location map for this project.

Project Alternative 2:

Estimated Project Cost:

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

Hazards included in the Genesee County Hazard Mitigation Plan

- Infrastructure Failure
- Riverine Flooding
- Terrorism
- Structure Fires
- Inclement Weather
- Extreme Temperatures
- Hazardous Materials Incidents (Transportation)
- Snow and Ice Storms
- Public Health Emergencies
- Tornadoes
- Civil Disturbance
- Dam Failure
- Hazardous Materials Incidents (Fixed Sites)
- Oil and Natural Gas Well/Pipeline Accidents
- Transportation Accidents (Bus, Airplane, Train)
- Drought
- Scrap Tire Fires
- Nuclear Attack
- Wildfires
- Nuclear Power Plant Accidents
- Subsidence (Sinkholes)
- Earthquakes

FEMA Grant Programs Eligibility

The attached document provides eligibility information for hazard mitigation projects. Please refer to this document when determining new hazard mitigation projects to be included in the plan update. To obtain funding for hazard mitigation projects, agencies must submit projects for consideration under three potential FEMA grant programs. These programs are the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), and Flood Mitigation Assistance (FMA). The chart below shows which project types are eligible under each program. In general, HMGP funding is available when authorized under a Presential major disaster declaration in the areas of the state requested by the Governor. PDM is designed to assist local communities in implementing a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events. FMA is authorized with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). See the attached for more details.

Table 3: Eligible Activities by Program

Eligible Activities	HMGP	PDM	FMA
1. Mitigation Projects	✓	✓	✓
Property Acquisition and Structure Demolition	✓	✓	✓
Property Acquisition and Structure Relocation	✓	✓	✓
Structure Elevation	✓	✓	✓
Mitigation Reconstruction	✓	✓	✓
Dry Floodproofing of Historic Residential Structures	✓	✓	✓
Dry Floodproofing of Non-residential Structures	✓	✓	✓
Generators	✓	✓	
Localized Flood Risk Reduction Projects	✓	✓	✓
Non-localized Flood Risk Reduction Projects	✓	✓	
Structural Retrofitting of Existing Buildings	✓	✓	✓
Non-structural Retrofitting of Existing Buildings and Facilities	✓	✓	✓
Safe Room Construction	✓	✓	
Wind Retrofit for One- and Two-Family Residences	✓	✓	
Infrastructure Retrofit	✓	✓	✓
Soil Stabilization	✓	✓	✓
Wildfire Mitigation	✓	✓	
Post-Disaster Code Enforcement	✓		
Advance Assistance	✓		
5 Percent Initiative Projects	✓		
Miscellaneous/Other[(1)]	✓	✓	✓
2. Hazard Mitigation Planning	✓	✓	✓
Planning Related Activities	✓		
3. Technical Assistance			✓
4. Management Cost	✓	✓	✓

[(1)] Miscellaneous/Other indicates that any proposed action will be evaluated on its own merit against program requirements. Eligible projects will be approved provided funding is available.

Additional information regarding eligible projects for **HMGP** is included in Part VIII, A.11 and A.12, and for **FMA**, in Part VIII, C.1.

Costs for eligible activities must be reasonable, allowable, allocable, and necessary as required by 2 CFR Part 200 Subpart E, applicable program regulations, and this guidance.

E.1.1 Mitigation Projects

This section briefly describes the mitigation projects eligible under one or more of the three HMA programs. **Table 3** summarizes the eligibility of the following project types for each program:

- **Property Acquisition and Structure Demolition:** The voluntary acquisition of an existing flood-prone structure and, typically, the underlying land, and conversion of the land to open space through the demolition of the structure. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions. For property acquisition and structure demolition projects, see Addendum, Part A.
- **Property Acquisition and Structure Relocation:** The voluntary physical relocation of an existing structure to an area outside of a hazard-prone area, such as the Special Flood Hazard Area (SFHA) or a regulatory erosion zone and, typically, the acquisition of the underlying land. Relocation must conform to all applicable State and local regulations. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions. For property acquisition and structure relocation projects, see Addendum, Part A.
- **Structure Elevation:** Physically raising and/or retrofitting an existing structure in accordance with ASCE 24-14 (Base Flood Elevation [BFE] plus freeboard) or higher when required by FEMA or local ordinance. Elevation may be achieved through a variety of methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts, or columns; and elevating on fill. Foundations must be designed to properly address all loads and be appropriately connected to the floor structure above, and utilities must be properly elevated as well. FEMA requires Recipients and subrecipients to design all structure elevation projects in accordance with ASCE 24-14. For additional information about structure elevation projects, see Addendum, Part E.
- **Mitigation Reconstruction:** The construction of an improved, elevated building on the same site where an existing building and/or foundation has been partially or completely demolished or destroyed. Mitigation reconstruction is only permitted for structures outside of the regulatory floodway or Coastal High Hazard Area (Zone V) as identified by the existing best available flood hazard data. Activities that result in the construction of new living space at or above the BFE will only be considered when consistent with mitigation reconstruction requirements. FEMA requires Recipients and subrecipients to design all mitigation reconstruction projects in accordance with ASCE 24-14. For additional information about structure elevation projects, see Addendum, Part D.
- **Dry Floodproofing:** Techniques applied to keep structures dry by sealing the structure to keep floodwaters out. For all dry floodproofing activities, FEMA requires Recipients and subrecipients to design all dry floodproofing projects in accordance with ASCE 24-14. Dry floodproofing is not permitted in the Coastal V Zone.

- **Dry Floodproofing of Historic Residential Structures** is permissible only when other techniques that would mitigate to the BFE would cause the structure to lose its status as a Historic Structure, as defined in 44 CFR Section 59.1.
- **Dry Floodproofing of Non-residential Structures** must be performed in accordance with NFIP Technical Bulletin (TB) 3-93, *Non-Residential Floodproofing—Requirements and Certification*, and the requirements pertaining to dry floodproofing of non-residential structures found in 44 CFR Sections 60.3(b)(5) and (c)(4).

♦ **Generators:** Generators are emergency equipment that provide a secondary source of power. Generators and related equipment (e.g., hook-ups) are eligible provided that they are cost effective, contribute to a long-term solution to the problem they are intended to address, and meet other program eligibility criteria.

GENERATORS

- Stand-alone generators and related equipment (e.g., generator hook-ups) are eligible under the 5 Percent Initiative.
- Stand-alone generators (including related equipment) are eligible for regular **HMGP** and **PDM** funding if the generator protects a critical facility and meets all other program eligibility criteria.
- Generators (including related equipment) that constitute a functional portion of an otherwise eligible mitigation measure are eligible for **HMGP** and **PDM** funding.

- Under **PDM:** A generator that is a stand-alone project can be considered for **PDM** funding if the generator protects a critical facility. Generators and/or related equipment purchases (e.g., generator hook-ups) are eligible when the generator directly relates to the hazards being mitigated and is part of a larger project.
- Under **HMGP:** A generator that is a stand-alone project can be considered under regular **HMGP** funding if the generator protects a critical facility. Critical facilities may include police and fire stations, hospitals, and water and sewer treatment facilities (for the definition of critical facilities, see Appendix B, Glossary). A generator that is a component of a larger project (e.g., elevation of a lift station) can also be funded under regular **HMGP** funding and the use of aggregation is permitted. Stand-alone generator projects that cannot be determined to be cost effective via standard HMA benefit-cost methodology may be eligible under the 5 Percent Initiative. See Part VIII, A.14 for additional information about the 5 Percent Initiative.

For additional information on generators, see HMA Job Aid (*Eligibility of Generators as a Fundable Project by the Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program*).

HMA funds are not available as a substitute for emergency, temporary, or partial solutions under the Stafford Act Section 403, Essential Assistance (42 U.S.C. 5170b) and/or the Stafford Act, Title VI Emergency Preparedness (42 U.S.C. 5195).

- **Localized Flood Risk Reduction Projects:** Projects to lessen the frequency or severity of flooding, and decrease predicted flood damage, within an isolated and confined drainage or catchment area that is not hydraulically linked or connected to a larger basin. These projects include but are not limited to installation or modification of culverts and other stormwater management facilities; construction or modification of retention and detention basins; and construction or modification of floodwalls, dams, and weirs. Modifications must be for the purpose of increasing risk reduction capabilities of the existing structures and cannot constitute only repairs. Localized flood risk reduction projects must not duplicate the flood prevention activities of other Federal agencies and may not constitute a section of a larger flood control system.
  - Under **FMA**, localized flood reduction projects should benefit NFIP-insured properties. Projects will be prioritized based on the number of NFIP-insured properties included in the project. Projects that do not include NFIP-insured properties will not be considered for funding. Documentation must be provided in the subapplication to verify the NFIP insurance coverage, including the flood insurance policy and property locator numbers as appropriate.
- **Non-localized Flood Risk Reduction Projects:** Projects that lessen the frequency or severity of flooding, and decrease predicted flood damage, within an area that is hydraulically linked or connected to a drainage basin that is regional in scale. These projects reduce flood hazards in areas larger than that of localized flood reduction projects and may include the construction, demolition, or rehabilitation of dams; construction or modification of dikes, levees, floodwalls, seawalls, groins, jetties, breakwaters, and stabilized sand dunes; and large-scale channelization of a waterway. Modifications must be for the purpose of increasing risk reduction capabilities of the existing structures and cannot constitute only repairs. These projects cannot constitute a section of a larger flood control system or duplicate the flood prevention activities of other Federal agencies on the same site. These projects types are only eligible under **HMGP** and **PDM**.
- **Structural Retrofitting of Existing Buildings:** Modifications to the structural elements of a building to reduce or eliminate the risk of future damage and to protect inhabitants. The structural elements of a building that are essential to prevent damage include foundations, load-bearing walls, beams, columns, building envelope, structural floors and roofs, and the connections between these elements.
- **Non-structural Retrofitting of Existing Buildings and Facilities:** Modifications to the non-structural elements of a building or facility to reduce or eliminate the risk of future damage and to protect inhabitants. Non-structural retrofits may include bracing of building contents to prevent earthquake damage or the elevation of utilities.
- **Safe Room Construction:** Safe room construction projects are designed to provide immediate life-safety protection for people in public and private structures from tornado and severe wind events, including hurricanes. For HMA, the term “safe room” only applies to

extreme wind (combined tornado and hurricane) residential, non-residential, and community safe rooms; tornado community safe rooms; and hurricane community safe rooms. This type of project includes retrofits of existing facilities or new safe room construction projects and applies to both single and dual-use facilities. For additional information, see Addendum, Part C.

- **Wind Retrofit Projects:** Wind retrofit projects of one- and two-family residential buildings must be designed in conformance with the design criteria found in FEMA P-804, *Wind Retrofit Guide for Residential Buildings* (2010). This document is available in the FEMA Library at http://www.fema.gov/library/viewRecord.do?id=4569.
- **Infrastructure Retrofit:** Measures to reduce risk to existing utility systems, roads, and bridges.
- **Soil Stabilization:** Projects to reduce risk to structures or infrastructure from erosion and landslides, including installing geotextiles, stabilizing sod, installing vegetative buffer strips, preserving mature vegetation, decreasing slope angles, and stabilizing with rip rap and other means of slope anchoring. These projects must not duplicate the activities of other Federal agencies.
- **Wildfire Mitigation:** Projects to mitigate at-risk structures and associated loss of life from the threat of future wildfire through:
  - **Creation of Defensible Space:** Projects creating perimeters around homes, structures, and critical facilities through the removal or reduction of flammable vegetation. For additional information, see Addendum, Part B.4.1.
  - **Application of Ignition-resistant Construction:** Projects that apply ignition-resistant techniques and/or non-combustible materials on new and existing homes, structures, and critical facilities. For additional information, see Addendum, Part B.4.2.
  - **Hazardous Fuels Reduction:** Projects that remove vegetative fuels proximate to at-risk structures that, if ignited, pose a significant threat to human life and property, especially critical facilities. For additional information, see Addendum, Part B.4.3.
- **Post-Disaster Code Enforcement:** Projects designed to support the post-disaster rebuilding effort by ensuring that sufficient expertise is on hand to ensure appropriate codes and standards, including NFIP local ordinance requirements, are used and enforced. For additional information, see Part VIII, A.11.
- **Advance Assistance:** Section 1104 of the SRIA authorizes the use of Advance Assistance to accelerate the implementation of **HMGP**. Applicants and subapplicants may use Advance Assistance to develop mitigation strategies and obtain data to prioritize, select, and develop complete **HMGP** applications in a timely manner. See Part VIII, A.12 for additional information on Advance Assistance.

- **5 Percent Initiative Projects:** These projects, which are only available pursuant to an **HMGP** disaster, provide an opportunity to fund mitigation actions that are consistent with the goals and objectives of the State or Tribal (Standard or Enhanced) and local mitigation plans and meet all **HMGP** requirements, but for which it may be difficult to conduct a standard BCA to prove cost-effectiveness. For additional information, see Part VIII, A.14.
- **Miscellaneous/Other:** FEMA encourages Applicants and subapplicants to pursue activities that best address mitigation planning and priorities in their community; however, these eligible activities are not limited to those that are described under Part III, E of the HMA Guidance. Miscellaneous/Other project activities will be reviewed according to Part V of the HMA Guidance for application eligibility, cost-effectiveness, feasibility and effectiveness, and EHP compliance.

  FEMA encourages mitigation projects that fall into the Miscellaneous/Other category to address climate change adaptation and resiliency. Mitigation projects must adapt to new challenges posed by more powerful storms, frequent heavy precipitation, heat waves, prolonged droughts, extreme flooding, higher sea levels, and other weather events. Miscellaneous/Other projects can also address projects that could benefit from sustainable development practices focusing on ecosystem-based and hybrid approaches to disaster risk reduction.

  Any mitigation activities prohibited in Part III, E.2 of the HMA Guidance will remain ineligible. It is important for Applicants and subapplicants to provide thorough descriptions of project activities because of the unique nature of this eligibility category.
- **Technical Assistance (FMA):** For information on Technical Assistance, see Part III, E.1.4.
- **Management Costs:** For information on Management Costs, see Part III, E.1.5, and Part IV, E.4.

E.1.2 Ineligible Stand-Alone Activities

The following activities are not eligible as stand-alone activities but are eligible when included as a functional component of eligible mitigation activities:

- For **PDM**, eligible information dissemination activities in project or planning subapplications. The information dissemination activities are limited to a maximum of 10 percent of the total cost of a subapplication.
- For **PDM**, generator-related equipment purchases (e.g., generator hook-ups), unless the generator-related equipment directly relates to the hazards being mitigated and is part of a larger project
- Real property or easement purchases required for the completion of an eligible mitigation project

- Studies that are integral to the development and implementation of a mitigation project, including hydrologic and hydraulic, engineering, or drainage studies

E.1.3 Hazard Mitigation Planning

Mitigation plans are the foundation for effective hazard mitigation. A mitigation plan is a demonstration of the commitment to reduce risks from natural hazards and serves as a strategic guide for decision-makers as they commit resources.

MITIGATION PLANNING-RELATED ACTIVITIES

Planning activities can include assessing risk, updating the mitigation strategy, and promoting resilience to reflect current disaster recovery goals (**HMGP** only).

The mitigation planning process includes hazard identification and risk assessment leading to the development of a comprehensive mitigation strategy for reducing risks to life and property. The mitigation strategy section of the plan identifies a range of specific mitigation actions and projects being considered to reduce risks to new and existing buildings and infrastructure. This section includes an action plan describing how identified mitigation activities will be prioritized, implemented, and administered.

Planning activities funded under HMA are designed to develop State, tribal, and local mitigation plans that meet the planning requirements outlined in 44 CFR Part 201. A mitigation planning subaward must result in a mitigation plan adopted by the jurisdiction(s) and approved by FEMA or it must result in a planning-related activity (eligible under **HMGP only**) approved by FEMA (e.g., incorporating new data into the risk assessment or updating the mitigation strategy to reflect current disaster recovery goals) consistent with the requirements in 44 CFR Parts 201 and 206.

For **FMA**, funds shall only be used to support the flood hazard portion of State, tribal, or local mitigation plans to meet the criteria specified in 44 CFR Part 201. Funds are only available to support these activities in communities participating in the NFIP.

For links to mitigation planning and risk assessment resources, see Part IX, C.2.

E.1.3.1 Eligible Hazard Mitigation Planning–Related Activities

Eligible activities that can be funded as mitigation planning–related activities under **HMGP** (these activities are not eligible under **PDM** and **FMA**) include but are not limited to:

- Updating or enhancing sections of the current FEMA-approved mitigation plan, such as:
  - The risk and vulnerability assessment based on new information, including supporting studies, such as economic analyses
  - The mitigation strategy, specifically strengthening the linkage to mitigation action implementation, with emphasis on available HMA project grant funding

  - The risk assessment and/or mitigation strategy, incorporating climate adaptation, green building, smart growth principles, or historic properties and cultural resources information

- Integrating information from mitigation plans, specifically risk assessment or mitigation strategies, with other planning efforts, such as:
  - Disaster recovery strategy (pre- or post-), preparedness, or response plans
  - Comprehensive (e.g., land use, master) plans
  - Capital improvement or economic development plans
  - Resource management/conservation plans (e.g., stormwater, open space)
  - Other long-term community planning initiatives (e.g., transportation or housing)
- Building capability through delivery of technical assistance and training
- Evaluating adoption and/or implementation of ordinances that reduce risk and/or increase resilience

E.1.3.2 Ineligible Hazard Mitigation Planning–Related Activities

The following activities cannot be funded as mitigation planning–related activities:

- Hazard identification or mapping and related equipment for the implementation of mitigation activities (eligible under 5 Percent Initiative)
- Geographic Information System (GIS) software, hardware, and data acquisition whose primary aim is mitigation activity (eligible under 5 Percent Initiative)
- Public awareness or education campaigns about mitigation (eligible under 5 Percent Initiative)
- Project scoping or development (also referred to as "project planning"), such as BCA, engineering feasibility studies, application development, construction design, or EHP data collection
- Activities not resulting in a clearly defined product or products

E.1.4 Technical Assistance

The Biggert-Waters Flood Insurance Reform Act of 2012 allows FEMA to provide a technical assistance grant to any Applicant that was awarded at least $1,000,000 (Federal share) in **FMA** grants in the prior fiscal year. A technical assistance award cannot exceed $50,000 (Federal share) to any single Applicant in any fiscal year.

Eligible technical assistance activities may include:

- Promoting **FMA** to communities
- Visiting sites with communities/Applicants
- Developing and reviewing project applications and mitigation plans
- Participating in planning meetings
- Providing planning workshops/materials
- Performing BCAs and providing grants management workshops/materials
- Funding, in part, salaries and expenses of staff working to develop, review, monitor, and close **FMA** grants

Essentially, a technical assistance award and a management costs award can achieve many of the same objectives. A technical assistance award is meant to allow Recipients to maintain a viable **FMA** program over time. Applicants must ensure that activities are not duplicated between the two awards. For instance, duplication would exist if a technical assistance award provides funding for project development that the Applicant seeks reimbursement for under management costs. Proper record-keeping is important to ensure activities are not duplicated.

E.1.5 Management Costs

Management costs are any indirect costs and administrative expenses that are reasonably incurred by a Recipient or subrecipient in administering an award or subaward.

EXAMPLES OF INDIRECT COSTS CATEGORIES

- Depreciation or use allowances on buildings and equipment
- Costs of operating and maintaining facilities
- General administration and general expenses
- Personnel and accounting administration

Eligible Applicant or subapplicant management cost activities may include:

- Solicitation, review, and processing of subapplications and subawards
- Subapplication development and technical assistance to subapplicants regarding feasibility and effectiveness and BCA
- Geocoding mitigation projects identified for further review by FEMA
- Delivery of technical assistance (e.g., plan reviews, planning workshops, training) to support the implementation of mitigation activities
- Managing awards (e.g., quarterly reporting, closeout)
- Technical monitoring (e.g., site visits, technical meetings)

- Purchase of equipment, per diem and travel expenses, and professional development that is directly related to the implementation of HMA programs
- Staff salary costs directly related to performing the activities listed above

Management costs are only awarded in conjunction with project or planning grants and subawards. For more information regarding management costs for **HMGP**, see Part VIII, A.5. For **PDM** and **FMA**, FEMA may provide up to 25 percent of the Applicant's anticipated management costs upon the award and final approval of the first subaward. The remaining management costs will be obligated as additional subawards are awarded.

E.2 Ineligible Activities

The following list provides examples of activities that are not eligible for HMA funding:

- Projects that do not reduce the risk to people, structures, or infrastructure
- Projects that are dependent on a contingent action to be effective and/or feasible (i.e., not a stand-alone mitigation project that solves a problem independently or constitutes a functional portion of a solution)
- Projects with the sole purpose of open space acquisition of unimproved land
- Property acquisition projects that are not compatible with open space and do not maintain open space for the conservation of natural floodplain functions or properties that include encumbrances that may allow for horizontal drilling or fracking
- Non-localized flood risk reduction projects specific to **FMA**
- Flood control projects related to the repair or replacement of dams and other flood control structures and repair of dams for the purpose of regular pre-scheduled or damage-induced maintenance
- Projects for which actual physical work, such as groundbreaking, demolition, or construction of a raised foundation, has occurred prior to award or final approval. Projects for which demolition and debris removal related to structures proposed for acquisition or mitigation reconstruction has already occurred may be eligible when such activities were initiated or completed under the FEMA PA program to alleviate a health or safety hazard as a result of a disaster.
- Projects for preparedness activities or temporary measures (e.g., sandbags, bladders, geotubes)
- Projects that create revolving loan funds
- Activities required as a result of negligence or intentional actions that contributed to the conditions to be mitigated; activities intended to remedy a code violation; or the

reimbursement of legal obligations, such as those imposed by a legal settlement, court order, or State law

- All projects located in Coastal Barrier Resources System (CBRS) Units, other than property acquisition and structure demolition or relocation projects for open space under HMA. For details on CBRS Units see Addendum, Part A.6.
- Projects located in an OPA that require flood insurance after project completion
- Activities on Federal lands or associated with facilities owned by another Federal entity
- Projects related to beach nourishment or re-nourishment
- Projects for hazardous fuels reduction in excess of 2 miles from at-risk buildings and structures
- Projects that address unmet needs from a disaster that are not related to mitigation
- Retrofitting facilities primarily used for religious purposes, such as places of worship (or other projects that solely benefit religious organizations). However, a place of worship may be included in a property acquisition and structure demolition or relocation project provided that the project benefits the entire community, such as when a significant part of the community is being removed from the hazard area.
- Activities that only address manmade hazards
- Projects that address, without an increase in the level of protection, the operation, deferred or future maintenance, rehabilitation, restoration, or replacement of existing structures, facilities, or infrastructure (e.g., dredging, debris removal, replacement of obsolete utility systems or bridges, maintenance/rehabilitation of facilities, including dams and other flood control structures)
- Projects for the purpose of:
  - Landscaping for ornamentation (e.g., trees, shrubs)
  - Site remediation of hazardous materials (with the exception eligible activities, such as the abatement of asbestos and/or lead-based paint and the removal of household hazardous wastes for disposal at an approved landfill)
  - Water quality infrastructure
  - Projects that primarily address ecological or agricultural issues
  - Forest management
  - Prescribed burning or clear-cutting
  - Creation and maintenance of fire breaks, access roads, or staging areas
  - Irrigation systems

- Studies not directly related to the design and implementation of a proposed mitigation project
- Preparedness measures and response equipment (e.g., response training, electronic evacuation road signs, interoperable communications equipment)

FEMA may, at its discretion, choose not to fund projects subject to ongoing litigation if such litigation may affect eligibility of the project or may substantially delay implementation of the project. All projects must also comply with any additional project-specific guidance provided in the Addendum.

E.3 Cost-Effectiveness

Mitigation program authorizing statutes (Flood Mitigation Assistance at 42 U.S.C. 4104c, Pre-Disaster Hazard Mitigation at 42 U.S.C. 5133, and Hazard Mitigation at 42 U.S.C. 5170c) require that FEMA provide funding for mitigation measures that are cost effective or are in the interest of the NFIF. FEMA has specified minimum project criteria via regulation (44 CFR Part 79 and 44 CFR Section 206.434), including that Applicants must demonstrate mitigation projects are cost effective. The determination of cost-effectiveness is performed in a variety of ways. It is typically demonstrated by the calculation of a benefit-cost ratio (BCR), dividing total annualized project benefits by total annualized project cost. Projects where benefits exceed costs are generally considered cost effective (see Part III, E.3 and Part V, A.3 for additional information).

E.4 Feasibility and Effectiveness

Mitigation projects funded by HMA must be both feasible and effective at mitigating the risks of the hazard(s) for which the project was designed. A project's feasibility is demonstrated through conformance with accepted engineering practices, established codes, standards, modeling techniques, or best practices. Effective mitigation measures funded under HMA provide a long-term or permanent solution to a risk from a natural hazard.

For additional information about the feasibility and effectiveness requirement for mitigation reconstruction projects, see the Addendum, Part D.2.1; for additional feasibility and effectiveness resources, see Part IX, C.4.

E.5 Hazard Mitigation Plan Requirement

This section presents information on plan requirements for Recipient mitigation plans, subrecipient mitigation plans, and Tribal Mitigation Plans. It also presents information on extraordinary circumstances and conformance with hazard mitigation plans.

Atlas Township – info provided via phone call

1. Project: Natural gas backup generators for Atlas Township Office/Hall which also serves as a Community Room and sub-station for the Genesee County Sheriff Department. Project description: To allow use as a safe haven room year-round for residents needing shelter. Location of generator would be: 7386 S. Gale Road, Grand Blanc, MI. Proposed timeline for implementation: 1-5 years. Budget: $31,000 (Have currently received quote from Consumers Energy- waiting for quotes from 2 private contractors). Update: Project completed.

2. Project: Dead Ash tree removal. Project description: Dead ash trees affect road safety throughout the entire township, along various roads, streets, and neighborhoods. Budget: $80,000. Update: Project is ongoing.

3. Project: Drainage improvements to reduce risk of flooding to residential structures. Project description: Catherwood/Farnsworth, Hill Road, Washburn Road between County Line (Ray Road) and Kipp Road. Proposed timeframe for implementation: 1-5 years. Budget: $500,000. Update: Project is ongoing.

4. Project: Boat for water or ice rescue. Project description: For Fire Department to help with evacuation in the event of floods or dam failure within the Village of Goodrich. Proposed timeframe for implementation: 1-5 years. Budget: $9,000. Update: Project is ongoing – cost of boat has increased to $9,000 from $5,000. Still looking to do project when funding is available.

5. Project: High Pressure 10-inch water wells (electric). Project description: To be used by the Fire Department to fight fires in various Township locations. Township would like eight wells. Proposed timeframe for implementation: 1-5 years. Budget: approximately $36,000 per well. Update: Project is getting started – costs for the high pressure 10-inch water wells have risen to $36,000 from $28,000.

6. Project: Emergency warning sirens. Project description: Emergency warning sirens placed in various locations within Atlas Township to be audible by all residents in all sections. Township would like eight sirens. Proposed timeframe for implementation: 1-5 years. Budget: Approximately $25,000 per siren. Update: Two emergency warning have been installed, looking to install more as funding is available.

GENESEE COUNTY HAZARD MITIGATION PLAN
PROPOSED HAZARD MITIGATION PROJECT
REQUEST FORM

March 26, 2021
Applicant Agency- Bendle Public Schools
Contact Person and Title- John Krolewski, Superintendent
Bendle Public Schools
3420 Columbine Ave.
Burton, Mi 48529
Phone: 810 591-2501
Email, jkrolewski@bendleschools.org

PROJECT DESCRIPTION

BACKGROUND INFORMATION - Bendle School District is a K-12 public school located in Burton, Mi. Bendle serves over 1,000 students and 100 % of the students qualify for free school breakfast and lunch. This project addresses the safety equipment needs of the high school kitchen and cafeteria. Bendle High School cafeteria is a **designated disaster site for Genesee County emergencies.** When the electrical power goes out, the freezer and refrigeration units stop working costing thousands of dollars to replace the loss of food.

Bendle Family Health Services is an onsite health clinic operated by Bendle Schools.The clinic began in 1998 and nurses continue to provide direct health education and prevention services to Bendle students.

Bendle has a partnership with the GCHD (Genesee County Health Department) to provide vaccines for preschool-Grade 12 students.
When the power goes out the vaccines are ruined if they are not maintained at a specific temperature. A generator needs to be installed to prevent the loss of vaccines.

PROJECT ALTERNATIVE #1

The primary need is to purchase a large generator that is wired into the electrical system of the kitchen at the high school. The address is 2283 E Scottwood Avenue Burton Mi. This would allow the kitchen to be operational during electrical shutdowns. Portable lighting would be purchased to enable staff to prepare food and serve students.

Approximate cost of the generator ----------48,000
6 portable lighting units @---------- 4,000

PROJECT ALTERNATIVE #2

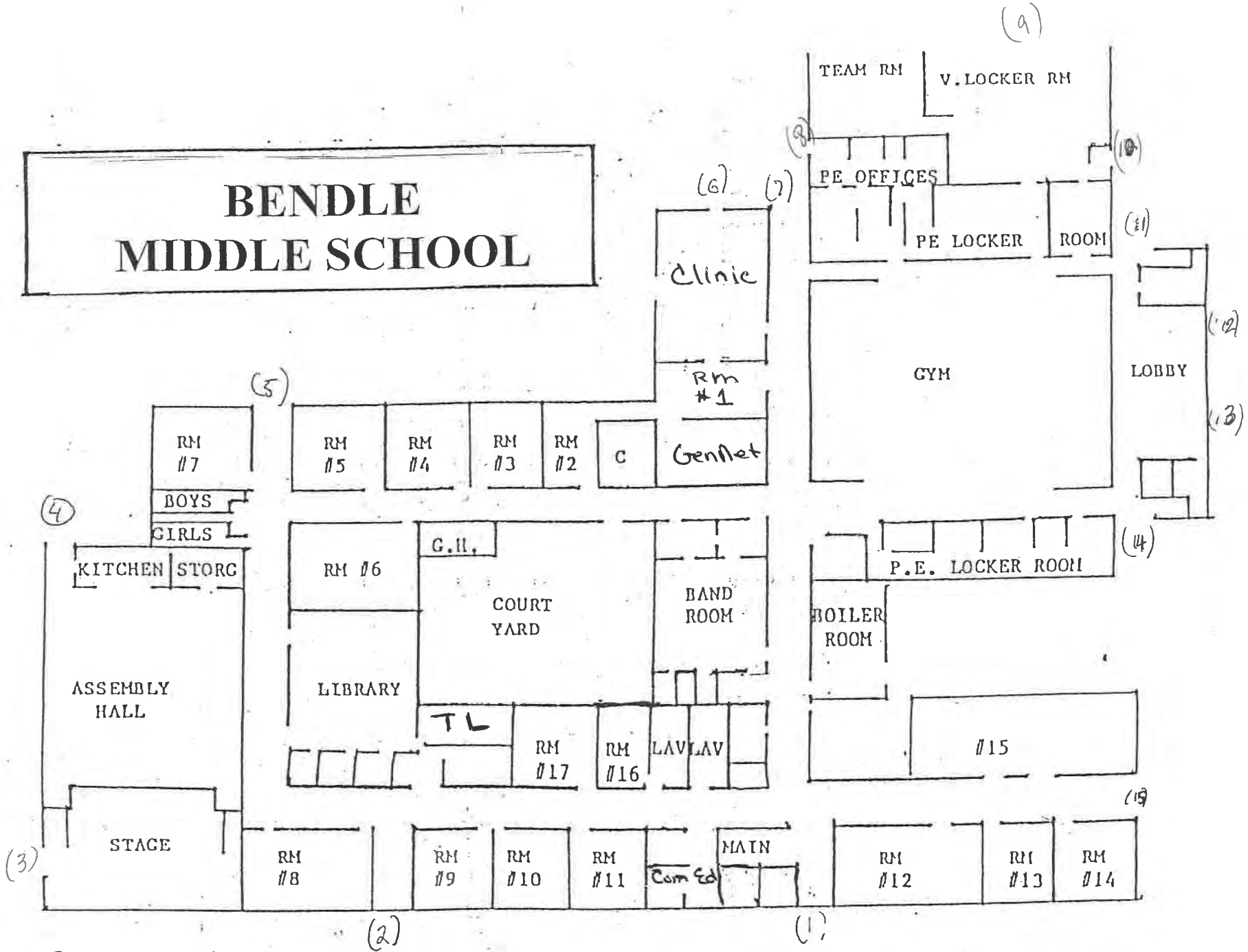
The second project is to purchase a generator and have it hard wired to the refrigerator where vaccines are stored in Bendle Family Health Services.

The location is: Bendle Middle School is located at 2294 E Bristol Road, Burton, Mi 48529.

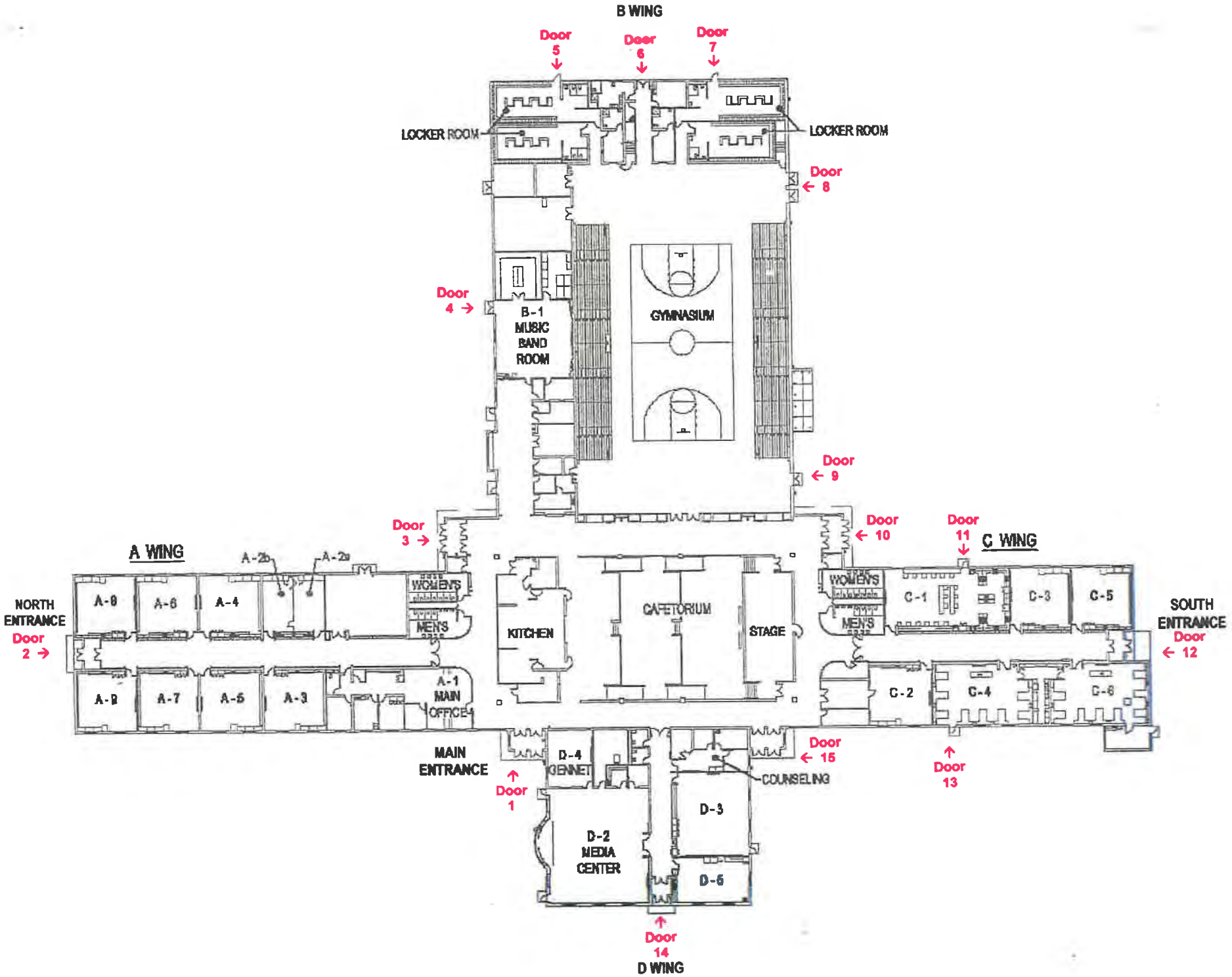
Cost for generator and installation----------15, 000
Caution tape- ---------- 150

Total cost of Bendle Project----------67,150

BENDLE MIDDLE SCHOOL



TL = Teacher's Lounge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Door 3
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A-1 MAIN OFFICE
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C-6
SOUTH ENTRANCE
Door 12
MAIN ENTRANCE
Door 1
D-4 BENNET
COUNSELING
Door 15
Door 13
D-3
D-2 MEDIA CENTER
D-6
Door 14
D WING

Roblyer, Cody

From: Christopher Yeates <cyeates@bishopairport.org>
Sent: Thursday, March 25, 2021 2:33 PM
To: Compton, Debra; Nino Sapone
Cc: Roblyer, Cody
Subject: RE: Genesee County Hazard Mitigation Project Request

Hi Cody,

The project that is listed below has been completed. I am working with staff regarding other Hazard Mitigation Projects that we have identified that may be included in the updated plan and will get you a response by Wednesday, March 31 if there is any new project to be included for BIAA.

Thank you,

Chris Yeates

Bishop International Airport • FNT
NOT THE ONLY WAY TO FLY. JUST A BETTER ONE.

From: Compton, Debra <DCompton@geneseecountymi.gov>
Sent: Thursday, March 25, 2021 1:49 PM
To: Nino Sapone <nsapone@bishopairport.org>; Christopher Yeates <cyeates@bishopairport.org>
Cc: Roblyer, Cody <CRoblyer@geneseecountymi.gov>
Subject: Genesee County Hazard Mitigation Project Request

Good Afternoon,

GLS Region V staff, in partnership with the Genesee County Office of Emergency Management, are requesting updates on hazard mitigation projects that were submitted by your agency to be included in the county's existing Hazard Mitigation Plan. Providing an update on previously submitted projects allows your agency's hazard mitigation projects to be prioritized when seeking grant funding through the Federal Emergency Management Agency (FEMA) in the future. Please provide an update on your agency's projects listed below by 5PM on Wednesday, March 31, 2021.

1. Project: Weather computer. Project description: This project includes a weather computer to help forecast snow, thunderstorms, and high winds; lightning warning systems for the airfield, and a direct phone line form the FAA Control Tower to the Airport Fire Department, Airport Police, and the security checkpoint. Budget: Not provided.

Project updates can be sent to Cody Roblyer, Planning Specialist at croblyer@geneseecountymi.gov.

Thank you,

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: City of Burton

Contact Person: Amber Abbey

Title: Deputy DPW Director

Project Description

Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Rd. The project includes the removal of the existing 3-sided cast-in-place concrete box culvert drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Rd. Replace with a 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding.

Please attach additional pages if necessary.

Estimated Project Cost: $700,000.00

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Project Alternatives

Project Alternative 1: None

Estimated Project Cost:

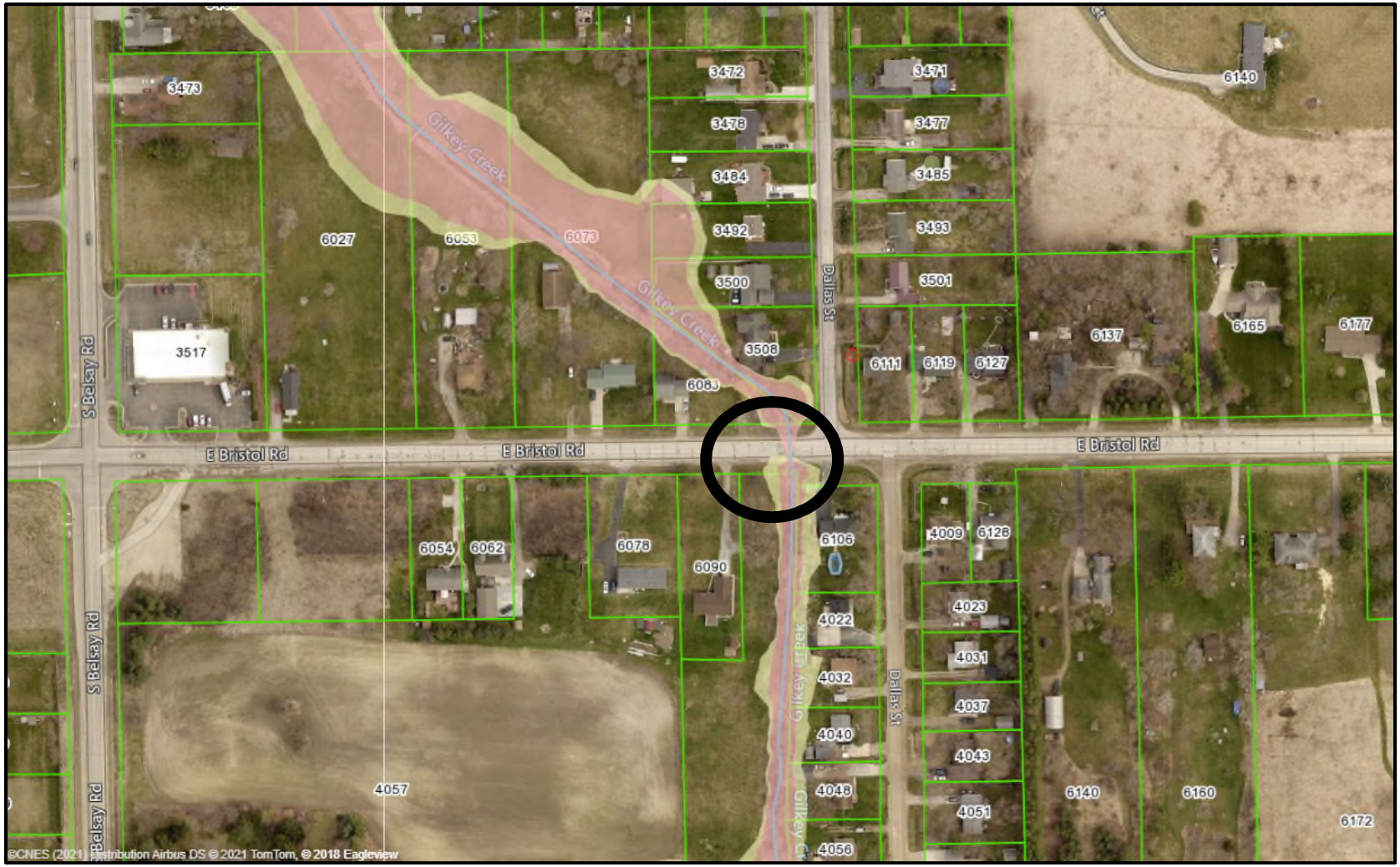
Please attach a location map for this project.

Project Alternative 2:

Estimated Project Cost:

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years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Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: City of Burton

Contact Person: Amber Abbey

Title: Deputy DPW Director

Project Description

Drainage project to reduce the risk of flooding to residential structures on a major thoroughfare. The crossing receives heavy flows during large storm events, is undersized and not long enough to fit the current use of Bristol Rd. The project includes the removal of the existing 3-sided cast-in-place concrete box culvert drain crossing of the Gilkey Creek on Bristol Road just east of Belsay Rd. Replace with a 24' span by 4' rise box culvert. This would be one of the last crossings along this stretch of the Gilkey Creek that has not been replaced and will reduce potential flooding.

Please attach additional pages if necessary.

Estimated Project Cost: $700,000.00

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Project Alternatives

Project Alternative 1: None

Estimated Project Cost:

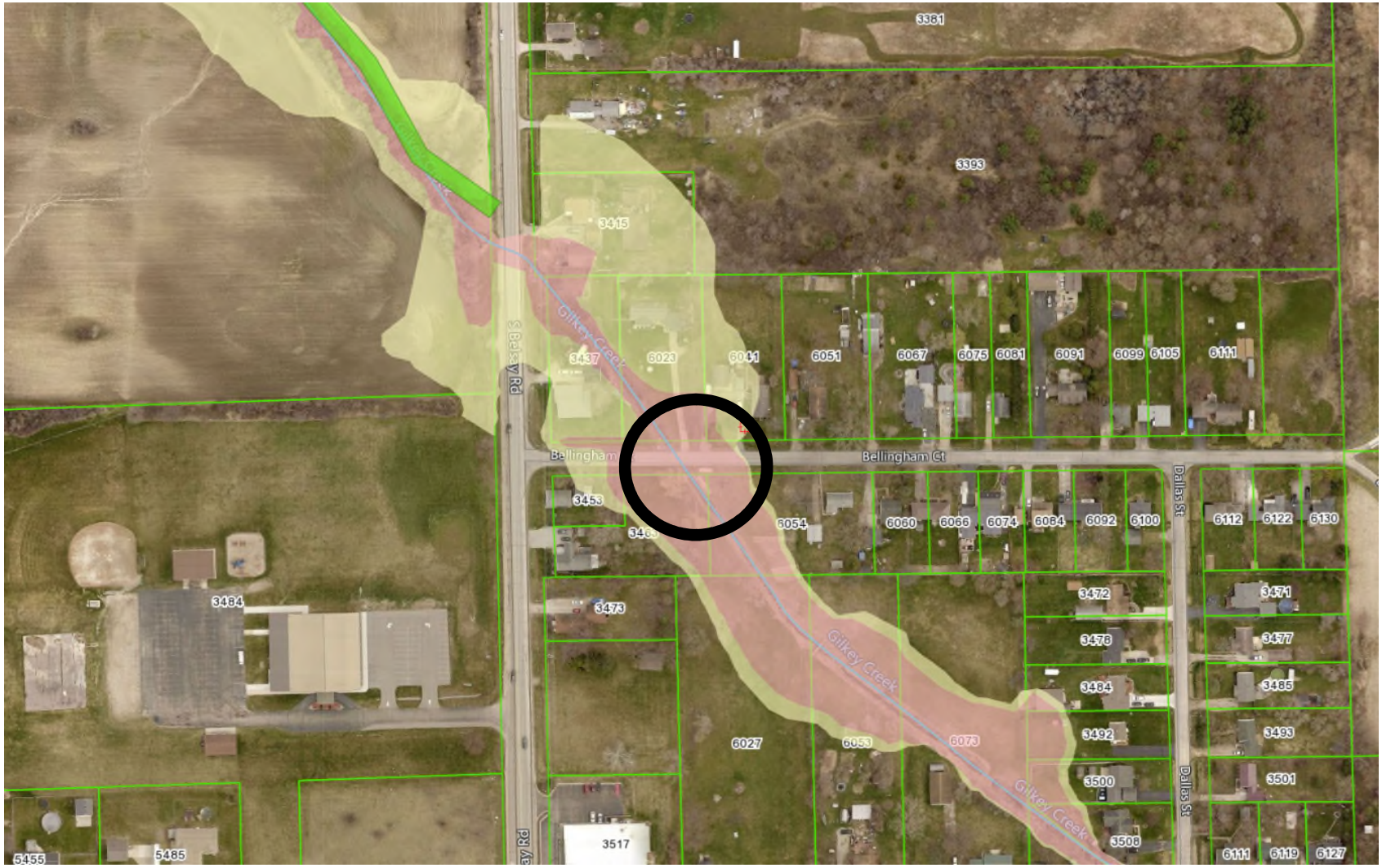
Please attach a location map for this project.

Project Alternative 2:

Estimated Project Cost:

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years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Roblyer, Cody

From: Tom Broecker <tbroecker@fentontownship.org>
Sent: Friday, March 26, 2021 8:30 AM
To: Roblyer, Cody
Subject: RE: Genesee County Hazard Mitigation Project Request

Good Morning Cody,

Fenton Township would like to keep the Emergency Shelter project on the list. Total budget for the project is $60,000. Please let me know if you need anything else. Thanks.

Thomas Broecker, MiPMC
Operations Manager/Deputy Clerk
Charter Township of Fenton
810-629-1537

From: Compton, Debra [mailto:DCompton@geneseecountymi.gov]
Sent: Friday, March 12, 2021 9:02 AM
Subject: Genesee County Hazard Mitigation Project Request

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: Village of Goodrich

Contact Person: Sheri Wilkerson 810-636-2570 ext 101

Title: Administrator/Clerk swilkerson@villageofgoodrich.com

Project Description

Natural gas backup generator for Village of Goodrich office/Hall and the DPW Building/office. The Village Hall serves as a safe haven room year-round for residents needing shelter. Location of generator would be: 7336 South State Road, Goodrich, MI 48438. Proposed timeframe for implementation is 1 to 5 years. Budget 20,000.00 Have currently received a quote from one private contractor.

Priority Level: #1 Top Priority.

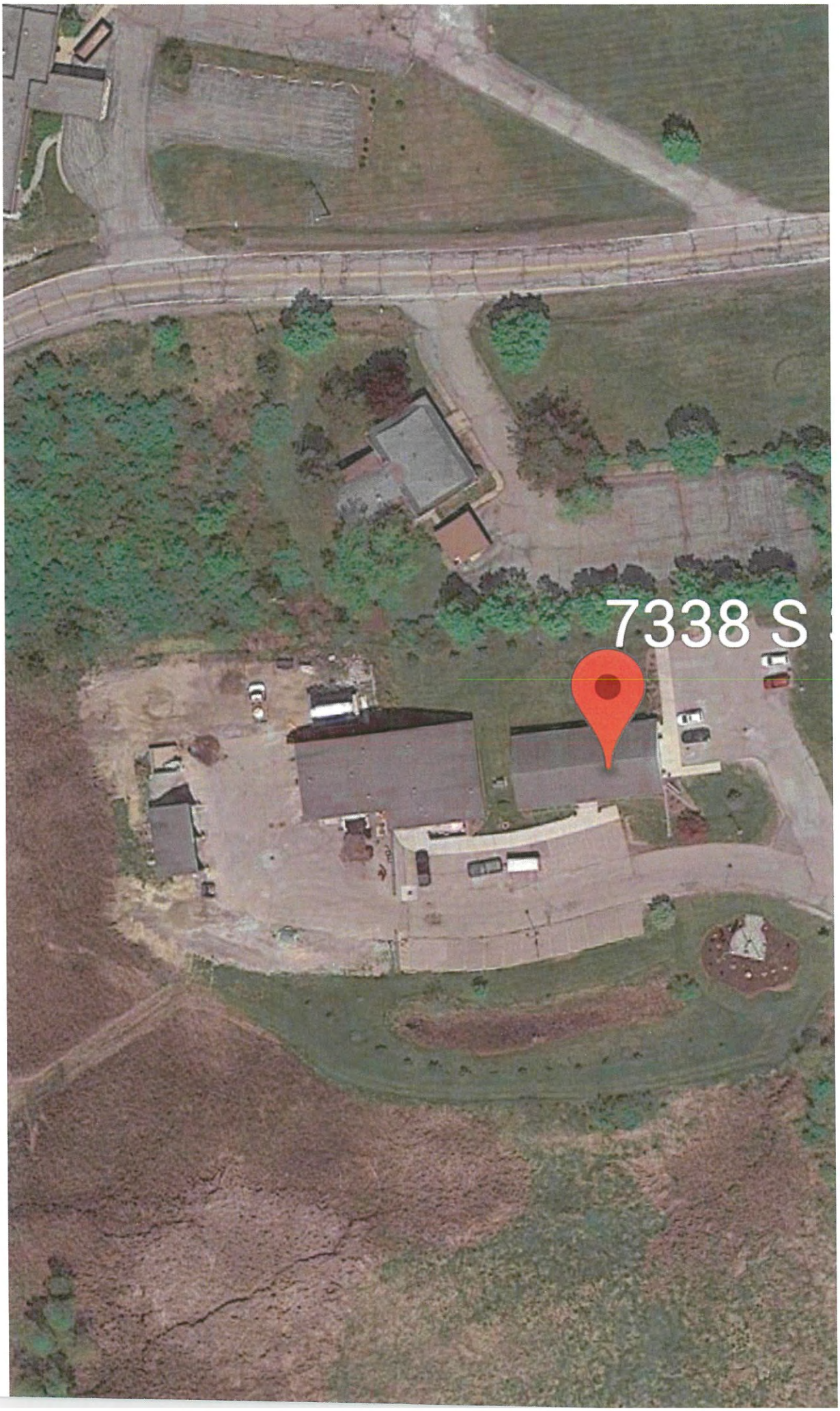
Previous Project: Goodrich Dam update provided: improvements have been made to the Goodrich/Mill Pond Dam. Two additional gates were altered to allow them to open but only under special situations.

Please attach additional pages if necessary.

Estimated Project Cost: 50,000.00

Please attach a location map for this project.

Proposed Timeframe for Implementation: | 1 to 5 years | 6 to 10 years | 11 or more years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CHARTER TOWNSHIP OF GRAND BLANC

DEPARTMENT OF PUBLIC SERVICES

Director ~ Jeffrey Sears

Date:	March 26, 2021
To:	Cody Roblyer, GCMPC
From:	Jeff Sears, Director of Public Services
Re:	Hazard Mitigation Grant Projects

Cody,

On behalf of Grand Blanc Township, I am pleased to submit the attached projects for inclusion in the Genesee County Hazard Mitigation Grant Program. Parks and Recreation Director Patrick Linihan and myself examined our future capital needs and both felt that these projects were the most fitting as they protect property and critical infrastructure. Please review these projects and provide feedback if necessary.

Project #1 – Standby generator installation at the Townships emergency well sites
Project #2 – Deadfall removal in Creasy Bicentennial Park

Also, the current list for Grand Blanc Township includes the installation of new community emergency sirens. You have indicated that project was submitted around 2006. I have verified with the Fire Department that the Township is no longer pursuing that project.

Thank you very much for your time and please contact me with any questions.

Best Regards,

Jeffrey Sears, *Director of Public Services*
Charter Township of Grand Blanc
Sears@twp.grand-blanc.mi.us
(810) 424-2640

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: Grand Blanc Township

Contact Person: Jeffrey Sears

Title: Director of Public Services

Project Description

Please see the attached documents.

Please attach additional pages if necessary.

Estimated Project Cost: $280,208.77

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Project Alternatives

Project Alternative 1:

Estimated Project Cost:

Please attach a location map for this project.

Project Alternative 2:

Estimated Project Cost:

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

CHARTER TOWNSHIP OF GRAND BLANC
DEPARTMENT OF PUBLIC SERVICES
Director ~ Jeffrey Sears

Date:	March 18, 2021
To:	GLS Region V Planning and Development Commision
From:	Jeff Sears, Director of Public Services
Re:	Hazard Mitigation Grant Project

Grand Blanc Township supplies water to approximately 21,000 of our 40,000 residents. We purchase water from the Genesee County Drain Commissioner who purchases water from the KARIGONDI Water Authority. Grand Blanc Township also has to back-up water well sites which can be used to supply the community with water if we ever experience service interruption from Genesee County.

Currently, our well sites identified as Knollwood *(located in the Concord Green Subdivision N of Hill RD, East of I475, South of Maple Rd, and East of Saginaw St)* and Stockbridge *(located in Stockbridge Commons Subdivision N of Perry, E of Belsay, S of Hill, W of Vassar)* are not served by any onsite, back-up power source. The Grand Blanc Township DPW does own two portables, diesel powered generators. In an emergency, employees must move the generators from the DPW facility to the well sites, set-up the generators, start the generators, connect the generators to the well house electrical system, and manually transfer power from the generators to the well house.

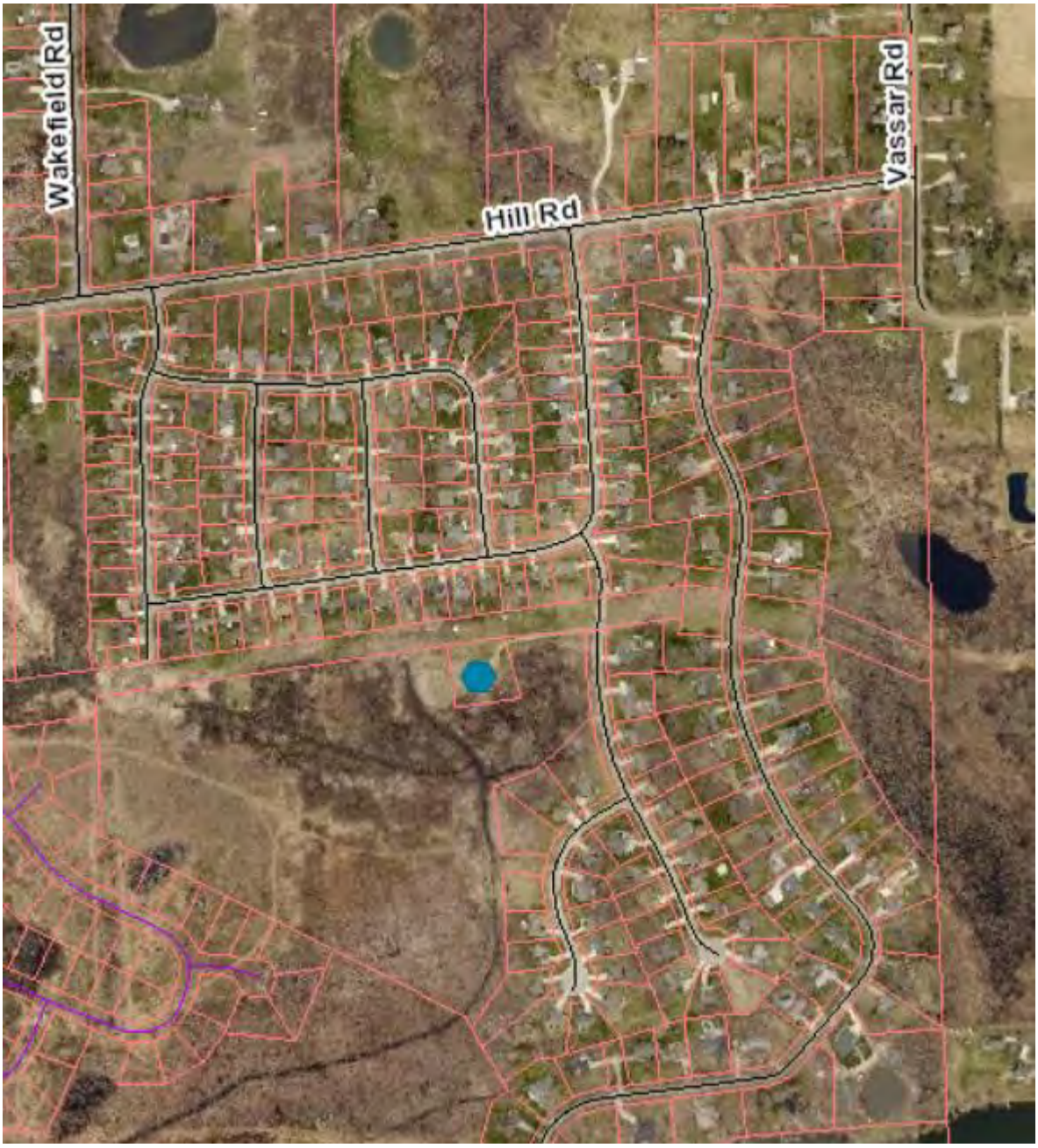
Grand Blanc Township is in the process of installing onsite, natural gas powered standby generators at each well house. These Cummins units will have the capacity to power each well pump at maximum production rates at the same time in order to sustain water supply. Each generator will be outfitted with an automatic transfer switch so in the event of a power outage and electrical draw, the generator will run without the need for employees to manually switch anything over.

The current estimate for this project is in the attached table and installation will commence in June of 2021.

Knollwood Wells		
Generator	$	136,400.00
Electrical	$	27,737.00
Trenching/Concrete	$	2,500.00
Consumers	$	27,086.92
TOTAL	$	193,723.92
Stockbridge Wells		
Generator	$	42,400.00
Electrical	$	21,397.00
Trenching/Concrete	$	2,500.00
Consumers	$	20,183.85
TOTAL	$	86,480.85
ESTIAMTED PROJECT TOTAL:	**$**	**280,204.77**

5371 South Saginaw Street • Grand Blanc, MI 48480-0057 • P.O. Box 1833
Phone - (810) 424-2640 • Fax – (810) 694-2881

STOCKBRIDGE GENERATOR SITE



KNOLLWOOD WELLSITE

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: Charter Township of Grand Blanc

Contact Person: Patrick Linihan

Title: Director of Parks and Recreation

Project Description

See attachments

Please attach additional pages if necessary.

Estimated Project Cost: $80,000

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years
	X		

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Project Alternatives

Project Alternative 1:

Estimated Project Cost:

Please attach a location map for this project.

Project Alternative 2:

Estimated Project Cost:

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

gb parks
Grand Blanc Township

03/25/2021

Cody Roblyer
Genesee Metropolitan Planning Commission
1101 Beach St
Flint, MI 48502

Mr. Roblyer:

For your consideration is the following project. Grand Blanc Parks and Recreation, a Department of the Charter Township of Grand Blanc submits the following proposal. If you or the selection committee has any questions please feel free to contact me.

Project: Dead Fall and Dead Tree Removal
Project Description: A recent audit at Bicentennial Park showed a high amount of deadfall and dead trees on the 66-acre plot on the northern part of the park. Most of the deadfall and standing dead trees are a direct result of the devastating effects of emerald ash bore and Dutch elm disease. This deadfall is located all across the ground and in the Sherwood Drain. The amount of deadfall poses a significant wildfire and flooding risk in the area. The amount of deadfall and standing dead trees in dry windy conditions could easily spread to and across I475 and into the neighborhoods to the North and East of the park causing a significant risk to life and property. Furthermore, blockages through the Sherwood drain could cause backups through the drain system and cause localized flooding that could affect personal property and I75. The project would pay from removal of downfall and removal of hazardous stands. Wood that is removed will chipped through a tub grinder and removed.
Budget anticipated $80,000
Priority High

Respectively,

Patrick D. Linihan CPRP, CPSI, AFO
Director of Parks and Recreation
linihan@gbtgov.com


018 - 04/27/2018

Roblyer, Cody

From: Ellen Glass <manager@lindenmi.us>
Sent: Thursday, April 8, 2021 10:22 AM
To: Roblyer, Cody
Subject: Update on City of Linden County Hazard Mitigation Project

Good Morning Cody,

I apologize for the late submission I have been out of the office. The City has completed the below referenced project.

Project: Stand-alone generator for City Hall. Project description: The City of Linden's Police, Fire, and Department of Public Works are housed at the City Hall. Currently, if the power goes out in the city, the City Hall building loses power as well. This prevents emergency sirens from being turned on and emergency personnel would not be able to operate. City Hall is designated as an Incident Command Post; however, with a loss in power, this would not be possible. Proposed timeframe for implementation: 1-5 years. Budget: $30,000.

Please let me know if you need additional information.

Ellen R. Glass
City Manager
City of Linden
132 E. Broad St. PO Box 507
Linden, MI 48451
manager@lindenmi.us
810-735-7980

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: Mundy Township

Contact Person: Chad Young; Township manager chad.young@mundytwp-mi.gov

Title: Fire Station #1 Emergency Backup Generator Replacement/Upgrade

Project Description

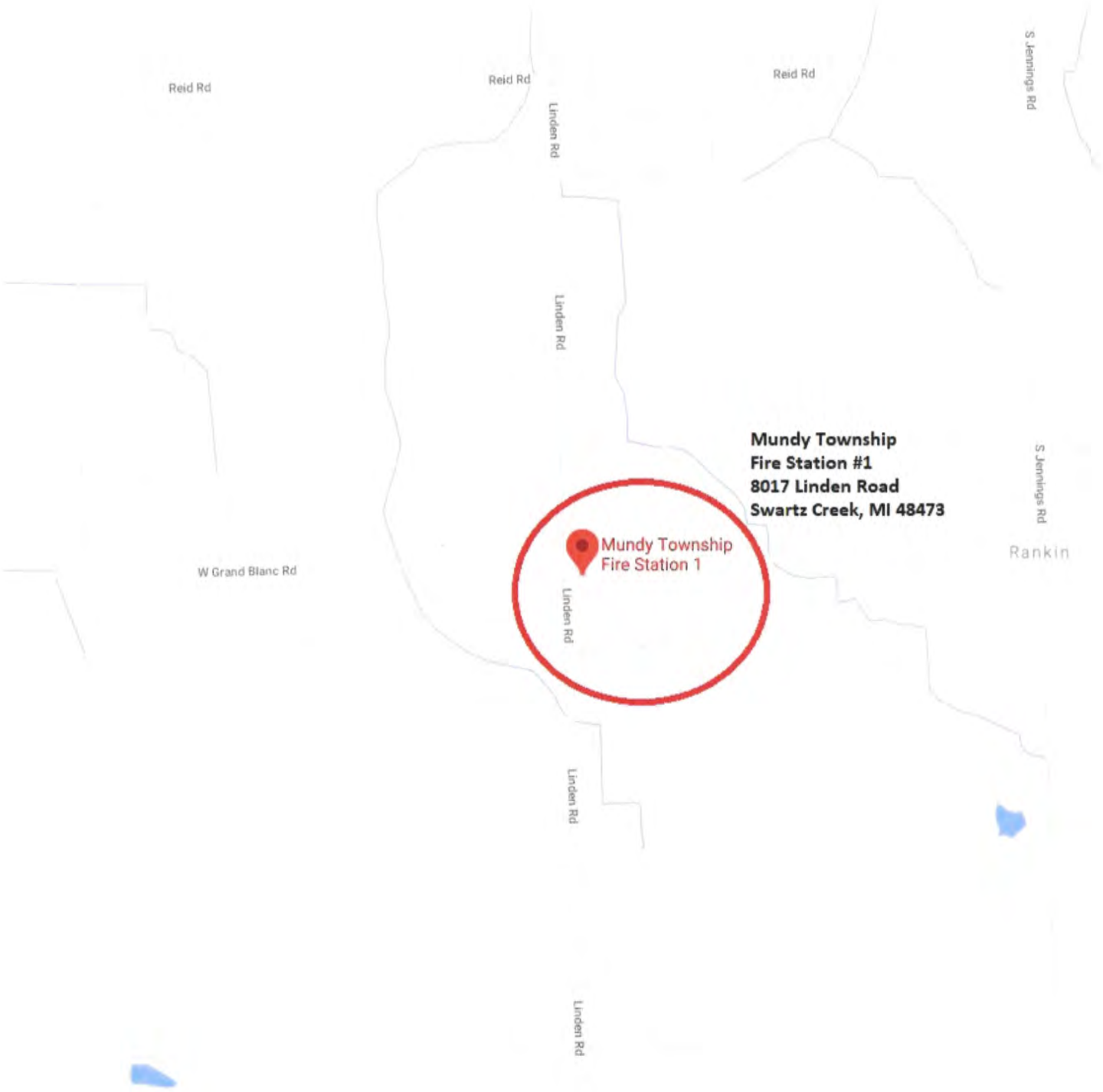
Rewiring of facility and installation of replacement/upgraded emergency backup generator at Mundy Township Fire Station #1 following failure of existing aged unit. This upgrade will allow the facility to remain operable for emergency response, command/staging, and community shelter in the event of a prolonged power outage.

Please attach additional pages if necessary.

Estimated Project Cost: $27,000

Please attach a location map for this project.

Proposed Timeframe for Implementation	1 to 5 years	6 to 10 years	11 or more years


Reid Rd
Reid Rd
Reid Rd
S Jennings Rd
Linden Rd
Linden Rd
Mundy Township
Fire Station #1
8017 Linden Road
Swartz Creek, MI 48473
Mundy Township
Fire Station 1
S Jennings Rd
Rankin
W Grand Blanc Rd
Linden Rd
Linden Rd
Linden Rd

Genesee County Hazard Mitigation Plan
Proposed Hazard Mitigation Project Request Form

Contact Information for Proposed Project

Applicant Agency: Mundy Township

Contact Person: Chad Young; Township manager chad.young@mundytwp-mi.gov

Title: Emergency Warning Sirens

Project Description

The purchase and installation of two advance warning sirens within Mundy Township.

Please attach additional pages if necessary.

Estimated Project Cost: $40,000

Please attach a location map for this project.

Proposed Timeframe for Implementation:	1 to 5 years	6 to 10 years	11 or more years

Mundy Township - Early Warning Sirens

N

0 0.35 0.7 1.4 Miles

Sirens
Siren Range
Township Boundary

GENESEE COUNTY METROPOLITAN PLANNING COMMISSION