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Jackson County Hazard Mitigation Plan
2022 Edition
(February 2022, Draft)

Plan Elements

Plan Appendices

Jackson County Hazard Mitigation Plan
2022 Edition Plan Element

American 1 Community Events Center | Keeley County Park

Introduction

Purpose

Jackson County is vulnerable to a wide range of hazards that affect the economy and our quality of life. For example, the Novel Coronavirus (COVID-19) is a worldwide catastrophic incident. Hazardous material threats, powerful electrical storms, tornadoes, and a broken gas pipeline have occurred locally. These disasters are costly, disruptive, and threaten human life as well as local infrastructure and the economy.

The Jackson County Hazard Mitigation Plan anticipates a wide variety of hazards and identifies actions to minimize their effect when they occur. Too often, we wait to ask what could have been done to avoid, or lessen the impact of a disaster. Jackson County has developed this edition of the *Jackson County Hazard Mitigation Plan* to address the threat these hazards pose to residents. This document will help Jackson County develop into a Disaster Resistant Community able to help residents protect themselves from the effects of disasters by encouraging damage prevention and preparation before a disaster occurs.

Managing varied threats, to protect life and property, is the challenge faced by emergency management officials at all levels of government. In order to maintain an effective emergency management capability to mitigate, prepare for, respond to, and recover from all types of hazardous events, an understanding of the variety of possible hazards that confront the County must first be obtained. When coupled with relevant land use and demographic information, this analysis becomes a powerful planning tool that enables emergency management officials to coordinate with the County and local municipal planners to set priorities and goals for resource allocation and mitigation and preparedness activities. It also allows the Jackson County Office of Emergency Management and Homeland Security to provide input on the possible effects of certain kinds of land uses and development projects.

The Federal Emergency Management Agency (FEMA) defines hazard mitigation "as any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event." It does not mean that all hazards are stopped or prevented. Nor does it mean complete elimination of damage or disruption caused by such incidents. Natural forces are powerful and most natural hazards are well beyond our ability to control. Hazard mitigation is not a quick fix; it is a long-term approach to reduce hazard vulnerability.

Why Plan? Each community faces different hazards, and each community has different resources and interests relative to those hazards. Because there are many ways to deal with natural hazards, and many agencies that can help, there is no one solution or cookbook for managing or mitigating all disastrous effects. Planning is the first step to correct these shortcomings by producing a program of activities that will best mitigate the impact of hazards as well as meet other needs. A well-prepared plan will ensure that all possible activities are reviewed and implemented so that the problem is addressed by the most appropriate and efficient solutions. A plan can also ensure that activities are coordinated with each other and with other goals and activities, thereby preventing conflicts and reducing the costs of implementing each individual activity.

Mitigation activities need funding. A mitigation plan is required for federal mitigation funds. Section 104 of the Disaster Mitigation Act of 2000 (42 USC 5165) states that local governments applying for pre-disaster mitigation funds must have an approved local mitigation plan. A plan will also be needed for post-disaster mitigation funds under the Hazard Mitigation Grant Program. These requirements are spelled out in 44 CFR (Code of Federal Regulations) Part 201. Therefore, a mitigation plan will guide the best use of mitigation funding and meet the prerequisite for obtaining such funds from the Federal Emergency Management Agency (FEMA).

The Plan: This plan was developed for Jackson County and all of its municipalities (i.e., city, villages and townships). This plan identifies activities that can be undertaken by both the public and the private sectors to reduce safety hazards, health hazards, and property damage caused by hazards. This plan fulfills the federal mitigation planning requirements of FEMA and provides the County and its municipalities with a blueprint for reducing the impacts of hazards on people and property.

This document's format consists of a narrative description in the following plan elements:

- Introduction (Purpose and Planning Process);
- Community Profile;
- Potential Hazards;
- Hazard Analysis;
- Goals and Objectives;
- Mitigation Strategies; and
- Plan Maintenance and Implementation.

The Community Profile element provides geographic, economic, social, and land use information that is relevant to how Jackson County is affected by, and responds to hazard events. The Potential Hazards element describes in detail the hazards that have the potential to occur in Jackson County. The Hazard Analysis element shows the overall ranking of hazards affecting Jackson County and also explains the methodology the County utilized to rank them. The Goals and Objectives element establishes Jackson County's overall direction for hazard mitigation planning and actions. The Mitigation Strategies element recommends structural and managerial actions that can be pursued to lessen the impacts of hazards; those strategies are also prioritized and each action is assigned a responsible party and timeline for implementation.

In Jackson County, the Office of Emergency Management and Homeland Security is the coordinating agency for local emergency management activities. This office is responsible for continually monitoring and updating this plan, the Jackson County Emergency Action Guidelines, as well as many other disaster-related activities. Questions and comments concerning this document should be addressed to Jason Breining, Director of the Jackson County Office of Emergency Management and Homeland Security at (517) 768-7946 or jbreining@mijackson.org.

Planning Process

This Plan is the product of a rational thought process that reviews alternatives then selects and designs those that will work best for the situation. This process is an attempt to avoid making quick decisions based on inadequate information and provides carefully considered directions to the County government and to the participating municipalities by studying the overall damage potential and ensuring that public funds are well spent.

For this edition of the Plan, the Jackson County Office of Emergency Management and Homeland Security hired the Region 2 Planning Commission to facilitate the development of the document. Region 2 then formed the Jackson County Hazard Mitigation Plan Advisory Committee. The Committee consisted of members from local and state agencies, businesses, and local government representatives. The committee followed a standard planning process based on guidance from the Michigan State Police -Emergency Management Division. The committee met several times throughout the planning

process. The Hazard Mitigation Plan Advisory Committee reviewed the hazards and subsequent effects on people and property, considered a variety of ways to reduce and prevent damage, and recommended the most appropriate and feasible measures for implementation.

The Jackson County Office of Emergency Management and Homeland Security, the Jackson County Health Department, and the Jackson County Drain Commissioner provided technical and planning support.

Plan Participation. A variety of county and municipal officials; fire, police, and medical professionals; and the business community served on the Jackson County Hazard Mitigation Plan Advisory Committee:

Organization/Department	Official	Organization/Department	Official
Jackson County Administrator	Mr. Michael Overton	Michigan State Police	Mr. Kevin Rod
Jackson County Office of the Sherriff	Capt. Kevin Hiller	Summit Township	Mr. John Worden
Jackson County Fire Chief's Association	Chief Tim McEldowney	Sandstone Township Supervisor	Mr. L. Keith Acker
Jackson County Health Department Emergency Preparedness	Ms. Stephanie Baker	Hanover Township Supervisor	Mr. Andrew Grimes
Jackson County Health Department Environmental Health	Mr. Don Hayduk	Henry Ford Allegiance Health	Mr. John Kahler
Jackson County Department of Trans-portation	Ms. Angela Kline	Jackson Community Ambulance	Mr. Karl Rock
Jackson County Drain Commissioner	Mr. Geoffrey Snyder	Consumers Energy	Ms. Lisa Douglas
Jackson County Central Dispatch | 911	Mr. Jason Hamman	Jackson Area Manufacturers Association | JAMA	Ms. Olivia Steele
City of Jackson Manager	Mr. Jonathan Greene	Marathon Petroleum	Mr. Tyler Haan
City of Jackson Police Department	Dir. Elmer Hitt	Citgo	Mr. Kevin Salgat
City of Jackson Fire Department	Chief David Wooden	Michigan State University Extension	Mr. Matthew Shane
City of Jackson Dept. of Public Works	Mr. Mike Osborn		

Each local unit of government was also contacted about participating in the Jackson County Hazard Mitigation Plan update. Here is a listing of municipalities that indicated their interest in being a continuing plan participant: Blackman Township, Columbia Township, Grass Lake Township, Henrietta Township, Leoni Township, Liberty Township, Napoleon Township, Norvell Township, Parma Township, Pulaski Township, Rives Township, Sandstone Township, Spring Arbor Township, Springport Township, Summit Township, Tompkins Township, Village of Brooklyn, Village of Concord, Village of Hanover, Village of Parma, and Village of Springport. Each municipality indicated that it would include hazard mitigation in the next update of its master plan, provided a hazard mitigation project for inclusion in the hazard mitigation plan, and indicated their intent to adopt the Jackson County Hazard Mitigation Plan as their municipal plan at the end of the planning process. Here is the listing of the municipalities and the officials contacted by phone in early 2022 to secure the information summarized above:

Municipality	Official	Municipality	Official
Blackman Township	Township Supervisor	Sandstone Township	Township Supervisor
Columbia Township	Township Supervisor	Spring Arbor Township	Township Supervisor
Grass Lake Township	Township Supervisor	Springport Township	Township Supervisor
Henrietta Township	Township Supervisor	Summit Township	Township Supervisor
Leoni Township	Township Supervisor	Tompkins Township	Township Supervisor
Liberty Township	Township Supervisor	Village of Brooklyn	Village Manager
Napoleon Township	Township Supervisor	Village of Concord	Village President
Norvell Township	Township Supervisor	Village of Hanover	Village President
Parma Township	Township Supervisor	Village of Parma	Village Clerk
Pulaski Township	Township Supervisor	Village of Springport	Village Manager
Rives Township	Township Supervisor		

Public Involvement. The hazard mitigation planning process incorporated a public involvement opportunity in the form of a series of workshops aimed at identifying the top hazards likely to impact Jackson County. The workshops took place remotely in late October of 2020 via Zoom due to the COVID-19 pandemic. Staff sent a two-page flyer to stakeholder organizations via email with a request that they distribute it to their members/staff. Staff also publicized the opportunities on the Jackson County Hazard Mitigation Planning webpage on the Region 2 website.

Plan Coordination. Existing plans and programs were reviewed during the planning process. However, it should be underscored that this plan does not replace other planning efforts such as the Jackson County Master Plan or the work of the Local Emergency Planning Committee (LEPC). This plan

complements those efforts. This edition of the Jackson County Hazard Mitigation Plan is consistent with the State of Michigan's 2011 Hazard Mitigation Plan (MHMP) as it relates to the development of risk and vulnerability assessments, identification and ranking of potential hazards, and recommendations for mitigation strategies. Also consistent with the MHMP, are the presence of clearly stated goals, measurable objectives, and a thorough list of implementation strategies for fulfilling the stated objectives.

Adoption. The Jackson County Board of Commissioners adopted the plan on the date shown on the adoption resolution accompanying the plan or on file at Jackson County Office of Emergency Management and Homeland Security. Various municipalities in the county also adopted the Plan and the resolutions are also on file at the Jackson County Office of Emergency Management and Homeland Security.

Jackson County Hazard Mitigation Plan
2022 Edition Plan Element

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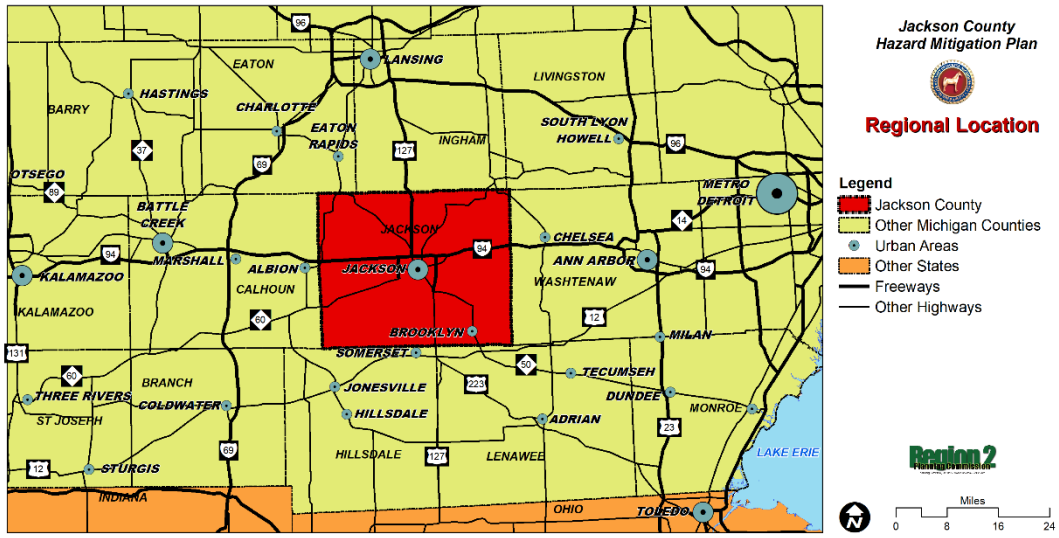
Community Profile

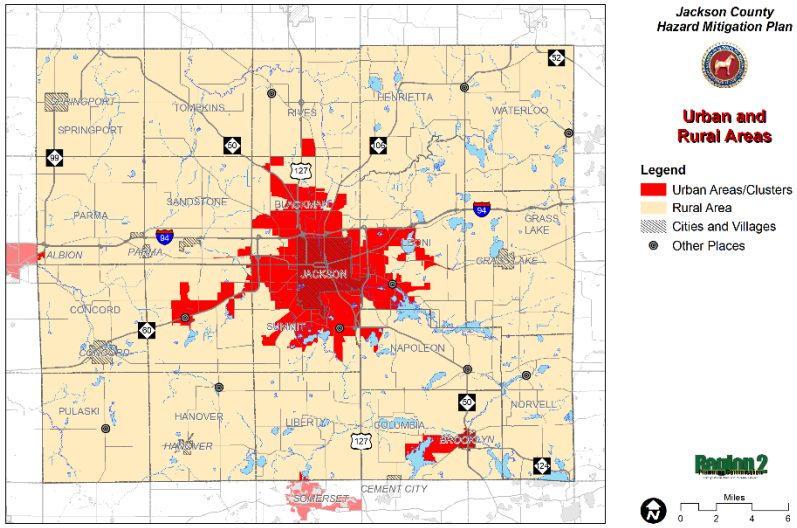
Regional Location

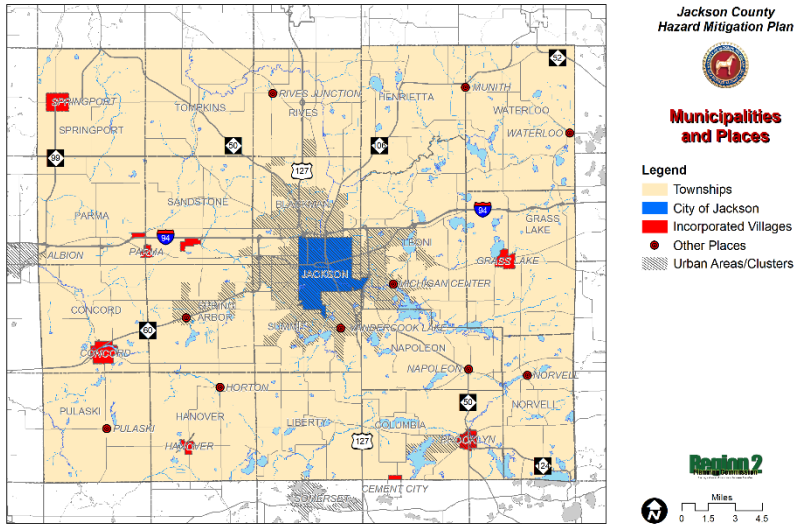
Jackson County is part of south-central Lower Michigan. It is located approximately 25 miles north of Ohio and bi-sected by the I-94 and US-127 corridors (see the Regional Location map).

Urban and Rural Areas

The Jackson Urbanized Area is located in central Jackson County (see the Urban and Rural Areas map). The Brooklyn Urban Cluster is located to the southeast. The Somerset and Albion Urban Clusters extend into the County from the south and west and the remainder of the County is rural. The Urbanized Areas of Lansing; Ann Arbor and Metro De-troit; Toledo; and Battle Creek and Kalamazoo are located to the north, east, southeast, and west, respectively.







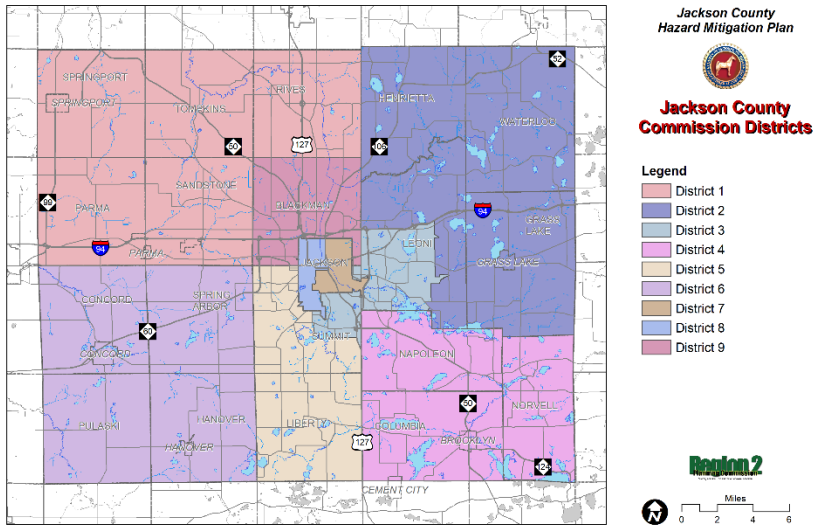
Political Jurisdictions

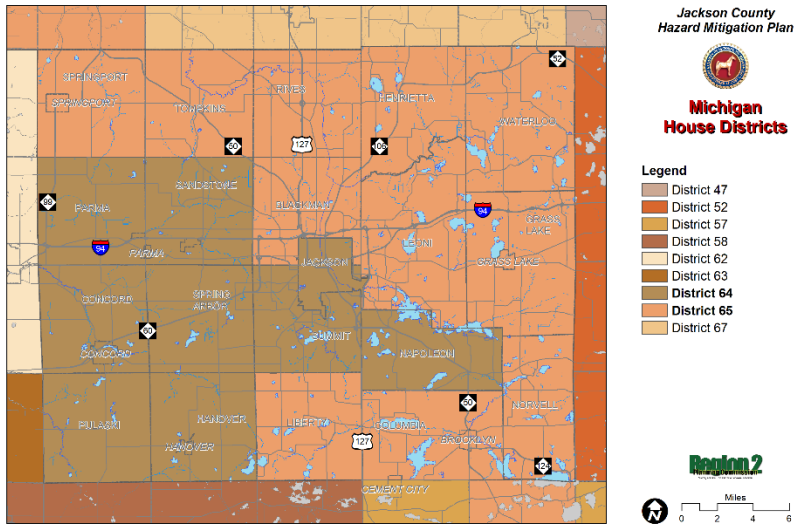
The county is composed of 19 townships, 7 incorporated villages, 1 city, and various unincorporated settlements (see the Political Jurisdictions table and the Municipalities and Places map). Elected boards and councils govern the townships, incorporated villages, and the city. The 9-member Jackson County Board of Commissioners also represents county residents (see the table and the Jackson County Commission Districts map). Michigan House Districts 64 and 65 cover Jackson County and various other districts border it (see the table and the Michigan House Districts map). The entire county is part of Michigan Senate District 19 and Michigan District 7 of the US House of Representatives and various other districts border it (see the table and Michigan Senate and United States House Districts maps).

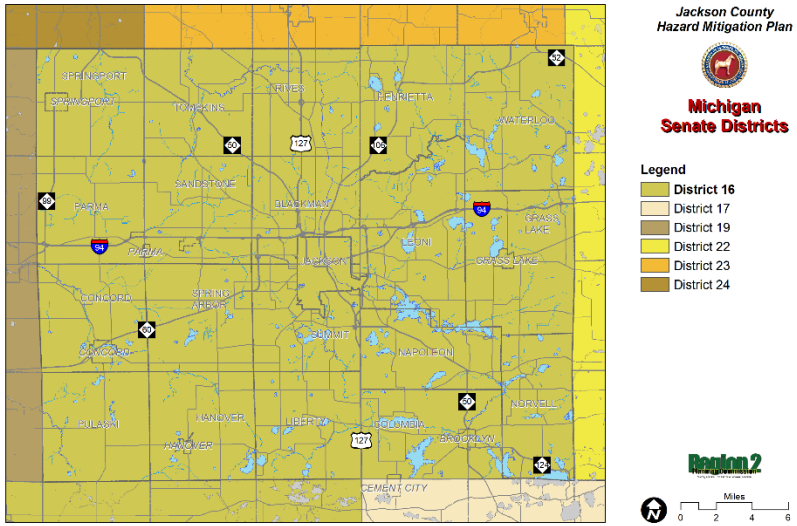
Political Jurisdictions

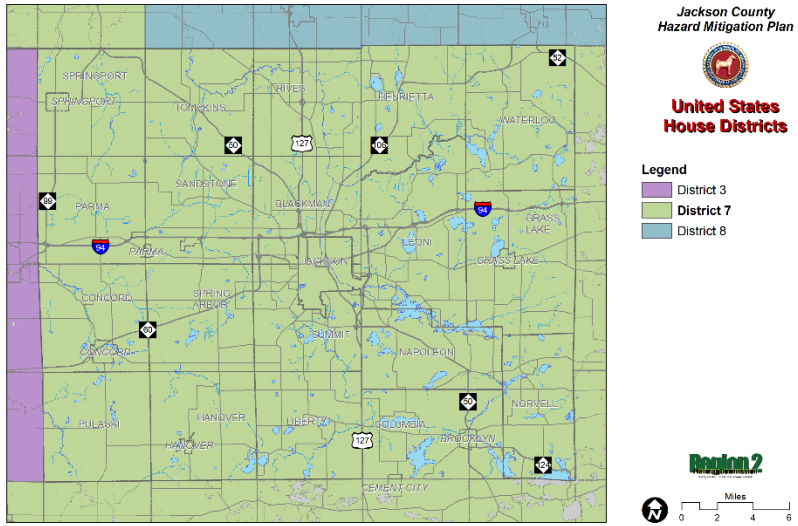
Community	County Comm.	MI House	MI Senate	US House	Community	County Comm.	MI House	MI Senate	US House
City					**Townships *(continued)***				
City of Jackson	7 & 8	64	19	7	Henrietta Township	2	65	19	7
Villages				7	Leoni Township	2 & 3	65	17	7
Village of Brooklyn	4	65	19	7	Liberty Township	5	65	19	7
Village of Cement City*	4	65	19	7	Napoleon Township	4	64	19	7
Village of Concord	6	64	19	7	Norvell Township	4	65	17	7
Village of Grass Lake	2	65	17	7	Parma Township	1	64	19	7
Village of Hanover	6	64	19	7	Pulaski Township	6	64	19	7
Village of Parma	1	64	19	7	Rives Township	1	65	19	7
Village of Springport	1	65	19	7	Sandstone Chtr. Twp.	1	64	19	7
Townships				7	Spring Arbor Township	6	64	19	7
Blackman Chtr. Twp.	9	65	19	7	Springport Township	1	65	19	7
Columbia Township	4	65	19	7	Summit Township	3 & 6	64	17	7
Concord Township	6	64	19	7	Tompkins Township	1	65	19	7
Grass Lake Chtr. Twp.	2	65	17	7	Waterloo Township	2	65	19	7
Hanover Township	6	64	19	7					

*Most of the Village and its population is located in Lenawee County.









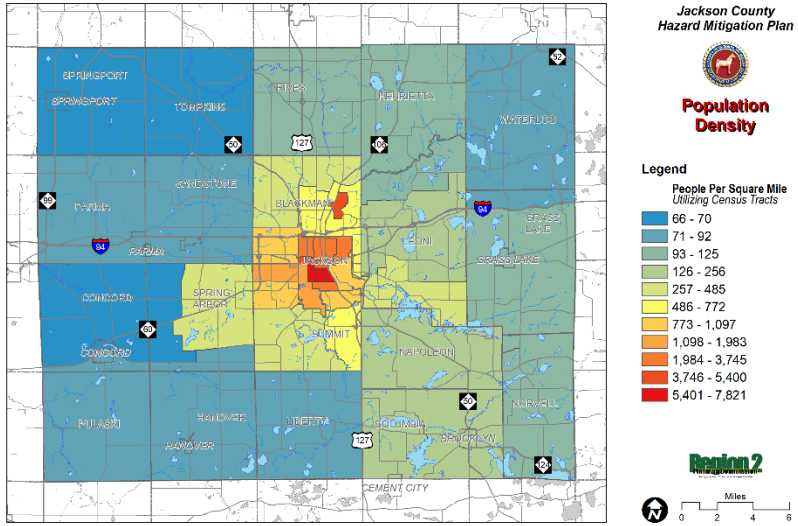
Community Characteristics

Jackson County was home to 160,248 people in 2000, according to the US Census. The official 2018 American Community Survey (ACS) estimate for the county was 158,913 people, indicating a stable population with only a slight loss (-0.8%).

Population Density

The Jackson Urbanized Area and the Brooklyn Urban Cluster were home to an estimated 58% of county residents in 2018 (i.e., 88,806 and 2,735 people, respectively). It is also interesting to note that the City of Jackson and the incorporated villages (excluding Cement City) comprised an estimated 24% of the countywide population in 2018 (i.e., 32,800 and 5,429 people, respectively).

Based upon the 2018 ACS estimate, the average density of population in the county was approximately 222 people per square mile (ppsm) that year. However, population density varied significantly across the county (utilizing Census Tracts) from a high of 6,804-7,821 ppsm in the City of Jackson (south of Michigan/Washington Avenues and west of Cooper Street) to a low of 66 ppsm in Springport and Tompkins Townships (including the Village of Springport).

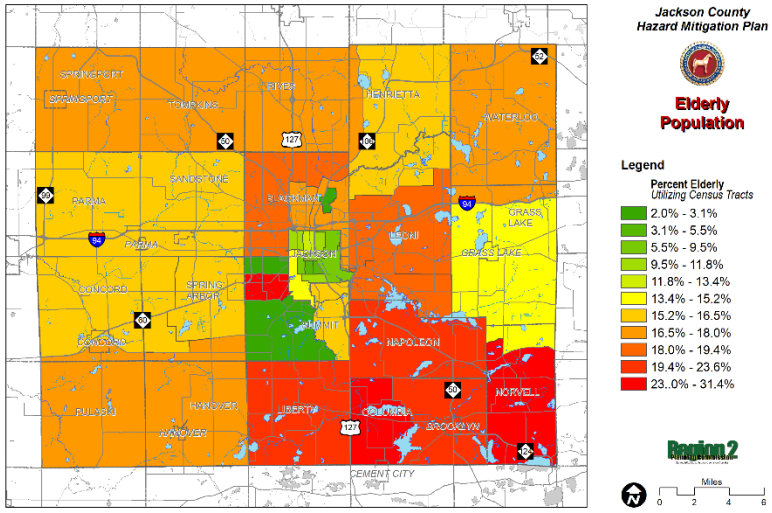


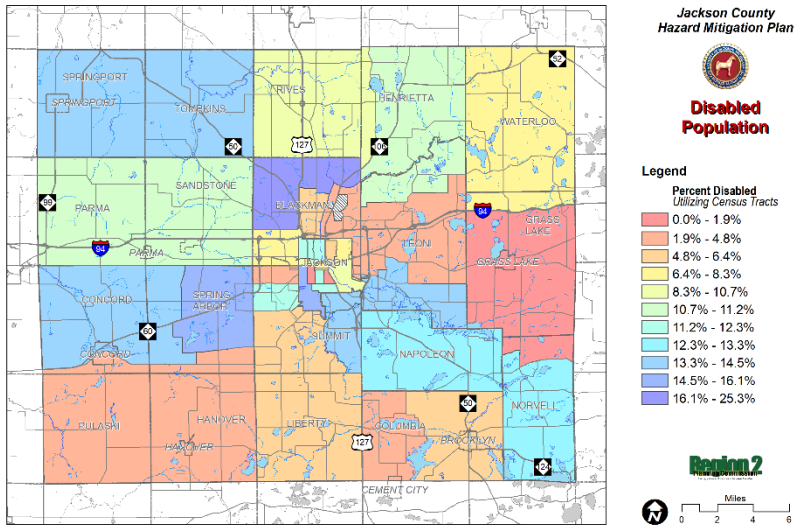
Populations with Special Needs and Social Vulnerability

Several population groups within the county have special needs that authorities should consider in any serious analysis of the risks residents may have from hazards. These analyses utilize census tracts because they provide more detail than municipalities in most cases. Please note that the analyses for many of these populations excludes the State of Michigan prisons in Blackman Township, which comprise their own census tract.

Elderly Residents

Approximately 16.7% of Jackson County residents were at least 65 years old in 2018 according to the ACS, although this average varies widely (see the Elderly Population map). For example, a portion of Summit Township (south of McCain Road and east of the City of Jackson) had the highest ratio of elderly residents at 31.4% while another portion of the Township directly to the south (south of the City of Jackson and west of the Grand River) had the lowest ratio at 2.0%. Various assisted living facilities are located in the County, many of them in the Jackson Urbanized Area.



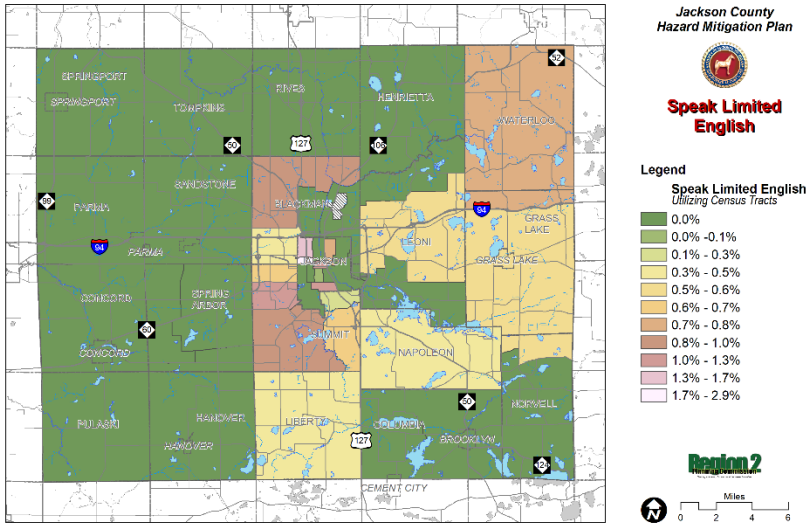


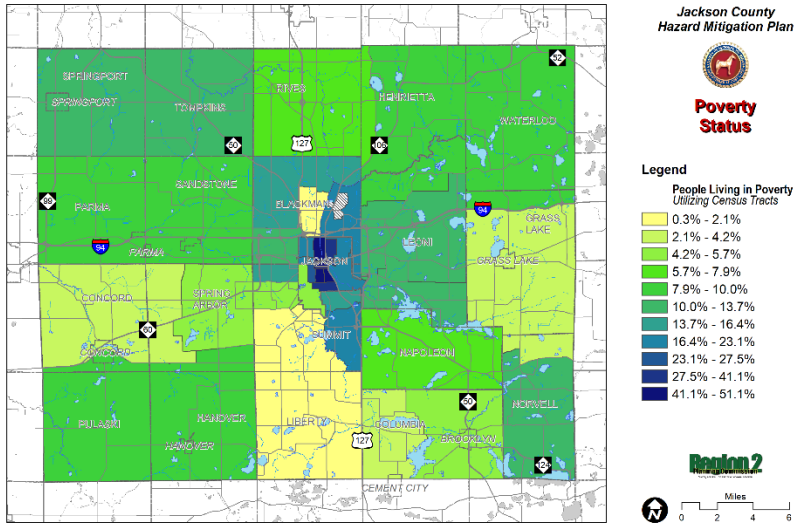
Disabled Residents

Residents disabled in some way in 2018, according to the ACS, comprised approximately 15.4% of Jackson County residents although this average varies widely (see the Disabled Population map). For example, disabled people only comprised 1.9% of Grass Lake Township residents living south of I-94, compared to 25.3% of residents living in northern and western Blackman Township.

Foreign Language Speakers

Only 1.7% of Jackson County households had limited English-speaking capabilities in 2018, according to the ACS, although this average varies (see the Speak Limited English map). For example, many townships, villages, and portions of the City contained no households with limited English-speaking capabilities compared to 2.9% of households in another part of Jackson (i.e., West Avenue, north of Michigan Avenue).



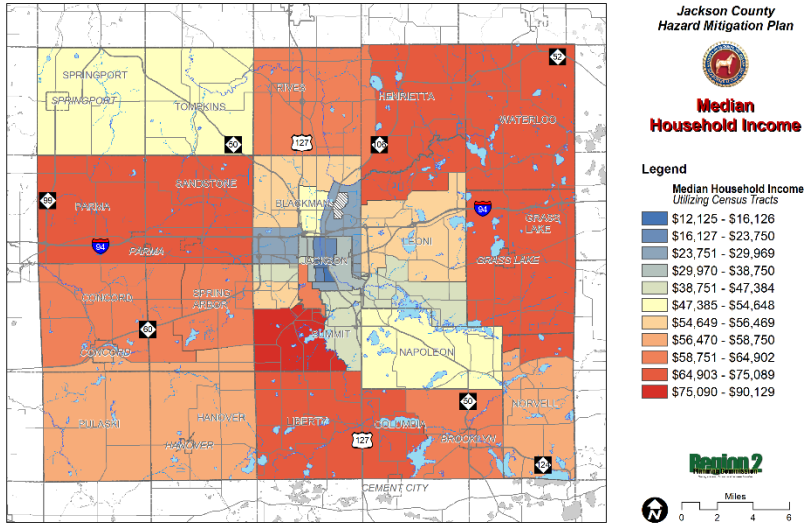


Impoverished Residents

Residents living in poverty in 2018 comprised approximately 13.7% of Jackson County residents although this average varies widely (see the Poverty Status map). For example, a portion of Summit Township (south of McCain Road and east of the City of Jackson) had the lowest poverty rate at 0.3%, compared to a portion of Jackson (north of Van Buren Street and east of Steward Street) at 51.1%.

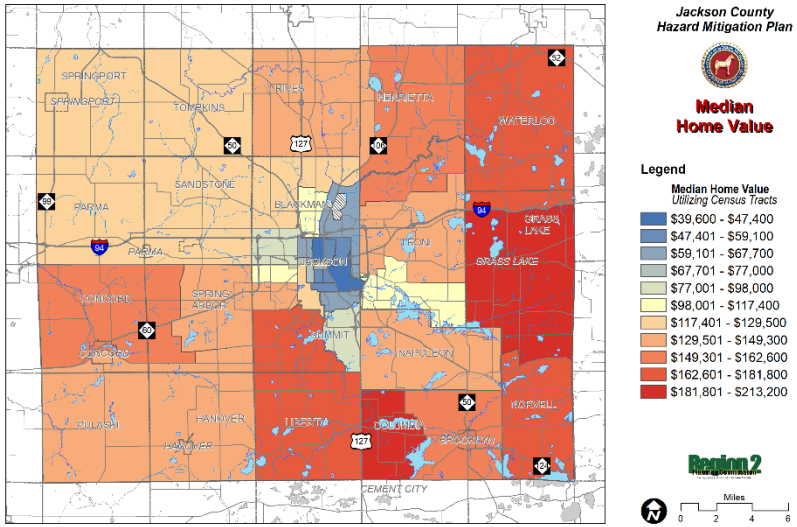
Median Household Income

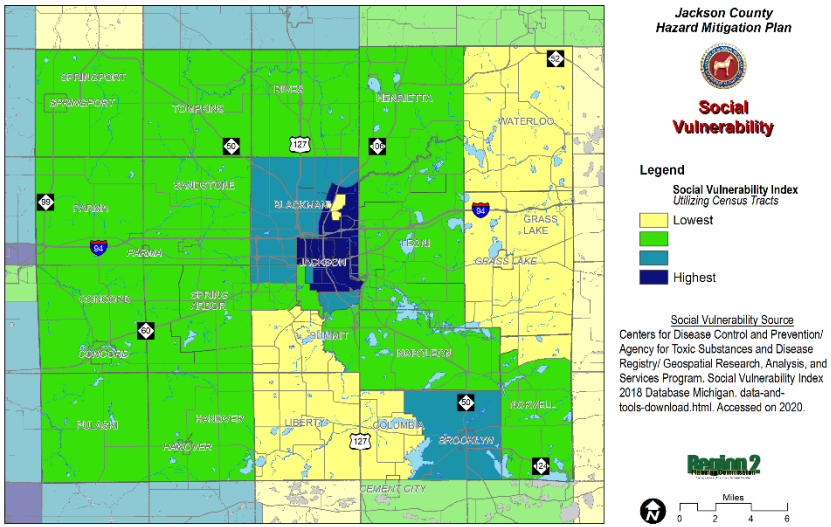
Median household income, according to the ACS, was approximately $51,031 in Jackson County although this average varies widely (see the Median Household Income map). For example, the lowest median household income of $12,125 occurred in a portion of the City of Jackson (i.e., near Louis Glick Highway and Washington Avenue, west of Cooper Street), compared to $90,129 for a portion of Summit Township (south of McCain road and east of the City of Jackson).



Median Home Values

The median home value in Jackson County was approximately $142,900 in 2018, according to the ACS, although this varies widely (see the Median Home Value map). For example, the median home value in the northcentral part of the City of Jackson (i.e., north of Van Buren Street, between Lansing Avenue and Cooper Street) was $39,600, compared to $213,200 for western Columbia Township (i.e., Clark Lake and the western shore of Lake Columbia, west to Liberty Township).





Social Vulnerability

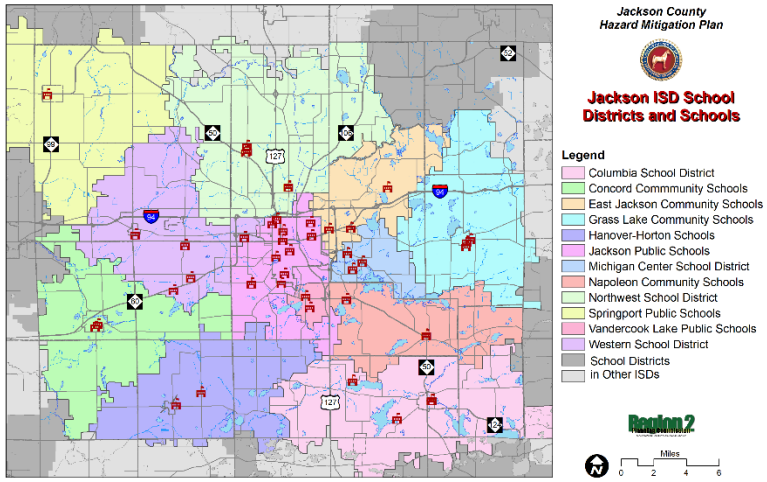
The CDC (Centers for Disease Control and Prevention) utilized 15 criteria from the 2018 ACS data, similar to the special needs information summarized in this section, to determine social vulnerability (see the Social Vulnerability map). The CDC defines social vulnerability as "a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters, such as tornadoes or disease outbreaks, to human caused threats, such as toxic chemical spills".

Educational Facilities

Public and private elementary, secondary and higher education institutions serve students and their families living in Jackson County:

Jackson Intermediate School District (JISD)

Twelve of the public school districts serving Jackson County are part of the Jackson Intermediate School District (JISD). The following is a listing of those districts and the schools they provide:



- Columbia School District. Columbia Elementary School, Columbia Upper Elementary School, Columbia Central Junior and Senior High Schools, and Columbia Options High School
- Concord Community Schools. Concord Elementary and Middle Schools and Concord High School
- East Jackson Community School. East Jackson Elementary School, East Jackson Secondary School, and East Jackson Alternative School
- Grass Lake Community Schools. George Long Elementary School and Little Warriors Preschool/Daycare, Grass Lake Middle School, and Grass Lake High School
- Hanover-Horton School District. Hanover-Horton Elementary School and Early Impressions Preschool/Childcare and Hanover-Horton Middle and High Schools
- Jackson Public Schools. Bennett Elementary School, Cascades and Frost Elementary Schools, Dibble Elementary School, Hunt Elementary School, Northeast Elementary School, JPS Montessori Center, Sharp Park IB World School, the Middle School at Parkside and Fourth Street Learning Center, Jackson High School and Jackson Pathways, T. A. Wilson Academy, and South Central Michigan Virtual
- Michigan Center Schools. Arnold Elementary School, Keicher Elementary School, and Michigan Center Junior/Senior High School
- Napoleon Community Schools. Ezra Eby Elementary School and Pirates Cove Pre-School and Child Care, Napoleon Middle School, Napoleon High School, and Ackerson Lake High School and Community Center
- Northwest Community Schools. Northwest Early Elementary School, Northwest Elementary School, R.W. Kidder Middle School, Northwest High School, and Northwest Alternate High School
- Springport Pubic Schools. Springport Elementary, Middle, and High Schools
- Vandercook Lake Public Schools. Townsend Elementary School and Vandercook Lake Middle/High School
- Western School District. Bean Elementary School, Parma Elementary School, Warner Elementary School, Western Middle and High Schools, and Western Career Prep High School

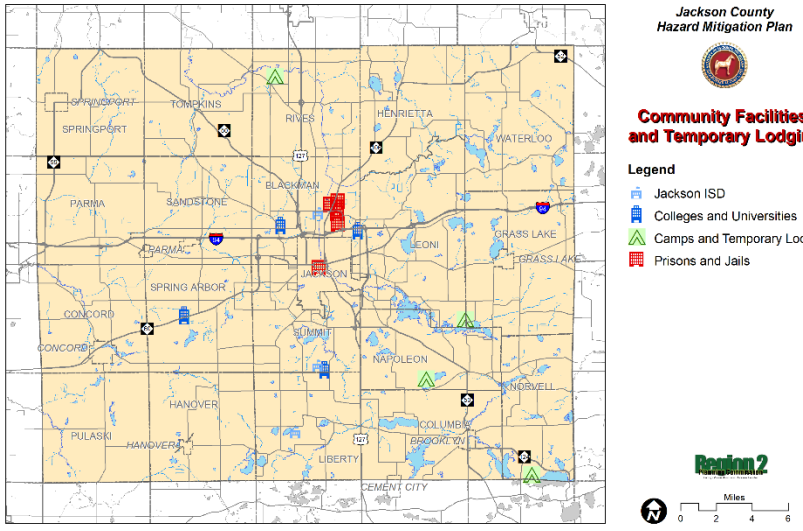
The JISD also maintains its Torrant and Kit Young Center in Blackman Township, Jackson Area Career Center in Summit Township, and Camp McGregor in Liberty Township.

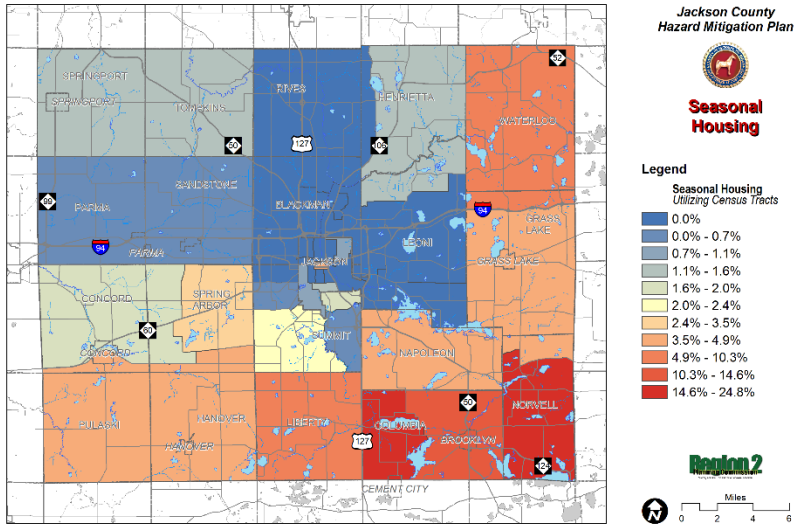
Other Public School Districts and Private Schools

Another 11 school districts extend into Jackson County. Chief among them is Stockbridge Community Schools (in terms of area), but none of them currently maintain any schools in the County. There are also a variety of charter and private schools. Jackson Preparatory & Early College, da Vinci (Primary School, High School, and virtual Downtown Center), 4th Street Primary, and Paragon Charter Academy are charter schools. Private schools include Jackson Christian Schools (Elementary/Preschool and Middle/High School), Jackson Catholic Schools (Queen of the Miraculous Medal Elementary School, St. John Elementary School, St. Mary Star of the Sea Elementary School, and Lumen Christi Catholic High School), and Jackson Seventh Day Adventist Elementary School.

Colleges and Universities

Several colleges are located in Jackson County. Baker College of Jackson is located in Blackman Township (see the Community Facilities and Temporary Lodging map). Jackson College's Central Campus is located in Summit Township and its W.J. Maher Campus is located in Blackman Township. Spring Arbor University is located in the unincorporated village of Spring Arbor (Spring Arbor Township).





Temporary/Seasonal Housing/Lodging

Seasonal dwellings comprised approximately 3.4% of Jackson County housing units in 2018 according to the ACS, although this varies widely (see the Seasonal Housing map). For example, there was no seasonal housing in the Townships of Blackman and Rives nor in most of Leoni Township and the City of Jackson. In comparison, approximately 24.8% of housing in most of Norvell Township was seasonal.

Various community facilities also have temporary lodging components. For example, Spring Arbor University and Jackson College's Central Campus host residence halls. Camp McGregor (Jackson County ISD, Liberty Township), the YMCA Storer Camps (Napoleon Township), Camp O' the Hills (Girl Scouts of America, Norvell Township), and Camp Teetonkah (Scouts BSA, Leoni Township) have facilities to accommodate overnight guests (see the Community Facilities and Temporary Lodging map). Youth Haven (Rives Township) is home to its charges. The Michigan Department of Correction's (MDOC's) Charles Egeler, Cooper Street, G. Robert Cotton, and Parnall Correctional Facilities (Blackman Township) and the Jackson County Office of the Sheriff's Chanter Road (Blackman Township) and Wesley Street (City of Jackson) Jails house prisoners. Henry Ford Allegiance Health and the Jackson County Medical Care Facility (City of Jackson), a variety of other assisted living facilities (various townships), several hotels (Blackman Township), and many campgrounds (various townships) also provide temporary accommodations (of varying lengths of time) to their patrons.

Public Safety Organizations

Law enforcement and fire/rescue services are coordinated through the 911 central dispatching service run by the County of Jackson, which utilizes the State of Michigan's 800 MHz radio system.

Law Enforcement

A variety of law enforcement agencies serves the residents and property/business owners of Jackson County:

Jackson County Office of the Sheriff

The primary countywide law enforcement agency is the Jackson County Office of the Sheriff, headquartered on Wesley Street in Downtown Jackson next to the County Courthouse. The following municipalities also contract with the Office of the Sheriff for additional law enforcement services:

- Village of Concord and Concord Township
- Village of Grass Lake and Grass Lake Township
- Norvell Township
- Parma Township
- Sandstone Township
- Summit Township

The Office of the Sheriff also operates a couple of jails (see the Community Facilities and Temporary Lodging Map. The Wesley Street Jail is part of the Office of the Sheriff headquarters. The Chanter Road Jail is located in Blackman Township, west of Elm Road, next to the Jackson County Department of Transportation.

Municipal Law Enforcement Agencies

Some of the municipalities within Jackson County also provide their own law enforcement agencies:

- Blackman-Leoni Township Department of Public Safety. Blackman and Leoni Townships
- Columbia Township Police Department. Village of Brooklyn and Columbia Township

- **Jackson Police Department.** City of Jackson
- **Napoleon Township Police Department.** Napoleon Township
- **Spring Arbor Township Police Department.** Spring Arbor Township
- **Springport Township Police Department.** Village of Springport and Springport Township

The Blackman-Leoni Township Department of Public Safety, the Columbia Township Police Department, and the Jackson Police Department serve their communities 24 hours a day/7 days a week.

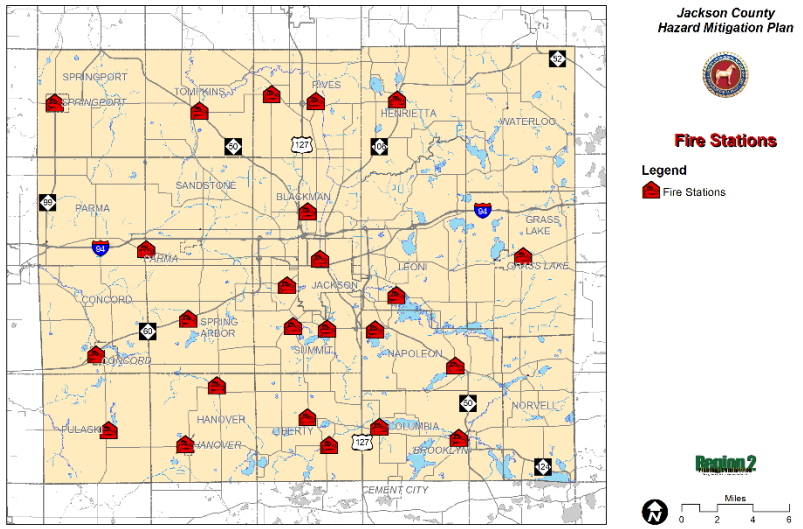
State of Michigan

The Michigan State Police (MSP) also serves Jackson County and its municipalities. MSP Jackson Post #13 is located on Cooper Street (M-106) in Blackman Township. Michigan's Departments of the Environment, Great Lakes, and Energy (EGLE) and Natural Resources (MDNR) also have enforcement officers who cover Jackson County.

Fire/Rescue Services and Facilities

Municipal fire departments serve their residents and property/business owners, which respond as necessary to fires and emergencies and participate in Jackson County's mutual aid system. The fire departments and the municipalities they serve are (see the Fire Stations map):

- **Blackman-Leoni Township Department of Public Safety.** Blackman and Leoni Townships
- **Cambridge Township Fire Department.** Norvell Township (southern ⅔) and part of Lenawee County
- **Columbia Township Fire Department.** Villages of Brooklyn and Cement City (north of Jackson St.) and Columbia Township
- **Concord Fire Department.** Village and Township of Concord
- **Grass Lake Charter Township Fire Department.** Village and Charter Township of Grass Lake
- **Hanover Township Fire Department.** Village and Township of Hanover
- **Henrietta Township Fire Department.** Henrietta Township
- **Jackson Fire Department.** City of Jackson
- **Liberty Township Fire Department.** Liberty Township
- **Napoleon Township Fire Department.** Napoleon and Norvell (northern ⅓) Townships
- **Parma-Sandstone Fire Department.** Village of Parma and Parma and Sandstone Townships
- **Pulaski Township Fire Department.** Pulaski Township
- **Rives-Tompkins Fire Department.** Rives and Tompkins Townships

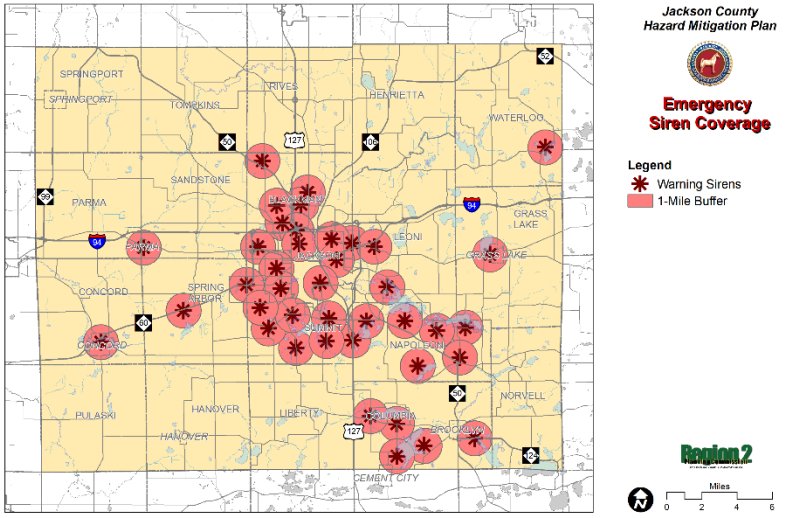


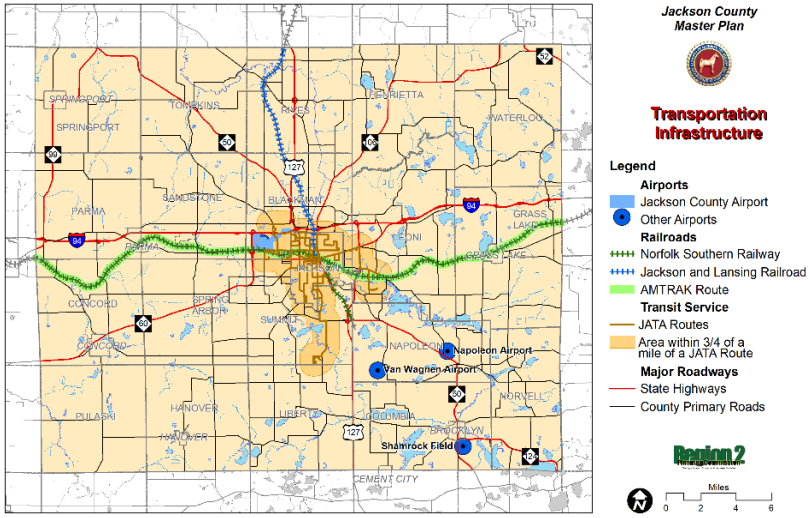
- **Spring Arbor Township Fire Department.** Spring Arbor Township
- **Springport/Clarence Fire Department.** Village of Springport, Springport Township, and part of Calhoun County
- **Stockbridge Area Emergency Services Authority.** Waterloo Township and part of Ingham County
- **Summit Township Fire Department.** Summit Township

Jackson Community Ambulance (JCA) provides paramedic emergency and non-emergency ambulance transportation to all of Jackson County and parts of Lenawee and Calhoun counties. JCA operates 25 ambulances out of several substations strategically located throughout the service area as well as its headquarters on Ingham St. in the City of Jackson.

Emergency Warning Sirens

Jackson County has a system of emergency warning sirens to warn residents of the approach of tornadoes, nuclear attack, or other emergencies (see the Emergency Siren Coverage map). The sirens are located primarily in the City of Jackson and Blackman and Summit Townships as well as the developed/lake areas of the Townships of Columbia, Grass Lake, Leoni, Napoleon and Spring Arbor. However, several areas have no coverage including the Villages of Hanover and Springport. In addition, areas of concentrated development that lack sirens include the lake areas of Round and Farwell Lakes, Pleasant Lake, and Wamplers Lake. Finally, populated areas in Horton and Hanover Township and in Norvell Township do not have siren coverage.





Infrastructure

A variety of roadway and transit, railroad, airport, and pipeline infrastructure serves Jackson County.

Roadways, Nonmotorized Facilities, and Transit

The Michigan Department of Transportation (MDOT) is in the long-term process of converting I-94, which runs east to west through the center of Jackson County, from a 4-lane to a 6- to 8-lane profile. US-127, which is a freeway from Summit Township to the north, bisects the County too (see the Transportation Infrastructure map). MDOT also provides various other state highways. The Jackson County Department of Transportation and its sister agencies in the City and the various villages operate the network of county primary and city

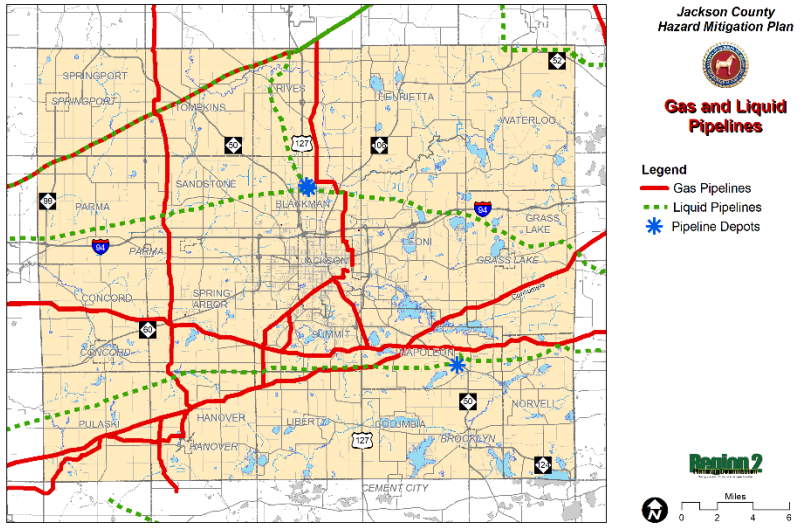
major roadways, as well as local roads and streets, that complete the road network. Local governments are also building a growing nonmotorized network, which is important to building a sustainable transportation system. The Jackson Area Transportation Authority (JATA) uses that network to provide bus service throughout the City of Jack-son and into surrounding townships.

Railroads and Airports

The Michigan Department of Transportation (MDOT) maintains a rail line utilized by AMTRAK for passenger service and Norfolk Southern for freight (see the Transportation Infrastructure map). The Jackson and Lansing Railroad owns and operates a rail line north of the MDOT line and Norfolk Southern owns and operates a line to the south, both for freight. The Jackson County Airport—Reynolds Field, located in Blackman Township, is the primary air facility in Jackson County. Three smaller private airports are located in Columbia and Napoleon Townships, to the southeast.

Pipelines

Various natural gas and liquid pipelines traverse Jackson County (see the Gas and Liquid Pipelines map). Citgo and Marathon Petroleum both operated depots in Blackman Township. The Buckeye Terminal (BP) is located in Napoleon Township.

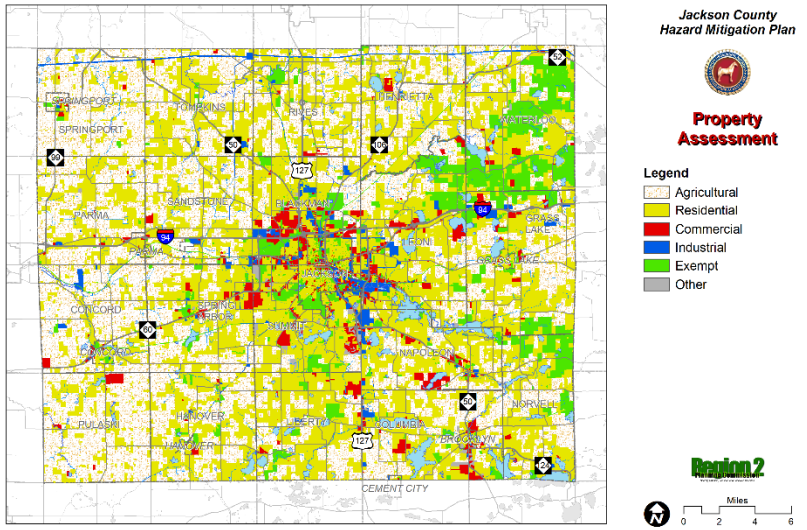


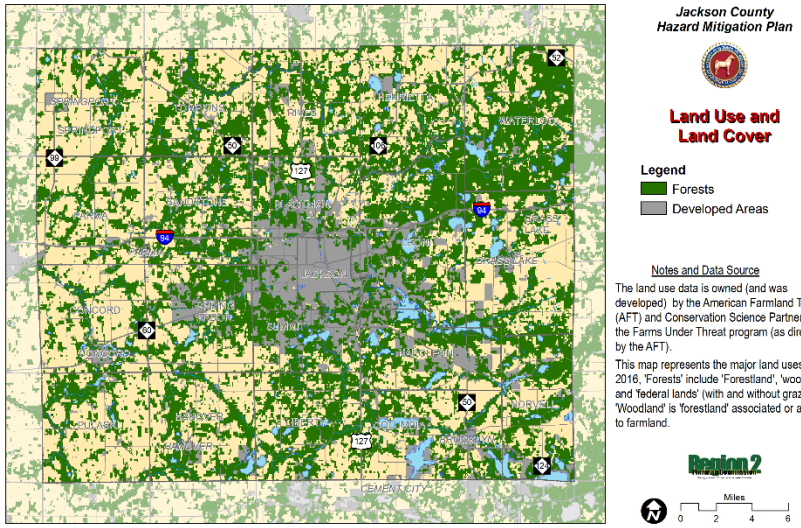
Existing Land Use

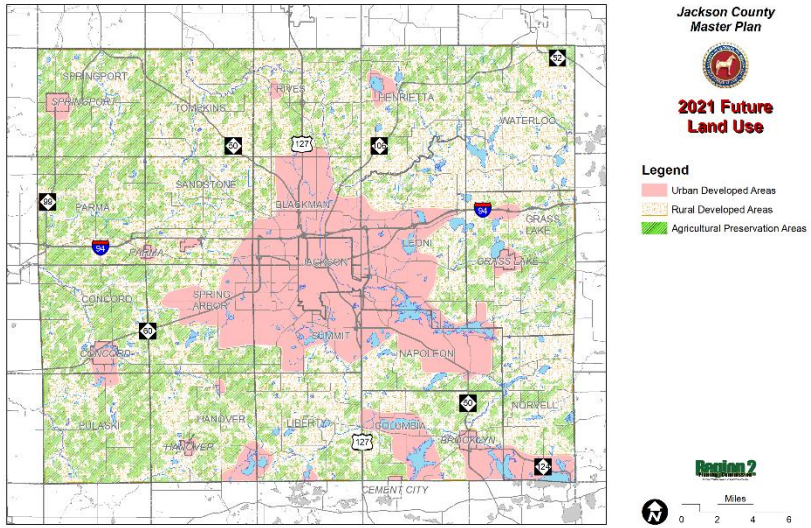
Property assessment data shows that residential, commercial, and industrial development is concentrated in the Jackson Urbanized Area and various villages as well as along state highways and other major roadways in 2019 (see the Property Assessment map). Residential development is also a significant component of every township. Exempt properties allude to the copious amount of public lands located throughout Jackson County. Land cover data highlights the forested areas of Jackson County (see the Land Use and Land Cover map).

Future Land Use

The future land use map proposed to part of the draft Jackson County Master Plan distinguishes between urban and rural development areas as well as areas proposed for agricultural preservation (see the 2021 Future Land Use map).







FEMA Hazard Mitigation Grants

The County of Jackson received hazard mitigation grants from the Federal Emergency Management Agency (FEMA) to develop this edition of the Jackson County Hazard Mitigation Plan as well as the first edition. FEMA has awarded no other hazard mitigation grants to Jackson County. FEMA has hazard mitigation grants available for local use in hazard mitigation project implementation. These grants are part of the Hazard Mitigation Assistance (HMA) Program, which includes the following: (1) Hazard Mitigation Grant Program (HMGP), which makes funds available for qualifying hazard mitigation projects after a federally declared disaster or emergency event, (2) Flood Mitigation Assistance (FMA) Program, which has funds available annually for qualifying flood mitigation projects, and (3) Building Resilient Communities and Infrastructure (BRIC), a new program that is available for the mitigation of many types of hazards, with funds available annually to qualifying projects, and that can handle larger, more expensive projects.

Jackson County Hazard Mitigation Plan
2022 Edition Plan Element

Bright Walls Mural | Downtown Jackson

Potential Hazards

Natural Hazards

Weather Hazards

- Hail
- Lightning
- Ice Storms and Sleet Storms
- Snowstorms
- Severe Wind Events
- Tornadoes
- Extreme Temperatures
- Fog

Hydrological Hazards

- Flooding
- Great Lakes Shoreline Hazards*
- Dam Failures
- Drought

Ecological Hazards

- Wildfires
- Invasive Species

Geologic Hazards

- Earthquakes
- Subsidence
- Space Weather
- Celestial Impacts

Technological Hazards

Industrial Hazards

- Structural Fires
- Scrap Tire Fires
- Hazardous Material Incidents
- Nuclear Power Plant Accidents
- Transportation Hazardous Material Incidents
- Petroleum and Natural Gas Pipeline Accidents
- Oil and Natural Gas Well Accidents

Infrastructure Hazards

- Infrastructure Failures
- Energy Emergencies
- Transportation Accidents

Human-Related Hazards

- Catastrophic Incidents
- Civil Disturbances
- Nuclear Attack
- Public Health Emergencies
- Terrorism

**Great Lakes shoreline hazards are not included in this analysis as Jackson County has no Great Lakes shoreline.*

Hail | Natural Hazards |Weather Hazards

Source: Mental Floss

Hail is a 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. 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 forms when strong updrafts within the storm carry water droplets above the freezing level, where they remain suspended and continue to grow larger until the winds cannot support their weight. They fall to the ground, battering crops, denting autos, and injuring wildlife and people. Large hail is a characteristic of severe thunderstorms.

Jackson County Perspective

Hail is an expected annual occurrence countywide in all municipalities, although the size and impact of hail is difficult to predict since it tends to have only a localized impact. Jackson County experiences an average of between 20 to 40 thunderstorm days per year, and expects several severe thunderstorm events to occur each year that are capable of producing damaging hail. Seventy (70) recorded incidents of hail storms occurred in the County during the 61-year period from 1958 through 2019. These events have resulted in $380,000 in property damage and $225,000 in crop damage. All of the reports of damage have occurred since 1996, which suggests improved reporting rather than a recent increase in hailstorm intensity. Please see the Potential Hazards Appendix for a table providing the history of hail events in Jackson County.

Lightning | Natural Hazards | Weather Hazards

Source: AccuWeather

Lightning is a random and unpredictable product of a thunderstorm's tremendous energy. The perception of lightning as a minor hazard lingers despite the fact that it damages many structures as well as killing and injuring more people on average in the United States per year than tornadoes or hurricanes. Conservative estimates of annual lightning-related property damages are several billion dollars per year, and will likely continue as the use of computers and other lightning sensitive electronic components continue. Since 1996, property damages due to lightning has averaged nearly $1 million annually across the State.

Jackson County Perspective

Lightning is considered an expected annual occurrence countywide in all municipalities, but with an impact that is difficult to predict and tends to be very localized unless it causes power failures or large fire events to occur. Jackson County experiences an average of between 20 and 40 thunderstorm days per year, any of which may produce damaging lightning strikes. The County expects several severe thunderstorm events to occur each year that are characterized by the production of great amounts of lightning activity, some of which can be expected to produce damage or injuries. Please see the Potential Hazards Appendix for a table providing the history of lightning events in the County.

Michigan Lightning Related Deaths and Injuries
1959 – 2005

	Deaths	Injuries
Open fields & recreation areas	29%	34%
Unspecified locations	19%	37%
Under a tree	26%	15%
Communications equipment & heavy equipment/machinery	6%	6%
Water related (boating, fishing, swimming, etc.)	11%	4%
Golf Course	10%	5%

Ice Storms and Sleet Storms | Natural Hazards | Weather Hazards

Source: Wikipedia

Although this plan combines the reporting on ice storms and sleet storms, they are two separate phenomena. People sometimes incorrectly refer to ice storms as sleet storms. 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. Sleet consists of small, already-frozen rain drops (ice pellets) that bounce when hitting the ground or other objects. These small pellets of ice then accumulate on surfaces, causing potential harm to transportation and electrical systems. Sleet does not stick to trees and wires as freezing rain does, but sleet in sufficient depth does cause hazardous driving conditions.

Jackson County Perspective

Ice storm and sleet storm damage is more likely to occur in southern Michigan—potentially impacting all municipalities in Jackson County—than in the northern portions of the State. Climate change effects seem likely to cause an increase in the number of ice storm and sleet storm events, especially in southern Michigan. There were 4 reports of ice storm/freezing rain events in the County between 1996 and 2017. This means that there is an average annual chance of 20% for this hazard to occur. These storms resulted in property damage estimated at $243,342,000 Statewide including $1,030,000 directly attributable to Jackson County. Please see the Potential Hazards Appendix for a table providing the history of ice storms and sleet storms in the County.

Past Presidential Declarations

- Date: *3/20-27/1976* | incident(s): *Ice storm and Tornadoes* | area: *Jackson and 28 other counties* | declaration: *Major Disaster*
- Date: *4/5/1972* | incident(s): *Snowstorm and Freezing Rain* | area: *Jackson and 8 other counties* | declaration: *Major Disaster*

Past Gubernatorial Declaration

- Date: 1/15/1985 | Incident(s): Ice storm | area: Jackson and 12 other counties | declaration: Disaster (Emergency)

Snowstorms | Natural Hazards | Weather Hazards

Source: East Idaho News

Blizzards are the most dramatic and perilous of all snowstorms, characterized by low temperatures and strong winds (35+ miles per hour) bearing enormous amounts of snow. Most of the snow accompanies a blizzard in the form of fine, powdery particles that are wind-blown in quantities that, at times, reduces visibility 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, and such storms may result in loss and disruption of essential services in affected communities. During the winter months in recent years, snowfall events have increased in intensity.

Jackson County Perspective

Snowstorms are a common occurrence in the winter months countywide in all municipalities. Fifty-three (53) snowstorm and winter storm events were reported in Jackson County from 1996 to 2017. This means an average of about 2.7 events per year. Vehicular crashes are more likely to occur, especially along the I-94 and US-127 corridors, during snowstorms. Schools and some business can close, depending on the nature and severity of the storms, causing a disruption to daily life. If there are power-outrages, residents may also have to seek out warming shelters. The snowstorms that have affected the County have resulted in a total of $1,225,000 in property damages. Please see the Potential Hazards Appendix for the history of snowstorms in Jackson County from 1993-2020.

Past Presidential Declarations

- Date: *12/11-31/2000* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and 38 other counties* | declaration: *Emergency*
- Date: *1/2-15/1999* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and 30 other counties* | declaration: *Emergency*
- Date: *1/26-27/1978* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and all 82 other counties* | declaration: *Emergency**
- Date: *4/5/1972* | incident(s): *Snowstorm and Freezing Rain* | area: *Jackson and 8 other counties* | declaration: *Major Disaster*

Past Gubernatorial Declaration

- Date: *1/26/78* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and all other 82 counties* | declaration: *Disaster**

* Also a Gubernatorial/Presidential Declaration

Severe Wind Events | Natural Hazards | Weather Hazards

Source: Storm Assist

Severe winds have occasionally had devastating effects on Michigan. Often, when straight-line winds occur, the presence of the forceful winds with velocities over 58 mph may be confused with a tornado. Severe winds have the potential to cause loss of life from falling trees, property damage, and flying debris. However, the property damage from straight-line winds can be more widespread than a tornado. In addition to property damage to buildings (especially less sturdy structures such as storage sheds, outbuildings, etc.), there is a risk of infrastructure damage from downed power lines due to falling limbs and trees. Large-scale power failures, with hundreds of thousands of customers affected, are common during straight-line wind events.

Severe wind events also include microbursts and derechos. A microburst is a localized but powerful wind gust that typically occurs from a single storm. Microbursts result in what are often referred to as straight-line wind damage, and usually result in damage that is comparable to a brief, weak tornado. Derechos are usually large-scale storm systems that travel hundreds of miles and are many counties wide. The damage path of a derecho often exceeds 250 miles in length, with damage reports typically stretching across many states. Derechos can happen any time of the year, but are most common in Michigan during the warmer half of the year. Wind speeds in derechos can exceed 100 mph at times and often result in damage that is more widespread than most other storms and tornadoes in Michigan.

Jackson County Perspective

Severe wind events can happen countywide in all municipalities. There were 125 severe wind events reported in the County between 1996 to 2017 that resulted in a total of $11,400,000 in property damage and $30,000 in agriculture damage. This means there has been an average of about 6.3 wind events per year. Please see the Potential Hazards Appendix for the history of severe wind events in Jackson County.

Past Gubernatorial Declaration

- Date: *7/21/80* | incident(s): *Thunderstorms and Severe Winds* | area: *Jackson and other 8 other counties (and various municipalities)* | declaration: *Disaster*

Tornadoes | Natural Hazards | Weather Hazards

Source: Wikipedia

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 called tornadoes. Powerful winds exert most of a tornado's destructive force, knocking down walls and lifting roofs from buildings in the storm's path. The violently rotating winds then carry debris aloft that may blow through the air as dangerous missiles.

The typical length of a tornado path is approximately 16 miles, but there are reports of tracks much longer than that—even up to 200 miles. Tornado path widths are generally less than one-quarter mile wide. Even though an average tornado might spend only a few minutes on the ground, those few minutes can result in devastating damages.

Jackson County Perspective

A tornado is a threat to all municipalities in Jackson County. The 2019 Michigan State Hazard Mitigation Plan reports that the County has seen 3 tornado events between 1996 – 2017 that resulted in no deaths, but $700,000 in property damage and $50,000 in crop damage. However, the same plan also reported that there were 15 tornados from 1950 – 2021 that ranged in intensity from EF0 - EF3 on the enhanced Fujita Scale (see the table). An EF3 tornado can result in roofs and some walls torn off well-constructed houses, trains overturned, and trees uprooted. The historical pattern means that there is an average annual chance of 15% for this hazard to occur. Please see the Potential Hazards Appendix for a table of historical of tornado events in Jackson County.

Past Presidential Declaration

- Date: *3/20-27/1976* | incident(s): *Ice storm and Tornadoes* | area: *Jackson and 28 other counties* | declaration: *Major Disaster*

The Enhanced Fujita (EF) Scale of Tornado Intensity

EF-Scale	Intensity Descriptor	Wind Speed
EF0	Gale Tornado	65-85
EF1	Weak Tornado	86-110
EF2	Strong Tornado	111-135
EF3	Severe Tornado	136-165
EF4	Devastating Tornado	166-200
EF5	Incredible Tornado	200+

Extreme Temperatures | Natural Hazards | Weather Hazards

Source: Medical Xpress

Past Gubernatorial Declaration

- Date: *1/29/2019* | incident(s): *Extreme Cold* | area: *Jackson and all other 82 counties* | declaration: *Emergency*

Wind Chill Chart

Wind (mph)

Temperature (°F)	Calm	5	10	15	20	25	30	35	40	45	50	55	60
40	36	34	32	30	29	28	28	27	26	26	25	25
35	31	27	25	24	23	22	21	20	19	19	18	17
30	25	21	19	17	16	15	14	13	12	12	11	10
25	19	15	13	11	9	8	7	6	5	4	4	3
20	13	9	6	4	3	1	0	-1	-2	-3	-3	-4
15	7	3	0	-2	-4	-5	-7	-8	-9	-10	-11	-11
10	1	-4	-7	-9	-11	-12	-14	-15	-16	-17	-18	-19
5	-5	-10	-13	-15	-17	-19	-21	-22	-23	-24	-25	-26
0	-11	-16	-19	-22	-24	-26	-27	-29	-30	-31	-32	-33
-5	-16	-22	-26	-29	-31	-33	-34	-36	-37	-38	-39	-40
-10	-22	-28	-32	-35	-37	-39	-41	-43	-44	-45	-46	-48
-15	-28	-35	-39	-42	-44	-46	-48	-50	-51	-52	-54	-55
-20	-34	-41	-45	-48	-51	-53	-55	-57	-58	-60	-61	-62
-25	-40	-47	-51	-55	-58	-60	-62	-64	-65	-67	-68	-69
-30	-46	-53	-58	-61	-64	-67	-69	-71	-72	-74	-75	-76
-35	-52	-59	-64	-68	-71	-73	-76	-78	-79	-81	-82	-84
-40	-57	-66	-71	-74	-78	-80	-82	-84	-86	-88	-89	-91
-45	-63	-72	-77	-81	-84	-87	-89	-91	-93	-95	-97	-98

Frostbite Times

30 minutes
10 minutes
5 minutes

Prolonged periods of extreme temperatures can pose severe and life-threatening problems. Although they are radically different in terms of initiating conditions, extremes of heat and cold 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 can result in heatstroke, heat exhaustion, heat syncope, and heat cramps. Extreme winter cold can result in hypothermia and frostbite.

In daily record temperature data, Michigan's new heat records outnumbered new cold records by 3-to-1 in the 1990s and by 6-to-1 in the 2000s. Those trends are continuing for the 2010s. Very high temperatures (above 90 degrees Fahrenheit) and/or humid conditions that cause an area's calculated Heat Index characterize extreme summer heat. When persisting for more than just a couple days, this phenomenon is classifiable as a heat wave. The Heat Index is a measure indicating the level of discomfort the average person experiences resulting from the combined effects of the temperature and humidity of the air.

In the wintertime, polar weather such as polar vortex events are becoming more common in the northern parts of the United States including Michigan. These and other dangerous cold weather events can produce extreme cold temperatures. The Wind Chill Factor or Index is a way cold weather is measured. This is defined as the temperature of windless air that would have the same effect on exposed human skin if there were a particular combination of wind speed and air temperature.

Jackson County Perspective

Extreme heat and cold are considered an annual occurrence within the County and all of its municipalities. The heat island effect may also exacerbate heatwaves in urban areas. There are typically a few days a year when extreme cold or extreme heat are recorded. The fluctuation in the recording of extreme temperatures may increase in the years ahead. Please see the Potential Hazards Appendix for a history of extreme temperatures in Jackson County.

Fog | Natural Hazards | Weather Hazards

Source: SciTechDaily

Fog forms near the ground when water vapor condenses into tiny liquid water droplets that remain suspended in the air. Many different processes can lead to the formation of fog, but the main factor is water-saturated air. Two ways that air becomes saturated are by cooling it to its dew point temperature or evaporating moisture into it to increase its water vapor content. Although most fog, by itself, is not generally a hazard because it does not actually apply damaging forces, the interaction between humans and fog can be a dangerous situation, sometimes resulting in disastrous consequences. It must be noted, however, that freezing fog (a hazard for which the National Weather Service issues special statements) can cause direct harm by causing slickness on roadways, walkways, bridges, and highway ramps, and therefore leading to serious transportation accidents. One of the main risks involves morning school buses and the safety of students and their parents while waiting near roadways under conditions of very low visibility.

Jackson County Perspective

Fog is a common occurrence in the County, and all of its municipalities, but only 1 severe fog event has been recorded between 1997 and 2017. This means that there is an average annual chance of 5% for this hazard to occur.

Flooding | Natural Hazards | Hydrological Hazards

Source: DataQuest

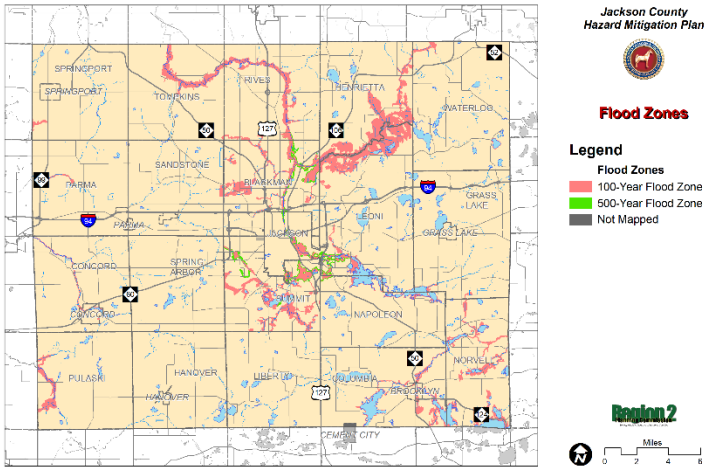
Past Presidential Declaration

- Date: *5/20/04-6/8/2004* | incident(s): *Thunderstorms and Flooding* | area: *Jackson and 22 other counties* | declaration: *Major Disaster**

Past Gubernatorial Declaration

- Date: *6/3/2004* | incident(s): *Thunderstorms and Flooding* | area: *Jackson and 22 other counties* | declaration: *Disaster**

* Also a Gubernatorial/Presidential Declaration



Floods can damage or destroy property, disable utilities, make roads and bridges impassable, destroy crops and agricultural lands, cause disruption to emergency services, and even 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.

Riverine (i.e., fluvial) flooding is the periodic overflowing of rivers, streams, and channels—due to inadequate drainage capacity, drainage system failures, ice or log jams, accumulated sediments, erosion, or meandering—that results in nearby property damage, safety issues, disruption of infrastructure function and services, and/or decreased quality of life. Urban (i.e., pluvial) floods occur when there is accumulation of water in low-lying and inadequately drained areas, following heavy precipitation events, including structural or power failures in municipal sewage systems, causing waters to flood or back-up into houses, other structures, and infrastructure.

Jackson County Perspective

The Federal Emergency Management Agency (FEMA) has established flood zones in the County. Only the Village of Cement City does not participate in FEMA's National Flood Insurance Program (NFIP) and is unmapped. A 100-year flood zone is an area having a 1% chance of being flooded in any given year. A 500-year flood zone is the area having a 0.2% annual chance of being flooded. The identified 100-year and 500-year flood zones in Jackson County—associated with the rivers, streams, lakes, and wetlands—are shown on the map to the left. Most of the riverine flooding likely occurs around rivers and lakes like the Grand River. Urban flooding will be likely to occur in developed areas, especially areas that are low-lying and near rivers, like Downtown Jackson or Blackman Township residential developments along the Grand River. Major flooding events have historically occurred in Jackson, though not recently. Please see the Potential Hazards Appendix for a history of flooding in the County.

There are no known repetitive loss properties in the county, according to Flood Mitigation Assistance Program data for Fiscal Year 2017, dated 8/23/2017). The newest data was requested from FEMA, but did not become available in time for this plan's scheduled update process, and therefore the 2017 information had to be used instead.

Dam Failures | Natural Hazards | Hydrological Hazards

Source: ClickOnDetroit

A dam is a structure that stretches across a stream or other waterbody in order to control its flow or to convert the energy within the water into more convenient forms, such as electricity. The impounded waters may be used for agriculture, flood-control, artificial lakes, municipal water supplies, or for energy generation. Some dams have become obsolete and should be removed to restore the natural water flow through the area. Otherwise, neglected dams will eventually fail and then be likely to cause a flash flood downstream through the sudden release of their impounded waters. Wildlife constructs some dams, but they can pose similar risks. The challenges facing local emergency management officials are:

- minimize loss of life and property by working closely with dam owners in the development of Emergency Action Plans (EAPs) to ensure consistency with the Emergency Operations Plan (EOP) for the jurisdiction
- developing procedures in the EOP for responding to a dam failure
- participating in dam site exercises
- increasing public awareness of dam safety procedures

Jackson County Perspective

There are 36 dams in the County according to the EGLE database, and most of them have a "low potential hazard" designation. EGLE rates 1 dam a high hazard potential and 4 dams have a significant hazard potential, including Brooklyn, Michigan Center, Horton, Liberty, and Mirror Lake (see the table). A third of the dams are in private ownership. The rest of the dams in Jackson County are owned by the State, the County, or a township. The following are dam or dike breach events that have occurred in the county.

- 1986 - the Horton Mill Pond and Moscow Road Dams breached. They were reconstructed by the Jackson County Drain Commissioner's Office.
- Prior to November 1994 – A storm caused the breach of the Mercedes Lake earthen dike, and the lake was drained. From 1995 – 2001 the Jackson County Drain Commissioner's Office designed, financed, and reconstructed the dam. The reconstruction of the dike included the installation of driven sheet piling beneath the earthen dike, which was paid for by the property owners abutting the lake.

Jackson County Dams with a High or Significant Hazard Designation

Dam Name	Pond Name	Hazard
Brooklyn Dam	Brooklyn Mill Pond	High
Michigan Center Dam	Center Lake	Significant
Horton Dam	Horton Mill Pond	Significant
Liberty Dam	Liberty Mill Pond	Significant
Mirror Lake Dam	Mirror Lake	Significant

Source: EGLE (Michigan Department of the Environment, Great Lakes, and Energy)

Drought | Natural Hazards | Hydrological Hazards

Source: New York Extension Disaster Education Network |Cornell

Drought is defined as a prolonged period of dryness due to a natural reduction in the amount of precipitation expected over an extended period of time, usually a season or more in length. Large urbanized areas are more vulnerable to water shortages and business disruptions due to the sheer number of water users that are competing for limited water resources. Rural agricultural areas in southern Lower Michigan are highly vulnerable to drought conditions that affect the quantity or quality of crops, livestock, and other agricultural activities. A prolonged drought can seriously effect local and regional income, which influences the local economy. Drought can also cause long-term problems that can affect the viability of some agricultural operations and increase the threat of wildfire.

A general trend toward a wetter Michigan climate has been in evidence for decades now. A pattern of fewer sustained and severe droughts is one of the benefits that Michigan has experienced as a result. Studies of climate have suggested that a gradual warming pattern has led to an increase in precipitation, since warmer air is capable of carrying more humidity. Climatological experts have advised, however, that the new pattern of concern in the medium-term is an increasing risk from seasonal droughts that may accompany heat waves. Within this historical overview, thanks to excellent historical data, we can see that the earliest years show 1 or 2 droughts per decade that reach sustained Statewide intensity that is at the severe D2 level on the Palmer Drought Classification or worse (see the table). By the mid-20th Century, the data shows an average of barely 1 major drought event per decade. No recent Michigan events have reached the same level as the severe historical droughts.

Palmer Drought Classification

Category	Description	Possible Impacts
D0	Abnormally Dry	Short-term dryness that slows crop growth
D1	Moderate Drought	Some damage to crops. Streams, reservoirs, wells are well [below average].
D2	Severe Drought	Crop loss likely. Water restrictions imposed.
D3	Extreme Drought	Major crop loss. Widespread water shortage or restrictions.
D4	Exceptional Drought	Exceptional crop loss. Shortages of water create water emergency.

Jackson County Perspective

The County receives approximately 76 inches of precipitation per year. The average annual rainfall is 34 inches, and the average annual snowfall is 39 inches. No measurement exists as to define a drought. However, much of that precipitation may occur during planting and harvesting rather than the growing season, affecting crop yields. The risk of drought is a countywide issue affecting all municipalities. Please see The Potential Hazards Appendix for a history of droughts in Jackson County.

Wildfires | Natural Hazards | Ecological Hazards

Source: Toledo Blade

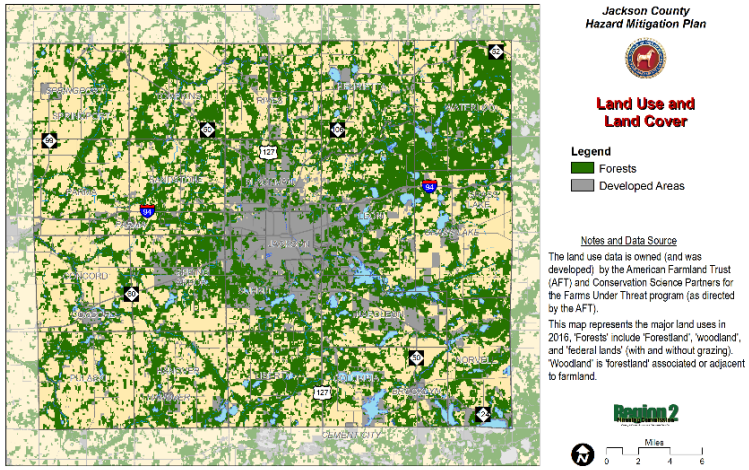
Michigan has the fifth largest timberland acreage in the country, with 19.3 million acres of hardwoods and soft woods; a substantial portion of Jackson County is wooded too (see the map). The forest cover is a boon for industry and recreation. However, it also makes many areas highly vulnerable to wildfires. Because the landscape has changed substantially over the last several decades, due to wild land development, the potential danger from wildfires has increased. More development in and around rural areas (a 60% increase in the number of rural homes Statewide since the 1980s) has increased the potential for loss of life and property from wildfires.

According to 2017 Michigan Department of Natural Resources (MDNR) information, the leading causes of wildfires from the previous ten years were:

- Debris burning (32%)
- Miscellaneous (17%)
- Power line (16%)
- Equipment (11%)
- Campfires (9%)
- Arson (6%)
- Lightning (4%)
- Fireworks (2%)
- Structural fires (2%)
- Smoking (1%)

Jackson County Perspective

There were 38 fires affecting 562 acres on MDNR controlled land in the County between 1981 and 2018. This should be taken as a conservative estimate of the expected annual number of wildfires, since information was not available or included regarding fire history on private, non-MDNR, lands. Though the general risk of wildfires is low across Jackson County based on MDNR risk assessment, the Irish Hills (i.e., Columbia and Norvell Townships) is an area of specific concern, due to the exurban development which exists around its many lakes.



Invasive Species | Natural Hazards | Ecological Hazards

Source: Lansing State Journal

Past Gubernatorial Declaration

- Date: *4/30/2004* | incident(s*): Insect Infestation (Emerald Ash Borer)* | area: *Jackson and 10 other counties (and various municipalities)* | declaration: *Emergency*

An invasive species is defined as a species that is non-native (alien) to the ecosystem under consideration and whose introduction causes, or is likely to cause, economic or environmental harm or harm to human health. Invasive species typically fall into two broad categories—terrestrial and aquatic.

Although invasive species primarily cause environmental damage and degradation, there are situations in which serious threats to public health, safety, and well-being can occur due to animal disease or plant and animal infestations. For example, certain diseases could wipe out large segments of an animal population, creating a potentially serious agricultural disaster and a potential public health emergency.

Different patterns of wildlife have already been affected due to the lengthening average growing season in Michigan. Species previously found only in warmer areas to the south have started to appear in Michigan. Although the definition of invasive species specifically refers to human species introduction, to distinguish these patterns from naturally occurring ones, species transported by human action—including boats (see the figure)—are more likely to survive (and thus to become invasive) as climatic changes occur.

Jackson County Perspective

The risk posed by invasive species is countywide, involving all municipalities. The State maintains a current and growing list of potential species and the habitats in which they are found. Continue to monitor resources like Jackson County Parks, MSU (Michigan State University) Extension, and the MDNR (Michigan Department of Natural Resources) to find current information on invasive species lists, management, risks, and precautions.

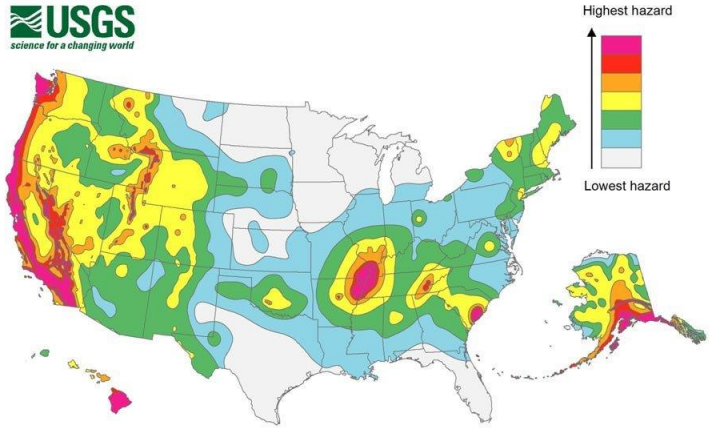
Earthquakes | Natural Hazards | Geologic Hazards

Source: Science | HowStuffWorks

Earthquakes range in intensity from slight tremors to great shocks. Their duration may range from a brief instant to several minutes, or come as a series of tremors over a longer period of days or weeks. Earthquakes usually occur without warning, as scientists cannot yet predict exactly when or where an earthquake will occur. Earthquakes tend to strike repeatedly along faults in the Earth's crust formed where tectonic forces cause the movement of rock bodies against each other. The United States Geologic Survey (USGS) produced a national earthquake risk map showing areas where different levels of earthquake are more likely to occur (see the figure below). The USGS, National Oceanic and Atmospheric Administration (NOAA), and universities throughout the country conduct earthquake monitoring.

Jackson County Perspective

The County is located in an area in which there is a low probability of earthquakes. The New Madrid Seismic Zone near Memphis, Tennessee, and St. Louis, Missouri, poses the most significant threat. According to the previous edition of this plan, if an earthquake were to strike within Jackson County, there would only be a 1-in-50 chance of the resulting horizontal shaking accelerating more than 4-8% in the next 50 years. Fortunately, less than 1.5% of the land in the County is subject to landslides, which further reduces the risk that earthquakes pose in Jackson County.

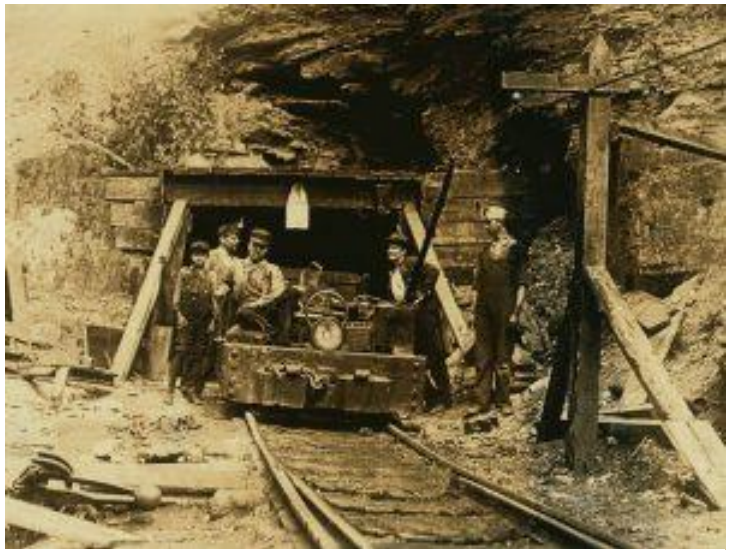


It seems reasonable to estimate that one or two minor ground disturbances will be felt during the next decade countywide, but will not cause any significant damage. There is some chance that a major earthquake may occur out-of-State during this timeframe and may cause some effects for Jackson County, such as energy disruptions or price increases, or the accommodation of refugees (in the case of a major New Madrid fault line event in the areas of Memphis and St. Louis).

The greatest impact on Jackson County would probably come from the damage to natural gas and petroleum pipelines. If an earthquake occurs in the winter, fuel shortages may affect the County and all of its municipalities. Damage would probably be negligible in well-designed and constructed buildings. However, poorly designed and constructed buildings could suffer considerable damage under the right circumstances.

Subsidence | Natural Hazards | Geologic Hazards

Source: Science | NOAA's National Ocean Service



Source: Jackson County District Library, Jackson Coal Mine

Subsidence is the lowering or collapse of the land surface due to a loss of subsurface support caused by natural or human-induced activities. Natural subsidence, such as sinkholes, occurs when the ground collapses into underground cavities produced by the dissolution of limestone or other soluble materials by groundwater. Subsidence poses a greater risk to property than to life. Groundwater withdrawal, drainage of organic soils, and underground mining are the principal causes of human-induced subsidence. In Southern Lower Michigan, the primary causes of subsidence are salt mining, gypsum mining, and coal mining.

Jackson County Perspective

Coal was discovered in Jackson in 1835. Several small underground and surface mines were opened and eventually closed. A subsidence incident occurred in October 1984 when the abandoned Andrews Street Coal Mine in the County partially collapsed, causing a detached garage, driveway and vehicle at a residence to collapse into a shallow sinkhole. A $12,000 emergency reclamation project was instituted in that subsidence incident. Since only one limited-scale event was noted in recent years, the probability of a similar event occurring again is difficult to estimate, but is possible.

Space Weather | Natural Hazards | Geologic Hazards

Source: Tech Explorist

A number of space weather events and celestial impacts may affect the United States. Solar geomagnetic storms can cause widespread failures of important satellite, electronic, communication, navigation, guidance and electric power systems. This hazard is fairly likely in the near term to cause notable disruptive effects, large economic impacts, and even some direct health risks to persons who are flying in aircraft in the far northern or southern areas of the planet (where the exposure to charged particles occurs in greater quantities). Solar flares and storms are important because of their potential impacts and possible disruption of complex modern communication systems (e.g., satellites, television, radio, GPS, power supply networks) and the extensive human and technological infrastructure that relies upon those communication and utility networks.

Space weather impacts can result in transportation delays and communication interference and some cases may result in fatal transportation accidents, large economic losses, and widespread power supply interruptions. Key facilities for electrical infrastructure were affected in the past, but the industry has reported improvements to reduce the chance of a widespread blackout resulting from a major solar storm. The key built infrastructure most at-risk in Michigan appears to be some of its pipelines and power grids.

Jackson County Perspective

An event like this is a rare occurrence in the County or any of its muncipalities. Agencies could consider operating procedures that include back-up systems allowing complex systems (e.g. air traffic control) to continue to function when key technological systems (e.g. GPS, radio communications, satellites) malfunction. Addressing issues associated with pipelines and power grids is also of critical importance. Other mitigation strategies include the use of special procedures, equipment, and redundancies by utility systems (e.g. electrical power and pipeline systems) to minimize the potential for geomagnetic effects to cause inappropriate shutdowns, impaired or lost functionality, and system damage.

Celestial Impacts | Natural Hazards | Geologic Hazards

Source: Science | National Space Society

Among the potential celestial impact hazards are the potential effects of large masses affecting the Earth's atmosphere or surface. Most such forces are extraterrestrial in origin—meteors or meteorites that were originally asteroids or comets from elsewhere in the solar system—but consideration also needs to be given to the crashing of human space vehicles and artificial satellites.

Meteors burn up in the atmosphere, but may cause strong winds and explosive blast forces when striking the Earth's surface. Even when a large meteor does not actually strike our planet's surface, the explosive energies from its impact upon the many layers of atmosphere can create an intense heat and blast area, along with very strong winds, and can release more energy than even the largest nuclear bombs. Meteorites are physical objects that have at least partially survived their plunge through the atmosphere and then strike the Earth's surface. Space vehicles and satellites occasionally fall to Earth, causing a state of heightened alert as information about its decaying orbit is gathered and tracked. Bolide events occur when a large meteor hits the atmosphere with such force that it violently flares up, often with an accompanying sonic boom, and literally appears as a giant fireball, explosion, or bright pulse of light. In Michigan, the most likely impact is upon communication and utility networks and the extensive human and technological infrastructure systems that rely upon them.

Jackson County Perspective

These kind of events are not expected to occur in the County or any of its municipalities within the next several decades. Certain types of costs are likely whenever there is an emergency alert in response to a particular event or threat, but tend to be well within the normal range of activities routinely undertaken by agencies who deal with emergencies.

Structural Fires | Technological Hazards | Industrial Hazards

Source: YouTube

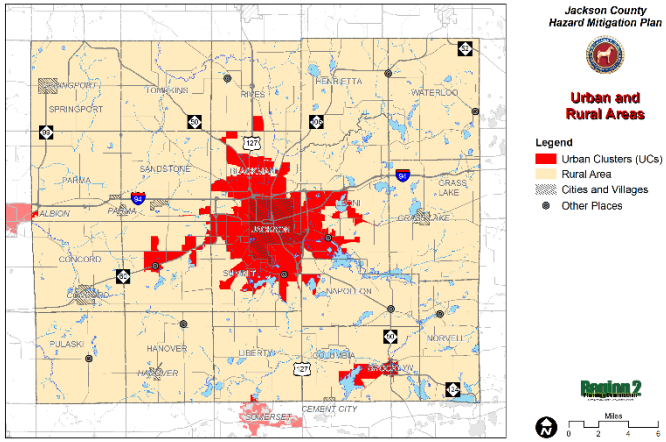
Structural fires are the most common and universal hazard facing any community. They include large fires occurring in buildings or structures that have the potential to affect a community, natural gas explosions in pipelines and wells as well as small residential fires. Each year in the United States, fires result in approximately 5,000 deaths and 25,000 injuries requiring medical treatment.

Unfortunately, death can be an outcome of structural fires, and Michigan's fire death rate in 1996 of 21.2 persons per million people puts it in the upper third of all states in the nation. According to the office of the State Fire Marshal, an average of 254 persons a year died in Michigan fires from 1975 through 2002.

Michigan has not had a catastrophic structural fire disaster in recent years that resulted in a significant loss of human life or significant injury. However, in any given year it is common for several multiple-casualty residential structural fires to occur throughout the State. Despite the best efforts of fire officials in fire safety education and prevention, deadly residential fires continue to occur year after year.

Jackson County Perspective

Hundreds of fires will occur annually in an area the size of Jackson County, but not all of these will be extremely serious events on a community-wide scale. Approximately 775 separate fire events might be estimated (based on the history of past occurrences) to cause an average of $5,725 of damage per event, totaling about $4.4 million in damage per year within Jackson County. For example, arson destroyed a large factory building on March 26, 2001.



Scrap Tire Fires | Technological Hazards | Industrial Hazards

Source: Eco Green Equipment

Management of scrap tires has become a major economic and environmental issue, as Michigan generates 10 million scrap tires annually. 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 due to the sheer number of tires typically present at a site. This large quantity of "fuel," coupled with the fact that the shape of a tire allows air to flow into the interior of a large tire pile, renders standard firefighting practices nearly useless. Flowing burning oil released by the tires spreads the fire to adjacent areas. Some scrap tire fires have burned for months, creating acrid smoke and an oily residue that can leach into the soil, creating long-term environmental problems.

Scrap tire fires differ from conventional fires in several respects:

- even relatively small scrap tire fires can require significant resources to control and extinguish;
- the costs of fire management are often far beyond that which local government can absorb;
- the environmental consequences of a major tire fire are significant; and
- the extreme heat converts a standard passenger vehicle tire into about two gallons of oily residue, which can leach into the soil or drain into streams.

Current technologies are sufficient to address the reuse of newly generated scrap tires, but some waste tires still end up in a scrap tire collection site.

Jackson County Perspective

There were no County-based scrap tire collection sites, haulers, or processors registered with the Michigan Department of Environment, Great Lakes, and Energy (EGLE) in 2020 and there has not been a recorded significant tire fire in Jackson County. There is no real basis for estimating the probability of a tire scrap fire anywhere in the County.

Hazardous Material Incidents | Technological Hazards | Industrial Hazards

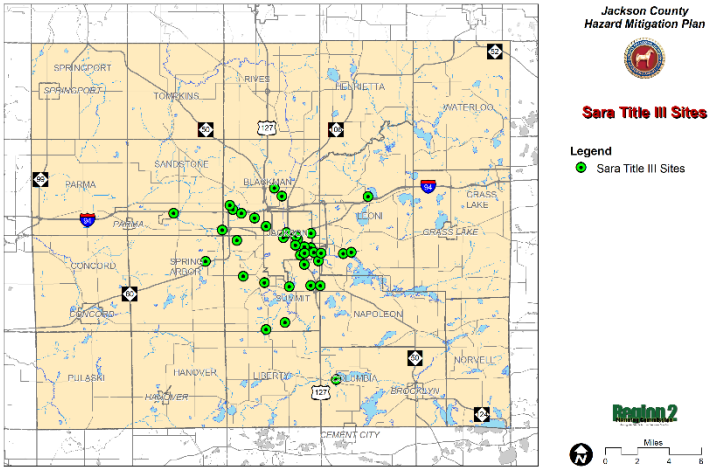
Source: www.hazmatspecialservices.com

A hazardous material is any solid, liquid, or gas that can harm humans and other living organisms due to its being radioactive, flammable, explosive, toxic, or corrosive; a biohazard, oxidizer, or asphyxiant; or capable of causing severe allergic reactions. Mitigating the risks associated with hazardous materials often requires extensive safety precautions during their transport, use, disposal and storage. Modes of transportation for hazardous materials include road, rail, pipeline, air, and water.

Industrial accidents differ from hazardous material incidents in the scope and magnitude of offsite impacts. Hazardous material incidents typically involve an uncontrolled release of material into the surrounding community and environment that may require evacuations or in-place sheltering of the affected population. The impacts of industrial accidents are often confined to the site or facility itself, with minimal physical outside impacts. Industrial accidents such as fires, explosions, and excessive exposure to hazardous materials, may cause injury or loss of life to workers at the facility, and significant property damage. They can also cause severe economic disruption to the facility and surrounding community, as well as significant long-term impacts on the families of the workers injured or killed.

Jackson County Perspective

There are several transport and treatment, storage, and disposal facilities identified by the Michigan Department of Environment, Great Lakes, and Energy (EGLE) in the County. There were also 40 SARA (Superfund Amendments and Reauthorization Act) Title III sites in Jackson County as of 2019 (see the map), which are mosly clustered in the Jackson Urban Area. The Michigan Hazard Analysis recorded no recent industrial accidents of any significance in the County and no reported hazardous materials incidents of any significance since 1976, the first year such records were kept.



Nuclear Power Plant Accidents | Technological Hazards | Industrial Hazards

Source: Business Insider

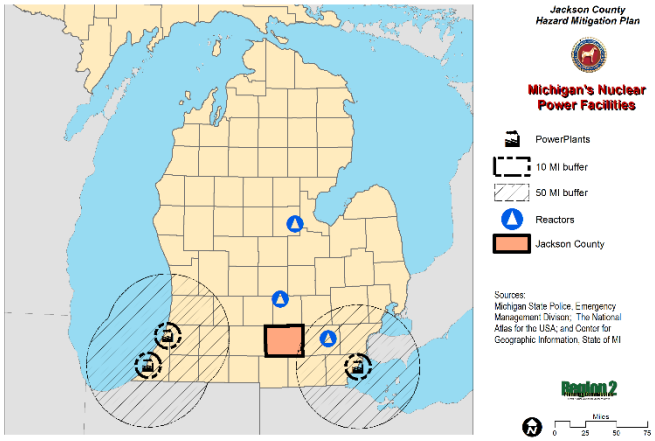
Even though the Nuclear Regulatory Commission (NRC) closely monitors the construction and operation of nuclear power plants, accidents at these plants are a possibility and appropriate on-site and off-site emergency planning is conducted. The following significant worldwide nuclear power plant accidents have occurred (including an accident in Michigan):

- 1986 — Chernobyl, Ukraine
- 1979 — Three Mile Island, Harrisburg, Pennsylvania
- 1966 — Enrico Fermi-1, Monroe County, Michigan

A primary emergency planning zone (EPZ) is established within a 10-mile radius of each nuclear power plant (see the map below). Within this zone, plans are developed to protect the public through in-place sheltering and evacuation in the event of an accident. A secondary emergency management zone is established within a 50-mile radius around most plants, exists for planning considerations that prevent the introduction of radioactive contamination into the food chain.

Jackson County Perspective

There are no nuclear power plants in the County. However, portions of Columbia, Grass Lake, and Norvell Townships are located within the 50-mile EPZ for the Enrico Fermi 2 Nuclear Power Plant near Monroe, Michigan. No such events are anticipated to affect Jackson County, although there is a slight possibility that one could happen.



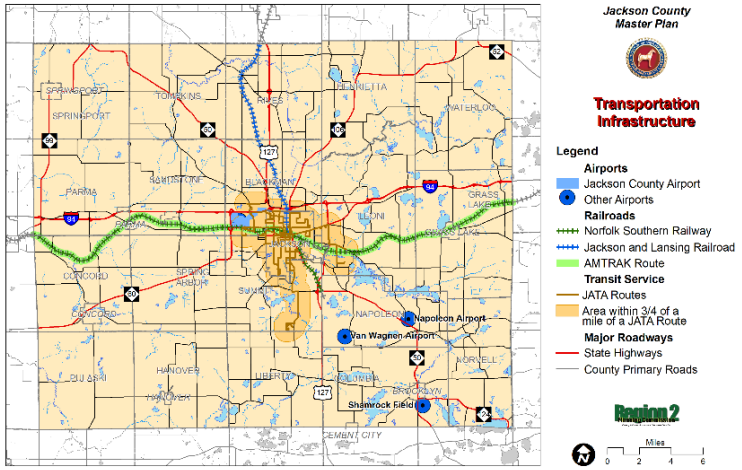
Transportation Hazardous Material Incidents | Technological Hazards | Industrial Hazards

Source: MABAS Division 3

A transportation hazardous material incident is an uncontrolled release of hazardous materials during transport capable of posing a risk to life, health, safety, property or the environment. Several state highways traverse Jackson County (i.e., I-94; BL-94; US-127; M-50; M-52; M-60; M-99; and M-106). Highways —in addition to major local roads and streets— are the most likely thoroughfares utilized for the transport of hazardous materials. Hazardous material transport trips will also occur on minor local roads and streets. Freight railroads are also used for the transport of hazardous materials. Several rail lines located in the County.

Jackson County Perspective

No post-1978 (the first year of records) County hazardous material transportation incidents have been recorded. For planning purposes, it is tentatively estimated that there is about a 20% chance of a major hazardous material incident (either fixed or transportation related) in Jackson County over the next decade. Based on the recent history of past events within the County, the estimated chance of a transportation hazardous materials incident is 8% per year.



Petroleum and Natural Gas Pipeline Accidents | Technological Hazards | Industrial Hazards

Source: Wall Street Journal

Though often overlooked, petroleum and natural gas pipelines pose a real threat in many Michigan communities. Petroleum and natural gas pipelines can leak or fracture and cause property damage, environmental contamination, injuries, and even loss of life. Third party damage caused the vast majority of Michigan pipeline accidents, often due to construction or some other activity that involves trenching or digging operations.

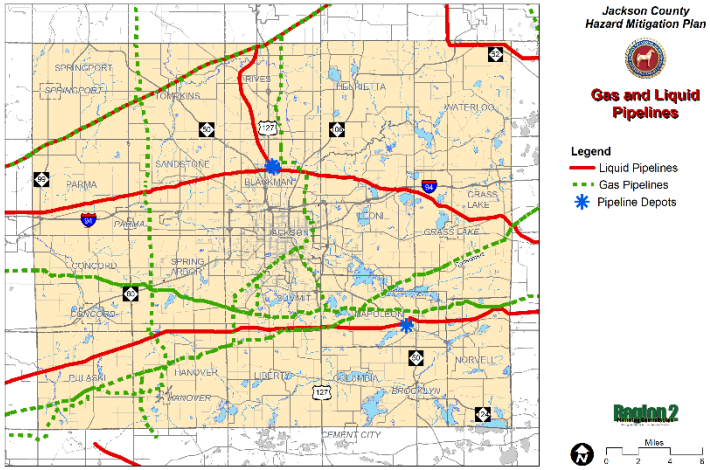
Past Gubernatorial Declaration

- Date: 6/7/2000 | incident(s): *Gasoline Pipeline Rupture* | area: *Blackman Township (Jackson County)* | declaration: *Emergency*

Jackson County Perspective

Pipelines traverse many parts of the County (see the map). A disruption in a strategic pipeline could lead to an energy emergency in the County. The following events have occurred since 1995.

- January 30, 2019. At 10:33am, a fire occurred at an important Consumer's Energy facility in Armada Township (Macomb County), and when the impacts of this fire were calculated to eventually lead toward natural gas shortages, the head of that major utility, followed by the Governor, appealed to residential and industrial customers to voluntarily reduce the use of natural gas. By reducing thermostat levels to the recommended 65 degrees or below, until the end of the day on January 31, and temporarily scaling back production activities at certain facilities, this collective effort succeeded in preventing the complete interruption of gas delivery that otherwise was expected to occur. The problem did not involve a supply of natural gas, but the ability to deliver that gas throughout the State's network. Temporary power failures occurred in some locations, affecting thousands of residents and businesses, but did not last long.
- June 7, 2000. A section of pipeline ruptured in Blackman Township releasing 75,000 gallons of gasoline into the environment and forcing the evacuation of more than 500 homes in one square mile area around the spill. Wolverine Pipeline Company expended $10 million in response to the rupture.
- February 1996. A house exploded in Napoleon, resulting in 2 fatalities. The cause of the explosion was a natural gas build-up.



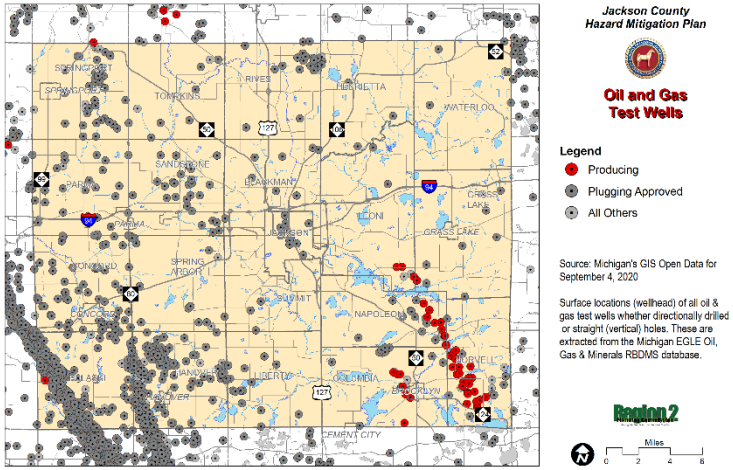
Oil and Natural Gas Well Accidents | Technological Hazards | Industrial Hazards

Source: Wall Street Journal

Over the years, Michigan has experienced periodic upward and downward trends in oil and natural gas production as new reservoirs were discovered and older ones became depleted. There are 56,525 oil and gas wells scattered across the 63 counties in the Lower Peninsula. Michigan reaps tremendous economic and social benefits from oil and natural gas production. As with all industrial and commercial activities, along with those benefits come some risks as well. Despite the best efforts of the State's Office of Geological Survey and the drilling companies to minimize oil and natural gas well accidents, it is inevitable that such accidents will occur from time to time. When they do, the affected local communities must be prepared to respond to the accident, institute necessary protective actions, and coordinate with State officials and the drillers.

Jackson County Perspective

There are 40 producing oil and gas wells as of 2012 in the County (mostly clustered in the southeast quadrant), although many more were drilled (see the map). It is difficult to ascertain how many oil and gas incidents have actually occurred in Jackson County. Although many wells are present in the County, not all are currently active, and the probability of any producing a major effect is quite low.



Infrastructure Failures | Technological Hazards | Infrastructure Hazards

Source: PACE

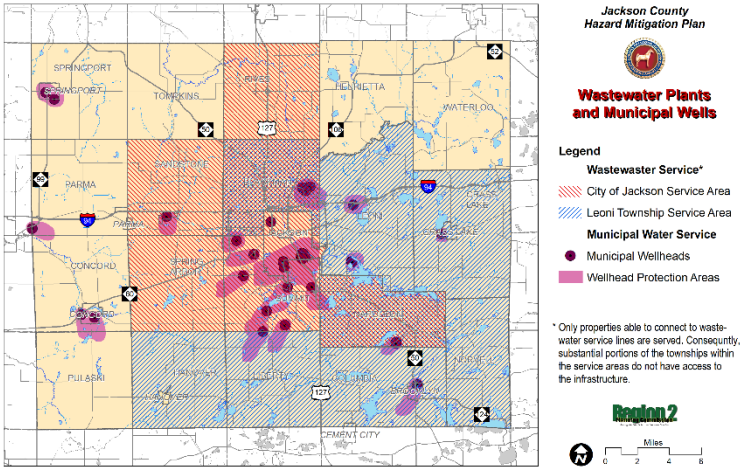
Michigan's citizens are dependent on public and private utility infrastructure to provide essential life supporting services such as electric power, heating and air conditioning, water, sewage disposal and treatment, storm drainage, communications, and transportation. When one or more of these independent yet interrelated systems fail due to disaster or other cause—even for a short period of time—it can have devastating consequences. A study completed by the American Society of Civil Engineers in 2009 found the top three infrastructure concerns for Michiganders was:

- roads,
- wastewater Infrastructure, and
- bridges

Cell tower reliability is also important in Jackson County. Many people rely on cell phones rather than landline phones for communication, including during an emergency.

Jackson County Perspective

To date, the County has been spared the difficulties related to disastrous infrastructure failures. Such failures are possible, however (e.g., the water treatment disaster in Flint). There are 2 wastewater treatment systems in Jackson County and wellhead protection areas are established for municipal wells (see the map). Surface pavement condition information for federally-funded and non-federally funded road is collected annually through the State funded Pavement Surface Evaluation Program (PASER). This information can be used in the decision making process about road improvement projects. The City of Jackson, the various villages, and the County maintain the database on the roads within their boundaries. To date, disastrous infrastructure failures in Jackson County are likely similar in frequency to a significantly damaging earthquake, subsidence, or dam failure events.



Energy Emergencies | Technological Hazards | Infrastructure Hazards

Source: ValleyCentral.com

An adequate energy supply is critical to Jackson County's economic and social well-being. The economy and lifestyles are dependent on a non-interrupted, reliable, and relatively inexpensive supply of energy that includes gasoline to fuel our vehicles and electricity, natural gas, fuel oil, and propane to operate our homes, businesses and public buildings (see the table). Major events like the 1973/74 Oil Embargo, the 1991 Gulf War, the aftermath of the September 11, 2001 terrorist attacks, and the COVID-19 pandemic have highlighted our continued vulnerability.

There are three types of energy emergencies:

- the physical destruction to energy production or distribution facilities caused by severe storms, tornadoes, floods, earthquakes, or sabotage;
- a sharp sudden escalation in energy prices, usually resulting from a curtailment of oil supplies; and
- a sudden surge in energy demand caused by a national security emergency involving mobilization of U.S. defense forces.

Jackson County Perspective

The County—and its municipalities—has experienced numerous and severe electrical power outages. Some of these are related to weather events while others are due to infrastructure failures. The event below highlights how local energy emergencies effect Jackson.

- June 2000. Jackson County: Petroleum Product Pipeline Rupture. On the morning of June 7, 2000 a Wolverine Pipeline Company pipeline ruptured in Jackson County's Blackman Township, releasing 75,000 gallons of gasoline into the environment and forcing the evacuation of more than 500 homes in a one square mile area around the spill. The leak was detected when a drop in pressure was recorded at a metering station along the 80-mile pipeline that runs through Blackman Township from Joliet, Illinois to Detroit. In addition to causing significant environmental and public safety problems, the spill shut down 30% of the State's gasoline transportation capability for 9 days. The ruptured pipeline was capable of carrying approximately seven million gallons of gasoline per day. (This is equivalent to having 467 tanker trucks with a capacity of 9,000 gallons each making daily round trips from Jackson to Detroit.) While the pipeline was being repaired, tanker trucks from several surrounding states were

Annual Energy Consumption in Michigan

Type	Amount
Electricity	104.8 trillion watt hours – 3% of U.S. total
Coal	30,700 thousand short tons – 3% of U.S. total
Natural Gas	762 billion cubic feet – 3% of U.S. total
Motor Gasoline	99,800 thousand barrels – 3% of U.S. total
Distillate Fuel	26,300 thousand barrels – 2% of U.S. total

U.S. Department of Energy

brought in to help make up for the loss of the pipeline. As truck deliveries could not fully replace the pipeline transportation capacity, drivers began falling behind on deliveries and a growing number of gas stations were without one or more grades of gasoline for periods of time. The pipeline was not returned to service until June 17, and then at only 80% of capacity. The pipeline rupture caused short-term supply problems in Southeast Michigan and, along with other factors, contributed to an increase in gasoline prices from an average of $1.68 per gallon, when the pipeline broke, to over $2.00 per gallon in the ensuing weeks of June. One of the major contributing factors to the shortages and price increases was that Michigan had very low gasoline inventories going into that summer. In some areas of the Midwest, inventories were 13.5% below average in May 2000—their lowest levels since 1981. The closing of the Total Refinery in Alma in December 1999 also contributed to the supply problem. The Alma refinery's capacity of just under one million gallons per day had satisfied approximately 8% of Michigan's average daily gasoline demand. The closing of the refinery increased Michigan's reliance on the Chicago area gasoline markets, thereby increasing the dependence on the Wolverine pipeline. A final contributing factor was a reduction in transportation capacity caused when one of the two barges supplying petroleum products to marine terminals in Traverse City, Cheboygan, and Bay City was in dry dock for repairs. Supply problems in northern Michigan and Bay City were eased once the barge returned to service in early June 2000. All of these factors combined to make gasoline supplies very tight even before the Wolverine pipeline ruptured

This is a common event although the severity of each event may vary. Multiple energy emergencies of one type or another are therefore expected to occur each year. (Also see the significant infrastructure failure hazard, which overlaps in classification.)

Transportation Accidents | Technological Hazards | Infrastructure Hazards

Source: CNN.com

A passenger transportation accident is defined as a crash or accident involving an air, land, or water-based commercial passenger carrier. While the safety record of passenger commercial transportation is very good for aircraft, buses, and trains, crashes will occur. There is a potential for harm or fatalities.

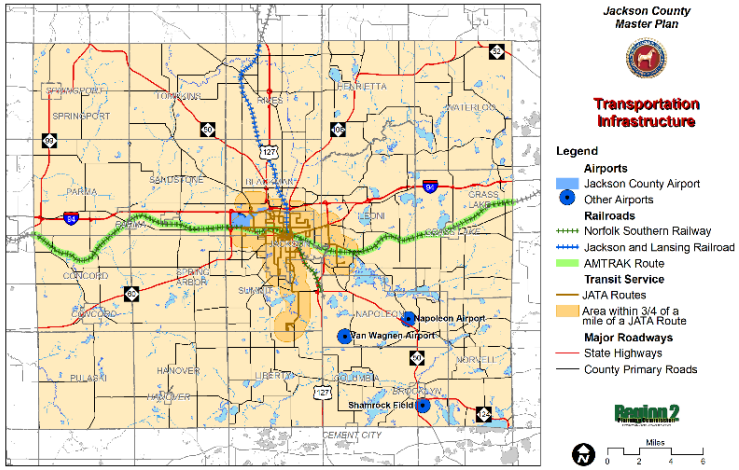
When responding to any of these types of commercial transportation accidents, emergency personnel may be confronted with a number of problems, including:

- suppressing fires;
- rescuing and providing emergency first aid for survivors;
- establishing mortuary facilities for victims;
- detecting the presence of explosive or radioactive materials; and
- providing crash site security, crowd and traffic control, and protection of evidence.

Airplane crashes and train derailments pose the largest problems potential to cause mass casualties and significant local property destruction. On a smaller scale, but still potentially devastating to smaller or rural areas like in Jackson, would be major highway accidents involving passenger buses that result in heavy casualties, with the potential to overwhelm smaller emergency medical systems in those areas.

Jackson County Perspective

There are a number of significant transportation facilities within the County. Interstate-94 (I-94) and US-127 traverse Jackson County. There are several airports, including the Jackson County Airport-Reynolds Field located south of I-94 in Blackman Township (see the map). Brooklyn Shamrock Field is located south of M-124, southeast of the Village of Brooklyn. Napoleon Airport and Van Wagnen Airport are located in Napoleon Township. The County is served by transit agencies like the Jackson Area Transportation Authority and Greyhound. AMTRAK (passenger) and other rail services (freight) also run through and serve the County. Jackson County has had no serious crashes involving commercial carriers.



Catastrophic Incidents | Human-Related Hazards

Source: World Economic Impact

A catastrophic incident—a large-scale event that has severe effects upon large numbers of persons, across a wide area, and immediately overwhelms State, tribal, and local response capabilities—is now one of the many hazards with the potential to have a direct impact within Michigan. Such incidents are likely to require coordination activities from many states. Since 2000, disastrous events affecting the nation caused various states, including Michigan, to undertake significant actions to respond to assist or help accommodate the impact of events that took place outside of their borders.

The COVID-19 pandemic (occurring during the writing of this plan) is an example of a catastrophic incident comprising a public health crisis that also affects the worldwide economy, including Michigan. As more people get sick and overwhelm the health care system, the economy also suffers due to decreases in employment and spending. Authorities also asked people to change their behaviors—wearing masks outside of the home, staying at least 6 feet apart, and vigilant hand washing—which impacts how they interact with each other in local communities.

Jackson County Perspective

The County—and its municipalities—has experienced these events, including the aftermath of the September 11, 2001, terrorist attacks and the Great Blackout of 2003. Jackson County also experienced the COVID-19 pandemic during the writing of this Plan. Like other communities around the world, Jackson County continues to try to manage the fluid situation caused by this worldwide catastrophic incident and will likely continue to do so long after this Plan is adopted. The County will continue to work with the State in trying to keep its residents safe while allowing the local economy to continue. Jackson County will also continue to seek guidance and resources from the State and Federal governments in pursuing the defeat of the novel virus and the economic downturn.

Past Presidential Declaration

- Date: *9/07/2005* | incident(s): *Hurricane Evacuation* | area: *Jackson and all 82 other counties* | declaration: *Emergency**

Past Gubernatorial Declaration

- Date: *9/4/2005* | incident(s): *Hurricane Evacuation* | area: *Jackson and all other 82 counties* | declaration: *Disaster**

* Also a Gubernatorial/Presidential Declaration

Civil Disturbances | Human-Related Hazards

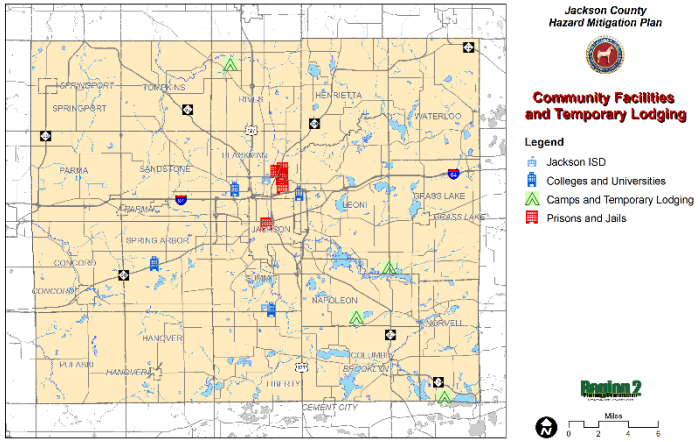
Source: Center for Disaster Philanthropy

Civil disturbances can be classified as single events. However, they can also be understood as a series of related events, and should be considered that way, especially as it relates to effecting a larger community and planning or preparing for an emergency response. Single event civil disturbances include the following:

- Acts or demonstrations of protest. Protests usually contain some level of formal organization or shared discontent that allows collective pursuance of goal-oriented activities like political protests and labor disputes. Many protest actions and demonstrations are orderly, lawful, and peaceful, but some may become threatening, disruptive, and even deliberately destructive or malicious. Events should only be classified as civil disturbance when they take a turn for the worse.
- Hooliganism. Hooliganism is relatively unorganized and involves individual or collective acts of deviance inspired by the presence of crowds. Examples include the disorder that has followed various sporting events and college parties. Common problems include the widespread destruction of property, numerous types of assault and disorderly conduct, and criminal victimization.
- Riots. Riots may stem from motivations of protest, but lacks the organization that formal protests include. Riots tend to involve violent gatherings of persons whose level of shared values and goals is not sufficiently similar to allow their collective concerns or efforts to coalesce in a relatively organized manner. There tends to be a diffused sense of shared discontent, but relatively few norms to shape these strivings into clearly coherent action.
- Insurrection. Insurrection involves a deliberate collective effort to disrupt or replace the established authority of a government or its representatives by persons within a society or under its authority. A few prison uprisings may fall into this category, but most are classified as riots or protests, depending upon the presence/extent of specific goals and organization, and the type of action used to achieving them.

Jackson County Perspective

Though there has been a history of State and national civil disturbances happening in Jackson, there have been just a few events to note centered in Downtown Jackson and the prison complex in Blackman Township.



Correctional Facilities in Jackson County

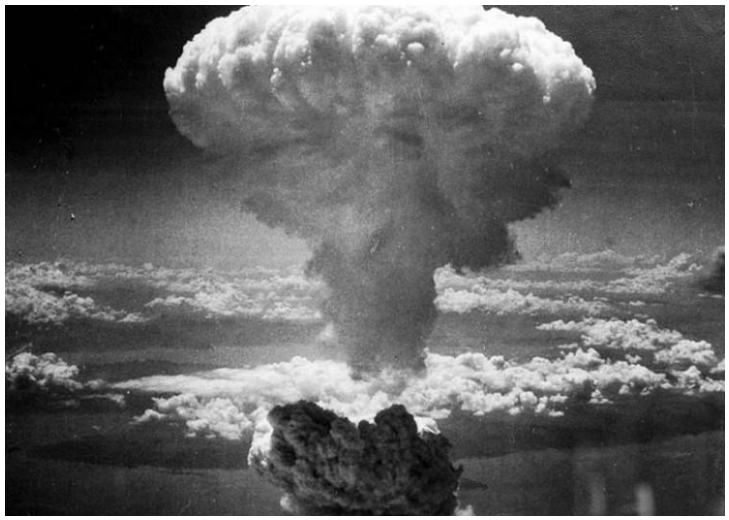
Name	Location
Charles Egeler Correctional Facility - MDOC	Blackman Township
Cooper Street Correctional Facility - MDOC	Blackman Township
G. Robert Cotton Correct. Facility - MDOC	Blackman Township
Parnall Correctional Facility - MDOT	Blackman Township
Wesley Street Jail - Jackson County	City of Jackson
Chanter Road Jail – Jackson County	Blackman Township

Source: Region 2 Planning Commission

- May 2020 and onward – Protest - George Floyd Demonstrations. Numerous protests occurred nationally after a pattern of widely publicized occurrences involving methods that some police had used when involved with members of visible minority groups. The key national event involved the video-recorded detainment of an African-American man, George Floyd, in Minneapolis, Minnesota, which caused the man's death on May 25, 2020. This was just one in a long series of incidents in which video documented questionable police activities and grew into a national movement toward greater civilian protections and police reform. Michigan's protests were more peaceful and well-organized than many other states saw, yet some criminal activities did occur along with occasional violence and substantial destruction of property. In Jackson there were peaceful protests that took place around the community.
- 1964 -1972 – Protests - Jackson, Anti-War Demonstrations
- 1952 - Insurrection – Jackson County Prison Uprising. Although violence is a fact of life in Michigan's prisons, large-scale, deadly prison uprisings are relatively rare. However, there have been two such incidents in the Michigan prison system over the past 68 years that have caused significant injury, loss of life, property destruction, and response support from other State agencies and the involved local government (see the map and table). The first of those incidents occurred from April 20-24, 1952, at the Southern Michigan Prison in Jackson. That five-day siege resulted in the death of one inmate and serious injury to nine others. More than a dozen guards were held hostage throughout the uprising. Eventually, all were released, though several had been beaten or were otherwise wounded. Officials estimated that approximately one-half of the prison's 6,500 inmates had participated in some way in the rioting. Numerous prison buildings were severely damaged or burned to the ground. When the dust settled, the official damage estimate was put at $2.5 million. Sometime after that, a new Department of Corrections riot squad was formed to handle any such incidents in the future. It is interesting to note that this incident at Southern Michigan Prison was the worst in a string of 30 major prison riots that occurred across the country in 1952 and 1953.
- 1981 – Insurrection – Jackson, Marquette, and Ionia Prison Uprising. The second major prison uprising in Michigan occurred over the Memorial Day weekend in

1981 at the State Prison of Southern Michigan in Jackson, Marquette Branch Prison in Marquette, and the Michigan Reformatory in Ionia. The uprisings, which occurred on May 22 at Jackson and Ionia, and again on May 26 at Jackson and Marquette, were thought to be related. Although all three facilities were damaged, the State Prison of Southern Michigan incurred the worst damage. The disturbances began when officials from the Michigan Corrections Organization at the State Prison of Southern Michigan attempted to take administrative control of the prison and lock down prisoners over the Memorial Day weekend. Rioting broke out at the facility, which then spread to the Michigan Reformatory in Ionia later in the day. The situation temporarily settled over the weekend, but rioting began again on May 26 at the State Prison of Southern Michigan, which then spread to Marquette Branch Prison. Both disturbances were quelled later in the evening, but only after major physical damage had been inflicted on the facilities. The final damage figures for the two days of rioting were significant. The May 22 disturbances at the State Prison of Southern Michigan and the Michigan Reformatory resulted in 67 inmates and 27 staff members being injured, many requiring hospitalization. The May 26 disturbances saw an additional 44 staff members injured, along with 42 inmates. Fortunately, no lives were lost in either disturbance. The physical damage to the three facilities totaled $5 million, with another $4.1 million in riot-related costs incurred. Damages at the State Prison of Southern Michigan included fire and smoke damage to eight cell blocks, destruction of eight modular units, and damage to the academic vocational building, the inmate store, and the food service facility. The master key system also had to be replaced. At the Michigan Reformatory, two cell blocks were damaged, in addition to the prison chapel, the food service building, and the school. The master key system also had to be replaced at this facility as well. It took many months for the damage at the three facilities to be totally repaired and services brought back to normal. In the end, legal and disciplinary actions were taken against 19 corrections personnel and numerous inmates for their roles in the two disturbances.

Nuclear Attack | Human-Related Hazards



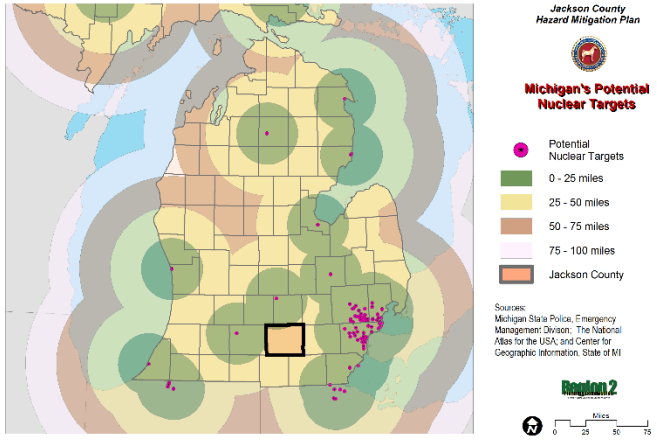
Source: Interesting Engineering

World events in recent years have greatly changed the nature of the nuclear attack threat against the United States. However, while the threat of attack is 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. Based upon the Nuclear Attack Planning Base 1990 (NAPB-90), the Federal Emergency Management Agency categorizes seven potential types of nuclear targets:

- commercial power plants
- chemical facilities
- counterforce military installations
- other military bases
- military support industries
- refineries
- political targets

Jackson County Perspective

There is no reason to suspect that the County or any of its municipalities would be specifically targeted for nuclear attack in the current geopolitical environment. However, potential targets are located in nearby counties (see the map).



Public Health Emergencies | Human-Related Hazards

Source: KESQ

Public health emergencies can take many forms including the following possibilities:

- disease epidemics and pandemics,
- large-scale incidents of food or water contamination,
- extended periods without adequate water and sewer services,
- harmful exposure to chemical, radiological or biological agents, and
- large-scale infestations of disease-carrying insects or rodents.

Public health emergencies can occur as primary events by themselves, or they may be secondary events to another disaster. They also have the potential to adversely impact a large number of people. The world is in the midst of the COVID-19 pandemic at the writing of this plan.

Jackson County Perspective

There are at least 4 Statewide emergencies that affected residents of Jackson County and its municipalities:

- COVID-19. On March 10, 2020 the Michigan Department of Health & Human Services identified the first two positive cases of COVID-19 in Michigan and a State of Emergency was declared. More cases were subsequently identified. The pandemic has largely disrupted the daily lives of Jackson County residents.
- H1N1. In the spring of 2009, a novel influenza A (H1N1) virus emerged and spread quickly across the United States and the world. This new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. This virus was designated as influenza A (H1N1)pdm09 virus. Work continues to better understand influenza, prevent disease, and prepare for the next pandemic.
- Foodborne Contamination (Hepatitis A). Almost 300 cases of Hepatitis A in at least 4 school districts in the Spring of 1997 were caused by frozen strawberries.
- Chemical Contamination (Polybrominated Biphenyl). Thousands of cattle and other animals died in 1973 from poisoning after a chemical company accidentally sent bags of a fire retardant in conjunction with a shipment of a livestock feed supplement.

- Communicable Disease Epidemic (Influenza Pandemic). "Influenza is an example of a potential public health emergency of [a] very large proportion." Flu pandemics caused widespread deaths nationally in 1957-1958 and 1968-1969. People suffer from the flu in the County every year.

Terrorism | Human-Related Hazards

Source: time.com

Terrorism is the use of violence to achieve political goals by creating fear. The political motives of terrorism distinguish it from ordinary crime. The United States is threatened not only by international terrorists, but also by homegrown domestic terrorist groups. Terrorists, including bombings, shootings, arson, and hijacking, can use a wide range of techniques. The goal of terrorists is to frighten as many people as possible, not necessarily to cause the greatest damage possible. Media coverage allows terrorists to affect a much larger population than those who are directly attacked.

Emergency management should prepare for crimes that impact large portions of the population. Such attacks may require resources not available to local law enforcement agencies. Crimes of this sort include mass shootings, random sniper attacks, sabotage of infrastructure, and cyber-attacks. There are five major categories of terrorist:

- Nationalists fight on behalf of a subset of a national population that wish to have an independent government.
- Religious extremist terrorists are violent adherents of a specific religion.
- Left wing terrorists tend to target the government, powerful institutions, and symbols of authority. Examples include socialist and communist terrorists and the Weathermen.
- Right wing terrorists tend to fight for "traditional values." Right wing groups tend to target members of hated ethnic or religious minorities, or government employees. They are associated with anti-immigration, white supremacy, anti-government, and Christian Identity movements.
- Single-issue terrorists commit to an all-encompassing belief system and are intensely concerned with one particular cause (e.g., anti-abortion, pro animal-rights).

Cyberattacks are also on the rise, especially against governmental entities. While cyberattacks have been present for a number of years, ransomware attacks have moved beyond some of the "cyber graffiti/vandalism" it started out as, it has now reached a point where government, hospitals, and even law enforcement systems are under attack for bitcoin ransom. This can mean many things as it impacts continuity of services, but will potentially get worse as more employees "work from home" and are outside of their normal networks.

Jackson County Perspective

The County has not been subject to any local events of terrorism. However, a cyber-attack could affect local governments, health care systems, and/or law enforcement at any time. Predicting when an event may occur is difficult, as there is rarely any notice prior to an event happening.

Past Presidential and Gubernatorial Disaster Declarations

Jackson County was included in the following disasters declared by Michigan's Governor and/or the U.S. President, listed by hazard type:

Gubernatorial Declarations| 1977-2020

Ice Storms/Sleet Storms

- Date: *1/15/1985* | incident(s): *Ice Storm* | area: *Jackson and 12 other counties* | declaration: *Disaster (Emergency)*

Snowstorms

- Date: *1/26/78* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and all other 82 counties* | declaration: *Disaster**

Severe Wind Events

- Date: *7/21/80* | incident(s): *Thunderstorms and Severe Winds* | area: *Jackson and other 8 other counties (and various municipalities)* | declaration: *Disaster*

Extreme Temperatures

- Date: *1/29/2019* | incident(s): *Extreme Cold* | area: *Jackson and all other 82 counties* | declaration: *Emergency*

Flooding

- Date: *6/3/2004* | incident(s): *Thunderstorms and Flooding* | area: *Jackson and 22 other counties* | declaration: *Disaster**

Invasive Species

- Date: *4/30/2004* | incident(s*): Insect Infestation (Emerald Ash Borer)* | area: *Jackson and 10 other counties (and various municipalities)* | declaration: *Emergency*

Petroleum and Natural Gas Pipeline Accidents

- Date: 6/7/2000 | incident(s): *Gasoline Pipeline Rupture* | area: *Blackman Township (Jackson County)* | declaration: *Emergency*

Catastrophic Incident

- Date: *9/4/2005* | incident(s): *Hurricane Evacuation* | area: *Jackson and all other 82 counties* | declaration: *Disaster**

Public Health

- Date: *3/10/2020* | incident(s): *Pandemic (COVID-19)* | area: *Jackson and all other 82 counties* | declaration: *Emergency**

*Also a Presidential Declaration

Presidential Declarations | 1953-2020

Ice Storms/Sleet Storms

- Date: *3/20-27/1976* | incident(s): *Ice storm and Tornadoes* | area: *Jackson and 28 other counties* | declaration: *Major Disaster*
- Date: *4/5/1972* | incident(s): *Snowstorm and Freezing Rain* | area: *Jackson and 8 other counties* | declaration: *Major Disaster*

Snowstorms

- Date: *12/11-31/2000* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and 38 other counties* | declaration: *Emergency*
- Date: *1/2-15/1999* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and 30 other counties* | declaration: *Emergency*
- Date: *1/26-27/1978* | incident(s): *Blizzard and Snowstorm* | area: *Jackson and all 82 other counties* | declaration: *Emergency**
- Date: *4/5/1972* | incident(s): *Snowstorm and Freezing Rain* | area: *Jackson and 8 other counties* | declaration: *Major Disaster*

Tornadoes

- Date: *3/20-27/1976* | incident(s): *Ice storm and Tornadoes* | area: *Jackson and 28 other counties* | declaration: *Major Disaster*

Flooding

- Date: *5/20/2004-6/8/2004* | incident(s): *Thunderstorms and Flooding* | area: Jackson and 22 other counties | declaration: *Major Disaster**

Catastrophic Incident

- Date: *9/07/2005* | incident(s): *Hurricane Evacuation* | area: *Jackson and all 82 other counties* | declaration: *Emergency**

Public Health

- Date: *3/13/2020* | incident(s): *Pandemic (COVID-19)* | area: *Jackson and all other 82 counties* | declaration: *Emergency**

*Also a Gubernatorial Declaration

Jackson County Hazard Mitigation Plan
2021 Edition Plan Element

Denton Road Bridge | Sparks Foundation County Park

Hazard Analysis

October 2020 Workshops

The hazard mitigation planning process incorporated a public involvement opportunity in the form of a series of workshops aimed at identifying the top hazards likely to impact Jackson County. The workshops took place remotely in late October of 2020 via Zoom due to the COVID-19 pandemic. Staff sent a two-page flyer (see opposite) to stakeholder organizations via email with a request that they distribute it to their members/staff. Staff also publicized the opportunities on the Jackson County Hazard Mitigation Planning webpage on the Region 2 website. Twenty-five people participated in the workshops.


Jackson County Hazard Mitigation Plan
Revised
Stakeholder Workshop

Help to inform Jackson County regarding the hazards of greatest local concern to you. The Novel Coronavirus (COVID-19) is a worldwide catastrophic incident. Hazardous material threats, powerful electrical storms, tornadoes, and a broken gas pipeline occurred locally. These disasters are costly, disruptive, and threaten human life as well as local infrastructure and the economy. The *Jackson County Hazard Mitigation Plan* anticipates a wide variety of hazards and identifies actions to minimize their effect when they occur.

Jackson County is currently updating the plan and seeks your input by participating in a workshop that will assess the risk posed by the hazards known to strike Jackson County and its vulnerability to those hazards by ranking them. There a several opportunities to participate in the first workshop series (see below).

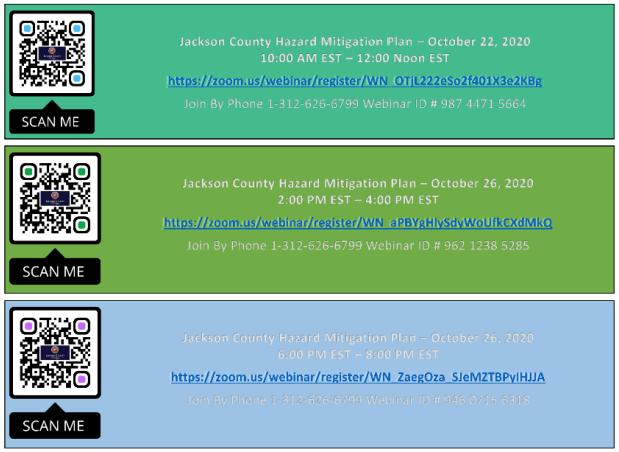
More information is available on the Jackson County Hazard Mitigation Planning webpage on www.region2planning.com. Contact Grant Bauman, project manager, with any questions at (517) 768-6711 or gbauman@mijackson.org.

October 22
Thursday
10:00 AM-12:00 Noon

October 26
Monday
2:00 - 4:00 PM

October 27
Tuesday
6:00 – 8:00 PM

Please see the other side for registration and attendance information!


SCAN ME

Jackson County Hazard Mitigation Plan – October 22, 2020
10:00 AM EST – 12:00 Noon EST
https://zoom.us/webinar/register/WN_OTjL222eSo2f401X3e2KBg
Join By Phone 1-312-626-6799 Webinar ID # 987 4471 5664

SCAN ME

Jackson County Hazard Mitigation Plan – October 26, 2020
2:00 PM EST – 4:00 PM EST
https://zoom.us/webinar/register/WN_aPBYgHlySdyWoUfkCXdMkQ
Join By Phone 1-312-626-6799 Webinar ID # 962 1238 5285

SCAN ME

Jackson County Hazard Mitigation Plan – October 26, 2020
6:00 PM EST – 8:00 PM EST
https://zoom.us/webinar/register/WN_ZaegOza_SJeMZTBPylHJJA
Join By Phone 1-312-626-6799 Webinar ID # 946 0715 6618

Workshop Agenda

Each workshop followed a set agenda:

- **Orientation.** Staff and participants introduced themselves and staff provided a brief synopsis of the hazard mitigation planning process.
- **Inventory and Analysis.** Staff made presentations regarding the community profile and potential hazards elements prepared for the hazard mitigation plan. Participants were then invited them to take part in a survey (via Survey Monkey) ranking each hazards based upon likelihood, intensity, and impact.

Community Profile

Staff provided a broad overview of the countywide community:

- **Jackson County Organization.** Municipalities/places and urban/rural areas.
- **Population Characteristics.** Population density, elderly population, disabled population, limited English, median household income, poverty, social vulnerability, and seasonal housing.
- **Community Infrastructure.** Schools, community facilities and temporary lodging, law enforcement agencies, fire stations, emergency siren coverage, transportation, pipelines, and land use/cover.

Please see the Community Profile element of this plan for details.

Potential Hazards

Staff then summarized each of the 32 hazards known to affect Jackson County:

- **Weather.** Hail, lightning, ice storms and sleet storms, snowstorms, severe wide events, tornadoes, extreme temperatures, and fog.
- **Hydrological.** Flooding, dam failures, and drought.
- **Ecological.** Wildfires and invasive species.

- **Geologic.** Earthquakes, subsidence, space weather, and celestial impacts.
- **Industrial.** Structural fires, scrap tire fires, hazardous material incidents, nuclear power plants, transportation hazardous materials incidents, petroleum and natural gas pipeline accidents, and oil and natural gas well accidents.
- **Infrastructure.** Infrastructure failures, energy emergencies, and transportation accidents.
- **Human-Related.** Catastrophic incidents, civil disturbances, nuclear attack, public health emergencies, and terrorism.

Please see the Potential Hazards element of this plan for details.

Priority, Risk and Vulnerability Assessment

At the conclusion of each workshop, participants were encouraged to complete a survey ranking the risk that each of the 32 hazards poses to Jackson County in terms of likelihood, intensity, and impact. Staff provided each participant a link to the questionnaire, hosted on Survey Monkey®, along with the request. Eleven participants completed the survey.

Criteria

The questionnaire asked respondents to rank each hazard type from 1 to 10—with 1 indicating the least risk and 10 indicating the greatest risk— for each of the following criteria (and staff applied the following weighting to each of the criteria in order to obtain a more nuanced ranking):

- Likelihood of Occurrence (35%)
- Percent of Population Affected (15%)
- Potential for Causing Casualties (15%)
- Potential for Neg. Econ. Impact (15%)
- Public Awareness of Hazard (5%)
- Corollary Effects (15%)

The sum of the average of each criteria determined the following weighted ranking:

1. Public Health Emergencies (8.5)
2. Snowstorms (6.8)
3. Ice Storms and Sleet Storms (6.5)
4. Energy Emergencies (6.3)
5. Infrastructure Failures (6.1)
   Terrorism (6.1)
   Transportation Accidents (6.1)
8. Catastrophic Incidents (5.9)
9. Petroleum and Natural Gas Pipeline Accidents (5.8)
10. Severe Wind Events (5.7)
11. Nuclear Attack (5.6)
    Extreme Temperatures (5.6)
13. Lightning (5.4)
    Civil Disturbances (5.4)
15. Transp. Haz. Material Incidents (5.3)
    Tornadoes (5.3)
17. Structural Fires (5.2)
    Hazardous Material Incidents (5.2)
19. Flooding (4.9)
20. Oil and Natural Gas Well Accidents (4.8)
21. Fog (4.6)
22. Hail (4.5)
    Invasive Species (4.5)
24. Drought (4.4)
25. Nuclear Power Plant Accidents (4.3)
26. Celestial Impacts (3.9)
    Space Weather (3.9)
28. Dam Failures (3.6)
29. Wildfires (3.4)
    Earthquakes (3.4)
31. Subsidence (3.0)
32. Scrap Tire Fires (2.2)

December Advisory Committee Meeting

The December 1, 2020, meeting of the Advisory Committee took place remotely via Zoom due to the COVID-19 pandemic. Staff publicized the meeting via email, directing members to review the Community Characteristics and Potential Hazards plan elements (see the summary provided for the work-shops). Members were made aware of the of the gubernatorial and presidential disaster declarations in which Jackson County was included (i.e., ice

storms and sleet storms, snowstorms, severe wind events, extreme temperatures, flooding, invasive species, a petroleum and natural gas pipeline accident, and a catastrophic incident) as well as the workshop survey results. Members were then invited to take part in the survey. The results of the seven members who participated in the survey (some members already completed the survey during the workshops) are:

1. Public Health Emergencies (8.4)
2. Snowstorms (6.8)
3. Ice Storms and Sleet Storms (6.5)
4. Energy Emergencies (6.3)
5. Infrastructure Failures (6.1)
   Transportation Accidents (6.1)
7. Terrorism (5.9)
8. Petroleum and Natural Gas Pipeline Accidents (5.8)
9. Catastrophic Incidents (5.7)
10. Severe Wind Events (5.6)
11. Extreme Temperatures (5.5)
    Civil Disturbances (5.5)
    Transportation Hazardous Material Incidents (5.5)
14. Lightning (5.4)
15. Nuclear Attack (5.2)
    Structural Fires (5.2)
    Hazardous Material Incidents (5.2)
18. Tornadoes (5.1)
19. Flooding (5.0)
20. Oil and Natural Gas Accidents (4.8)
21. Invasive Species (4.7)
22. Hail (4.6)
23. Fog (4.5)
24. Drought (4.3)
25. Nuclear Power Plant Accidents (4.1)
26. Space Weather (3.7)
    Celestial Impacts (3.7)
28. Dam Failures (3.6)
29. Wildfires (3.4)
30. Earthquakes (3.2)
31. Subsidence (3.0)
32. Scrap Tire Fires (2.2)

Final Priority, Risk and Vulnerability Assessment

Staff then combined the results of the two exercises to create the following final ranking:

1. **Public Health Emergencies (7.4)**
2. **Snowstorms (6.4)**
3. **Ice Storms and Sleet Storms (6.1)**
   Energy Emergencies (6.1)
5. **Infrastructure Failures (6.0)**
6. **Transportation Accidents (5.7)**
7. **Terrorism (5.6)**
   Nuclear Attack (5.6)
9. **Lightning (5.5)**
10. **Extreme Temperatures (5.2)**
    Severe Wind Events (5.2)
12. Civil Disturbances (5.1)
13. Structural Fires (5.0)
    Transportation Hazardous Material Incidents (5.0)
    Catastrophic Incidents (5.0)
16. Tornadoes (4.9)
    Petroleum and Natural Gas Pipeline Accidents (4.9)
18 Flooding (4.8)
   Fog (4.8)
20. Hazardous Material Incidents (4.8)
21. Hail (4.7)
22 Drought (4.5)
23. Invasive Species (4.4)
24. Oil and Natural Gas Accidents (4.0)
    Nuclear Power Plant Accidents (4.0)
26. Celestial Impacts (3.9)
27. Space Weather (3.8)
28. Dam Failures (3.6)
29. Earthquakes (3.4)
30. Wildfires (3.2)
31. Subsidence (3.0)
32. Scrap Tire Fires (2.5)

In the end, Hail, Tornadoes, and Flooding were also added to Vulnerability Assessment.

Jackson County Hazard Mitigation Plan
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Goals and Objectives

Goals and Objectives

The following goals and objectives guide hazard mitigation efforts in Jackson County:

Goal 1: *Promote life safety* – Minimize disaster-related injuries and loss of life through public education, hazard analysis, and early warning.

Objective 1.1: Increase public and private sector awareness of hazard related dangers, resiliency principles, and mitigation solutions.

Objective 1.2: Encourage and promote multi-hazard emergency plans in all public and private institutions, including provisions for mitigating applicable hazards.

Objective 1.3: Promote local early warning systems and capabilities.

Objective 1.4: Better serve at-risk populations (e.g., the elderly, disabled, limited English).

Goal 2: *Reduce property damage* – Incorporate hazard mitigation considerations into land use planning, resource management, land development processes, and disaster-resistant structures.

Objective 2.1: Increase knowledge of elected/appointed county/municipal officials and other local leaders about sound land use and development practices that can help reduce long-term hazard risks and vulnerabilities.

Objective 2.2: Identify appropriate mitigation measures for vulnerable public and private facilities and infrastructure.

Objective 2.3: Promote and assist with winter weather mitigation projects countywide.

Objective 2.4: Encourage tree trimming and maintenance in public rights-of-way and utility easements to prevent limb breakage and safeguard utility lines.

Goal 3: *Provide leadership* – Provide leadership, direction, coordination, guidance, and advocacy for hazard mitigation.

Objective 3.1: Educate and inform governmental officials, other local policy-makers, and the public, about resilience and hazard mitigation concepts, programs, and processes.

Objective 3.2: Promote better information flow/coordination regarding hazard mitigation among units of government, and between public and private entities.

Objective 3.3: Identify strategies to assist local governments in overcoming obstacles to successfully applying for hazard mitigation grants.

Objective 3.4: Identify, establish, and promote new partnership opportunities.

Goal 4: *Secure funding* – Explore funding options for priority mitigation activities.

Objective 4.1: Use a cost-benefit review of mitigation activities to evaluate impact feasibility.

Objective 4.2: Develop public/private partnerships to implement mitigation activities.

Objective 4.3: Identify preparedness, mitigation, and responses gaps countywide and leverage grant dollars to implement recommendations.

Hazard Mitigation Approaches

Just as there is a wide range of hazards that potentially face Jackson County, there is a wide range of alternative approaches for mitigating them:

1. Modify the hazard to remove or eliminate it. Modification will reduce its size or amount, or control the rate of release of the hazard.
2. Segregating the hazard to try to "keep the hazard away from the people." This is often accomplished through the construction of structural protection measures. This can be a highly effective strategy but also very expensive. Care must be taken to maintain structural solutions over time. Risks could be compounded if development continues behind a structure that is allowed to deteriorate!
3. Preventing or limiting development in locations where people and structures would be at risk. This approach seeks to "keep the people away from the hazard" and includes a variety of land use planning and development regulation tools, such as comprehensive planning, zoning, floodplain management ordinances, capital improvements planning, disclosure laws, and the acquisition and relocation of hazard-prone properties. When properly applied, this strategy can be highly effective in promoting safe, sustainable development.
4. Altering design or construction to make it less vulnerable to disaster damage. Also known as "interacting with the hazard," it focuses on engineering structures to withstand potentially destructive impacts.
5. Early warning and public education to ensure that the public is aware of potential hazards, and that proper warning and communication systems are in place to save lives and protect property.

Hazard Mitigation Tools

Hazard mitigation tools generally fall into the following categories:

Corrective measures. When structures and communities are located in hazardous areas, corrective measures are directed at working with current conditions. Examples of corrective measures include:

1. Acquisition: Public acquisition and management of lands that are vulnerable to damage from local hazards. Following acquisition, land uses more appropriate to the degree of risk may be chosen. Public acquisition has been achieved by: a) purchase at full market value; b) purchase at less than full market value through such methods as foreclosure of tax delinquent property, bargain sales, purchase and lease back, etc.; c) donation, through reserved real estate, donation by will, donation and lease back; d) leases; and e) easements.
2. Relocation: Permanent evacuation of hazard-prone areas through movement of existing hazard-prone development and population to safer areas. The two common approaches to relocation are physical removal of buildings to a safer area with future use of the vacated area limited to permanent open space, and replacing existing land uses with others that are less vulnerable to the hazard.
3. Redevelopment: Rebuilding damaged areas in such a way that future damages are reduced and economic viability is improved. An example of this approach would be the redesign of deteriorated urban areas using renewal authorities and funds.

4. Modifications: Modifications can be made both to a site and to a structure. Examples include landscape grading, or retrofitting existing structures to be damage resistant (e.g., flood-proofing existing buildings, adding structural braces to buildings to improve earthquake or wind resistance, etc.)

Public works measures. This category covers the most commonly known engineering measures used to contain or redirect natural hazards away from development and affected populations. Examples of these types of measures include:

1. Structural protection measures: Construction of measures that directly protect people and property at risk (in Michigan, primarily from flood hazards). Examples include dams, reservoirs, dikes, levees, seawalls, bulkheads, revetments, high flow diversions, and spillways.
2. Land treatment: Measures which are intended to reduce the intensity of hazard effects by modifying the natural environment. Examples include reforestation, contour plowing, grading, and soil stabilization.

Planning and regulatory measures. Government has the power and resources to guide and influence the location, type, and amount of development within a jurisdiction. The tools of this "development management" are contained in the community's plans, regulations, public facilities and taxation measures, in addition to land acquisition policies which were discussed previously.

1. Plans: Land use plans specify the planned location of types of development activity, including commercial, industrial, and residential. As a hazard mitigation tool, plans can also identify hazard areas such as floodplains, fault zones, landslide and high-erosion areas, and hazardous waste sites. Land use plans can guide concentrated development away from these hazard areas by designating them for open space or other low density uses.
2. Zoning: Zoning ordinances are used to regulate the use of land and structures to ensure the public health, safety, and general welfare. Hazard areas such as floodplains can be zoned as low density districts. Hazard areas can also be identified in other zoning districts where special performance standards may be applied to development.
3. Regulations: Certain regulations, such as subdivision regulations, place requirements and standards for the conversion of raw land into building sites. These types of regulations can require floodproofing of such facilities as water and sewer lines, and storm drains. The subdivider can be required to prevent environmental degradation (e.g. using cluster developments) and mitigate hazards (e.g. retention basins). Development in high-hazard areas can be prevented or protected by requiring elevation or floodproofing. The regulations may also require that hazard information appear on deeds for lots within the development.

   Environmental regulations also provide an opportunity to accomplish hazard mitigation. Since sensitive areas are protected by these regulations, mitigation can be accomplished when this protection reduces hazard impacts, and when the protection guides new development away from these areas.

4. Codes: Building codes protect lives and property by setting standards for construction materials, techniques, and design procedures. Both performance codes and specification codes can be valuable hazard mitigation tools when used to require protection of new construction (or substantial redevelopments). Housing and sanitary codes establish minimum standards, one for occupancy and the other for waste disposal. Special standards may be established for hazard-prone areas.
5. Disclosure: Hazard mitigation goals can be accomplished by requiring sellers and real estate brokers to inform prospective buyers about the vulnerability of buildings and lots to specific hazards.
6. Moratoria: Ordinances or regulations can be applied to delay rebuilding after a disaster until mitigation priorities have been established. This can be done either before, or immediately following a disaster.
7. Development rights: This type of regulation or policy may prevent development in hazardous areas by purchasing the development rights from the seller. The land can then be maintained as open space, or leased back for agricultural purposes. Another option is to transfer the development rights to another location that is safer. By increasing densities in the safer location in exchange for decreased densities in the hazard zone, both sellers and developers can realize a profit while accomplishing hazard mitigation at little or no cost to government.
8. Open space planning: By employing some of the same strategies as for acquisition of developed properties, jurisdictions can lessen the potential for natural hazards by acquiring vulnerable undeveloped areas.

Persuasion and encouragement. Other mitigation strategies are available to discourage new development in hazardous areas and encourage practices which are consistent with mitigation goals. These include:

1. Incentives: Financial incentives and disincentives, such as taxes, mortgage standards, and insurance credits can be used to conform with mitigation objectives. An example of a disincentive would be the denial of loans to would-be borrowers who cannot show that hazard-related standards are being met.
2. Location: Leading by example, such as a clear and consistent government policy aimed at preventing the location of public buildings in hazardous areas, may discourage private development in these locations. An extension of this policy would be the denial of public services, such as water, power, and sewage into these areas. Finding alternatives to repairing or rebuilding damaged public facilities which service hazard-prone areas may also set an example for the private sector.

Public education and awareness. Public awareness programs are necessary to periodically inform and remind people about an area's hazards, and the measures necessary to minimize potential damage and injury. Tools in this category include:

1. Public relations: Providing general information or establishing public consensus can be accomplished through a formal or informal public relations program.
2. Public information: Information about hazards or mitigation efforts can be disseminated through the media.

3. Public hearings: The public may obtain information and express opinions about mitigation efforts at public forums run by appropriate government agencies.
4. Surveys and polls: Government agencies or other organizations can gather information about public support for mitigation efforts.
5. Public education: Learning experiences, such as workshops and seminars, may be used to communicate hazard mitigation information to special target audiences.

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Mitigation Strategies

The next step in the hazard mitigation planning process is to identify mitigation actions pertinent to Jackson County for the top eleven hazard types identified in the hazard analysis. The strategies are organized by hazard type for ease of reference. Each strategy is displayed in a table that also identifies who should implement the strategy, its suggested priority, its timing, and potential funding sources. Codes are utilized to identify the proposed implementers. The following table provides a more detailed explanation for each code:

Implementers	*Key*
Business owners & managers (including site developers and builders and government administrators whose activities are similarly associated with the selection, design, and operation of specific sites performing economic or community functions)	B
Public Citizens and those who provide educational services or marketing campaigns to them	C
Emergency management coordinators and related persons (LEPCs (Local Emergency Planning Committees), incident commanders, 911-Dispatch, etc.)	E
First-responders (law enforcement, fire fighters, medical services, other response services at all levels)	F
Insurance agencies & industry, including the NFIP (National Flood Insurance Program)	I
Elected officials and Legislators	L
Non-profit organizations and government departments which support them or have similar concerns (welfare provision, environmental protection, public health, environmental health, etc.)	N
Building Officials and other inspection, regulation, and code enforcement Officials (health, fire, etc.)	O
Planning departments, consultants, officials, engineers, and others involved in similar activities guiding long-term development patterns and conditions in a community, a larger area, or at development sites	P
Researchers, engineers, architects, etc. involved in the study and design of human environments and support infrastructure; also includes public works, utility providers, and others dealing with infrastructure design, development and maintenance (Departments of Transportation Commissioners, Drain Commissioners, etc.)	R
HMA GRANTS (SEE PAGE 20): where HMA grants are identified below, HMA grant funds will be sought.	

All Hazards

Various strategies apply to most if not all hazards. Rather than repeating them under each hazard type, they are displayed here for succinctness:

	Mitigation Strategies – All Hazards	*Implementers*	*Priority*	*Time*	*Funding*
1.	Producing and/or distributing family emergency preparedness information of various types. Encourage residents to develop a Family Disaster Plan that includes the preparation of a Disaster Supplies Kit.	C,E,N	High	Ongoing	Operating, Private, Grants

	Mitigation Strategies – All Hazards	*Implementers*	*Priority*	*Time*	*Funding*
2.	Wireless Emergency Alerts warn anyone in the area with a WEA-capable phone in the case of an extreme or imminent danger.	E,L,N	High	Ongoing	Operating, Grants
3.	Tree trimming and maintenance to prevent limb breakage and safeguard nearby utility lines (e.g. maintaining a disaster-resistant landscape in public rights-of-way).	B, N, R	Medium	Ongoing	Operating, Private
4.	Increased coverage and use of NOAA Weather Radio (which can provide notification to the community during any period of emergency).	C, E, L	Medium	Ongoing	Operating, HMGP Grants
5.	Expand the use of Electronic Message Boards and other Intelligent Transportation Systems (ITS) equipment along the I-94 and US-127 corridors.	E,R,L	Medium	Ongoing	Operating, Grants
6.	Pre-planning for debris management staging and storage areas for various hazards. (The area may simultaneously need to be treated as a crime scene, site of urban search and rescue, area of hazardous materials, and/or a public health threat.)	E, P	Low	Ongoing	Operating
7.	Purchase and install generators for essential critical facilities.	B, N, R	Low	As needed	HMGP Grants
8.	Continued training for first responders	E,F	High	Ongoing	Operating

Public Health Emergencies

Public Health Emergencies is the #1 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Mitigation Strategies – Public Health Emergencies	*Implementers*	*Priority*	*Time*	*Funding*
1.	Encouraging residents to receive immunizations against communicable diseases and other potential public health emergencies.	C, N	High	As needed	Operating, Private
2.	Maintaining community water and sewer infrastructure at acceptable operating standards.	B, N, R	High	Ongoing	Operating, Grants
3.	Increasing public awareness of the causes, symptoms, and protective actions for disease outbreaks and other potential public health emergencies.	C, N	High	As needed	Operating, Grants
4.	Pollution control, enforcement, and cleanup; proper disposal of chemicals and scrap materials.	B, N, O	High	Ongoing	Operating, Grants
5.	Improving ventilation techniques in areas/facilities prone to crowding, or that may involve exposure to contagion or noxious atmospheres.	B, N, R	High	Ongoing	Operating, Grants
6.	Separation of storm and sanitary sewer systems.	P, R	High	As needed	BRIC Grants

	Mitigation Strategies – Public Health Emergencies	*Implementers*	*Priority*	*Time*	*Funding*
7.	Community support of free or reduced-expense clinics and school health services.	B, N	High	Ongoing	Private, Grants
8.	Preventing public contact with contaminated sites or waters.	C, E, F	High	As needed	Operating
9.	Consider a countywide point of sale ordinance for wells and septic systems to be inspected and repaired/replaced if needed when property transfers.	L,O,P	High	Long Term	Operating
10.	Maintaining a community public health system with sufficient disease monitoring and surveillance capabilities to adequately protect the population from large-scale outbreaks.	N, O, R	Medium	Ongoing	Operating
11.	Demolition and clearance of vacant condemned structures to prevent rodent infes-tations.	B, O, P	Medium	As needed	Operating, Grants
12.	Implement the comprehensive watershed management plans and policies covering Jackson County, considering the connections between land-use, urban growth, and surface water, and ground water issues.	B, N, O	Medium	Ongoing	Operating, Grants
13.	Encourage brownfield and urban blight clean-up activities and redevelopment.	B, O, P	Low	As needed	Private, Grants

Snowstorms and Ice and Sleet Storms

Snowstorms is the #2 hazard in Jackson County and Ice and Sleet Storms is the #3 hazard. Given their similarities, strategies pertinent to both hazard types are listed in the following table:

	Mitigation Strategies – Snowstorms and Ice and Sleet Storms	*Implementer*	*Priority*	*Time*	*Funding*
1.	Bury/protect power and utility lines.	B, R	Medium	Long Term	Private, Grants
2.	Enforcement of proper building/site design and code enforcement relating to snow loads, roof slope, snow removal and storage, etc.	B, O, R	Low	Ongoing	Operating
3.	Encourage farmer preparedness to address livestock needs.	B	Low	Ongoing	Operating
4.	Continue to support and increase participation in the SkyWarn Program.	C,E,N	Low	Ongoing	Operating
5.	Including safety strategies for severe weather events in driver education classes and materials.	C	Low	Ongoing	Operating, Grants

	Mitigation Strategies – Snowstorms and Ice and Sleet Storms	*Implementer*	*Priority*	*Time*	*Funding*
6.	Using snow fences or "living snow fences" (rows of trees or vegetation) to limit blowing and drifting of snow over critical roadway segments.	B, P, R	Low	As needed	Operating, Grants
7.	Encourage home and public building maintenance to prevent roof and wall damage from "ice dams."	B, C, N	Low	Ongoing	Private, Grants

Energy Emergencies and Infrastructure Failures

Energy Emergencies is the #4 hazard in Jackson County and Infrastructure Failures is the #5 hazard. Given their similarities, strategies pertinent to both hazard types are listed in the following table:

	Mitigation Strategies – Energy Emergencies and Infrastructure Failures	*Implementer*	*Priority*	*Time*	*Funding*
1.	Proper maintenance of water and sewer systems.	P, R	High	Ongoing	Operating
2.	Regular maintenance, equipment and deficiency checks.	B, R	High	Ongoing	Operating
3.	Mutual aid assistance for failures in utility and communications systems (including 9-1-1).	E, F, N	High	Ongoing	Operating
4.	Replacement or renovation of aging structures and equipment (to be made as hazard-resistant as economically possible).	B, R	Medium	As needed	Grants
5.	Bury/protect power and utility lines.	B, R	Medium	Long Term	Private, HMA Grants
6.	Increasing public awareness and widespread use of the "MISS DIG" utility damage prevention service (1-800-482-7171).	B, C	Low	Ongoing	Operating, Grants
7.	Redundancies/reliability in utility and communications systems (including cell phones), especially those associated with critical community, safety, health, and employment services.	B, R	Low	Long Term	HMA Grants
8.	Institute "rolling blackouts" in overloaded electrical systems that would otherwise fail completely due to overloading.	B, R	Low	As needed	Private

Transportation Accidents

Transportation Accidents is the #6 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Mitigation Strategies – Transportation Accidents	*Implementer*	*Priority*	*Time*	*Funding*
1.	Enforce safety regulations	O	High	Ongoing	Operating
2.	Improved design, routing, and traffic control at problem transportation areas.	P,R	Medium	As needed	Operating, Grants
3.	Develop a nonmotorized network that follows federal and state guidelines that will enhance the development of a resilient and redundant multi-modal transportation system.	L,P,R	Medium	Ongoing	Operating, Grants
4.	Training, planning, and preparedness for mass-casualty incidents involving all modes of the transportation system within the Jackson community.	B, E, O, R	Medium	Ongoing	Operating
5.	Improvements in driver education, traffic law enforcement, and transportation planning that balance needs of transportation providers with the safety of the general public.	C, E P, R	Low	Ongoing	Operating, Grants
6.	Continue railroad inspections and improved designs at problem railway/roadway intersections (at grade crossings, rural signs/signals for RR crossing).	O, P, R	Low	Ongoing, As needed	Operating, Grants
7.	Use of designated truck routes and enforcement of weight and travel restrictions.	B, C, F	Low	Ongoing	Operating
8.	Ensure that there is a realistic, practiced transportation program in place to support the safe movement of vulnerable populations in case of a hazardous event.	E,F,N	Low	Ongoing	Operating
9.	Support the development of a robust, reliable, and resilient transit system and programs that will allow for transportation choice in the event of a hazardous event.	L,P,R	Low	Ongoing	Grants
10.	Support the ongoing need for Jackson County Airport-Reynolds Field maintenance, security, and safety projects and programs.	B, F, R	Low	Ongoing	Operating, Grants
11.	Safety training for transit, airplane, train operators, including simulated response exercises	E, N, R	Low	Ongoing	Operating, Grants
12.	Using snow fences or "living snow fences" (rows of trees or vegetation) to limit blowing and drifting of snow over critical roadway segments.	B, P, R	Low	As needed	Grants

Terrorism

Terrorism is the #7 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Mitigation Strategies – Terrorism	*Implementer*	*Priority*	*Time*	*Funding*
1.	Consistent use of computer data back-up systems and anti-virus software to mitigate against cyber-attacks.	B, E, N, R	High	Ongoing	Operating
2.	Training, planning, and preparedness by local law enforcement and other first responders for terrorist/ sabotage/WMD attacks.	E, F	High	Ongoing	Operating, Grants
3.	Prepare vulnerability assessment for critical infrastructure	R*	High	Short Term	Operating, Grants
4.	Greater awareness of, and provision for, mental health services in schools, workplaces, and institutional settings.	B, N, R	High	Ongoing	Grants
5.	Implementing school safety and violence prevention programs.	C, F, N*	High	Ongoing	Operating
6.	Heightening security at public gatherings, special events, and critical community facilities and industries.	B, F, R	Medium	As needed	Operating, Grants
7.	Using laminated glass and other hazard-resistant, durable construction techniques in new public buildings and critical facilities.	B, N, R	Low	Ongoing	Private, Grants
8.	Alertness, awareness, and monitoring of organizations and activities that may threaten the community.	F, R*	Low	Ongoing	Operating, Grants
9.	The development and testing of internal emergency plans and procedures by businesses and organizations.	B, R	Low	Ongoing	Operating
10.	Development of a thorough community risk and threat assessment that identifies potential vulnerabilities and targets for a sabotage/ terrorism/WMD attack.	E, F, P	Low	Short Term	Operating, Grants
11.	Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.	B, E	Low	Long Term	Private, Grants
	* With assistance from E				

Nuclear Attack

Nuclear Attack is the #8 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Mitigation Strategies – Nuclear Attack	*Implementer*	*Priority*	*Time*	*Funding*
1.	Community awareness of designated fallout shelters and attack warning systems.	C, E	Low	Ongoing	Operating, Grants
2.	Developing and promoting workable population protection plans (evacuation and in-place sheltering plans, as appropriate).	E, L, P	Low	Ongoing	Operating, Grants
3.	Construction of concrete safe rooms (or shelters) in houses, trailer parks, community facilities, and business districts.	B, L, P	Low	Long Term	Private, Grants
4.	Using laminated glass, metal shutters, structural bracing, and other hazard-resistant, durable construction techniques in public buildings (especially schools) and critical facilities.	B, R	Low	As needed	Operating, Grants
5.	Developing site emergency plans for schools, factories, office buildings, shopping malls, hospitals, correctional facilities, stadiums, recreation areas, and other appropriate sites.	B, E, R	Low	Ongoing	Operating

Lightning

Lightning is the #9 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Mitigation Strategies – Lightning	*Implementer*	*Priority*	*Time*	*Funding*
1.	Using surge protectors on critical electronic equipment.	B, C, N	Medium	Ongoing	Private, HMA Grants
2.	Installing lightning protection devices on the community's communications infrastructure.	B, N, R	Low	Ongoing	Operating, HMA Grants
3.	Enhance public awareness on correct safety procedures during lightning events.	C,E,N	Low	Ongoing	Operating, Grants
4.	Training for citizens to become Weather Spotters	C,E,N	Low	Ongoing	Operating, Grants

Extreme Temperatures

Extreme Temperatures is the #10 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Strategy	*Implementer*	*Priority*	*Time*	*Funding*
1.	Public education on safety during extreme temperatures	B,C,R	High	Ongoing	Operating, Grants
2.	Organizing outreach to vulnerable populations during periods of extreme temperatures, including establishing and building awareness of accessible heating and/or cooling centers in the community, and other public information campaigns about this hazard.	C, L, N	High	As needed	Operating, Grants
3.	Continue special arrangements for heating/cooling bill assistance for low income and elderly residents.	B,N,R	Medium	Ongoing	Private, Grants
4.	Housing/landlord codes enforcing heating requirements.	L, O	Low	Ongoing	Operating, Grants

Severe Winds

Severe Winds is the #11 hazard in Jackson County. Strategies pertinent to that hazard type are listed in the following table:

	Strategy	*Implementer*	*Priority*	*Time*	*Funding*
1	Proper anchoring of manufactured homes and exterior structures such as carports and porches.	B,C,O	High	Ongoing	Private, HMA Grants
2	Securing loose materials, yard, and patio items indoors or where winds cannot blow them about.	B,C,O	High	Ongoing	Operating
3	Using appropriate wind engineering measures and construction techniques (e.g. structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced entry and garage doors, window shutters, waterproof adhesive sealing strips, and interlocking roof shingles) to strengthen public and private structures against severe wind damage.	B,O,R	Medium	As needed	Private, HMA Grants
4	Construction of concrete safe rooms in homes and shelter areas in mobile home parks, fairgrounds, shopping malls, or other vulnerable public areas.	B,N,R	Low	Long Term	Private, HMA Grants

Municipal Strategies

Municipalities were also asked to provide hazard mitigation strategies for inclusion in the plan.

For example, most of the townships and villages have indicated that they will address hazard mitigation in the next update to their master plans: Columbia Township, Grass Lake Township, Henrietta Township, Leoni Township, Liberty Township, Napoleon Township, Norvell Township, Parma Township, Pulaski Township, Rives Township, Sandstone Township, Spring Arbor Township, Springport Township, Summit Township, Tompkins Township, Village of Brooklyn, Village of Concord, Village of Hanover, Village of Parma, and Village of Springport.

The municipalities also came up with the following listing of hazard mitigation strategies: Where the following projects identify HMGP as a potential grant source, the lead agency for the FEMA funding application would likely be the Jackson County Office of Emergency Management and Homeland Security (OEMHS), in cooperation with the named local agency. Where the following projects identify HMA as a potential grant source, the lead agency for implementation is likely to be the named local jurisdiction/agency, in cooperation with the Jackson County OEMHS.

- **Blackman Township.** Install two 80 kW emergency natural gas generators at the Township Office and the Sewer and Water Building to allow for uninterrupted service delivery of public safety services, sewer and water and shelter needs for the Township residents during power failures. The total cost of this project is $149,631. (HMA grants)
- **Columbia Township.** Install up to five additional emergency sirens to cover the entire community. Estimated cost is $24,000/siren ($120,000 total). (HMGP grants)
- **Henrietta Township.** Install 3-4 additional emergency sirens to cover the entire community. Estimated cost is $90,000. (HMGP grants)
- **Leoni Township.** Institute study to determine location on new emergency sirens. No cost estimate is available. (HMGP grants)
- **Liberty Township.** Install up to four additional emergency sirens to cover the entire community. Estimated cost is $90,000. (HMGP grants)
- **Napoleon Township.** Institute a tree removal/trimming program to cut down trees, decreasing the number of downed power lines/other infrastructure damage during severe wind events. Napoleon Cemetery. Estimated cost is $15,000. (HMA grants)
- **Norvell Township.** Institute study to determine location on new emergency sirens. At least three are anticipated. Estimated cost is $50,000. (HMGP grants)
- **Parma Township.** Flooded sections of 30 Mile Road and Ludlow Road due to the South Branch of Rice Creek. Enlarge road ditches to encourage the flow of water. No cost estimates available. (HMA grants)
- **Pulaski Township.** West side of Lippert Road floods due to a narrow culvert. Enlarge culvert to diminish flooding (this project is likely to be prioritized). No cost estimate available. Replace Hanover Road bridge to allow for fire and rescue/safety. No cost estimate available. (HMA grants)
- **Rives Township.** Institute study to determine location of additional emergency sirens. Two to three sirens are anticipated. Cost estimate is unavailable. Flooded sections of Wood Road and Rives-Eaton Road at the railroad tracks, due to undersized culverts (this project is likely to be prioritized). No cost estimate available. (HMA grants)

- **Sandstone Township.** Institute study to determine what causes the flooding of Dearing Road near MACI (south of County Farm Road) and then implement the solution. No cost estimate available. Add emergency sirens outside of the Village of Parma (this project is likely to be prioritized). No cost estimate available. New satellite fire station to serve the eastern part of the Township . No cost estimate available. (HMA grants)
- **Spring Arbor Township.** Add two emergency sirens. Estimated cost is $50,400. (HMGP grants)
- **Springport Township.** Replace inoperable emergency siren at the fire station. Estimated cost is $15,000. (HMGP grants)
- **Tompkins Township.** The north end of Dixon Road is unstable due to flooding and is closed. Options are to reconstruct with drainage system, move the road, or move the river. The Township wants to work with the Jackson County Department of Transportation to choose/implement an option. Estimated cost is at least $500,000. (HMA grants)
- **Village of Brooklyn.** Remove the dam that creates the Brooklyn Mill Pond, eliminating the threat of dam failure, which may cause the loss of the Mill Street Bridge, well contamination, and loss of homes/businesses. Estimated cost is $4,000,000. (HMA grants)
- **Village of Concord.** Take control of the private dam that creates the Concord Mill Pond and make the necessary repairs to make it safe. No cost estimate available. Institute a tree trimming program to cut down 3-5 trees/year, decreasing the number of downed power lines during severe wind events (this project is likely to be prioritized). Estimated cost is $5,000-$10,000/year. (HMA grants)
- **Village of Hanover.** Institute a tree removal/trimming program to cut down trees, decreasing the number of downed power lines during severe wind events. No available cost estimate.
- **Village of Parma.** The intersections of Eastlawn and Grove Streets and Grove and Railroad Streets need culverts replaced to address flooding. There are many other locations in the Village with collapsed culvert No cost estimate available. No cost estimate available. (HMA grants)

Jackson County Hazard Mitigation Plan
2022 Edition Plan Element

Cascades Golf Course | Sparks Foundation County Park

Plan Maintenance and Implementation

Implementation

The implementation of the Jackson County Hazard Mitigation Plan will depend upon the cooperative efforts of the Jackson County Office of Emergency Management and Homeland Security and local units of government. Upon plan adoption, the Jackson County Office of Emergency Management and Homeland Security will begin the implementation of the strategies established in the Hazard Mitigation Plan. Implementation will focus first on strategies identified as "high" priority. Where opportunities become apparent that enable implementation of a strategy due to a temporary or immediate change in perceived benefit, cost opportunity, or implementation potential, strategies may be implemented to take advantage of such opportunities. A committee may be established to address the details of specific mitigation strategies within local units of government which might be affected by specific hazards in the plan. Where capital improvements are necessary, or where significant outlays of community funds are required, the Jackson County Office of Emergency Management and Homeland Security will work with local units of government to identify, in detail, the improvement or project necessary, and to locate appropriate funding.

The Monitoring of Progress

The Jackson County Office of Emergency Management and Homeland Security will monitor the implementation of the policies and strategies contained within this plan. The Office of Emergency Management and Homeland Security will review hazardous events, their effect upon the community, and the degree to which hazard mitigation strategies were effective in protecting human life and minimizing property damage. The Office of Emergency Management and Homeland Security will oversee implementation activities by local units of government, agencies, and private sector entities. The plan will be amended when deemed necessary by the Office of Emergency Management and Homeland Security or upon the request of the State of Michigan or Federal government. In its evaluation of the Hazard Mitigation Plan, the Office of Emergency Management and Homeland Security will use the following criteria:

1. Has there been a potential or actual change in the hazards facing Jackson County?
2. Has new development in the county resulted in a change in circumstances or conditions which necessitates a review or revision of strategies?
3. Have actions been taken, or strategies applied that reduce or eliminate the hazard's impact on the county?
4. Are there new programs or funding available to address specific hazards facing Jackson County?
5. Are there changes in laws, regulations, techniques or practices that warrant an amendment to the plan?

Plan Update

The Jackson County Hazard Mitigation Plan will be reviewed and updated by amendment in 2027 or as deemed necessary prior to 2027. A review will take place within every five years, following plan approval.

The Jackson County Hazard Mitigation Plan will also be incorporated into master planning processes. For example, the Jackson County Master Plan is currently under development and will be reviewed and updated as required by the Michigan Planning Act, PA 110 of 2006. In addition, local units of government, including the City of Jackson, and Jackson County townships and villages, will be encouraged to incorporate the hazard mitigation planning process into their local master plans. At the time of update, the community will be advised of the contents of the Hazard Mitigation Plan so that they

may incorporate relevant provisions of the plan into their local master plan. In addition, the local units will be encouraged to review potential hazards facing their unit of government and to develop mitigation strategies which can be applied. The strategies resulting from this effort will be provided to the Jackson County Office of Emergency Management and Homeland Security for their use in the preparation of the update to the Jackson County Hazard Mitigation Plan.

Public Participation

Public participation is viewed to be an important component in the planning process, in the development of the goals, objectives, and strategies contained within the plan and to facilitate the implementation of strategies. The public, including area agencies, businesses, non-profits, academic institutions, and other invested parties, has and will continue to be offered opportunities for participation in the hazard mitigation planning process through the following:

1. **Public hearings.** Public hearings will be held before each unit of government that considers adoption of the Jackson County Hazard Mitigation Plan.
2. **Public discussion.** Public discussion has, and will continue to be encouraged and received in open forums at meetings of the City of Jackson, Jackson County township and village planning commission meetings, and the meetings of the Jackson City Council, the Jackson County Board of Commissioners, township boards, and village councils.
3. **Web based opportunities.** Web based opportunities for citizen participation in the implementation and subsequent updates to the Jackson County Hazard Mitigation Plan will be continued on an ongoing basis as the Plan is approved, reviewed and updated in the future. The draft Jackson County Hazard Mitigation Plan has been available for public review on the Region 2 Planning Commission website.

Jackson County Hazard Mitigation Plan
2022 Edition Plan Appendix

Bright Walls Mural | Downtown Jackson

Potential Hazards Appendix

Natural Hazards

Weather Hazards

- Hail
- Lightning
- Ice Storms and Sleet Storms
- Snowstorms
- Severe Wind Events
- Tornadoes
- Extreme Temperatures

Hydrological Hazards

- Flooding
- Drought

Hail | Natural Hazards |Weather Hazards

The following table provides the history of hail storms in the County from 1958 through 2019.

Jackson County Hail Events, 1958-August 2020

	Date	Description	Location
1.	08/03/1958	1400: Hail, 2.00 inch., LAT/LON: 42°17'N / 84°30'W	Sandstone
2.	06/01/1961	1500: Hail, 2.00 inch., LAT/LON: 42°17'N / 84°30'W	Sandstone
3.	05/31/1962	1443: Hail, 0.75 inch., LAT/LON: 42°12'N / 84°24'W	Summit
4.	08/08/1962	1715: Hail, 0.75 inch., LAT/LON: 42°05'N / 84°11'W	Columbia
5.	04/17/1963	1650: Hail, 1.25 inch., LAT/LON: 42°17'N / 84°30'W	Sandstone
6.	08/27/1965	1730: Hail, 0.75 inch., LAT/LON: 42°05'N / 84°41'W	Pulaski
7.	07/04/1977	0430: Hail, 1.00 inch., LAT/LON: 42°16'N / 84°28'W	Blackman
8.	08/02/1980	0300: Hail, 1.25 inch., LAT/LON: 42°12'N / 84°21'W	Napoleon
9.	04/28/1981	1345: Hail, 1.00 inch., LAT/LON: 42°11'N / 84°23'W	Summit
10.	06/09/1985	0130: Hail, 0.75 inch., LAT/LON: 42°14'N / 84°24'W	Jackson
11.	07/09/1985	07/09/1985 2110: Hail, 1.50 inch., LAT/LON: 42°23'N / 84°41'W 2128: Hail, 1.50 inch., LAT/LON: 42°23'N / 84°41'W Springport	Springport
12.	07/25/1988	1810: Hail, 1.75 inch., LAT/LON: 42°15'N / 84°36'W	Parma
13.	03/14/1989	1654: Hail, 1.00 inch., LAT/LON: 42°16'N / 84°28'W	Blackman
14.		1714: Hail, 0.75 inch., LAT/LON: 42°23'N / 84°11'W	Waterloo
15.	05/30/1989	1830: Hail, 0.75 inch., LAT/LON: 42°15'N / 84°26'W	Jackson
16.	05/31/1989	1989 1700: Hail, 0.75 inch., LAT/LON: 42°15'N / 84°36'W	Parma
17.	03/27/1991	1915: Hail, 2.75 inch., LAT/LON: 42°15'N / 84°26'W	Jackson
18.	04/09/1991	1428: Hail, 2.75 inch., LAT/LON: 42°23'N / 84°41'W	Springport
19.	07/04/1992	1830: Hail, 0.75 inch., LAT/LON: 42°19'N / 84°24'W	Blackman
20.	10/08/1992	1940: Hail, 1.75 inch., LAT/LON: 42°14'N / 84°24'W	Jackson
21.	06/13/1994	1621: Hail, 0.75 inch. Although a report was made by trained spotter, the exact location is unavailable.	Unavailable
22.	07/24/1996	11:40 AM: Thunderstorm Wind/hail in Concord. Thunderstorm winds, combined with half inch hail, knocked down numerous tree limbs.	Concord
23.	09/11/1996	02:50 PM: Hail, LAT/LON: 42°14'N / 84°24'W, 0.88 inch. Several reports of dime-sized to nickel-sized hail were received from the City of Jackson.	Jackson
24.	07/08/1997	05:55 PM: Hail, LAT/LON: 42°06'N / 84°33'W, 0.88 inch. Jackson Central Dispatch relayed reports from Hanover Township fire officials of nickel-sized hail.	Hanover
25.	07/14/1997	05:50 PM: Hail 4 Miles South East of Springport, LAT/LON: 42°21'N / 84°38'W, 0.88 inch. Strong to locally severe thunderstorms developed, with isolated reports received of up to nickel-sized hail and winds gusting to 70 mph. Downed trees and power lines	Springport

	Date	Description	Location
		cut power to approximately 48,000 Consumers Energy customers in southwest and south central Lower Michigan. No injuries were reported.	
26.	05/31/1998	05:19 AM: Hail at Hanover, LAT/LON: 42°06'N / 84°33'W, 1.50 inches. Numerous sources indicated that the widespread and severe damages from a fast-moving line of thunderstorms during the early morning hours of Sunday, May 31st, were caused primarily by strong straight-line winds and isolated wet microburst winds. This derecho event produced widespread 60 to 90 mph wind gusts, which caused extensive tree and structural damage and left over 861,000 homes and businesses without electricity across Michigan's Lower Peninsula. Consumers Energy reported that the derecho event was the most destructive weather event in the company's history, leaving over 600,000 of its customers without power (Consumers Energy is the largest utility company in western and mid Lower Michigan). There were 4 storm-related fatalities reported in the state and 146 injuries (mostly minor). Statewide, approximately 250 homes were destroyed, 12,250 homes damaged, 34 businesses destroyed, and 829 businesses damaged. (This was subsequently denoted as federally declared disaster number 1226.) Damage estimates across the above listed counties totaled over $166 Million.	Hanover
		At 05:47 AM: Hail at Waterloo, LAT/LON: 42°21'N / 84°08'W, 1.00 inch.	Waterloo
27.	06/12/1998	04:25 PM: Hail at Vandercook Lake, LAT/LON: 42°11'N / 84°23'W, 0.88 inch. Several severe thunderstorms included a supercell over southern Barry County, which propagated east-southeast across Calhoun and Jackson Counties. Downed trees and power lines and lightning strikes knocked out power to 22,000 in southern Michigan, (most of whom were in Barry, Calhoun, and Wayne Counties).	Summit
		At 04:40 PM: Thunderstorm Wind/Hail 1 Mile South West of Brooklyn, $25,000 property damage. Jackson County Emergency Management Coordinator reported trees and power lines down in the vicinity of the Michigan International Speedway, located 1 mile south of Brooklyn in southern Jackson County. Three-quarter inch diameter hail also fell in the same location. No injuries or significant structural damage was reported.	Columbia
28.	06/24/1998	05:04 PM: Jackson County Emergency Management reported a funnel cloud near the intersection of Lansing Ave. and Maple Grove Road in southern Rives Township, approximately 6 miles north of the city of Jackson. Scattered severe thunderstorms were characterized by several large hail reports, including golf-ball sized hail reports received from Jackson County and hail of 2 to 3 inches in diameter associated with a supercell thunderstorm as it tracked east-southeast across southern Ingham and northern Jackson County. This storm resulted in several wind damage and large hail reports, and an F1 tornado touched down in north central Jackson County near Layton Corners. No injuries were reported with the tornadoes, but damage was estimated at half a million dollars across Henrietta and Waterloo Townships in northern Jackson County. Hail was estimated to have reached 2 to 3 inches in diameter in association with this tornadic storm. The most significant damage was reported around the Pleasant Lake area, where several boats were overturned and several homes reported minor to moderate structural damage. Along North Meridian Road from near Layton Corners along the west end of Pleasant Lake, 2 homes reported destroyed garages. Pleasant Lake County Park was closed due to downed trees. The Waterloo State Recreation Area reported hundreds of trees uprooted, which resulted in the closing of some roads and horse trails. 5,800 were without power in the affected areas of Henrietta and Waterloo Townships. Damage was estimated at approximately $500,000.	Waterloo
		At 05:25 PM: Hail 2 Miles North of Grass Lake, LAT/LON: 42°17'N / 84°13'W, 1.75 inch. Jackson County Emergency Management reported golf ball-sized hail on Morrisey Road in Grass Lake Township, 2 miles north of the city of Grass Lake	Grass Lake

	Date	Description	Location
29.	06/26/1998	01:10 AM: Thunderstorm Wind at Jackson, LAT/LON: 42°14'N / 84°24'W, 52 knots. Scattered reports of wind damage and hail were received across west central, southwest, and south central Lower Michigan, as widespread thunderstorm activity moved across Michigan's Lower Peninsula during the late evening hours of Thursday, June 25th, and early morning hours of Friday, June 26th. No injuries were reported, but an estimated 22,000 people lost power across the southern third of Michigan's Lower Peninsula, due to downed trees and power lines.	Unavailable
30.	05/17/1999	04:00 PM: Hail, 0.75 inch, $50,000 property damage. 0.75" hail was reported in Parma, LAT/LON: 42°15'N / 84°36'W. There were also a few reports of hail 0.75" - 1.00" in diameter.	Parma
31.	06/09/1999	04:22 AM: Hail, LAT/LON: 42°23'N / 84°27'W, 0.75 inch. Hail was observed in Rives Junction, where dime-sized hail covered the ground.	Rives
32.	09/28/1999	06:28 PM: A thunderstorm became severe, producing pea-sized hail and wind gusts to 60 mph.	Jackson
33.	03/15/2000	07:05 PM: Hail at Spring Arbor, LAT/LON: 42°12'N / 84°33'W, 1.50 inch. One thunderstorm produced hail (1.5” diameter) in Spring Arbor. There were also several reports of very small hail along the Interstate 94 corridor from Kalamazoo to Jackson.	Spring Arbor
34.	07/14/2000	02:08 PM: Hail, LAT/LON: 42°23'N / 84°27'W, 0.88 inch., $20,000 property damage, $10,000 crop damage. Thunderstorms produced several reports of large hail during the afternoon hours. 0.88" diameter hail was reported in Rives Junction at 2:08 p.m. Severe thunderstorm warnings were issued. Marble to nickel-sized hail was reported in the Rives Junction and Pleasant Lake areas.	Rives Henrietta
35.	08/02/2000	07:15 PM: Hail, 1.25 inch., LAT/LON: 42°23'N / 84°27'W, $30,000 property damage, $10,000 crop damage. Severe thunderstorms developed in the afternoon and evening. Hail of 1.25” was reported in Rives Junction and broke the windshield of a car. Wind damage included a 12-inch diameter tree limb that was blown down at 7:15 p.m. Severe thunderstorm warnings were issued.	Rives
36.	07/29/2001	07:10 PM, Thunderstorm Wind, Parma to Spring Arbor, Begin LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°12'N / 84°33'W, 53 Knots, 25,000 property damage. A large severe weather outbreak across southern and central lower Michigan during the late afternoon and evening hours resulted in numerous reports of downed trees and power lines, and a few reports of large hail. A 911 center in Spring Arbor (Jackson county) reported trees down in that area	Unspecified
37.	4/20/2003	03:25 PM, Hail, LAT/LON: 42°14'N / 84°24'W, 1.00 inch., $10,000 property damage. One and three quarters inch hail was reported by Blackman township police and fire personnel 5 miles north of Jackson.	Blackman
		A report of a large tree down was also received from Spring Arbor, and a one foot diameter pine tree was snapped in half 5 miles southwest of Spring Arbor	Spring Arbor
38.	4/30/2003	10:30 PM, Hail, LAT/LON: 42°14'N / 84°24'W, 1.00 inch., $10,000 property damage. One inch diameter hail was reported one mile north of Jackson.	Blackman
39.	5/1/2003	2330:, One inch hail in Jackson. (also listed as flooding and hail)	Jackson
40.	5/9/2003	11:10 PM, Hail, LAT/LON: 42°07'N / 84°21'W, 1.00 inch., $15,000 property damage, $15,000 crop damage. One inch diameter hail was reported about one mile west of Brooklyn near Clark Lake.	Columbia
41.	5/17/2004	01:15 PM: Hail, 1.75 inch., Rives Junction to Munith, Begin LAT/LON: 42°23'N / 84°27'W, End LAT/LON: 42°23'N / 84°15'W, $40,000 property damage, $40,000 crop damage. The broadcast media reported one and three quarters inch diameter hail	Northern Jackson County

	Date	Description	Location
		near I-127 in Rives Junction and a trained spotter reported one and three quarter inch diameter hail in Munith. Severe thunderstorm warning issued for JACKSON	
42.	5/21/2004	08:40 PM, Hail, 2.00 inch., LAT/LON: 42°14'N / 84°24'W, $30,000 property damage, $30,000 crop damage. Two inch diameter hail was reported by the public in Jackson.	Jackson
		2:42 PM, Hail, 0.88 inch., LAT/LON: 42°14'N / 84°24'W, $40,000 property damage. Seven eighths inch diameter hail was reported 5 miles south of Jackson, and several power poles were blown down near Jackson as well.	Liberty
43.	6/9/2004	12:35 PM, Hail, 4.25 inch., LAT/LON: 42°23'N / 84°27'W, $50,000 property damage, $50,000 crop damage. Four and one quarters inch diameter hail was reported at the intersection of Berry and US-127 roads. Several reports of smaller hail were also reported in and near Rives Junction.	Rives
44.	6/5/2005	06:00 PM, Thunderstorm Wind, Parma to Springport, Begin LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°23'N / 84°41'W, 52 Knots, $10,000 property damage. A large severe weather outbreak occurred across our area resulting in numerous downed tree limbs and power lines, many reports of large hail and many reports of downed power lines. Several trees were blown down across area roads. There were several reports of three quarters to inch diameter hail and estimated wind gusts to 60 m.p.h	Parma Springport
45.	6/30/2005	09:55 AM, Hail at Brooklyn, LAT/LON: 42°06'N / 84°15'W, 0.88 inch., $10,000 property damage, $10,000 crop damage.	Brooklyn
46.	7/25/2005	10:04 PM, Thunderstorm Wind, 53 Knots, LAT/LON: 42°06'N / 84°33'W, $25,000 property damage. A large severe weather outbreak occurred and produced numerous reports of wind damage, one tornado and one isolated hail report. As a result of severe thunderstorm wind gusts, there were numerous reports of wind damage including downed trees, limbs, and power lines across the area.	Hanover
47.	9/22/2005	04:49 PM, Hail, 1.75 inch, LAT/LON: 42°15'N / 84°13'W, $15,000 property damage, $10,000 crop damage. The public reported one and three quarters inch diameter hail in Grass Lake	Grass Lake
48.	4/22/2006	06:31 PM, Hail, LAT/LON: 42°06'N / 84°33'W, 1.00 inch, $10,000 property damage, $5,000 crop damage. The public in Hanover reported one-inch diameter hail.	Hanover
		7:01 PM, Hail, LAT/LON: 42°10'N / 84°15'W, 1.00 inch, $10,000 property damage, $5,000 crop damage. Law enforcement three miles south of Napoleon reported one-inch diameter hail.	Napoleon
49.	6/19/2006	11:05 AM, Hail, 0.75 inch., LAT/LON: 42°11'N / 84°38'W, $5,000 property damage, $5,000 crop damage. Three quarters inch hail was reported in Concord.	Concord
		12:00 PM, Hail, LAT/LON: 42°06'N / 84°15'W, 1.25 inch, $20,000 property damage, $15,000 crop damage. Hail ranging anywhere from one and a quarter to seven eighths inches in diameter was reported in Brooklyn.	Brooklyn
50.	06/28/2006	01:55 PM, Hail, LAT/LON: 42°06'N / 84°24'W, 0.75 inch, $5,000 property damage, $5,000 crop damage. A trained spotter reported three quarters inch hail in Liberty.	Liberty
51.	5/15/2007	17:18 PM, Thunderstorm Wind 1 Mile North East of Pleasant Lake, LAT/LON: 42°24'N/84°19'W, 50 Knots, $10,000 property damage. EVENT NARRATIVE: A combination of six trees and large limbs were blown down on a golf course one mile northeast of Pleasant Lake in Jackson county. EPISODE NARRATIVE: Severe storms produced several reports of large hail and high winds which brought down several trees and branches in Jackson County.	Henrietta

	Date	Description	Location
52.	6/02/2007	18:15 PM, Thunderstorm Wind 3 Miles West North West of Pleasant Lake, LAT/LON: 42°25'N/84°23'W, 52 Knots, $20,000 property damage. EVENT NARRATIVE: Multiple trees and power lines were blown down along the Jackson County line. EPISODE NARRATIVE: Severe storms affected much of southwestern lower Michigan, resulting in several reports of large and numerous reports of wind damage.	Henrietta
53.	6/27/2007	JACKSON, at 16:45, dime-sized hail (between 0.5” and 0.75” in diameter) was reported 5 miles north of Jackson.	Blackman
54.	1/7/2008	21:54 PM, Thunderstorm Wind 2 Miles North, North East of Horton, LAT/LON: 42°10'N / 84°30'W, 52 Knots, $2,000 property damage. EVENT NARRATIVE: One tree was blown down near the intersection of Reynolds and Horton roads three miles south-east of Spring Arbor. EPISODE NARRATIVE: A rare mid winter severe weather event occurred and resulted in several reports of high winds and large hail. There were few reports of damage associated with the severe weather. A tree was blown down just southeast of Spring Arbor	Spring Arbor
55.	4/11/2008	15:55 PM, Hail 1 Mile North of Parma, LAT/LON: 42°15'N / 84°36'W, 1.00 inch., $10,000 property damage, $5,000 crop dam-age. EVENT NARRATIVE: Hail briefly covered the ground in Parma and there were also several reports of broken windshields. EPISODE NARRATIVE: A round of severe thunderstorms resulted in numerous reports of large hail during the afternoon hours of April the eleventh. Hail briefly covered the ground at several locations and there were several reports of broken windshields from hail in Parma in Jackson County.	Parma
56.	6/6/2008	17:45 PM, Thunderstorm Wind 1 Mile North West of Spring Arbor, LAT/LON: 42°12'N /84°33'W, 52 knots. EVENT NARRATIVE: Law enforcement reported that a couple of trees were blown down. EPISODE NARRATIVE: Severe thunderstorm wind gusts resulted in several reports of significant wind damage. Several reports of large hail were also received.	Spring arbor
57.	7/2/2008	17:35 PM, Hail 1 Mile West of Knollwood Park, LAT/LON: 42°15'N / 84°23'W, 0.88 inch. A severe weather outbreak on July 2 resulted in numerous reports of wind damage and large hail. Another area of large hail stretched from Allegan county east through Ingham county and south into Kalamazoo and Jackson counties. The hail was large enough to damage some crops.	Jackson
58.	7/16/2008	20:53 PM, Thunderstorm Wind 1 Mile North West of Rives Junction, LAT/LON: 42°23'N /84°27'W, 52 knots. EVENT NARRATIVE: Law enforcement in Jackson county reported that a couple of trees were blown down. One was blown down on Spring Court and another was blown down near Zion Road and East Berry Road. EPISODE NARRATIVE: Numerous severe thunderstorms across southwest Michigan resulted in wind damage and large hail.	Rives
59.	4/25/2009	16:40 PM, Thunderstorm Wind 1 Mile East South East of Pleasant Lake to End Location: 7 Miles North of Waterloo, Begin LAT/LON: 42°24'N / 84°18'W, End LAT/LON: 42°27'N / 84°08'W, 53 knots. EVENT NARRATIVE: Scattered to widely scattered tree damage occurred including occasional uprooted trees along a 9 mile stretch from 2 miles westsouthwest of Pleasant Lake to 2.5 miles southwest of Stockbridge. The damage swath was 4 to 6 miles wide. A measured 53 knot gust with pea sized hail occurred just north of Batteese Lake. The damage crossed into extreme southeast Ingham County at 42.4284 north latitude and 84.2094 west longitude. The damage continued east-northeast to at least the Livingston County line.	Henrietta
60.	8/9/2009	19:20 PM, Hail 3 Miles South of Rives Junction, LAT/LON: 42°20'N / 84°27'W, 0.70 inch. EVENT NARRATIVE: No damage re-ported in association with the hail.	Rives
61.	6/18/2010	1.25 in Hail, 3 Miles West of Concord. EPISODE NARRATIVE: Thunderstorms developed during the late afternoon and evening hours of April 19th in an axis of increasing elevated instability well to the north of a warm front across Indiana and Ohio. The storms produced numerous reports of hail across southern lower Michigan. Most of the hail was sub severe, but there were a	Concord

	Date	Description	Location
		couple of reports of hail reaching an inch to an inch and a quarter in diameter. The thunderstorms were also accompanied by heavy rainfall and frequent lightning. EVENT NARRATIVE: A spotter one mile west northwest of Concord reported one and three quarters inch diameter hail. Several trees and large limbs were blown down in and near Jackson. A 47 mph wind gust was measured at the Jackson airport.	
62.	4/19/2011	1.25 in Hail, 1 Mile West of Woodville. EPISODE NARRATIVE: Thunderstorms developed during the late afternoon and evening hours of April 19th in an axis of increasing elevated instability well to the north of a warm front across Indiana and Ohio. The storms produced numerous reports of hail across southern lower Michigan. Most of the hail was sub severe, but there were a couple of reports of hail reaching an inch to an inch and a quarter in diameter. The thunderstorms were also accompanied by heavy rainfall and frequent lightning. EVENT NARRATIVE: A public reports from the city of Jackson indicated that hail around 0.75 inches in diameter. A report was also received that hail broke a window in a home in the City of Jackson.	Jackson
63.	5/10/2011	0.88 in Hail, 1 Mile North of Spring Arbor. EPISODE NARRATIVE: Hail up to seven eighths of an inch in diameter was reported with an early morning thunderstorm which affected Spring Arbor in Jackson County. The thunderstorm developed well to the northeast of a warm front in an area of enhanced elevated instability. EVENT NARRATIVE: Media reported seven eighths inch diameter hail accompanied an early morning thunderstorm in Spring Arbor. The media also reported mothball (three quarters inch) hail four miles south southwest of Jackson.	Spring Arbor
64.	5/23/2011	0.75 in Hail, 1 Mile South of Napoleon. EPISODE NARRATIVE: A strong late afternoon thunderstorm affected portions of south-eastern Jackson County, resulting in three quarters inch diameter hail in Napoleon. EVENT NARRATIVE: A trained spotter in Napoleon reported three quarters inch diameter hail.	Napoleon
65.	8/13/2011	0.75 in Hail, 0 Mile South of Woodville. EPISODE NARRATIVE: Numerous reports of thunderstorms producing hail ranging from three quarters of an inch up to an inch and a quarter were received throughout the day on March 15th. The largest hail reports came from portions of Isabella and Clare counties where one and a quarter inch diameter hail fell. EVENT NARRATIVE: Trained spotters reported three quarters inch diameter hail well to the north of the City of Jackson.	Jackson
66.	3/15/2012	0.75 in Hail, 3 Miles East of Minard. EPISODE NARRATIVE: Numerous reports of thunderstorms producing hail ranging from three quarters of an inch up to an inch and a quarter were received throughout the day on March 15th. The largest hail reports came from portions of Isabella and Clare counties where one and a quarter inch diameter hail fell. EVENT NARRATIVE: Trained spotters reported three quarters inch diameter hail well to the north of the City of Jackson.	Minard
67.	5/3/2012	2.00 in Hail, 1 Mile East of Woodville. EPISODE NARRATIVE: An upper low moving over a warm front that stretched across northern Lower Michigan set the stage for heavy rainfall on May 3rd. Training thunderstorms (storms that move over the same location) produced 5 to 7 inches of rainfall across portions of Mason and Lake counties. The heavy rainfall resulted in roads that were either flooded or washed out. As the day progressed, strong to severe storms developed in the warm humid airmass. Golf ball size hail was reported in Mason and a 10 x 20 foot section of roof was blown off of a commercial building a few miles south of Lansing. EVENT NARRATIVE: A trained spotter reported hail up to two inches in diameter two miles southeast of Jackson with one inch hail in Jackson.	Jackson
68.	9/11/2013	1.00 in Hail, 1 Mile West of Tompkins Center. EPISODE NARRATIVE: Microburst straight line wind damage impacted downtown Albion on September 11th, where maximum winds were estimated at 70 to 80 mph. The worst damage occurred along a path one and three quarters mile long and up to a half a mile wide where numerous trees and power lines were blown down. Albion	Tompkins Center

	Date	Description	Location
		college was shut down for several days due to all the wind damage and lack of power. Isolated damaging wind gusts from severe storms were reported elsewhere during the late afternoon hours of September 11th, and there was also an isolated severe storm that produced one inch diameter hail. EVENT NARRATIVE: The public reported one inch diameter hail near Tompkins Center.	
69.	7/27/2014	1.00 in Hail, 1 Mile West of Tompkins Center. EPISODE NARRATIVE: A cold front triggered development of severe thunderstorms with numerous reports of large hail and wind damage during the afternoon and early evening hours of July 27th. Hail up to two inches in diameter was reported in northern Kalamazoo county. EVENT NARRATIVE: The public reported one inch diameter hail near Waterloo.	Waterloo
70	6/1/2019	1.75 in Hail, 1 Mile Northeast of Parma. EPISODE NARRATIVE: There were numerous reports of large hail as well as a little bit of wind damage in association with severe thunderstorms on June 1st. EVENT NARRATIVE: Hail up to around one and three quarters of an inch in diameter was reported.	Parma

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Lightning | Natural Hazards | Weather Hazards

The following table provides the history of lighting in the County from 1994 through 2020.

Jackson County Lightning Events, 1994-August 2020

	Date	Description	Location
1.	6/13/1994	1300: Lightning, 1 injury. A man cleaning out a storm drain during a thunderstorm was struck by lightning and thrown across the road. He was treated at a local hospital for minor injuries.	Unspecified
2.	08/16/1997	02:45 PM: LAT/LON: 42°14'N / 84°24'W. Local utility companies reported approximately 55,000 power outages during the afternoon and evening across far southern Michigan, with most caused by of lightning strikes, but some due to downed trees and utility poles (also listed under thunder storm wind).	Jackson
3.	07/21/1998	04:30 PM: LAT/LON: 42°14'N / 84°24'W. Jackson area law enforcement reported numerous trees and power lines downed in Blackman Township and the City of Jackson. The Jackson Citizen Patriot reported that a Jackson woman was trapped when the wind dropped a large branch and live power lines over her car on Sixth Street, just north of W. Morrell. Damage to the car was minor and the woman was not injured. Over 200 power lines were downed by the storm and transformers were damaged by lightning strikes. Approximately 5,000 residents lost power in Jackson County. Damage estimates were not available. (Also reported under thunderstorm wind).	Jackson Blackman Township
4.	7/18/2015	During the "Faster Horses Festival" at the Michigan International Speedway (Brooklyn, Jackson County), severe weather caused a concert to be evacuated around 8:20 pm, with tens of thousands of persons in attendance. The main stage was dismantled after visible lightning appeared in the sky, and weather sirens were sounded. The performance by headline act Brad Paisley was delayed by three hours.	

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Ice Storms and Sleet Storms | Natural Hazards | Weather Hazards

The following table provides the history of ice and sleet storms in the County from 1976 through 2020.

Jackson County Ice Storms/Freezing Rain Events, 1976-2020

	Date	Description	Location
1.	03/02-07/1976	Ice Storm with accompanying high winds and tornadoes struck Jackson and 28 other counties in Central Lower Michigan. The storm, considered to be one of the worst to hit the state, caused over $56 million in damage and widespread power outages. A Presidential Major Disaster was granted.	
2.	01/01/1985	Ice Storm affecting Jackson and 12 other counties in Southern Lower Michigan. Up to 1 inch of freezing rain downed tree limbs, trees, and power lines, blocked roads, and caused widespread power outages. More than 430 thousand electric customers were without power for up to 10 days. An estimated $50 million in public and private damages, 3 deaths, and 8 injuries are attributed to this event. A Governor's Disaster Declaration was issued.	
3.	01/27/1994	Heavy Snow/Freezing Rain. $5,000,000 property damage statewide. Over the southern third of Lower Michigan, snow mixed with, then changed to, sleet and freezing rain. By late afternoon on the 27th, most of Lower Michigan had freezing rain or sleet. The freezing rain changed to rain by mid afternoon and continued, heavy at times after 7 pm. Overnight on the 27th and into the morning hours of the 28th, occasional rain continued. During the rest of the 28th, the area of freezing rain changed to snow. The snow, heavy at times, continued until around 2300 EST on the 28th. Light snow continued until mid afternoon on the 29th, but little additional accumulations occurred. During the freezing rain, around a quarter inch of ice had accumulated over the southern third of lower Michigan. This resulted in numerous outages. Detroit Edison reported 50,000 people affected by power outages. Consumers Power County reported 2,000 customers without power. Most of the power loss problems were over the southeastern part of Michigan even though this was not the area of heaviest ice accumulation or of the strongest winds. Most of the power loss occurred on Thursday, January 27th, during the ice accumulation phase of the storm. More than 150 schools canceled classes across the state. Across Michigan, there were numerous reports of cars skidding off the road and minor fender-bender type accidents. Also added as snowstorm.	Unspecified location
4.	02/27/1995	0100: Ice Storm. Freezing rain developed late on the 26th, then continued through the morning hours on the 27th. Several hours of sleet preceded the freezing rain in many places. Ice accumulations of one-quarter inch were common by late morning on the 27th. Numerous traffic accidents were reported, and most schools were closed. Despite the heavy icing, only widely scattered power outages occurred, since the storm was accompanied by very little wind.	Unspecified location
5.	03/06/1995	0000: Ice Storm. Freezing rain and sleet occurred during the early morning on the 6th, but the heaviest accumulation of ice occurred early on the 7th, when many areas reported accumulations of one-quarter inch. Most schools were closed for at least one day, and many schools were closed on both the 6th and the 7th. A brief thaw occurred across the far south during the afternoon on the 7th, followed by a sharp temperature drop and a light accumulation of snow, making roads extremely hazardous once again during the evening on the 7th. Scattered power outages occurred, but the outages were not as widespread as what might have occurred had the storm been accompanied by strong winds. Many traffic accidents were reported.	Unspecified location

	Date	Description	Location
6.	12/13/1995	1800: Ice Storm. Snow developed across southeast Michigan late in the afternoon on the 13th, then quickly changed to freezing rain and sleet during the evening. Snow accumulations were generally two inches or less, but 1/4 inch ice accumulations occurred in many places. At least 230 school districts throughout southern Michigan cancelled school on the 14th, as roads became icy and hazardous. Scattered power outages were also reported.	Unspecified location
7.	03/13/1997 - 03/14/1997	01:30 AM: Ice Storm. An Ice Storm lasting slightly more than 12 hours blanketed much of West Central Lower Michigan and all of Southwest Lower Michigan. The worst hit areas included the County of Jackson. Ice accumulations were near 1 inch. Power was out for up to 24 hours in Jackson County (affecting 38,000 customers). Trees and power lines were downed, and automobile accidents occurred continually throughout the storm. Emergency Management and Road Department budgets were heavily affected. Ice Storm affecting the southern third of Michigan. Detroit Edison and Consumers Energy outages affected 514,000 customers, including those in Jackson County. Shelters were also opened in many communities	Unspecified location
8.	01/04/1998	12:00 AM: Freezing Rain. A strong cold front moved in during the early morning hours of Sunday, January 4th. Temperatures behind the cold front fell into the upper 20's and lower 30's, changing light rain to freezing rain. One period of light freezing rain fell from after midnight to around 10:00 AM EST, resulting in light ice accumulations of around one-tenth of an inch. No serious problems were reported, other than icy spots on secondary roads and bridges/overpasses.	Unspecified location
9.	01/12/1998	12:00 PM: Freezing Rain. A brief period of freezing rain on the afternoon of Monday, January 12th, caused major roads and highways to become icy and hazardous across Jackson County. Numerous weather-related accidents were reported, including a several-car pile-up on the South Street bridge over U.S. Highway 127 in Jackson. Bridges and overpasses were most affected by icing.	Unspecified location City of Jackson Summit Township
10.	03/09/1998	07:00 AM: Winter Storm, $100,000 property damage. Heavy snow and blizzard conditions occurred, as rain changed to freezing rain and sleet in the Jackson area and surrounding communities. This icy mix changed to snow during the mid to late morning hours, but a prolonged period of sleet across Jackson County cut down on the snowfall total in the area. Snowfall was heavy and was reported at rates around and slightly over 1 inch per hour. Occasional white-outs were reported. Snowfall totals of 2 to 5 inches were reported. Schools and businesses were closed by this winter storm, the most intense of the 1997-98 winter season. Saturated ground in Jackson from heavy rainfall Sunday night and early Monday morning weakened an old oak tree, which was blown over by winds gusting to 30 mph just before daybreak. This tree crashed through a home in the city of Jackson and caused an estimated $100,000 in damage. No injuries were reported from residents inside the home. Also listed as snow.	Unspecified location City of Jackson
11.	03/20/1998	04:00 PM: Winter Storm. A mixture of snow, sleet, and freezing rain fell across much of southwest and south central Lower Michigan. The precipitation started out as a mixture of sleet and freezing rain Friday afternoon, then turned to mostly snow Friday evening. The ice at the onset made travel conditions hazardous for the Friday afternoon rush hour, and several minor weather-related accidents were reported along and south of the Interstate-94 corridor. Snow accumulations ranged from 3 to 4 inches in Jackson County. Also included as snow.	Unspecified location
12.	02/05/1999	07:00 PM: Freezing Rain. A fast moving storm system produced a mix of light freezing rain, light snow, and sleet across southern lower Michigan during the evening hours. The band of precipitation was narrow, and the precipitation was light, only lasting for 3 to 4 hours. No damage was reported.	Unspecified location

	Date	Description	Location
13.	01/30/2002	04:00 AM, Winter Storm. A stationary front set up to the south of lower Michigan, setting the stage for a prolonged overrunning precipitation event for southern lower Michigan on the 30th and 31st. Anywhere from eight to as much as thirteen inches of snow fell across the area, and freezing rain fell in Jackson County as low pressure moved into lower Michigan. Winter Storm warning for JACKSON, snow up to 7" with a quarter inch of ice. Also listed as snow	Unspecified location
14.	1/31/2002	Ice storm warning was issued this day for the following Michigan counties: JACKSON. Flash Report for JACKSON County. Road conditions icy and slippery. 25 businesses damaged. Power wires, phones, cable TV lines down due to accumulation of ice and falling trees. Flash Report from JACKSON County, weather related power outages. Winter Storm Warnings for JACKSON. Ice Storm Warning for BARRY, CALHOUN, EATON, INGHAM, JACKSON Counties, ice accumulation up to half inch. School Closings in JACKSON	Unspecified location
15.	12/1/2006	JACKSON, at 0600, an ice storm was reported at Jackson, with some trees and wires down. 05:00 AM, Ice Storm , 30,000 property damage. EVENT NARRATIVE: A third of an inch of ice was reported across most of Jackson county. EPISODE NARRATIVE: A strong early winter season low pressure system brought snow and freezing rain to southwestern and west central lower Michigan. The heaviest ice accumulations occurred over southern lower Michigan south of I-96 where many locations reported at least three tenths of an inch of ice.	City of Jackson Unspecified location
16.	12/21/2013	EPISODE NARRATIVE: An Ice Storm affected portions of Southern Lower Michigan from December 21-22. Ice accumulations of one half to three quarters of an inch occurred across much of Barry, Eaton, Clinton, Ingham, and northern Calhoun and Jackson counties. This resulted in a very prolonged power outage that affected hundreds of thousands of residents across Lower Michigan. Many people did not have power restored until 4 to 6 days after the ice storm hit. In addition there was widespread damage in the form of downed trees and tree limbs across the area. A total of 60 million dollars in estimated insured losses occurred across Michigan from this storm with approximately 36 million of this being in SW lower Michigan. A half to three quarters of an inch of ice accumulation occurred across the northern third of Jackson county, causing numerous power outages and downed tree limbs and lines.	

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Snowstorms | Natural Hazards | Weather Hazards

The following table presents the history of snowstorms in Jackson County from 1993-2020.

Jackson County Snow Storms, 1993-2020

	Date	Description	Location
1.	01/12/1993	1200: Heavy Snow. Snowfall totals were probably about six inches, with winds gusting up to 30 mph at times, causing considerable drifting snow.	Unspecified location
2.	01/23/1993	0400: Heavy Snow.	Unspecified location
3.	04/11/1993	0700: Heavy Snow.	Unspecified location
4.	04/15/1993	0700: Heavy Snow	Unspecified location
5.	01/27/1994	0000: Heavy Snow/Freezing Rain. $5,000,000 property damage statewide. Over the southern third of Lower Michigan, snow mixed with, then changed to, sleet and freezing rain. By late afternoon on the 27th, most of Lower	Unspecified location

	Date	Description	Location
		Michigan had freezing rain or sleet. The freezing rain changed to rain by mid afternoon and continued, heavy at times after 7 pm. Overnight on the 27th and into the morning hours of the 28th, occasional rain continued. During the rest of the 28th, the area of freezing rain changed to snow. The snow, heavy at times, continued until around 2300 EST on the 28th. Light snow continued until mid afternoon on the 29th, but little additional accumulations occurred. During the freezing rain, around a quarter inch of ice had accumulated over the southern third of lower Michigan. This resulted in numerous outages. Detroit Edison reported 50,000 people affected by power outages. Consumers Power County reported 2,000 customers without power. Most of the power loss problems were over the southeastern part of Michigan even though this was not the area of heaviest Unspecified location ice accumulation or of the strongest winds. Most of the power loss occurred on Thursday, January 27th, during the ice accumulation phase of the storm. More than 150 schools canceled classes across the state. Across Michigan, there were numerous reports of cars skidding off the road and minor fender-bender type accidents. Also listed as ice storm.	
6.	02/25/1994	1100: Heavy Snow. An intense snow burst caused five to eight inches of snow to fall across most of the southern third of lower Michigan. The heaviest snowfalls, seven to eight inches, fell over a 50-mile wide area across southern lower Michigan, with Jackson on the southern edge of the heaviest snowfall area. Snowfall rates of one to two inches an hour, for a period to two to three hours, were common. Northeast to east winds at 15 to 25 mph with frequent gusts to 35 mph combined with temperatures around 20F resulted in wind chill values of 10 to 20 degrees below zero. The combination of strong winds and heavy snow caused near blizzard conditions for a period of about six hours. Considerable blowing and drifting of the falling snow resulted in near zero visibility and numerous multi-vehicle accidents on Interstate 94. As a result some sections of highway were closed for hours during the storm.	Unspecified location
7.	12/06/1994	1800: Heavy Snow. Heavy snow fell from the evening on the 6th through the morning of the 7th. Snow amounts of 2 to 4 inches occurred, and some of the precipitation fell as freezing rain. Numerous traffic accidents were reported across the area, along with scattered power outages.	Unspecified location
8.	01/01/1995	0000: Heavy Snow. Numerous traffic accidents were reported across the state.	Unspecified location
9.	01/20/1995	0000: Heavy Snow. Accumulations ranged from 6 to 12 inches. Travel disruptions were not as severe as what would normally be expected with such large snow amounts, since much of the snow fell during the weekend, and the snow fell over a several day period. Still, many serious traffic accidents were reported, along with scattered power outages.	Unspecified location
10	02/03/1995	1800: Heavy Snow. Accumulations of six to eight inches were widespread, accompanied by strong winds and bitterly cold temperatures. Blowing and drifting snow through the 5th resulted in numerous traffic accidents reported.	Unspecified location
11.	02/11/1995	0000: Heavy Snow. Most areas had from 4 to 10 inches of snow, accompanied by strong winds. The combination of wind and snow created whiteout conditions on many roadways, making travel nearly impossible.	Unspecified location

	Date	Description	Location
12.	02/25/1995	1500: Heavy Snow. Accumulations of three to six inches were common. Numerous traffic accidents were reported during the evening of the 25th, when temperatures fell quickly below freezing once the snow began, and caused sudden icing on roadways.	Unspecified location
13.	03/19/1996	08:30 PM: Winter Storm. 4 to 8 inches of snow fell in a band that covered eastern Branch, Hillsdale, Jackson, and southeast Ingham Counties. Winds up to 45 mph caused drifts up to 2 feet, forcing the closing of many roads and schools. Power outages also affected nearly 5,000 customers.	Unspecified location
14.	01/10/1997	02:00 AM: Heavy Snow. A lake-effect snow storm tied up all activities for over 3 days. Some schools closed early on Friday, the 10th, and numerous shift workers were told not to report for 2nd and 3rd shifts. Heavy snow continued through Saturday and tapered off to flurries on Sunday morning. All areas reported new snowfall of 12 inches or more. Secondary roads across all of Central Lower and Southwest Lower Michigan were blocked from Friday night into Saturday, and interstates were also closed for a few hours late Friday into Saturday. Accidents occurred at the rate of 50 to 100 per day from the 10th through the 12th. Some secondary roads remained plugged on Sunday but were open by Monday morning.	Unspecified location
15.	11/11/1997	09:00 PM: Lake Effect Snow. A lake-enhanced snow event began in the late evening on Tuesday, November 11th. In general, 1 to 5 inches of snow fell across western and southern Lower Michigan. The snow-covered and icy roads caught many overnight and early morning motorists by surprise. The snow initially melted on road surfaces overnight, then froze early Wednesday morning as temperatures fell below freezing. This resulted in extremely icy conditions and an unusually high number of minor accidents, which included many slide-offs into ditches.	Unspecified location
16.	11/15/1997	07:00 AM: Snow. Snow accumulations of 3 to 4 inches occurred across Jackson during a 14 hour period.	Unspecified location
17.	12/10/1997	01:00 AM: Winter Storm. Snow first moved in shortly after midnight on Wednesday, December 10th and ended during the early afternoon hours. The heaviest snow fell between 6 and 10 am, when snowfall rates of 1 to 2 inches per hour were common. Snow accumulations totaled 10 to 12 inches in Jackson County. With the heaviest snow falling during the morning rush hour, numerous accidents were reported. A fatal accident claimed the life of a Spring Arbor man who was killed instantly when his automobile was struck by oncoming traffic, after he lost control when trying to pass a county snow plow on southbound U.S. Highway 127 around 3 pm in Jackson County. Several other injury and property damage accidents were reported throughout the storm. Many area schools along and north of Interstate 94 started classes for the day because snow had not yet started falling at the decision-making time of 4-5:30 am, even though Winter Storm Warnings had been posted the night before. However, snow became heavy at the onset, catching many school bus drivers off-guard. Many schools which had opened for the day sent students home early. The weight of the wet snow caused power outages, with up to 18,000 customers without power at the height of the storm due to arcing wires and downed branches. Flight delays and cancellations were common at airports across southern Michigan and local bus service was suspended for several hours of the day in Jackson.	Unspecified location
18.	01/22/1998	07:00 PM: Winter Storm. A winter storm spread a large swath of moderate to occasionally heavy snow across most of western, central, and southern portions of Michigan's Lower Peninsula from Thursday evening through mid-morning Friday, January 22nd-23rd. Snow accumulations ranged from 3 to 6.5 inches, with 6-inch or greater	Unspecified location

	Date	Description	Location
		amounts concentrated in Jackson County. Most major highways and roads became snow-covered during the storm and travel conditions were hazardous from late Thursday evening through the Friday morning rush hour. Numerous weather related minor accidents were reported across the region. Many local school districts were closed because of road conditions on Friday, January 23rd. Snowfall reports included 5.5 inches in Jackson.	
19.	03/09/1998	07:00 AM: Winter Storm, $100,000 property damage. Heavy snow and blizzard conditions occurred, as rain changed to freezing rain and sleet in the Jackson area and surrounding communities. This icy mix changed to snow during the mid to late morning hours, but a prolonged period of sleet across Jackson County cut down on the snowfall total in the area. Snowfall was heavy and was reported at rates around and slightly over 1 inch per hour. Occasional white-outs were reported. Snowfall totals of 2 to 5 inches were reported. Schools and businesses were closed by this winter storm, the most intense of the 1997-98 winter season. Saturated ground in Jackson from heavy rainfall Sunday night and early Monday morning weakened an old oak tree, which was blown over by winds gusting to 30 mph just before daybreak. This tree crashed through a home in the city of Jackson and caused an estimated $100,000 in damage. No injuries were reported from residents inside the home. Also listed as snow.	Unspecified location City of Jackson
20.	03/20/1998	04:00 PM: Winter Storm. A mixture of snow, sleet, and freezing rain fell across much of southwest and south central Lower Michigan. The precipitation started out as a mixture of sleet and freezing rain Friday afternoon, then turned to mostly snow Friday evening. The ice at the onset made travel conditions hazardous for the Friday afternoon rush hour, and several minor weather related accidents were reported along and south of the Interstate-94 corridor. Snow accumulations ranged from 3 to 4 inches in Jackson County. Also included as snow.	Unspecified location
21.	12/21/1998	01:00 PM: Lake Effect Snow. Snowfall totals ranged from 1 inch to several inches, but as is typically the case, the first snow of the season contributed to a dramatic increase in the reported number of traffic accidents. Most of the accidents were minor.	Unspecified location
22.	01/02/1999	07:00 AM: Blizzard. Wind gusts of 45 to 60 mph were common across all of southern lower Michigan through the afternoon hours, causing blowing and drifting snow and whiteout conditions at times. By the late evening hours of the 2nd, 6 to 12 inches of snow had already fallen across all of southwest and west central lower Michigan.	Unspecified location
23.	01/04/1999	12:00 AM: Snow. Snow showers continued from the previous day throughout a new day, accompanied by continued blowing and drifting of snow. Overall, this winter storm ended up being one of the strongest to affect western lower Michigan in 2 decades, and came to be known as the "Blizzard of '99". All of southern lower Michigan was affected by blizzard conditions at times on January 2nd. Snow began in the morning and continued through the afternoon, making travel difficult to impossible. By the evening hours of the 2nd, 6 to 12 inches of snow had already fallen across southwest and west central lower Michigan, with both Van Buren and Kalamazoo counties reporting up to a foot of new snow by 10 pm. The snow continued through the 3rd and 4th, and even lingered into the early morning hours of the 5th before finally tapering to flurries. Travel through the period ranged from difficult to impossible, due to all the blowing and drifting of snow, and occasional whiteout conditions. Some snow drifts measured to 5 to 6 feet in open rural areas. Roads became impassable and many highways and rural roads were closed through the 4th. There were several car accidents through the period. Most schools were closed, some for over a week in rural areas. Most colleges and universities, as well as quite a few area businesses, were	Unspecified location City of Jackson

	Date	Description	Location
		closed on the 4th and 5th as well. Final snow storm total snowfalls for the 2nd through the 5th included 16 inches in the city of Jackson.	
24.	01/11/1999	04:00 AM: Snow. 2 to 4 inches of snow fell across Jackson county.	Unspecified location
25.	03/04/1999	10:00 PM: Snow. 8 inches across Jackson County.	Unspecified location
26.	03/08/1999	10:00 PM: Snow. 5 to 6 inches across Jackson County.	Unspecified location
27.	12/11/2000 – 12/30/2000	06:00 AM: Winter Storm. A significant winter storm affected southern lower Michigan with very heavy snow and strong winds. Anywhere from 6 to as much as 15 inches of snow fell across the area. Strong winds caused blowing and drifting snow. The combination of the heavy snow and winds that gusted to 40 m.p.h. created blizzard conditions at times, causing virtually every school and many businesses to close for a day. In fact many area schools, particularly in outlying and rural areas, were closed for several days and even a week in some instances. Numerous accidents were reported in blowing and drifting snow. Many counties reported upwards of 100 accidents occurring between 7 a.m. on the 11th and 7 a.m. on the 12th. Snowstorm affecting 39 counties in central and southern Lower Michigan. A series of snowstorms caused a host of public health and safety concerns and problems across the region including Jackson County for the next several weeks. A Presidential Emergency Declaration was granted.	Unspecified location
28.	12/13/2000	02:00 PM: Heavy Snow. Jackson saw 5-6 inches of snowfall.	Unspecified location
29.	01/30/2002	04:00 AM, Winter Storm. A stationary front set up to the south of lower Michigan, setting the stage for a prolonged overrunning precipitation event for southern lower Michigan on the 30th and 31st. Anywhere from eight to as much as thirteen inches of snow fell across the area, and freezing rain fell in Jackson County as low pressure moved into lower Michigan. Winter Storm warning for JACKSON, snow up to 7" with a quarter inch of ice. Also listed as freezing rain.	Unspecified location
30.	2/1/2002	School Closings in JACKSON. 1149, Winter storm warning was issued for JACKSON	Unspecified location
31.	2/25 to 2/26/2002	Winter storm warnings were issued for JACKSON	Unspecified location
32.	2/25/2002	07:00 PM, Winter Storm. Moderate to heavy snow developed across much of southern Lower Michigan on the 25th and continued on the 27th. There were two phases to the snowfall. During the first phase of this event, the heaviest snow fell across Ingham and Jackson counties, where six to eight inches of snow fell during the late evening hours of the 25th into the morning hours of the 26th. The second phase of this event occurred during the late evening hours of the 26th through the 27th as lake effect snow bands set up across west central lower Michigan.	Unspecified location
33.	12/24/2002	09:00 PM, Heavy Snow. A winter storm caused snow to begin to fall along the I-94 corridor of southern lower Michigan at around 9 p.m. on Christmas Eve. It spread north to near I-96 by midnight. The maximum snowfall report of 9 inches was received from Jackson (Jackson County).	Unspecified location
34.	3/4/2003	06:00 PM, Heavy Snow. Low pressure moved from the panhandle of Texas northeast to Nebraska and eventually to near Toledo Ohio, producing heavy snow across central and southern lower Michigan. Most of the area between I-96 and I-94 generally received anywhere from 6 to 7 inches of snow in less than 12 hours. Winter storm warnings were issued for JACKSON	Unspecified location
35	3/5/2003	Winter storm warning was issued for JACKSON	Unspecified location

	Date	Description	Location
36.	4/6/2003	Winter storm warning issued for JACKSON	Unspecified location
37.	4/7/2003	04:00 AM, Heavy Snow. A late season snow event produced an isolated report of heavy snow in Jackson where seven inches of snow fell.	Unspecified location
38.	1/27/2004	07:00 AM, Winter Storm. A low pressure system developed over the gulf coast states and moved northeast to southern Lake Huron, bringing a combination of moderate to heavy snow and strong gusty winds that caused blowing and drifting of snow across the area. The snow developed around sunrise on the 27th across extreme southwest lower Michigan and expanded northeast to cover most of central and southern lower Michigan by 10 a.m. This was the heaviest general snowfall across our area for the 2003-2004 winter season. A general six to ten inch snowfall occurred across the area.	Unspecified location
39.	11/24/2004	12:00 PM, Winter Storm A potent winter storm brought heavy snow and wind across southern and south central lower Michigan on November the 24th on the day before Thanksgiving. Low pressure developed over eastern Texas late on the 23rd and intensified rapidly as it moved northeast to western Ohio on Wednesday evening. Precipitation began as rain along the I-94 corridor but changed to snow by around noon. Snow became moderate to heavy during the early to mid afternoon hours, when snowfall rates of two to three inches an hour were reported at times. Moderate to heavy snow continued into the early evening hours before gradually diminishing overnight. Reports of six to nine inches of snow were received from Kent, Allegan, Calhoun, Jackson, Clinton and Eaton counties	Unspecified location
40.	12/22/2004	09:00 PM, Heavy Snow. Heavy snow was reported in Jackson County, where up to 7 inches of snow fell in Brooklyn in southern Jackson County. The remainder of Jackson county received an average of 5 to 6 inches of snow.	Unspecified location Brooklyn
41.	1/4/2005	07:00 PM, Heavy Snow. An initial burst of snow occurred during the late evening hours of the 4th into the early morning hours of the 5th. The main low pressure system moved northeast from Texas and brought the most substantial snow during the daytime hours of the 5th. Six to nine inches of snow fell in less than 24 hours across much of the rest of the area.	Unspecified location
42.	1/21/2005	11:00 PM, Heavy Snow. A potent Alberta clipper system in combination with a strong upper air system produced heavy snow across central and southern Lower Michigan. 10 to 12 inches of snow was reported across most of the area across central and southern Lower Michigan from Interstate 96 south.	Unspecified location
43.	12/8/2005	04:00 PM, Heavy Snow. A synoptic snow event resulted in total snow accumulations of six to eight inches across much of southern lower Michigan.	Unspecified location
44.	2/13/2007	02:00 AM, Heavy Snow. EVENT NARRATIVE: Six inches of snow fell in about a 9 hour period in Jackson County by late in the day on Tuesday February 13th. EPISODE NARRATIVE: A low pressure system moved northeast along a stationary front well south of our region and this produced a band of snow which clipped southern lower Michigan. Six inches of snow fell in about a 9 hour period in Jackson County by late in the day on Tuesday February 13th.	Unspecified location
45.	12/31/2007	22:30 PM, Winter Storm. EVENT NARRATIVE: This heavy snow event continued into the early morning hours on New Year's Day. EPISODE NARRATIVE: Heavy snow moved into southern lower Michigan during the early evening hours of New Year's Eve, impacting New Year's travel plans by creating very hazardous travel conditions in heavy	Unspecified location

	Date	Description	Location
		snow and snow covered roads. Many locations across southern Michigan reported total snowfall of 7 to 10 inches, with as much as 11.5 inches reported three miles south southeast of Jackson.	
46.	2/1/2008	02:00 AM, Winter Storm. EPISODE NARRATIVE: A low pressure system tracked northeast between Toledo and Cleveland and brought significant snowfall to most of southern lower Michigan on the first of February. The heaviest snow occurred between midnight and daybreak before gradually diminishing during the mid to late morning hours. Snow continued to taper off to flurries in the afternoon before ending. Approximately five to seven inches of snow fell south of a line from Muskegon to Clare	Unspecified location
47.	3/21/2008	13:20 PM, Winter Storm. EPISODE NARRATIVE: A low pressure system brought heavy snow to much of southwestern Lower Michigan from the 21st through the 22nd. Snow began during the morning hours of the 21st and continued into the early morning hours of the 22nd before gradually diminishing. The heaviest snow fell during the afternoon and early evening hours of the 21st, when snowfall rates of two inches per hour were reported at some locations. Eight to fourteen inches of snow fell south of a line from Holland to Jackson.	Unspecified location
48.	12/19/2008	04:00 AM, Winter Storm. EVENT NARRATIVE: A total of eight to twelve inches of snow was reported. EPISODE NARRATIVE: An area of low pressure moved from Kansas City, Missouri to north of Pittsburgh, Pennsylvania. Snow spread into southwest lower Michigan out ahead of the low, starting in South Haven at around 2:00 a.m. on the nineteenth. Heavy Snow occurred across most of the area between 5:00 a.m. and 1:00 pm, with snowfall rates reaching 1 to 2 inches per hour at times. Thundersnow was even reported at locations across southern lower Michigan, evidence to the instability in place with this system. Some sleet and freezing rain mixed in along the Interstate 94 corridor. A maximum of snow was found across south central lower Michigan from Bellevue in Eaton county southeast to Vandercook Lake in Jackson county.	Unspecified location Summit Township
49.	1/9/2009	12:00 PM, Winter Storm. EVENT NARRATIVE: Four to eight inches of snow fell. EPISODE NARRATIVE: Six to twelve inches of snow fell south of the I-96 corridor over south and southwest Michigan on the ninth and tenth. The snow began during the morning of the ninth and continued through the early evening hours. The mainly light snow combined with fog to produce visibilities between one quarter and one half of a mile along the I-94 corridor. Many locations saw a break in the falling snow during the late evening hours of the ninth, before a second period of heavier snow began during the early morning hours of the tenth. Snow fell throughout the day on the tenth before tapering to flurries in the evening.	Unspecified location
50.	4/5/2009	22:30 PM, Winter Storm. EVENT NARRATIVE: Six to seven and a half inches of snow was reported across Jackson county, resulting in downed trees, branches and power lines, 34 property damage accidents and two accidents with injuries. Scattered power outages were also reported. EPISODE NARRATIVE: A spring snowstorm brought 4 to 8 inches of heavy wet snow to the south and southeast part of the county warning area on the evening of April 5th through the morning of April 6th. The snowfall resulted in numerous traffic accidents with at least one known fatality. The wet snow also brought down some trees and numerous tree limbs resulting in sporadic power outages that affected between 25,000 and 50,000 persons during the storm. Rain spread into the region between	Unspecified location Southeast Jackson County

	Date	Description	Location
		5:00 and 8:00 pm and then changed to snow between 10:00 and 11:00 pm. Accumulating snow fell with temperatures near freezing through Monday morning. Temperatures rose just above freezing Monday morning with the snow ending from west to east by midday.	
51.	2/9/2010	05:00 AM, Heavy Snow. A low pressure system formed over the Tennessee Valley region and moved to the north northeast to just east of Toledo Ohio, bringing heavy snow to southern lower Michigan. The snow fell from the morning hours of February 9th through the mid morning hours of February 10th. The snow was heaviest during the late afternoon and evening hours of the 9th. Most of the area south of a line from Muskegon to St. John's had between 6 and 10 inches of snow. The storm coincided with Michigan's winter 'Count Day' used to determine base funding for local public school systems. Many school systems closed due to the snowstorm. Several significant accidents occurred on the regions primary arteries. I-94 was closed for several times due to jackknifed trucks.	Unspecified location
52.	2/21/2010	21:00 PM, Heavy Snow. Four to eight inches of snow fell south of a Muskegon to St. John's line over southwest lower Michigan during the morning hours of Monday, February 22nd. The highest amounts fell over Eaton, Ingham, Calhoun, and Jackson counties. The highest observed snow accumulation rates, between 0.5 and 1.0 inch per hour, occurred during the morning commute on the 22nd.	Unspecified location
53.	2/1/2011	A major winter storm brought 10 to 15 inches of snow and blizzard conditions to much of southwest Lower Michigan the during the late evening of Tuesday, February 1st into the morning hours of Wednesday, February 2nd. Wind gusts in excess of 40 mph combined with heavy snow to produce whiteout conditions and snowdrifts of 3 to 5 feet. Thunder accompanied the snow in some areas with snowfall rates exceeding two inches per hour. Many businesses, schools, and some government offices were closed on Wednesday. Most main roads were plowed by midday Wednesday but some side streets were not cleared until Thursday. The storm is considered a 1 in 10 year event for southwest Michigan. The storm also brought blizzard conditions to parts of Kansas, Missouri, Iowa, Illinois, Wisconsin, New York, Vermont, New Hampshire, and Maine. Winter storm conditions began during the late afternoon hours Tuesday, February 1st and continued into the early morning hours on Wednesday. Five to ten inches of snow fell across the county. Winds gusts up to 45 mph accompanied one inch per hour snowfall rates. Snowdrifts of 1 to 2 feet occurred in open areas.	Unspecified location
54.	2/20/2011	A storm brought heavy wet snow from Holland to Lansing and points north during the afternoon and evening hours of Sunday, February 20th. South of those areas up to three quarters of an inch of freezing rain fell. There were numerous accidents including a sixty car pile-up on Route 131 near Big Rapids. More than one-hundred thousand people lost power along the Interstate 94 corridor where the freezing rain was the most severe. The storm responsible for the snow and ice was located over eastern South Dakota Sunday morning. The storm center then tracked east moving along the Michigan and Indiana border Sunday night before redeveloping off the Mid-Atlantic Coast on Monday. Ice accumulations of one-tenth to one-quarter of an inch occurred over the county. The ice was preceded by 3 to 6 inches of a snow-sleet mixture. Approximately ten thousand people lost power during the storm.	Unspecified location

	Date	Description	Location
55.	11/29/2011	A significant early season winter storm brought heavy wet snow and windy conditions to south central Lower Michigan. A swath of 8 to 10 inches of snow fell from Marshall northeast to Lansing and St. John's, with the highest total of 10 inches reported in St. John's. There was a sharp gradient to the snow, with Battle Creek receiving around 5 inches of snow, and Kalamazoo and Hastings receiving only 3 inches. In fact just a little further northwest in Grand Rapids there was no snow at all. The combination of the heavy wet snow with high liquid content and strong winds and falling temperatures caused quite a few trees, tree limbs and power lines to come down near to east of a line from Battle Creek to Lansing and St. John's. Approximately 30,000 people were left without power in south central Michigan. There were numerous accidents. A gas station awning in Haslett collapsed under the weight of the snow. The public reported seven inches of snow in Rives Junction. A trained spotter reported 5.2 inches of snow in Jackson and that many tree limbs had come down.	Unspecified location
56.	1/4/2014	Arctic low pressure dropped southeast from Canada during the night of the fourth into the 5th. This system combined with a southern Plains system that also moved in on the 5th to bring as much as 15 to 17 inches of snow to portions of southern Lower Michigan, with numerous reports of over a foot of snow. This resulted in numerous accidents and school closures. More than one foot of snow with wind chills between thirty and forty below zero.	Unspecified location
57.	3/12/2014	A low pressure system moved northeast across the Ohio Valley region, bringing around seven to nine inches of snow to much of south central and southeastern Lower Michigan, mostly during the early to mid morning hours of March 12th. This resulted in slick roads and several traffic accidents across the area. Trained weather spotters reported six inches of snow in Jackson.	Jackson
58.	2/1/2015	A low pressure system strengthened as it tracked east to near Indianapolis during the evening of February 1st, spreading a large swath of moderate to heavy snow into southern Michigan. Snowfall totals reached as high as 12 to 15 inches in the Kalamazoo and Battle Creek areas and along the I-94 corridor. A little further north around 8 to 10 inches of snow fell in Grand Rapids and along the I-96 corridor. The system also brought strong winds which caused a considerable amount of blowing and drifting snow during the afternoon through the late evening hours of February 1. Grand Rapids and Lansing both set daily snowfall records on February 1st. winds increased on the afternoon and evening of February 1st, gusting to 30 to 35 mph across Lower Michigan. The wind was a significant factor in creating blowing snow, very low visibilities, and deep drifts. Arctic air wrapped in behind the storm system and skies cleared during the early morning hours of February 2nd, resulting in low temperatures in the single digits with wind chills down to 10 to 15 degrees below zero. Twelve to eighteen inches of snow fell across Jackson county, and the combination of heavy snow and blowing and drifting snow resulted in very hazardous travel conditions.	Unspecified location Jackson County
59.	2/24/2016	A major winter storm moved into Lower Michigan on February 24 producing heavy wet snow. This snow continued into the morning hours of February 25 before ending. Total accumulations for many locations ranged from 6 to 14 inches. This caused some strain on trees with the wet snow weighing down branches, causing some scattered power outages across the region. Also, many schools and even state government offices were closed during this storm. Interstates were in better shape compared to some state highways and other secondary roads, which	City of Jackson Rives Junction

	Date	Description	Location
		in many cases were snow packed and treacherous. Eleven inches of snow was reported in Jackson and a foot of snow fell in Rives Junction. The heavy wet snow resulted in scattered power outages.	
60.	3/1/2016	A winter storm strengthened as it tracked east northeastward just south of Lower Michigan on March 1. A swath of 8-12 inches of snow, with localized amounts over a foot, fell from southwest lower Michigan into the thumb region. The winter storm featured two main rounds of heavier snow, separated by a 2-3 hour period of light freezing rain and sleet mainly south of Interstate 96. The freezing rain was enough to coat vehicles in a thin layer of ice. No significant power outages were noted. The freezing rain and sleet occurred from late morning into early afternoon as the low pressure center tracked closest to Michigan. A thin layer of warm air well above the ground was able to melt snowflakes, but surface temperatures in the lower 20s resulted in freezing rain and sleet rather than just plain rain. The atmosphere sufficiently cooled by mid afternoon and changed the precipitation back to all snow. A significant burst of heavy snow during the afternoon hours brought traffic to a crawl. This resulted in hundreds of school closings on March 1st and 2nd. Seven to eight inches of snow was reported across Jackson county. Travel conditions became very hazardous on March 1st into March 2nd due to the heavy snow.	Unspecified location
61.	12/11/2016	A low pressure system brought widespread snowfall to much of southern lower Michigan with numerous reports of 9 to 10 inches of snow. This caused numerous traffic accidents and travel delays. Around 8 to 10 inches of snow fell across Jackson County.	Jackson County
62.	2/9/2018	A low pressure system brought significant snowfall on February 9th to far southern lower Michigan, where up to around 8 to 10 inches of snow was reported from near Keeler and Paw Paw east to near Jackson along the I-94 corridor. Trained spotters reported that 8 to 9 inches of snow fell across portions of Jackson County.	Jackson County
63.	4/14/2018	A significant late season winter storm brought a mix of high winds, heavy rain, sleet and freezing rain. The highest wind gusts occurred on the 14th and heavy sleet and freezing rain developed during the early morning hours of the 15th through the early to mid afternoon hours of the 15th. Numerous accidents and slide-offs were reported across the region, including on I-94 during the early afternoon hours of the 15th. Michigan State Police requested weather conditions for an investigation into a serious head on accident on M-21 that shut the road down in both directions. Medical support from AeroMed was requested from Grand Rapids but denied due to hazardous weather conditions. Road conditions were poor in the morning into the afternoon with sleet-packed roads and ice coated roads where freezing rain was prevalent. Total ice accumulations ranged from around a tenth of an inch to about half an inch. Total sleet accumulations reached 1 to 2 inches in some areas. Numerous flights were either delayed or cancelled. A total of 450,000 customers were impacted by power outages across Michigan, with 110,000 Consumers Energy Customers being impacted. Power was restored to the majority of Consumers Power customers by the evening hours of the 15th. A quarter to four tenths of an inch of freezing rain was reported. The combination of freezing rain and strong winds caused power outages.	Unspecified location
64.	1/28/2019 – 2/2/2019	A series of heavy snowfall events began this week-long event. On Monday, January 28, much of the state faced the start of a blizzard, with snowfall ranging up to over a foot in depth as sustained winds began (with gusts up to 40 mph) and were soon accompanied by a dangerous drop in temperatures. An extremely large number of schools throughout the state were closed as a result of the snowfall, and then remained closed for most of the	Jackson County

	Date	Description	Location
		week as the combination of sustained subzero temperatures and strong winds produced dangerously low wind-chill values throughout the state. Wind-chill values below -30 degrees Fahrenheit were common throughout Michigan for multiple days, and often dipped below -40. In additional to numerous local states of emergency, non-essential State Government offices were closed for more than half a day on Monday, and for the entire day on Wednesday and Thursday. Governor Gretchen Whitmer's State of Emergency declaration took effect on January 29, anticipating the dangerous impacts of the deep freeze that had been forecast by the National Weather Service. At least three deaths were attributed to weather exposure, and special shelters and over a hundred warming centers were activated at many locations around the state. Additional hospitalizations took place, not just as a direct result of the cold, but also to treat for carbon monoxide exposures resulting from makeshift efforts to heat residents' homes. Hundreds of local and county government offices were closed for at least one or two days during the week, as well. (It should be noted that Jackson County chose to remain open.) Driving conditions were treacherous and slow. Visibility was often a problem, with white-out conditions resulting from the blizzard. On Wednesday, January 30, at 10:33am, a fire occurred at an important Consumer's Energy facility in Armada Township (Macomb County), and when the impacts of this fire were calculated to eventually lead toward natural gas shortages, the head of that major utility, followed by the Governor, appealed to both residential and industrial customers to voluntarily reduce their use of natural gas. By voluntarily reducing thermostat levels to the recommended 65 degrees or below, until the end of the day on January 31, and temporarily scaling back production activities at certain facilities, this collective effort succeeded in preventing the complete interruption of gas delivery that otherwise was expected to occur. The problem did not involve a supply of natural gas, but only the constraints that the fire had caused in the ability to deliver that gas throughout the state's network. Temporary power failures occurred in some locations, affecting thousands of residents and businesses but fortunately not lasting very long. Other midwestern states also authorized state emergency and disaster declarations during this event. By Friday, February 1, temperatures went back above zero, and Michigan's State of Emergency expired on February 2, 2019.	
65.	11/11/2019	An early season snowstorm and lake effect snow event impacted the western Great Lakes from November 11th to Tuesday November 12th. Snow totals measured in feet in the lake effect snow belts. Some locations picked up 12 to 18 inches of snow in just 12 hours! Record breaking cold temperatures followed on Tuesday enabling wind chills to drop into the single digits. While such snow totals and cold temperatures are not uncommon in Michigan during the winter months, experiencing such conditions in early November is unusual. Nine to ten inches of snow fell across much of Jackson County. Nine inches of snow was reported in Napoleon with 8 inches in Jackson.	Jackson County

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Severe Wind Events | Natural Hazards | Weather Hazards

The following table presents the history of severe wind events in Jackson County from 1956-2020.

Jackson County Severe/Strong/High Wind Events, 1956-2020

	Date	Description	Location
1.	05/11/1956	1845: Thunderstorm Wind, LAT/LON: 42°17'N / 84°17'W	Leoni
2.	05/30/1956	1435: Thunderstorm Wind, LAT/LON: 42°17'N / 84°30'W	Blackman
3.	05/14/1957	2215: Thunderstorm Wind, 50 Knots, LAT/LON: 42°17'N / 84°30'W	Blackman
4.	08/03/1958	1400: Thunderstorm Wind, LAT/LON: 42°17'N / 84°30'W	Blackman
5.	08/26/1959	1925: Thunderstorm Wind, LAT/LON: 42°23'N / 84°41'W	Springport
6.	07/22/1960	1600: Thunderstorm Wind, LAT/LON: 42°17'N / 84°30'W.	Blackman
7.	06/01/1961	1329: Thunderstorm Wind, 50 Knots, LAT/LON: 42°17'N / 84°30'W.	Blackman
8.	09/30/1961	1920: Thunderstorm Wind, 70 Knots, LAT/LON: 42°17'N / 84°30'W	Blackman
9.	08/08/1962	1715: Thunderstorm Wind, LAT/LON: 42°05'N / 84°11'W.	Norvell
10.	11/12/1965	2000: Thunderstorm Wind, 50 Knots, LAT/LON: 42°17'N / 84°24'W.	Jackson
11.	04/02/1967	1556: Thunderstorm Wind, LAT/LON: 42°17'N / 84°24'W.	Jackson
12.	06/16/1967	1700: Thunderstorm Wind, 50 Knots, LAT/LON: 42°17'N / 84°30'W.	Blackman
13.	10/24/1967	2030: Thunderstorm Wind, LAT/LON: 42°17'N / 84°30'W.	Blackman
14.	08/16/1968	1915: Thunderstorm Wind, LAT/LON: 42°17'N / 84°30'W.	Blackman
15.	04/27/1969	1930: Thunderstorm Wind, LAT/LON: 42°17'N / 84°11'W.	Grass Lake
16.	09/06/1969	1400: Thunderstorm Wind, LAT/LON: 42°05'N / 84°35'W	Hanover
17.	07/02/1970	2020: Thunderstorm Wind, 50 Knots, LAT/LON: 42°17'N / 84°30'W.	Blackman
18.	04/12/1971	0900: Thunderstorm Wind, LAT/LON: 42°12'N / 84°41'W	Concord
19.	04/12/1971	0930: Thunderstorm Wind, LAT/LON: 42°12'N / 84°11'W.	Norvell
20.	05/19/1971	1355: Thunderstorm Wind, LAT/LON: 42°17'N / 84°30'W.	Blackman
21.	06/12/1973	1200: Thunderstorm Wind, LAT/LON: 42°06'N / 84°18'W.	Columbia
22.	08/09/1973	1100: Thunderstorm Wind, 50 Knots, LAT/LON: 42°16'N / 84°28'W.	Blackman
23.	05/25/1975	1515: Thunderstorm Wind, LAT/LON: 42°11'N / 84°38'W.	Concord
24.	08/21/1975	1400: Thunderstorm Wind, LAT/LON: 42°23'N / 84°27'W.	Rives
25.	05/05/1976	1830: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W.	Jackson
26.	05/17/1977	1750: Thunderstorm Wind, 65 Knots, LAT/LON: 42°16'N / 84°28'W.	Blackman
27.	05/20/1978	1222: Thunderstorm Wind, LAT/LON: 42°24'N / 84°36'W.	Sandstone
28.	05/13/1980	1455: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W	Jackson
29.	06/01/1980	2020: Thunderstorm Wind, 52 Knots, LAT/LON: 42°14'N / 84°24'W.	Jackson
30.	07/16/1980	0607: Thunderstorm Wind, 55 Knots, LAT/LON: 42°16'N / 84°28'W.	Blackman
31.	07/20/1980	2205: Thunderstorm Wind, 52 Knots, LAT/LON: 42°10'N / 84°15'W.	Napoleon

	Date	Description	Location
32.	04/04/1981	0400: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W.	Jackson
33.	06/20/1982	1930: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
34.	06/27/1983	1445: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
35.	07/01/1983	1130: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
36.	07/17/1983	1020: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
37.	07/21/1983	1430: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
38.	07/21/1983	1624: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
39.	07/29/1983	1615: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
40.	07/29/1983	1715: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
41.	07/29/1983	1735: Thunderstorm Wind, LAT/LON: 42°09'N / 84°29'W.	Hanover
42.	07/29/1983	1815: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
43.	05/18/1984	1830: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Spring Arbor
44.	09/25/1984	1637: Thunderstorm Wind, LAT/LON: 42°05'N / 84°16'W.	Columbia
45.	06/09/1985	0130: Thunderstorm Wind, 52 Knots, LAT/LON: 42°14'N / 84°24'W.	Jackson
46.	07/05/1985	0130: Thunderstorm Wind, LAT/LON: 42°09'N / 84°29'W.	Hanover
47.	07/09/1985	2135: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Hanover
48.	09/08/1985	1600: Thunderstorm Wind, LAT/LON: 42°14'N / 84°29'W.	Hanover
49.	04/28/1986	1300: Thunderstorm Wind, LAT/LON: 42°15'N / 84°13'W	Grass Lake Village
50.	05/17/1986	1945: Thunderstorm Wind, 52 Knots, LAT/LON: 42°14'N / 84°24'W.	Jackson
51.	07/25/1986	1520: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
52.	09/26/1986	1630: Thunderstorm Wind, LAT/LON: 42°06'N / 84°15'W.	Brooklyn
53.	05/30/1987	1805: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
54.	05/30/1987	1847: Thunderstorm Wind, 50 Knots, LAT/LON: 42°14'N / 84°24'W.	Jackson
55.	06/29/1987	1615: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
56.	07/20/1987	1805: Thunderstorm Wind, 52 Knots, 1 injury, LAT/LON: 42°15'N / 84°26'W.	Jackson
57.	08/05/1988	1435: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
58.	09/19/1988	2000: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
59.	05/30/1989	1729: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
60.	09/07/1990	0100: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
61.	06/14/1991	1550: Thunderstorm Wind, 52 Knots, 1 injury, LAT/LON: 42°15'N / 84°25'W	Jackson
62.	06/15/1991	1600: Thunderstorm Wind, LAT/LON: 42°12'N / 84°33'W.	Spring Arbor
63.	07/07/1991	1805: Thunderstorm Wind, 62 Knots, LAT/LON: 42°12'N / 84°33'W.	Spring Arbor
64.	07/07/1991	1820: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W.	Jackson
65.	06/17/1992	1805: Thunderstorm Wind, 56 Knots, LAT/LON: 42°12'N / 84°29'W.	Summit
66.	06/17/1992	1838: Thunderstorm Wind, 52 Knots, LAT/LON: 42°14'N / 84°24'W.	Jackson

	Date	Description	Location
67.	06/18/1992	1345: Thunderstorm Wind, 52 knots, LAT/LON: 42°10'N / 84°15'W.	Napoleon
68.	06/28/1994	1900: Thunderstorm Winds, $1,000 property damage. In addition to a tree falling on a house, additional tree and power line damage was reported.	Unspecified
69.	07/06/1994	2115: Thunderstorm Winds, 13 Miles North East of Jackson. Numerous trees were reported down.	Waterloo
70.	11/18/1994	1200: High Winds, 62 knots, $1,000,000 property damage. High winds affected much of Michigan. Gusts of 40 to 50 mph were widespread throughout the state	Unspecified
71.	07/04/1995	1535: Thunderstorm Winds, 52 Knots, $1,000 property damage. Trees and power lines were blown down in the city of Jackson. Over 3,000 customers lost electric power around the county.	Jackson Jackson County
72.	07/05/1995	1610: Thunderstorm Winds, 52 Knots, $1,000 property damage. In the City of Jackson, large tree damage and damage to mobile homes was reported by a spotter.	Jackson
73.	07/16/1995	1630: Thunderstorm Winds, 52 Knots, $2,000 property damage. Trees and power lines were blown down in the City of Jackson. Several cars were damaged at a dealership, after one was flipped over by being pulled by the footings of a 20-foot promotional balloon that was caught in the wind and torn from its anchors.	Jackson
74.	08/15/1995	1600: Thunderstorm Winds, 52 knots. 60 MPH wind and tree damage was reported in Grass Lake by amateur radio operators.	Grass Lake
75.	07/23/1996	07:30 PM: Thunderstorm Wind at Jackson, 42°14'N / 84°24'W, 50 knots. Thunderstorm winds knocked down trees in the northern part of the City of Jackson.	Jackson
76.	07/24/1996	11:25 AM: Thunderstorm Wind, Location: 8 Miles North of Jackson, LAT/LON: 42°21'N /84°24'W, 50 knots. Thunder-storm winds blew trees down onto M-106 north of Jackson.	Rives
77.	07/24/1996	11:40 AM: Thunderstorm Wind/hail in Concord. Thunderstorm winds, combined with half inch hail, knocked down nu-merous tree limbs. (also listed in hail)	Concord
78.	07/24/1996	11:55 AM: Thunderstorm Wind at Clark Lake, LAT/LON: 42°08'N / 84°21'W, 50 knots. Thunderstorm winds knocked down tree limbs.	Columbia
79.	08/07/1996	09:00 PM: Thunderstorm Wind at Springport, LAT/LON: 42°23'N / 84°41'W, $5,000 property damage. Power lines and several large trees were downed by the wind.	Springport
80.	08/20/1996	01:15 PM: Thunderstorm Wind at Springport, LAT/LON: 42°23'N / 84°41'W, $5,000 property damage. Numerous trees and limbs were blown down.	Springport
81.	09/11/1996	02:25 PM: Thunderstorm Wind, $3,000 property damage, LAT/LON: 42°15'N / 84°36'W. Several large trees were blocking roads in and around Parma.	Parma
82.	04/06/1997	04:00 PM: High Winds, $5,000,000 property damage statewide. Sustained wind speeds of 35 to 45 mph, along with frequent wind gusts of 50 to 70 mph, were common through midnight on April 6. Winds continued to gust to gale force through 5 PM EDT on April 7. Widespread wind damage was reported across the area, but no serious injuries were reported from the storm. The winds downed trees and power lines and resulted in roof damage to area homes and businesses. Between 180,000 and 200,000 Consumers Energy customers lost power across the state on Sunday evening. Nearly 70,000 customers were still without power Monday morning at 5 AM EDT.	Unspecified

	Date	Description	Location
83.	07/08/1997	05:55 PM: Thunderstorm Winds, LAT/LON: 42°06'N / 84°33'W, $5,000 property damage. Jackson Central Dispatch reported trees uprooted along Fowler Road in Hanover Township. Local fire officials estimated thunderstorm wind gusts up to 50 mph.	Hanover
84.	07/14/1997	05:50 PM: Hail 4 Miles South East of Springport, LAT/LON: 42°21'N / 84°38'W, 0.88 inch. Strong to locally severe thunderstorms developed, with isolated reports received of up to nickel-sized hail and winds gusting to 70 mph. Downed trees and power lines cut power to approximately 48,000 Consumers Energy customers in southwest and south central Lower Michigan. No injuries were reported. Also listed under hail	Springport
85.	07/14/1997	05:50 PM: Thunderstorm Wind 4 Miles South East of Springport, LAT/LON: 42°21'N /84°38'W, 61 Knots, $10,000 property damage. Jackson County officials reported a 70 mph wind gust and nickel-sized hail 4 miles southeast of Springport in Springport and Parma Townships. Numerous trees and power lines were knocked down in the mostly rural area. Also listed under hail	Springport
86.	07/14/1997	05:59 PM: Thunderstorm Wind, LAT/LON: 42°23'N / 84°28'W, 52 Knots, $5,000 property damage. Jackson County officials reported a 60 mph wind gust in Rives Junction in Rives Township in north central Jackson County, as well as downed trees.	Rives
87.	08/16/1997	02:45 PM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, 52 knots. Jackson County Central Dispatch relayed a report of a 60 mph wind gust in the City of Jackson. Thunderstorms produced heavy rainfall amounts of 2 to 5 inches, along with isolated reports of wind damage from 60 mph thunderstorm wind gusts. Local utility companies reported approximately 55,000 power outages during the afternoon and evening across far southern Michigan, with most caused by lightning strikes, but some due to downed trees and utility poles (also listed under lightning).	Jackson
88.	08/16/1997	06:45 AM: Thunderstorm Wind, LAT/LON: 42°06'N / 84°33'W, $5,000 property damage. Downed trees were reported in Hanover	Hanover
89.	09/19/1997	04:10 PM: Thunderstorm Wind, LAT/LON: 42°15'N / 84°36'W, $10,000 property damage. Jackson County Central Dispatch reported trees and power lines down in Parma Township, as a line of severe thunderstorms moved across southwest and south central Lower Michigan, producing wind gusts to 70 mph and small hail. Trees and power lines were downed in a line from Allegan County east-southeast through Jackson County. Around 10,000 customers in this swath lost power, nearly half of which occurred in Jackson County.	Parma
	09/19/1997	At 04:20 PM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, $25,000 property damage. Jackson County Central Dispatch reported trees, power lines, and traffic lights were downed in and around the city of Jackson. A large tree limb fell across a van parked at the corner of N. Wisner and Norfolk Streets. A Consumers Energy spokesman reported that 5,000 customers had lost power across Jackson County because of the severe thunderstorms. Water was also knocked out briefly at the Jackson Water Department, which resulted in customers not having water or having reduced water pressure until backup systems could kick in.	Jackson
	09/19/1997	At 04:25 PM: Thunderstorm Wind, LAT/LON: 42°15'N / 84°16'W, $5,000 property damage. Jackson County Central Dispatch reported trees and power lines were downed in Leoni Township. Thunderstorm Wind, LAT/LON: 42°23'N / 84°15'W, $15,000 property damage. The Jackson County Sheriff's Department reported that trees and power lines were downed in Munith. One tree fell on the roof of a home and another across a vehicle in the area.	Leoni

	Date	Description	Location
	09/19/1997	At 04:30 PM: Thunderstorm Wind, LAT/LON: 42°15'N / 84°13'W, $5,000 property damage. Jackson County Central Dispatch reported that trees and power lines were down across Grass Lake Township.	Waterloo Grass Lake
	09/19/1997	At 04:35 PM: Thunderstorm Wind at Brooklyn, LAT/LON: 42°06'N / 84°15'W, $15,000 property damage. A barn under construction on Cement City Highway near Hayes Road was severely damaged.	Brooklyn Cement City
91.	09/29/1997	12:00 PM: High Wind, 42 knots. Southwest, then west winds gusted between 40 and 50 mph through much of Monday afternoon and night. Gusts reached 46 mph at Jackson County Airport Monday evening. The winds caused some trees and power lines to come down, which resulted in 35,000 power outages across the region. Felled trees blocked a few isolated roads across the area for a brief time including Woodbridge and Union Streets in Jackson. No injuries were reported. Damage estimates were not available for the event.	Blackman Jackson
92.	03/28/1998	11:00 AM: Thunderstorm Wind from 5 Miles East of Brooklyn to 5 Miles East South East of Brooklyn, Begin LAT/LON: 42°06'N / 84°09'W, End LAT/LON: 42°06'N / 84°09'W, $5,000 property damage. Jackson County Central Dispatch reported that trees and power lines were downed in Norvell Township near the intersection of Michigan Highway 124 and Wellwood Road, approximately 5 miles east of Brooklyn. A large branch from a downed tree broke the front window of a home on Wellwood Road. No injuries were reported.	Norvell
93.	05/31/1998	05:19 AM: Hail at Hanover, LAT/LON: 42°06'N / 84°33'W, 1.50 inches. Numerous sources indicated that the widespread and severe damages from a fast-moving line of thunder storms during the early morning hours of Sunday, May 31st, were caused primarily by strong straight-line winds and isolated wet microburst winds. This derecho event produced widespread 60 to 90 mph wind gusts, which caused extensive tree and structural damage and left over 861,000 homes and businesses without electricity across Michigan's Lower Peninsula. Consumers Energy reported that the derecho event was the most destructive weather event in the company's history, leaving over 600,000 of its customers without power (Consumers Energy is the largest utility company in western and mid Lower Michigan). There were 4 storm-related fatalities reported in the state and 146 injuries (mostly minor). Statewide, approximately 250 homes were destroyed, 12,250 homes damaged, 34 businesses destroyed, and 829 businesses damaged. (This was subsequently denoted as federally-declared disaster number 1226.) Damage estimates across the above listed counties totaled over $166 Million. Also listed under hail and thunderstorms.	Hanover
94.	06/24/1998	This storm resulted in several wind damage and large hail reports, and an F1 tornado touched down in north central Jackson County near Layton Corners. No injuries were reported with the tornadoes, but damage was estimated at half a million dollars across Henrietta and Waterloo Townships in northern Jackson County. At 5:05 PM: Thunderstorm Wind at Rives Junction, LAT/LON: 42°23'N / 84°27'W, $5,000 property damage. Jackson County Central Dispatch reported trees and power lines downed in the village of Rives Junction and scattered reports across Rives Township. The Waterloo State Recreation Area reported hundreds of trees uprooted, which resulted in the closing of some roads and horse trails. 5,800 were without power in the affected areas of Henrietta and Waterloo Townships. Damage was estimated at approximately $500,000. At 05:25 PM: Hail 2 Miles North of Grass Lake, LAT/LON: 42°17'N / 84°13'W, 1.75 inch. Jackson County Emergency Management reported golf ball-sized hail on Morrisey Road in Grass Lake Township, 2 miles north of the City of Grass Lake. Also listed under hail	Henrietta Waterloo Rives

	Date	Description	Location
95.	06/26/1998	01:10 AM: Thunderstorm Wind at Jackson, LAT/LON: 42°14'N / 84°24'W, 52 knots. Scattered reports of wind damage and hail were received across west central, southwest, and south central Lower Michigan, as widespread thunderstorm activity moved across Michigan's Lower Peninsula during the late evening hours of Thursday, June 25th, and early morning hours of Friday, June 26th. No injuries were reported, but an estimated 22,000 people lost power across the southern third of Michigan's Lower Peninsula, due to downed trees and power lines. Also listed under hail.	Jackson
	06/26/1998	At 01:20 AM: Thunderstorm Wind at Sandstone, LAT/LON: 42°15'N/ 84°31'W, 52 knots. Jackson County Emergency Management reported wind gusts to 60 mph in Sandstone Township along with scattered reports of trees and power lines having been felled.	Sandstone
	06/26/1998	At 12:58 AM, Thunderstorm Wind at Parma, LAT/LON: 42°15'N / 84°36'W, 52 knots. Jackson County Emergency Management reported wind gusts to 60 mph in Parma Township along with scattered reports of trees and power lines having been felled.	Parma
96.	07/21/1998	04:30 PM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W. Jackson area law enforcement reported numerous trees and power lines downed in Blackman Township and the City of Jackson. The Jackson Citizen Patriot reported that a Jackson woman was trapped when the wind dropped a large branch and live power lines over her car on Sixth Street, just north of W. Morrell. Damage to the car was minor and the woman was not injured. Over 200 power lines were downed by the storm and transformers were damaged by lightning strikes. Approximately 5,000 residents lost power in Jackson County. Damage estimates were not available. Wind gusts of 60 to 80 mph occurred across portions of the county. No injuries were reported, but power outages across southwest and south central Lower Michigan peaked at approximately 110,000.	Blackman Jackson
97.		At 06:30 AM, Thunderstorm Wind at Jackson, LAT/LON: 42°14'N / 84°24'W. The Jackson Citizen Patriot newspaper reported tree limbs and power lines down across the County. According to the Patriot, the Jackson County Road Commission reported tree limbs down on Pulaski, Lansing, Sargent, and County Farm Roads, with most of the damage north of the city of Jackson in the northern part of county. Approximately 1,500 homes lost power in the Jackson Area, including a section of N. West Avenue in the City (also listed under lightning).	Jackson County
98.	09/07/1998	02:50 AM: Thunderstorm Wind at Napoleon, LAT/LON: 42°10'N / 84°15'W, 60 knots. Large trees were down near Napoleon at 0250 and 0315, and near Brooklyn at 0310.	Napoleon
99.	11/10/1998	10:00 AM: High Wind, 87 Knots, 1 death. Winds exceeded 50 mph across the entire county, with gusts exceeding 60 mph. Over 167,000 Michigan homes were without power, and clean-up efforts were extensive.	Jackson County
100.	12/06/1998	03:10 PM: Thunderstorm Wind at Spring Arbor, LAT/LON: 42°12'N / 84°33'W, $2,000 property damage. A weather spotter reported 2 large trees down in Spring Arbor.	Spring Arbor
101.	12/06/1998	03:15 PM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, $5,000 property damage. The Jackson County Sheriff's Department reported 5 trees down in the City of Jackson.	Jackson
102.	05/17/1999	04:00 PM: Numerous trees and power lines were also brought down in the Napoleon and Clark Lake areas. A large severe weather outbreak featured numerous reports of wind gusts of 60 to 70 miles per hour that downed many trees and power lines. There were also a few reports of hail 0.75" - 1.00" in diameter. Also listed under hail	Napoleon Columbia

	Date	Description	Location
103.	07/23/1999	01:38 PM: Thunderstorm Wind, LAT/LON: 42°22'N / 84°32'W, 53 Knots, $10,000 property damage. Several trees were downed in Tompkins, during numerous rounds of strong to severe thunderstorms. Many of the thunderstorms produced gusty winds of 50 to 60 mph. At 11:10 PM: Thunderstorm Wind at Jackson, LAT/LON: 42°14'N / 84°24'W, $1,000 property damage. A large tree was downed on Comdon Road.	Tompkins Jackson
104.	07/24/1999	10:28 PM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, $10,000 property damage. Trees and a few power lines were down in Jackson. Scattered strong to severe thunderstorms developed during the afternoon and continued through the evening.	Jackson
105.	07/31/1999	01:05 PM: Thunderstorm Winds, Pleasant Lake to Grass Lake, Begin LAT/LON: 42°24'N / 84°20'W, End LAT/LON: 42°15'N / 84°13'W, 53 Knots, $10,000 property damage. Several large trees were downed near Pleasant Lake and Grass Lake.	Henrietta Grass Lake
106.	09/28/1999	06:28 PM: Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W, 53 Knots, $10,000 property damage. Thunderstorm winds knocked down several trees, and one car drove into a tree that had fallen onto a road. The thunderstorm became severe, producing pea-sized hail and wind gusts to 60 mph. also listed under hail	Jackson
107.	05/09/2000	06:50 PM: Thunderstorm Wind at Parma, LAT/LON: 42°15'N / 84°36'W, 53 Knots, $50,000 property damage. Severe thunderstorms resulted in several trees being blown down in Parma. Severe thunderstorm warnings were issued.	Parma
108.	06/21/2000	12:30 AM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, 53 Knots, $10,000 property damage. An isolated severe thunderstorm produced wind gusts estimated near 60 mph, blowing down several trees in Jackson during the early morning hours.	Jackson
109.	07/28/2000	03:04 PM: Thunderstorm Wind, LAT/LON: 42°15'N / 84°36'W, 53 Knots, $10,000 property damage. A tree was downed at the intersection of Erie and Little roads (1 mile southwest of Parma) at 3:04 p.m. Severe thunderstorm warnings were issued.	Parma
110.	06/19/2001	08:30 PM, Thunderstorm Wind, LAT/LON: 42°10'N / 84°15'W, 53 Knots, $25,000 property damage. A severe thunderstorm produced numerous reports of wind damage across Jackson county during the evening hours of the 19th. Trees were blown down in Napoleon township, and numerous trees and power lines were also blown down in the City of Jackson. Trees were also blown down in Leoni township. All of the reports of trees blown down came from Jackson County area law enforcement.	Jackson County Napoleon
	06/19/2001	08:43 PM, Thunderstorm Wind, Jackson to Leoni, Begin LAT/LON: 42°14'N / 84°24'W, End LAT/LON: 42°15'N / 84°16'W, 53 Knots, $75,000 property damage. A severe thunderstorm produced numerous reports of wind damage across Jackson County during the evening hours of the 19th. Trees were blown down in Napoleon township, and numerous trees and power lines were also blown down in the City of Jackson. Trees were also blown down in Leoni township. All of the reports of trees blown down came from Jackson County area law enforcement.	Jackson Leoni Napoleon
111.	07/29/2001	07:10 PM, Thunderstorm Wind, Parma to Spring Arbor, Begin LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°12'N / 84°33'W, 53 Knots, 25,000 property damage. A large severe weather outbreak across southern and central Lower Michigan during the late afternoon and evening hours resulted in numerous reports of downed trees and power lines, and a few reports of large hail. A 911 center in Spring Arbor (Jackson county) reported trees down in that area. Also recorded as hail.	Parma Spring Arbor

	Date	Description	Location
112.	08/28/2001	12:28 AM, Thunderstorm Wind, LAT/LON: 42°12'N / 84°33'W, 53 Knots, 20,000 property damage. An isolated severe thunderstorm blew down numerous trees in Spring Arbor. Several trees fell on power lines, causing scattered power outages.	Spring Arbor
113.	09/07/2001	07:05 PM, Thunderstorm Wind, LAT/LON: 42°06'N / 84°24'W, 53 Knots, $10,000 in property damage. In Liberty, in Jackson county, several trees were also blown down.	Liberty
114.	10/24/2001	06:05 PM, Thunderstorm Wind, LAT/LON: 42°15'N / 84°26'W, 53 Knots, 5,000 property damage. A major severe weather episode occurred across southern lower Michigan, highlighted by three supercell thunderstorms that caused extensive damage. It moved northeast between 50 and 55 m.p.h. across northwest Jackson. The storm blew down several trees and power lines but did not cause extensive damage in Jackson County.	Jackson
115.	03/09/2002	12:54 PM, High Wind, 62 Knots, 485,000 property damage. A very strong area of low pressure produced numerous reports of wind gusts over 60 m.p.h. across southern lower Michigan, with sustained winds of 30 to 40 m.p.h. High wind damage across the area ranged from downed trees and power lines to property damage.	Unspecified
116.	7/22/2002	05:40 PM, Thunderstorm Wind, LAT/LON: 42°07'N / 84°21'W, 53 Knots, 5,000 property damage. Numerous eight to ten inch diameter tree limbs were blown down and several fell down on and blocked roads in the Clark Lake area.	Columbia
117.	7/26/2002	08:24 AM, Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, 53 Knots, 20,000 property damage. An isolated severe thunderstorm during the morning in Jackson produced several high wind gusts, causing several large trees and limbs to be blown down. One large tree was blown down on a home on the west side of Jackson, and another report of a tree blown down onto a home in Jackson was received as well. Another large tree limb was blown down and blocked a road. Storm report for JACKSON County. Wind damage and large trees blown down on a home in the west side of Jackson reported by law enforcement. Large limb knocked down by gusty winds blocking a road reported by law enforcement.	Jackson
118.	8/4/2002	04:05 PM, Thunderstorm Wind, LAT/LON: 42°07'N / 84°38'W, 53 Knots, $2,000 property damage. A tree was blown down in Pulaski by a severe thunderstorm wind gust, as reported by area law enforcement.	Pulaski
119.	8/4/2002	04:30 PM, Thunderstorm Wind, LAT/LON: 42°10'N / 84°15'W, 53 Knots, $2,000 property damage. Spotters two miles west of Napoleon reported that a thunderstorm wind gust blew down one tree.	Napoleon
120.	9/10/2002	04:16 PM, Thunderstorm Wind, Parma to Jackson, Begin LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°14'N / 84°24'W, 53 Knots, $20,000 property damage. Several trees were blown down in Parma and also in Jackson by thunderstorm wind gusts, as reported by local law enforcement.	Parma Jackson
121.	10/04/2002	04:25 PM, Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, 53 Knots, $15,000 property damage. Several power lines and trees were blown down in Jackson and also about five miles south of Jackson.	Jackson
122.	3/28/2003	432 PM, Thunderstorm Wind, Jackson to Brooklyn, Begin LAT/LON: 42°14'N / 84°24'W, End LAT/LON: 42°06'N / 84°15'W, 52 Knots, $25,000 property damage. Numerous trees were blown down across Jackson county, and two large trees were uprooted two miles west of Brooklyn.	Brooklyn Columbia Jackson
123.	4/20/2003	Storm report: JACKSON County has wind damage and trees and limbs down and some are one foot in diameter. NWS reported a number of trees and road signs downed as it passed through JACKSON County.	Unspecified location

	Date	Description	Location
124.	6/28/2003	04:38 PM, Thunderstorm Wind, Pulaski to Jackson, LAT/LON: 42°07'N / 84°38'W, End LAT/LON: 42°14'N / 84°24'W, 53 Knots, $15,000 property damage. Several trees were blown down in Pulaski, Spring Arbor, and Jackson.	Pulaski Spring Arbor Jackson
	6/28/2003	05:05 PM, Thunderstorm Wind, LAT/LON: 42°10'N / 84°15'W, 53 Knots, $5,000 property damage. Severe thunderstorm wind gusts blew down several trees in Napoleon.	Napoleon
125.	7/8/2003	01:00 PM, Thunderstorm Wind, Brooklyn, LAT/LON: 42°06'N / 84°15'W, 53 Knots, $15,000 property damage. Several trees were blown down and some fell across and blocked roads in Norvell township.	Brooklyn Norvell
	7/8/2003	12:30 PM, Thunderstorm Wind, LAT/LON: 42°07'N / 84°38'W, 53 Knots, $15,000 property damage. Numerous trees were blown down across Pulaski and Concord townships	Pulaski Concord
126.	7/21/2003	01:50 AM, Thunderstorm Wind, 53 Knots, LAT/LON: 42°14'N / 84°24'W, $30,000 property damage. Law enforcement in Jackson reported that several trees and power lines were blown down.	Jackson
127.	8/1/2003	01:38 PM, Thunderstorm Wind, 67 Knots, $20,000 property damage. A 77- m.p.h. wind gust was recorded in the City of Jackson.	Jackson
128.	8/2/2003	Storm report: 77 mph wind gusts in JACKSON County.	Unspecified
129.	11/12/2003- 11/13/2003	High wind warnings issued for JACKSON	Jackson
130.	3/5/2004	High wind warning for JACKSON 1121, High wind warning issued for JACKSON – West winds of 40 mph or greater, or gusts of 58 mph or stronger are likely. 1530, High wind warning issued for JACKSON. West winds 25-35 mph with gusts to 60 mph.	Jackson
131.	5/9/2004	06:30 PM: Thunderstorm Wind, Spring Arbor to Hanover, Begin LAT/LON: 42°12'N / 84°33'W, End LAT/LON: 42°06'N / 84°33'W, 53 Knots, 20,000 property damage, 5,000 crop damage. One tree was blown down in Spring Arbor, Brooklyn and Hanover.	Spring Arbor Hanover Brooklyn
132.	6/14/2004	01:40 PM, Thunderstorm Wind, Jackson to Brooklyn, Begin LAT/LON: 42°14'N / 84°24'W, End LAT/LON: 42°06'N / 84°15'W, 53 Knots, $10,000 property damage. The general public reported a couple of trees were blown down one mile east of Brooklyn and two miles south of Jackson.	Jackson Brooklyn
133.	7/6/2004	10:45 PM, Thunderstorm Wind, LAT/LON: 42°11'N / 84°38'W, 53 Knots, $5,000 property damage. A storm chaser in Jackson County reported that several trees were blown down along M-60 one mile east of Concord.	Concord
134.	10/30/2004	11:00 AM, High Wind, 59 Knots, $1,200,000 property damage. Law enforcement from all the counties in our area reported scattered downed trees and power lines due to gusty winds. Wind gusts of around 58 to 60 m.p.h. were estimated across our area based on all the reports. The wind knocked out power to about 100,000 people statewide.	Unspecified
135.	5/13/2005	04:25 PM, Thunderstorm Wind, LAT/LON: 42°12'N / 84°33'W, 53 Knots, $5,000 property damage. A severe thunderstorm produced an estimated wind gust to 60 m.p.h. in Spring Arbor which blew down numerous trees.	Spring Arbor
136.	6/5/2005	06:00 PM, Thunderstorm Wind, Parma to Springport, Begin LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°23'N / 84°41'W, 52 Knots, $10,000 property damage. A large severe weather outbreak occurred across our area resulting in numerous downed tree limbs and power lines, many reports of large hail and many reports of downed power lines.	Parma Springport

	Date	Description	Location
		Several trees were blown down across area roads. There were several reports of three quarters to inch diameter hail and estimated wind gusts to 60 m.p.h. also listed as hail	
137.	6/30/2005	07:35 PM, Thunderstorm Wind at Parma, End LAT/LON: 42°15'N / 84°36'W, 52 Knots, $10,000 property damage	Parma
138.	6/30/2005	09:20 AM, Thunderstorm Wind, Parma to Jackson, Begin LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°14'N / 84°24'W, 52 Knots, $10,000 property damage. Twelve trees were blown down in and near Parma.	Parma Jackson
139.	7/4/2005	05:15 PM, Thunderstorm Wind at Brooklyn, LAT/LON: 42°06'N / 84°15'W, 53 Knots, $10,000 property damage. Three trees greater than one foot in diameter were uprooted in Brooklyn.	Brooklyn
140.	7/25/2005	10:04 PM, Thunderstorm Wind, 53 Knots, LAT/LON: 42°06'N / 84°33'W, $25,000 property damage. A large severe weather outbreak occurred and produced numerous reports of wind damage, one tornado and one isolated hail report. As a result of severe thunderstorm wind gusts, there were numerous reports of wind damage including downed trees, limbs, and power lines across the area. Also listed as hail	Hanover
141.	5/30/2006	02:08 PM: Thunderstorm Wind, LAT/LON: 42°07'N / 84°38'W, 52 Knots, $10,000 property damage, $5,000 crop damage. The public reported numerous trees blown down one mile north of Pulaski in Jackson County.	Pulaski
142.	06/21/2006	04:10 PM, Thunderstorm Wind, LAT/LON: 42°11'N / 84°38'W, 52 Knots, $10,000 property damage. Law enforcement in Jackson reported several trees were blown down one mile south of Concord.	Concord
143.	06/21/2006	05:30 PM, Thunderstorm Wind, Pulaski to Hanover, Begin LAT/LON: 42°07'N / 84°38'W, End LAT/LON: 42°06'N / 84°33'W, 52 Knots, $20,000 property damage. Several trees were blown down in Pulaski and near Hanover.	Pulaski Hanover
144.	06/21/2006	08:54 PM, Thunderstorm Wind, LAT/LON: 42°15'N / 84°36'W, 52 Knots, $15,000 property damage. Several trees were blown down two miles east of Parma.	Parma
145.	07/17/2006	10:00 PM: Thunderstorm Wind, LAT/LON: 42°14'N / 84°24'W, 53 Knots, $25,000 property damage, $5,000 crop damage. Numerous trees were blown down across the City of Jackson.	Jackson
146.	5/15/2007	17:18 PM, Thunderstorm Wind 1 Mile North East of Pleasant Lake, LAT/LON: 42°24'N/84°19'W, 50 Knots, $10,000 property damage. EVENT NARRATIVE: A combination of six trees and large limbs were blown down on a golf course one mile northeast of Pleasant Lake in Jackson County. EPISODE NARRATIVE: Severe storms produced several reports of large hail and high winds which brought down several trees and branches in Jackson County. Also listed under hail.	Henrietta
147.	6/02/2007	18:15 PM, Thunderstorm Wind 3 Miles West North West of Pleasant Lake, LAT/LON: 42°25'N/84°23'W, 52 Knots, $20,000 property damage. EVENT NARRATIVE: Multiple trees and power lines were blown down along the Jackson County line. EPISODE NARRATIVE: Severe storms affected much of southwestern lower Michigan, resulting in several reports of large and numerous reports of wind damage. Also listed under hail. JACKSON, at 1915, a thunderstorm wind gust of 60 mph was reported 3 miles southeast of Leslie, with multiple trees and limbs down along the Ingham/Jackson county line.	Henrietta
148	06/07/2007	11:10 AM, Strong Wind, 43 Knots, $15,000 property damage. EVENT NARRATIVE: Non convective thunderstorm wind gusts brought down several trees and power lines. EPISODE NARRATIVE: High Winds not related to thunderstorms brought down several trees and power lines and also caused damage to some area buildings.	Unspecified

	Date	Description	Location
149.	08/7/2007	Severe Thunderstorm Warnings issued for JACKSON. JACKSON, at 1919, thunderstorm wind damage was reported by county dispatch, with mature healthy large tree branches blown down near Pulaski and Howard. 18:19 PM, Thunderstorm Wind 1 Mile West of Pulaski, LAT/LON: 42°07'N / 84°38'W, 50 Knots, $5,000 property damage. EVENT NARRATIVE: County dispatch reported that mature healthy large tree branches were blown down near the intersection of Pulaski and Howard. EPISODE NARRATIVE: An isolated severe thunderstorms brought down large tree limbs and branches in Jackson county.	Pulaski
150.	8/23/2007	18:25 PM, Thunderstorm Wind 1 Mile North of Jackson, LAT/LON: 42°14'N / 84°24'W, 50 Knots, $100,000 property damage. EVENT NARRATIVE: Numerous trees were blown down throughout the county. EPISODE NARRATIVE: A large severe weather event unfolded on August 23rd and resulted in numerous reports of wind damage.	Blackman
151.	8/29/2007	16:28 PM, Thunderstorm Wind 1 Mile West of Springport to 2 Miles North, North West of Woodlawn Orchards, Begin LAT/LON: 42°22'N / 84°42'W, End LAT/LON: 42°16'N / 84°21'W, 50 Knots, $15,000 property damage. EVENT NARRATIVE: Several trees were blown down in Springport. A couple of trees were also blown down near Jackson. EPISODE NARRATIVE: Severe thunderstorms produced widespread wind damage with numerous reports of downed trees and power lines across far southern lower Michigan.	Springport Jackson
	8/29/2007	16:48 PM, Thunderstorm Wind 1 Mile West of Springport, LAT/LON: 42°22'N / 84°42'W, 50 Knots, $3,000 property damage. EVENT NARRATIVE: Two trees were blown down in Springport. EPISODE NARRATIVE: Severe thunderstorms produced widespread wind damage with numerous reports of downed trees and power lines across far southern lower Michigan.	Springport
152.	10/18/2007	21:04 PM, Thunderstorm Wind 1 Mile East of Springport, LAT/LON: 42°22'N / 84°39'W, 52 Knots, $5,000 property damage. EVENT NARRATIVE: A few trees were blown down by wind gusts estimated at 60 mph. EPISODE NARRATIVE: A late season severe weather outbreak occurred on October 18th.	Springport
	10/18/2007	23:02 PM, Thunderstorm Wind 2 Miles East of Rives Junction, LAT/LON: 42°22'N / 84°25'W, 52 Knots, 5,000 property damage. EVENT NARRATIVE: Several trees were blown down by wind gusts estimated at 60 mph. EPISODE NARRATIVE: A late season severe weather outbreak occurred on October 18th.	Rives
	10/18/2007	23:08 PM, Thunderstorm Wind 1 Mile North West of Tompkins Center, LAT/LON: 42°22'N / 84°32'W, 52 Knots, $5,000 property damage. EVENT NARRATIVE: Several trees were blown down by wind gusts estimated at 60 mph. EPISODE NARRATIVE: A late season severe weather outbreak occurred on October 18th.	Tompkins
153.	12/23/2007	06:30 AM, Thunderstorm Wind 1 Mile North of Jackson, LAT/LON: 42°14'N / 84°24'W, 52 knots. EVENT NARRATIVE: A trained spotter reported a 52 knot wind gust in Jackson. EPISODE NARRATIVE: A narrow line of rain with embedded thunderstorms just ahead of an arctic cold front produced high wind gusts ranging from 50 to 78 mph. This resulted in widespread power outages and reports of wind damage across central and southern lower Michigan.	Blackman Jackson
154.	1/7/2008	21:54 PM, Thunderstorm Wind 2 Miles North, North East of Horton, LAT/LON: 42°10'N /84°30'W, 52 Knots, $2,000 property damage. EVENT NARRATIVE: One tree was blown down near the intersection of Reynolds and Horton roads three miles southeast of Spring Arbor. EPISODE NARRATIVE: A rare mid winter severe weather event occurred and resulted in several reports of high winds and large hail. There were few reports of damage associated with the severe weather. A tree was blown down just southeast of Spring Arbor. Also listed under hail	Hanover Spring Arbor

	Date	Description	Location
155.	6/6/2008	17:45 PM, Thunderstorm Wind 1 Mile North West of Spring Arbor, LAT/LON: 42°12'N / 84°33'W, 52 knots. EVENT NARRATIVE: Law enforcement reported that a couple of trees were blown down. EPISODE NARRATIVE: Severe thunderstorm wind gusts resulted in several reports of significant wind damage. Several reports of large hail were also received. Also listed under hail	Spring Arbor
156.	6/8/2008	15:34 PM, Thunderstorm Wind 1 Mile West of Pleasant Lake, LAT/LON: 42°24'N / 84°21'W, 70 knots. EVENT NARRATIVE: A trained spotter reported an estimated wind gust to 80 mph between Rives and Pleasant Lake.	Henrietta Rives
	6/8/2008	15:40 PM, Thunderstorm Wind 1 Mile South of Leoni, LAT/LON: 42°14'N / 84°16'W, 52 knots. EVENT NARRATIVE: The public reported that trees were blown down and that a tree and some debris were lifted up into the air.	Leoni
	6/8/2008	15:48 PM, Thunderstorm Wind, LAT/LON: 42°10'N / 84°15'W, 52 knots. EVENT NARRATIVE: Several trees were blown down around Napoleon.	Napoleon
157.	6/26/2008	14:39 PM, Thunderstorm Wind 5 Miles North West of Concord, LAT/LON: 42°13'N /84°42'W, 52 knots. EVENT NARRATIVE: One tree was blown down. EPISODE NARRATIVE: A round of severe thunderstorms resulted in several reports of strong to severe thunderstorm wind gusts which downed several trees.	Concord
	6/26/2008	14:39 PM, Thunderstorm Wind 4 Miles South, South East of Devereaux, LAT/LON: 42°16'N / 84°40'W, 52 knots.	Parma
	6/26/2008	14:39 PM, Thunderstorm Wind 1 Mile South West of South Jackson, LAT/LON: 42°09'N / 84°24'W, 52 knots.	Spring Arbor
	6/26/2008	14:40 PM, Thunderstorm Wind 1 Mile North West of Minard, LAT/LON: 42°20'N / 84°33'W, 52 knots.	Spring Arbor
	6/26/2008	14:40 PM, Thunderstorm Wind 2 Miles South West of South Jackson, LAT/LON: 42°09'N / 84°25'W, 52 knots.	Spring Arbor
	6/26/2008	14:46 PM, Thunderstorm Wind 2 Miles South East of Tompkins Center, LAT/LON: 42°21'N / 84°30'W, 52 knots.	Tompkins
	6/26/2008	18:04 PM, Thunderstorm Wind 1 Mile North of Brooklyn, LAT/LON: 42°06'N / 84°15'W, 52 knots. EVENT NARRATIVE: A trained spotter in Brooklyn reported that the entire village was without power due to blown down power lines.	Columbia
158.	7/16/2008	20:53 PM, Thunderstorm Wind 1 Mile North West of Rives Junction, LAT/LON: 42°23'N / 84°27'W, 52 knots. EVENT NARRATIVE: Law enforcement in Jackson county reported that a couple of trees were blown down. One was blown down on Spring Court and another was blown down near Zion Road and East Berry Road. EPISODE NARRATIVE: Numerous severe thunderstorms across southwest Michigan resulted in wind damage and large hail. Also listed under hail	Rives
159.	12/28/2008	04:00 AM, High Wind, 52 knots. EVENT NARRATIVE: Wind gusts up to 60 mph brought down several trees and power lines. EPISODE NARRATIVE: A strong low pressure system produced very windy conditions across southwestern lower Michigan on December the 28th. The highest wind gusts occurred mainly before sunrise, however very gusty conditions persisted well into the afternoon. Hundreds of thousands of people across the state lost power at least temporarily due to high winds.	Unspecified
160.	4/25/2009	12:04 PM, Thunderstorm Wind, 53 knots. EVENT NARRATIVE: A wind gust of 61 mph was measured by the ASOS at the Jackson County Airport. An NWS storm survey team did not find any damage beyond a few small branches down in areas adjacent to the airport or in the city of Jackson itself. Severe storms developed ahead of a cold front that swept across Michigan during the afternoon and evening hours.	Blackman Jackson

	Date	Description	Location
	4/25/2009	16:30 PM, Thunderstorm Wind 1 Mile West of Munith, LAT/LON: 42°22'N / 84°16'W, 50 knots. EVENT NARRATIVE: Roughly a 1 by 2 mile area of widely scattered tree damage was observed about two miles west-northwest of Tompkins.	Tompkins
	4/25/2009	16:30 PM, Thunderstorm Wind 1 Mile North West of Parma to 3 Miles South, South West of Munith, LAT/LON: 42°15'N / 84°36'W, End LAT/LON: 42°20'N / 84°16'W, 50 knots. EVENT NARRATIVE: Widely scattered tree damage was observed from about one mile west of Parma to 18 miles east-northeast of Parma. The swath was 2 to 3 miles wide. Other than tree damage a highway billboard was blown down on Interstate-94 just outside of Parma. Several eyewitnesses were interviewed to confirm that damage was from second storm.	Parma
	4/25/2009	16:40 PM, Thunderstorm Wind 1 Mile East South East of Pleasant Lake to End Location: 7 Miles North of Waterloo, Begin LAT/LON: 42°24'N / 84°18'W, End LAT/LON: 42°27'N / 84°08'W, 53 knots. EVENT NARRATIVE: Scattered to widely scattered tree damage occurred including occasional uprooted trees along a 9 mile stretch from 2 miles west southwest of Pleasant Lake to 2.5 miles southwest of Stockbridge. The damage swath was 4 to 6 miles wide. A measured 53 knot gust with pea sized hail occurred just north of Batteese Lake. The damage crossed into extreme southeast Ingham County at 42.4284 north latitude and 84.2094 west longitude. The damage continued east-northeast to at least the Livingston County line. Also listed under hail	Henrietta
161.	8/9/2009	19:09 PM, Thunderstorm Wind, 5 Miles North, North West of Jackson Airport to 5 Miles North East of Jackson Airport, Begin LAT/LON: 42°20'N / 84°30'W, End LAT/LON: 42°19'N / 84°24'W, 55 knots. EVENT NARRATIVE: A roof section was partially peeled off of Kidder Middle School. Approximately three dozen trees were blown down. EPISODE NARRATIVE: Severe thunderstorms developed across west central lower Michigan ahead of a cold front during the late afternoon hours of August 9th. An area of thunderstorms developed south and east of Grand Rapids and produced wind damage in eastern Ingham county along Interstate-96 near Webberville and in central Jackson county. A severe storm just northwest of Jackson a few miles from the Interstate 94 and U.S. - 127 interchange produced 70 mph wind gusts that peeled part of the roof off of Kidder Middle School as well as damaging as many as 100 trees. The storm produced damaging wind gusts over a 5 mile long and up to 1.75 mile wide path.	Blackman Henrietta
162.	6/23/2010	Law enforcement from Jackson county reported that several trees were blown down by a severe thunderstorm during the mid evening hours of June 23rd. Jackson County central dispatch reported that several trees were blown down across portions of the county. Very heavy rainfall also caused some street flooding in Napoleon and Vandercook Lake.	South Jackson
163.	7/15/2010	Portions of southwestern Lower Michigan were affected by strong to severe thunderstorms during the afternoon and early evening hours of July 15th. A few isolated storms began to develop between 1 and 2 pm in a line from near Grand Rapids to Big Rapids. These storms expanded into a more solid line of storms as it reached a Clare to Ionia county line. The storms were responsible for injuries to four teens that were struck by lightning near Vestaburg in Montcalm county. The storms increased in intensity as they reached Gratiot county, and produced some wind damage in the form of trees and powerlines down in the vicinity of Alma. Trained spotters reported that tree limbs and power lines were blown down four miles south southwest of Leslie. Power lines were also blown down across Kennedy road in Henrietta township.	Rives Junction

	Date	Description	Location
164.	7/29/2011	Severe thunderstorms developed during the late night hours producing wind gusts of over 60 mph across portions of Van Buren, Kalamazoo, Calhoun and Jackson counties. Broadcast media reported that aluminum siding was torn off of a house by estimated 50 to 60 mph wind gusts.	Unspecified
165.	8/24/2011	Severe thunderstorms developed during the early to mid evening hours across portions of Kalamazoo, Calhoun and Jackson counties resulting in scattered downed trees and power lines from estimated wind gusts to 60 mph. Law enforcement from Jackson county reported several downed trees and power lines from Tompkins to Rives Junction and Henrietta.	Rives Junction
166.	9/3/2011	A line of severe thunderstorms struck from Muskegon to Newaygo and Isabella counties on the morning of September 3rd. A National Weather Service storm survey found a 40 mile path of intermittent downburst wind damage, with winds estimated to be from 40 to 70 mph. Several trees were downed at around 8:35 a.m. in the southern part of the town of Newaygo. Scattered tree damage continued to Croton Dam. After a brief break, damage resumed near Morley in southern Mecosta County and continued to Remus in eastern Mecosta County where scattered trees and large limbs were downed. The most concentrated area of damage occurred in western Isabella County just northeast of Millbrook, where peak winds were estimated at 70 mph around 9:55 a.m. A tree fell on a house and roofs were damaged on an outbuilding and a trailer home. Strong to severe thunderstorms struck Calhoun and Jackson Counties in the early evening. One inch diameter hail fell near Leroy in Calhoun County and several trees were downed along the path of the storms. Several large tree limbs were blown down near Brooklyn and Horton in southern Jackson County.	Brooklyn Horton
167.	7/5/2012	Severe thunderstorms during the early morning hours of July 5th resulted in numerous reports of damaging wind gusts. Several trees were blown down across portions of Jackson County.	Jackson County
168.	7/6/2012	Isolated severe storms produced isolated damaging wind gusts across portions of Ingham and Jackson counties. Law enforcement reported about twenty trees blown down and a few power outages.	Jackson County
169.	7/27/2013	Damaging wind gusts occurred due to an isolated severe thunderstorm that impacted portions of Jackson county. A couple of trees were blown down by an isolated severe thunderstorm.	Jackson County
170.	9/11/2013	Microburst straight line wind damage impacted downtown Albion on September 11th, where maximum winds were estimated at 70 to 80 mph. The worst damage occurred along a path one and three quarters mile long and up to a half a mile wide where numerous trees and power lines were blown down. Albion college was shut down for several days due to all the wind damage and lack of power. Isolated damaging wind gusts from severe storms were reported elsewhere during the late afternoon hours of September 11th, and there was also an isolated severe storm that produced one inch diameter hail. Isolated trees and limbs were blown down in southern Jackson county.	Jackson County
171.	11/17/2013	A very strong low pressure system continued to intensify as it moved northeast across the Great Lakes region November 17th and 18th. The system brought a round of severe thunderstorms during the afternoon hours of Sunday the 17th, followed by very strong winds in the 60 to 80 mph range Sunday evening and Sunday night. Some of the strongest winds occurred between 8 pm and midnight on the 17th. South Haven had a peak wind gust of 77 mph and a 63 mph gust was recorded at Grand Rapids. This caused hundreds of thousands of power outages across lower Michigan as numerous trees, limbs and power lines were blown down. In some of the more rural areas, power was not restored	Jackson County

	Date	Description	Location
		for four to five days after the storm. Wind gusts of 60 to 70 mph across Jackson county resulted in thousands of power outages.	
172.	4/16/2012	A strong low pressure system moved across the northern Great Lakes region on April 16th, resulting in numerous wind gusts in the 45 to 55 mph range across Lower Michigan. A woman was killed when a tree fell on the van she was driving in two miles northeast of Bloomingdale in Van Buren county. A carnival ride was blown down in Jackson. A peak wind gust of 55 mph was measured at the Kalamazoo International Airport and also two miles south of Holland. A trained spotter estimated peak winds to around 45 mph in Jackson that brought down a carnival ride at Jackson Westwood Mall. No injuries were reported.	Jackson
173	7/27/2014	A cold front triggered development of severe thunderstorms with numerous reports of large hail and wind damage during the afternoon and early evening hours of July 27th. Hail up to two inches in diameter was reported in northern Kalamazoo county. Numerous trees were blown down in Rives and Parma townships.	Rives Parma
174.	6/22/2015	A NWS storm survey confirmed that an EF-1 tornado struck Portland in Ionia county between 1:30 pm and 1:36 pm. It had peak winds of 110 mph with a path length a little over 4 miles. The path width was 50 to 100 yards. Three churches incurred heavy damage and dozens of trees were uprooted and snapped. There were 5 minor injuries and no fatalities. Multiple homes had significant roof damage and a baseball field was heavily damaged. It was estimated that the tornado caused 3.2 million dollars in damage. Severe thunderstorms also produced several reports of damaging wind gusts. Several trees and power lines were blown down in and near Jackson.	Jackson
175.	8/14/2015	There were several reports of large hail of around an inch to an inch and a quarter in diameter on August 14th. Isolated wind damage also occurred across portions of Kalamazoo and Jackson counties, were several trees were blown down. Jackson county dispatch reported that several trees were blown down across portions of the county.	Jackson County
176.	7/12/2016	Scattered severe storms developed during the late afternoon and evening hours of July 12th, resulting in wind damage that included numerous downed tree branches and several blown down trees in Kentwood and East Grand Rapids. Severe thunderstorm winds brought down numerous trees and limbs, some of which fell on homes, cars and power lines.	Jackson Airport, Reynolds Field
177.	11/18/2016	An isolated severe thunderstorm produced wind gusts of up to 80 mph in Jackson, resulting in downed trees and limbs and numerous power outages. At one point close to 8,000 people lost power in Jackson during the evening hours of November 18th. An isolated severe thunderstorm produced wind gusts up to 80 mph in Jackson. A 69 knot measured wind gust was reported at the Jackson airport. This resulted in numerous downed trees and limbs and power lines.	Jackson Airport, Reynolds Field
178.	3/8/2017	Widespread non thunderstorm wind gusts of 60 to 70 mph caused hundreds of thousands of people to lose power on March 8th. At one point slightly over one million people were without power in Michigan. The winds caused numerous trees and tree limbs to fall and downed thousands of power lines. The winds also caused damage to many homes and numerous homes incurred significant roof damage. Two people were killed in central lower Michigan in Clare county near the Osceola and Clare county line when a large tree fell on their vehicle while they were driving on M-115 in Freeman township. A peak wind gust of 62 mph was measured at the Jackson county Reynolds field airport in Jackson. Peak wind gusts in the 60 to 70 mph range resulted in numerous downed trees and limbs and power lines and widespread power outages.	Jackson Airport, Reynolds Field

	Date	Description	Location
179.	5/2/2018	Isolated severe thunderstorms produced several reports of large hail of up to one and three quarters inches in diameter and isolated damaging wind gusts. An estimated wind gust to 60 mph was reported by the public just west of Jackson.	Sandstone
180.	8/6/2018	Isolated severe thunderstorm wind gusts brought down several trees and power lines across portions of Calhoun and Jackson counties. The Jackson county 911 call center reported that 3 trees were blown down in Spring Arbor and 1 was blown down in Concord.	Spring Arbor
181.	2/24/2019	A high wind event occurred with wind gusts reaching the 55 to 65 mph range that resulted in the loss of power to around a million people on the 24th into the 25th. In Kent County alone over 280,000 people lost power. Over a hundred thousand people lost power across Kalamazoo County. Downed tree limbs and power lines and widespread power outages occurred due to wind gusts of up to around 60 mph.	Jackson County
182.	6/1/2019	There were numerous reports of large hail as well as a little bit of wind damage in association with severe thunderstorms on June 1st. Law enforcement reported that several trees and power lines were blown down in the Pleasant Lake area.	Henrietta
183.	7/29/2019	Isolated severe storms produced sporadic wind damage in the form of a few downed trees and power lines. Several trees and power lines were blown down.	Greenbrier
184.	6/10/2020	Severe storms moved across southern Lake Michigan and into west central and southwest lower Michigan during the late morning hours of June 10th. There were numerous reports of peak wind gusts in the 65 to 75 mph range that brought down trees, tree limbs, power lines and caused numerous power outages. A peak wind gust to 62 mph was reported at Jackson Reynolds field. There were several reports of power outages and downed trees.	Jackson Airport, Reynolds Field

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Tornadoes | Natural Hazards | Weather Hazards

The following table provides a history of tornados in Jackson County from 1954-2020.

Jackson County Tornado Events, 1954-2020

	Date	Description	Location
1.	06/19/1954	1600: Tornado, LAT/LON: 42°12'N / 84°21'W, F0, $3,000 property damage.	Napoleon
2.	08/06/1955	1700: Tornado, Begin LAT/LON:, 42°06'N / 84°20'W, End LAT/LON:, 42°09'N / 84°11'W, Length:, 7.90 Miles, Width:, 300 Yards, F2, $3,000 property damage.	Columbia Norvell
3.	06/15/1960	1730: Tornado, Begin LAT/LON: 42°15'N / 84°20'W, End LAT/LON: 42°15'N / 84°13'W, Length: 5.60 Miles, Width: 33 Yards, Magnitude: F2, $25,000 property damage.	Leoni Grass Lake
4.	07/04/1969	2310: Tornado, LAT/LON: 42°18'N / 84°20'W, Length: 0.30 Mile, Width: 27 Yards, Magnitude: F1, Injuries: 11, Property Damage: $25,000.	Leoni
5.	05/30/1972	1025: Tornado, LAT/LON: 42°15'N / 84°16'W, Length: 1.10 Miles, Width: 17 Yards, Magnitude: F1, $2,500 property damage.	Grass Lake

	Date	Description	Location
6.	04/03/1974	1900: Tornado, Begin LAT/LON: 42°05'N / 84°24'W, End LAT/LON: 42°07'N / 84°22'W, Length: 1.30 Miles, Width: 440 Yards, Magnitude: F2, Property Damage: $25,000.	Columbia
7.	03/12/1976	1645: Tornado, LAT/LON: 42°04'N / 84°30'W, End LAT/LON: 42°05'N / 84°28'W, Magnitude: F2, Property Damage: $250,000.	Hanover, Liberty
8.	03/12/1976	1650: Tornado, LAT/LON: 42°11'N / 84°15'W, Length: 2.00 Miles, Width: 90 Yards, Magnitude: F2, Property Damage: $250,000.	Napoleon
9.	05/20/1978	1215: Tornado, LAT/LON: 42°22'N / 84°31'W, Length: 0.70 Mile, Width: 70 Yards, Magnitude: F0, Property Damage: $300.	Tompkins
10	07/28/1979	1800: Tornado, LAT/LON: 42°22'N / 84°20'W, Length: 0.20 Mile, Width: 17 Yards, Magnitude: F0	Henrietta
11.	05/30/1980	2125: Tornado, LAT/LON: 42°13'N / 84°36'W, Length: 1.90 Miles, Width: 17 Yards, Magnitude: F0, Property Damage: $ 2,500.	Spring Arbor
12.	06/15/1982	1457: Tornado, Begin LAT/LON: 42°21'N / 84°22'W, End LAT/LON: 42°24'N / 84°08'W, Length: 10.00 Miles, Width: 500 Yards, Magnitude: F3, Fatalities: 1, Injuries: 1, Property Damage: $ 2,500,000.	Henrietta Waterloo
13.	06/02/1990	1930: Tornado, LAT/LON: 42°06'N / 84°33'W, Length: 0.50 Mile, Width: 20 Yards, Magnitude: F1, Property Damage: $ 25,000.	Hanover
14.	06/14/1991	1555: Tornado, LAT/LON: 42°25'N / 84°22'W, Length: 1.00 Mile, Width: 30 Yards, Magnitude: F1, Injuries: 1, Property Damage: $25,000.	Henrietta
15.	06/24/1998	05:04 PM: Funnel Cloud 6 Miles North of Jackson. Jackson County Emergency Management reported a funnel cloud near the intersection of Lansing Ave. and Maple Grove Road in southern Rives Township, approximately 6 miles north of the city of Jackson. Scattered severe thunderstorms were characterized by several large hail reports, including golf-ball sized hail reports received from Jackson County and hail of 2 to 3 inches in diameter associated with a supercell thunderstorm as it tracked east-southeast across southern Ingham and northern Jackson County. This supercell thunderstorm developed over eastern Barry County and tracked across Eaton County, southwest Ingham County, and northern Jackson County. This storm resulted in several wind damage and large hail reports, and an F1 tornado touched down in north central Jackson County near Layton Corners. No injuries were reported with the tornadoes, but damage was estimated at half a million dollars across Henrietta and Waterloo Townships in northern Jackson County. At 5:05 PM: Thunderstorm Wind at Rives Junction, LAT/LON: 42°23'N / 84°27'W, $5,000 property damage. Jackson County Central Dispatch reported trees and power lines downed in the village of Rives Junction and scattered reports across Rives Township. At 05:06 PM: Tornado from 3 Miles East of Rives Junction to Waterloo, Begin LAT/LON: 42°23'N / 84°23'W, End LAT/LON: 42°21'N / 84°08'W, Length: 11.30 Miles, Width: 50 Yards, Magnitude: F1, $500,000 property damage. The Jackson County Emergency Management Coordinator confirmed that a weak tornado had touched down just west of Layton Corners, in rural eastern Rives Township, and traveled east-southeast to near Waterloo, along the Washtenaw County line. The tornado was not on the ground for the entire 11.3 mile path, but due to the heavily wooded rural areas it traversed, exact path lengths could not be determined. Path width was narrow, estimated to be 50 yards at most. No injuries or deaths were associated with this F1 tornado. Damage consisted of downed trees and power	Rives Henrietta Waterloo

	Date	Description	Location
		lines, roof damage to approximately 12 homes, minor structural damage (broken windows, damaged siding, damaged vehicles and aluminum campers—mainly caused by large hail), fallen trees, and overturned boats on Pleasant Lake in Henrietta Township. Hail was estimated to have reached 2 to 3 inches in diameter in association with this tornadic storm. The most significant damage was reported around the Pleasant Lake area, where several boats were overturned and several homes reported minor to moderate structural damage. Along North Meridian Road from near Layton Corners along the west end of Pleasant Lake, 2 homes reported destroyed garages. Pleasant Lake County Park was closed due to downed trees. The Waterloo State Recreation Area reported hundreds of trees uprooted, which resulted in the closing of some roads and horse trails. 5,800 were without power in the affected areas of Henrietta and Waterloo Townships. Damage was estimated at approximately $500,000. At 05:25 PM: Hail 2 Miles North of Grass Lake, LAT/LON: 42°17'N / 84°13'W, 1.75 inch. Jackson County Emergency Management reported golf ball-sized hail on Morrisey Road in Grass Lake Township, 2 miles north of the city of Grass Lake. Also listed under hail	
16.	3/31/2006	06:05 PM, Tornado near Leoni, LAT/LON: 42°15'N / 84°16'W, Length: 7.00 Miles, Width: 65 Yards, Magnitude: F1, $200,000 property damage, $50,000 crop damage. The tornado began near Napoleon Road just north of Center Lake and moved northeast. Two small barns collapsed and a patio addition was blown away near the intersection of Page and Noon roads. Minor roof damage occurred at a house on Michigan avenue and a dozen large spruce trees were uprooted. The total damage path was 7 miles long and 200 feet wide and this F1 tornado was on the ground for approximately ten minutes. No injuries or fatalities occurred.	Leoni
17.	10/18/2007 10/19/2007	Tornado warnings issued for JACKSON.	Unspecified
18.	9/1/2018	Severe thunderstorms developed across central, southern, and southwestern Lower Michigan during the late afternoon and evening of September 1st, 2018. Four tornadoes occurred. Most of the damage was confined to trees and associated structural damage due to falling trees. Some of the storms were well-photographed and had a visible structure resembling supercell thunderstorms, including rotating rain-free updraft bases, wall clouds, and brief funnel clouds. The tornado mostly had damage indicating 65 mph winds but reached 80 mph at its strongest point halfway through its life. It began at the western Jackson City limits north of the Cascades Golf Course and continued north-northeast to cross Washington Avenue. The tornado then weakened near the railroad tracks near Hibbard Avenue. Many trees or limbs were snapped and several trees were uprooted.	Jackson

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Extreme Temperatures | Natural Hazards | Weather Hazards

The following table provides a history of extreme temperatures in Jackson County from 1954-2020.

Jackson County Extreme Temperature Events, 1995-2019

	Date	Description
1.	12/09/1995	Cold Wave, 3 deaths statewide. Low temperatures ranged from three above zero at Detroit to one on the 10th. On the 9th, winds averaging 20 to 25 mph combined with afternoon temperatures in the single digits to produce wind chills of 30 to 35 below zero.
2.	8/1/2001	Heat Advisory for JACKSON, index at 105 degrees
	1/28/2019 – 2/2/2019	A series of heavy snowfall events began this week-long event. On Monday, January 28, much of the state faced the start of a blizzard, with snowfall ranging up to over a foot in depth as sustained winds began (with gusts up to 40 mph) and were soon accompanied by a dangerous drop in temperatures. An extremely large number of schools throughout the state were closed as a result of the snowfall, and then re-mained closed for most of the week as the combination of sustained subzero temperatures and strong winds produced dangerously low wind-chill values throughout the state. Wind-chill values below -30 degrees Fahrenheit were common throughout Michigan for multiple days, and often dipped below -40. In additional to numerous local states of emergency, non-essential State Government offices were closed for more than half a day on Monday, and for the entire day on Wednesday and Thursday. Governor Gretchen Whitmer's State of Emergency declaration took effect on January 29, anticipating the dangerous impacts of the deep freeze that had been forecast by the National Weather Service. At least three deaths were attributed to weather exposure, and special shelters and over a hundred warming centers were activated at many locations around the state. Additional hospitalizations took place, not just as a direct result of the cold, but also to treat for carbon monoxide exposures resulting from makeshift efforts to heat residents' homes. Hundreds of local and county government offices were closed for at least one or two days during the week, as well. (It should be noted that Jackson County chose to remain open.)Driving conditions were treacherous and slow. Visibility was often a problem, with white-out conditions resulting from the blizzard. On Wednesday, January 30, at 10:33am, a fire occurred at an important Consumer's Energy facility in Armada Township (Macomb County), and when the impacts of this fire were calculated to eventually lead toward natural gas shortages, the head of that major utility, followed by the Governor, appealed to both residential and industrial customers to voluntarily reduce their use of natural gas. By voluntarily reducing thermostat levels to the recommended 65 degrees or below, until the end of the day on January 31, and temporarily scaling back production activities at cer-tain facilities, this collective effort succeeded in preventing the complete interruption of gas delivery that otherwise was expected to occur. The problem did not involve a supply of natural gas, but only the constraints that the fire had caused in the ability to deliver that gas throughout the state's network. Temporary power failures occurred in some locations, affecting thousands of residents and businesses but fortunately not lasting very long. Other midwestern states also authorized state emergency and disaster declarations during this event. By Friday, February 1, temperatures went back above zero, and Michigan's State of Emergency expired on February 2, 2019.

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and local input from plan participants.

Flooding | Natural Hazards | Hydrological Hazards

The following table provides a history of flooding in Jackson County from 1995-2020.

Jackson County Flood Events, 1995-2020

	Date	Description	Location
1.	8/2/1995	1630: Flood/flash Flood, $2,000 property damage. 3.17 inches of rain fell over Downtown Jackson in less than an hour, causing sewage overflow into the Grand River. A newly installed stone retaining wall at the New Tribes Bible Institute partially collapsed when loose soil became saturated and gave way. Low-lying streets were flooded throughout the City.	Jackson
2.	8/17/1995	1130: Flood/flash Flood, $20,000 property damage. More than two inches of rain fell over the City of Jackson following similar amounts from the previous day, giving two-day totals near six inches at some locations. The flash flooding that resulted left water two to three feet deep at many intersections and parking lots, with water entering many cars and buildings, including the Y Center downtown where a gymnasium and other recreation rooms were flooded.	Jackson
3.	3/9/1998	08:00 AM: Flood. Minor flooding occurred along the Grand River in Jackson during the morning of March 9th. During the previous 24 hours, heavy rains of around an inch and a half had occurred in the Jackson area, resulting in significant run-off from the urban area and rapid rises in river levels. Jackson is located near the headwaters of the Grand River and the heavy rains caused the river to respond quickly and crest just above flood stage at 13.3 feet. The river was only at or above flood stage for 2 hours. Minor flooding occurred, but no property damage was reported.	Jackson
4.	06/16/1998	06:00 PM: Flash Flood at Munith. Jackson County local law enforcement reported the flooding of several intersections along Michigan Highway 106 across northeastern Jackson County, in and around the Munith area. NWS Doppler Radar estimated two to three inch per hour rainfall, with storm totals in excess of five inches during a two-hour period over this area. No injuries or significant damages were reported.	Henrietta Township Munith
5.	05/18/2000	07:00 AM: Flood.. Flood warnings were therefore issued in Jackson County on May 18th and 19th.	Jackson County
6.	05/26/2000	06:30 PM: Flood, $450,000 property damage. Several severe thunderstorms produced flooding in multiple areas, and also caused the wall of a bowling alley to collapse (no injuries or fatalities). Law enforcement in the City of Jackson reported that part of a roof and a wall of a bowling alley collapsed at 6:30 pm. Further investigation into this event revealed that debris from the damaged building was found about 400 yards away near an airport runway. However, the damage did not appear to be caused by a tornado. The dome shape of the roof implies that water loading on the roof did not cause the collapse, although there were reports of flooding in the area. The most likely cause of the damage was deemed to be a “gustnado” or microburst. At 7:15 p.m., a trained spotter reported that Interstate 94 near the City of Jackson was flooded. (NOTE: Faults in the NCDC online data base caused this information to also appear under an entry for 8/26/2000 as well as 5/26. In this plan, information for 8/26 was taken from the Law Enforcement Information Network instead of NCDC.)	Jackson, Blackman Township
7.	2/9/01- 2/18/01	Rain, snowmelt, and flooding JACKSON, Flood warnings issued. 2/10/2001 JACKSON, at 1220, Flash report sent reporting flash flooding along the Grand River (measured at 12.2') in the county.	Jackson, Jackson County
8.	2/26/2001	JACKSON, Flash Flooding in Jackson	Jackson

	Date	Description	Location
9.	10/16/2001	Flood Warning for the Grand River at Jackson (JACKSON), maximum, stage forecast at 13.3ft, flood stage is 13ft NWS in Grand Rapids issued a flood warning for the Grand River at Jackson in JACKSON County. The river was expected to go above flood stage of 13.0 feet that afternoon. The latest stage was 12.5 feet at 1200 on Tuesday. Flood stage is 13.0 feet. Minor flooding is forecasted. The river will go above flood stage this evening and is expected to fall back below flood stage this evening. At 13.0 feet expect minor flooding of low-lying areas.	Jackson
10.	7/28/2002	Flood warning for Grand River at Jackson in JACKSON County. NWS in Grand Rapids has issued a flood warning for Grand River at Jackson. Moderate flooding is expected. Two to three inches of rain fell at Jackson in less than 2 hours. Moderate flooding with a stage of 14 feet measured. Flood stage is 13 feet.	Jackson
11.	8/23/2002	05:30 PM, Flood at Jackson, $50,000 property damage, $5,000 crop damage. More than two inches of rain also fell in a short time in Jackson, causing an underpass to be flooded on Jackson Street north of Glick Highway, where several cars got stuck in up to three feet of standing water. Flash flood warning for JACKSON County: NWS indicated rainfall in the city of Jackson of almost two inches has resulted in widespread flooding. Flood warning for Grand River at Jackson in JACKSON County. The latest stage was 11.7 feet. Flood stage is 13 feet, which is 0.6 feet above flood stage. The river was forecast to rise above the flood stage of 13.0 feet this evening. The river is forecast to fall below the flood stage of 13.0 feet early Saturday morning. This crest compares to a previous crest of 13.5 feet on March 30, 1982. Local storm report for JACKSON County: Flash floods and several roads and I-94 had water over them. Several manhole covers were lifted off.	Jackson
12.	8/24/2002	Hydrologic statement: The Grand River at Jackson. Flood stage is 13.0 feet. Forecast stage is 9.3.	Jackson
13.	3/23/2003	Hydrologic statement: For the Grand River at Jackson in JACKSON County, the latest stage was 10.1 feet. Flood stage is 13.0 feet. No flooding is forecast. The maximum stage forecast is 10.1 feet.	Jackson
14.	5/1/2003	Flood warning: The Grand River at Jackson in JACKSON County. The latest stage was 13.0 feet. The river is expected to rise to 13.8 feet and then recede slowly.	Jackson
15.	5/21/2004	11:32 PM, Flood, $2,500,000 property damage, $4,600,000 crop damage. The biggest and longest duration flooding event in the past ten to twenty years occurred across southwestern and south central lower Michigan from May 20th through the third of June. Flooding in mid May resulted in very high river levels and the ground was saturated on the 20th. Numerous thunderstorm complexes and areas of heavy rainfall developed repeatedly in the vicinity of a quasi stationary frontal boundary draped across southern Lower Michigan. The heaviest rain fell on Saturday, May 22nd, when over two inches of rain fell over most of the area. Total rainfall over the Grand River basin from May 20th through June 3rd varied from four to as much as seven inches. The Grand Rapids office of the National Weather Service issued a Hazardous Weather Outlook as early as Wednesday morning, May 19th, to mention the threat of flooding. A hydrologic outlook was issued on May 20th to further address the potential for widespread flooding. A flood watch was issued for the entire area on Friday, May 21st. Flood warnings were issued for the southern half of our area at 12:10 a.m. EDT Saturday May 22nd, and for all of our area at 4:10 a.m. EDT Sunday May 23rd through 12 a.m. EDT May 24th. The following is a summary of peak river crests from across our Hydrological Service Area (HSA): Here are some daily flooding headlines from the period from May 22nd through June 4th: May 22nd: The Woodward Elementary School in Jackson county was flooded and damage there was estimated at $200,000. June 4th: Governor Granholm issued a disaster declaration for 24	Jackson County

	Date	Description	Location
		counties in Michigan. That list included Jackson County. President George Bush supported the governor's declaration for 19 of the 24 counties and federal disaster relief was made available to Jackson County. It was the wettest May on record in Lansing and Muskegon and the third wettest May on record in Grand Rapids. 9.29" of rain fell in Grand Rapids for the month, which is 5.94" above normal. 10.44" of rain fell in Lansing, which 7.73 inches above normal there. 9.59" of rain fell in Muskegon, which is 6.64 inches above normal. When it was all said and done with, approximately 500 homes were flooded, three dams were damaged, two schools were flooded, one state university building had flooding problems, and a zoo was flooded and closed for four days. The monetary estimate of flood damages incurred is in the millions of dollars. However, there was no loss of life due to all of the flooding.	
16.	7/28/2011	Several rounds of heavy rain and thunderstorms moved across southwest lower Michigan from July 27 to July 29, flooding roadways and intersections across areas near to mainly south of Interstate 96. The most significant impacts from flash flooding occurred in and near the Lansing area. Radar estimated that 6 to 10 inches of rain fell from July 27 to 29 near and southwest of Lansing. Six to eight inches of rain fell across far northern Jackson county from the late evening hours of July 27 through the early morning hours of July 29. This caused flash flooding and several road closures and washouts across that area.	Jackson County
17.	4/23/2013	Record flooding occurred during the month of April and record crests occurred on the lower portions of the Grand River at Ionia, Lowell, Ada, Comstock Park, and Grand Rapids, Michigan. Due to the severity of the flooding, Michigan's Governor Rick Snyder declared a state of disaster for 19 counties and two cities. The two cities declared in the disaster were Grand Rapids and Ionia. The counties included in the disaster declaration included Barry, Gratiot, Ionia, Kent, Mecosta, Muskegon, Newaygo, Osceola and Ottawa. Hundreds of homes were flooded, over 300 roads closed, and preliminary flood damage estimates were in excess of 32 million dollars. On a positive note, no lives were lost during this record flooding. Parts of West Michigan experienced flooding rainfall from the afternoon of April 17th through the day on April 18th. Most areas saw between 2 to 4 inches of rainfall. Some local areas near Holland and Grand Rapids saw around 5 inches of rainfall. All of this rainfall fell on top of already fully saturated soil from big rains that came during early to mid April. The flooding in many areas lingered through the weekend of April 20th and 21st into the following week. In downtown Grand Rapids flooding problems did not reach their peak until April 22nd, when the Grand River in Grand Rapids crested at 21.85 feet, causing significant flooding damage to numerous businesses and homes near the river. Record stages were set at 5 River Forecast Points: The Grand River at Ionia, Michigan, set a new crest stage record of 24.69 feet; the old record was 24.30 feet set back in 1948. This also set a flow/discharge record at 25,100 cubic feet per second (cfs). The Grand River at Lowell, Michigan, set a new crest stage record of 19.02 feet; the old record was 19.00 feet set back in 1948. The Grand River at Ada, Michigan, set a new crest stage record of 22.94 feet; the old record was 21.60 feet set back in 1986. The Grand River at Grand Rapids, Michigan, set a new crest stage record of 21.85 feet; the old record was 19.64 feet set back in 1985. However, this was only the fifth highest flow/discharge at 35,100 cfs. The Grand River at Comstock Park, Michigan, set a new crest stage record of 17.80 feet; the old record was 17.75 feet set back in 1948. Heavy rainfall caused significant flooding on rivers and streams across Jackson county.	Unspecified

Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and input from plan participants.

Drought | Natural Hazards | Hydrological Hazards

The following table provides a history of flooding in Jackson County from 1913-2020.

Jackson County Droughts 1913-2020

	Date	Description	Location
1.	1913 - 1914	A 10-month drought took place in the south central portion of the state, effecting Jackson County.	Barry, Branch, Calhoun, Clinton, Eaton, Hillsdale, Ingham, Ionia, Jackson, Shiawassee, and St. Joseph Counties
2.	1922-1923	A 10-month drought took place in the south central portion of the state, effecting Jackson County.	Barry, Branch, Calhoun, Clinton, Eaton, Hillsdale, Ingham, Ionia, Jackson, Shiawassee, and St. Joseph Counties
3.	1930-1931	A 18-month drought took place in the south central portion of the state, effecting Jackson County.	
4.	1934-1935	A 13-month drought took place in the south central portion of the state, effecting Jackson County.	Barry, Branch, Calhoun, Clinton, Eaton, Hillsdale, Ingham, Ionia, Jackson, Shiawassee, and St. Joseph Counties
5.	1962-1963	A 31-month drought took place in the south central portion of the state, effecting Jackson County.	Barry, Branch, Calhoun, Clinton, Eaton, Hillsdale, Ingham, Ionia, Jackson, Shiawassee, and St. Joseph Counties
6.	1976-1977	A 8-month drought took place in the south central portion of the state, effecting Jackson County.	Barry, Branch, Calhoun, Clinton, Eaton, Hillsdale, Ingham, Ionia, Jackson, Shiawassee, and St. Joseph Counties

	Date	Description	Location
7.	2002-2003	A 8-month drought took place in the south central portion of the state, effecting Jackson County.	Barry, Branch, Calhoun, Clinton, Eaton, Hillsdale, Ingham, Ionia, Jackson, Shiawassee, and St. Joseph Counties
8.	4/22/2007	Red flag warnings issued for JACKSON	Jackson County
9.	4/29/2007	Red flag warnings issued for JACKSON	Jackson County
10.	8/1/2007 8/3/2007	Drought conditions persist across portions of southwest and west-central lower Michigan, with numerous locations receiving less than 2 inches of rainfall during the entire month of July. Precipitation deficits were increasing over the course of the summer months. Drought category 1 (D1: moderate drought) status affected JACKSON County and all points southwest of this line. It involves damage to vegetation and a high fire risk, with streams, reservoirs, and wells running low. 8/2/2007 drought category, precipitation deficits (inches below normal) since April 1. (Normal is 12.90" for Jackson County.) JACKSON: D1, -3.14" at Brooklyn. The Grand River at Jackson was low, its 8.55' being 63% of normal. On 8/3/2007, Red Flag Warnings were issued (just for the day) for JACKSON	Jackson County
11.	8/17/2007	Red flag warnings had been issued for JACKSON. A proclamation is issued by the Michigan DNR prohibiting the use of fire on forest lands and adjacent lands in JACKSON. This prohibits (except under specified conditions) the building of campfires, smoking, and the burning of materials within these counties.	Jackson County

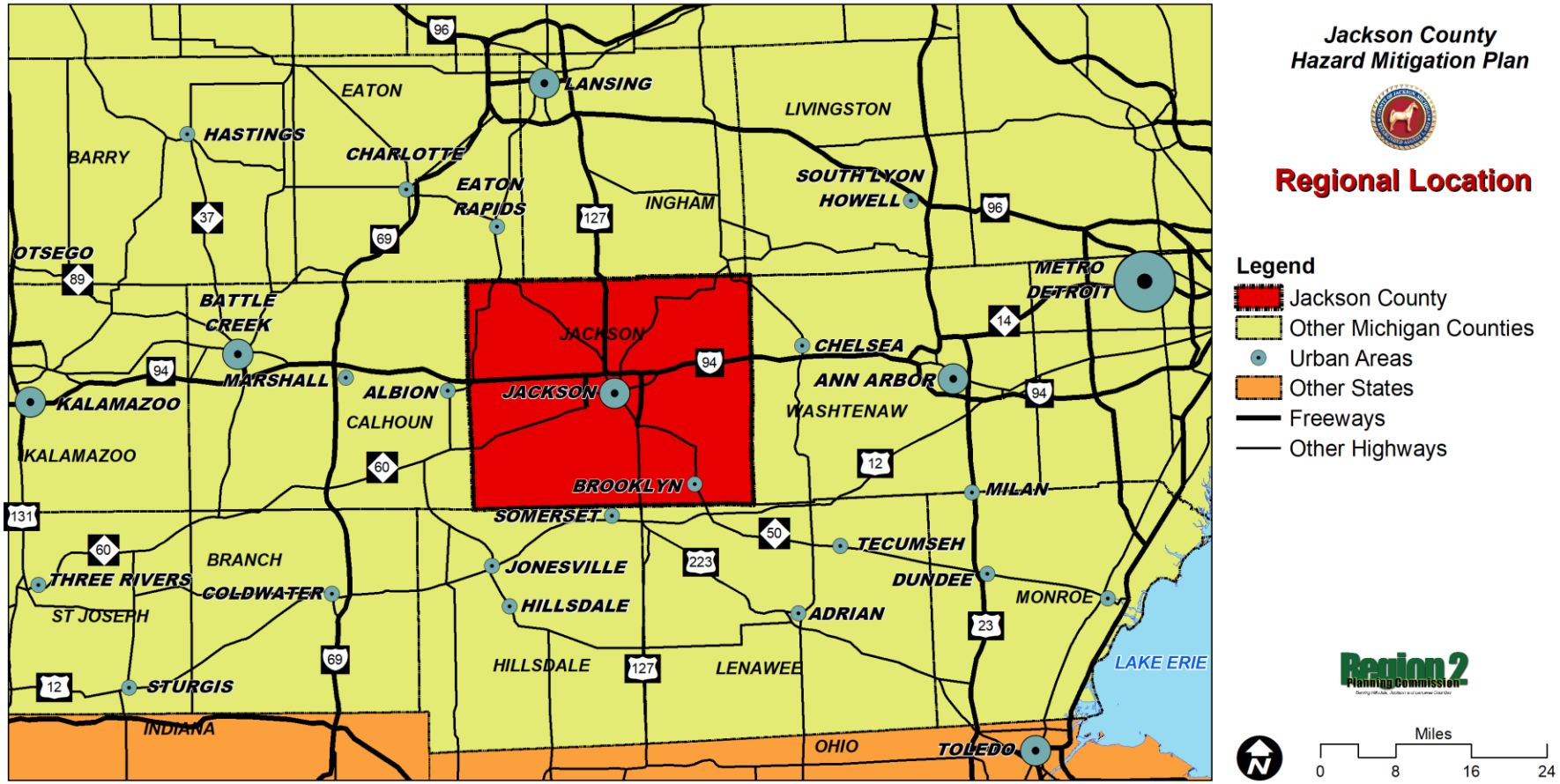
Sources: Michigan Hazard Analysis, the National Climatic Data Center (NCDC) storm events database, reports from the Law Enforcement Information Network (LEIN), and input from plan participants.

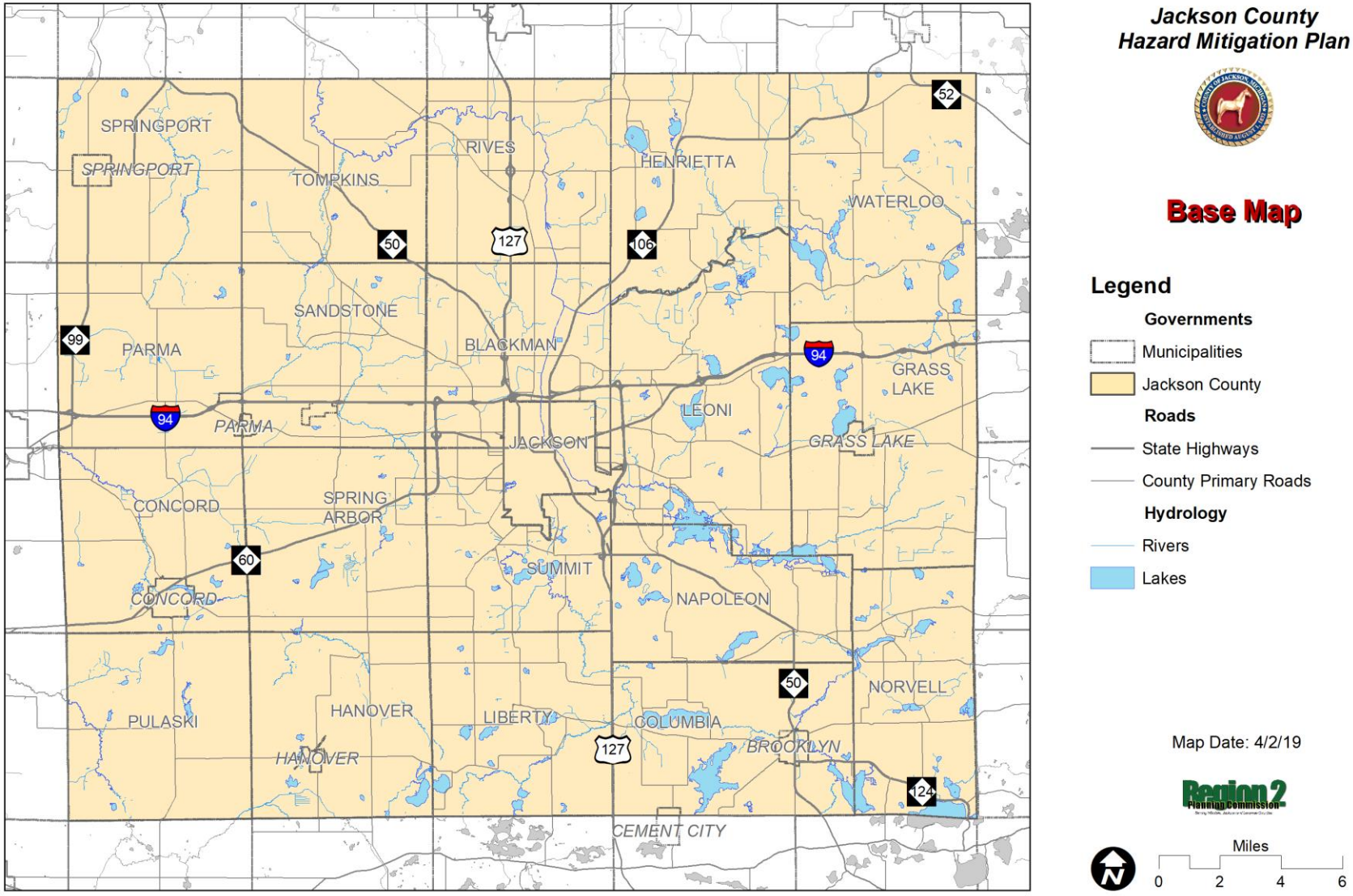
Jackson County Hazard Mitigation Plan
2022 Edition Plan Appendix

Cascades Manor House | Sparks Foundation County Park

Mapping Appendix

- Regional Location
- Base Map
- Municipalities and Places
- Jackson County Commissioner Districts
- Michigan House Districts
- Michigan Senate Districts
- United States House Districts
- Population Density
- Elderly Population
- Disabled Population
- Speak Limited English
- Poverty Status
- Median Household Income
- Median Home Value
- Social Vulnerability
- Jackson ISD School Districts and Schools
- Community Facilities and Temporary Lodging
- Seasonal Housing
- Fire Stations
- Emergency Siren Coverage
- Transportation Infrastructure
- Gas and Liquid Pipelines
- Property Assessment
- Land Use and Cover
- Flood Zones
- Sara Title III Sites
- Oil and Gas Test Wells
- Wastewater Plants and Municipal Wells


Jackson County
Hazard Mitigation Plan
Regional Location
Legend
Jackson County
Other Michigan Counties
Urban Areas
Other States
Freeways
Other Highways
LANSING
EATON
LIVINGSTON
HASTINGS
BARRY
CHARLOTTE
EATON RAPIDS
INGHAM
SOUTH LYON
HOWELL
OTSEGO
BATTLE CREEK
JACKSON
METRO DETROIT
CHELSEA
MARSHALL
ALBION
JACKSON
ANN ARBOR
KALAMAZOO
CALHOUN
WASHTENAW
KALAMAZOO
BROOKLYN
MILAN
SOMERSET
TECUMSEH
BRANCH
JONESVILLE
DUNDEE
THREE RIVERS
COLDWATER
HILLSDALE
MONROE
ST JOSEPH
ADRIAN
HILLSDALE
LENAWEE
LAKE ERIE
STURGIS
INDIANA
OHIO
TOLEDO
Region 2
Planning Commission
Miles
0
8
16
24


SPRINGPORT
SPRINGPORT
TOMPKINS
RIVES
HENRIETTA
WATERLOO
SANDSTONE
PARMA
BLACKMAN
PARMA
JACKSON
LEONI
GRASS LAKE
GRASS LAKE
CONCORD
SPRING ARBOR
CONCORD
SUMMIT
NAPOLEON
NORVELL
PULASKI
HANOVER
HANOVER
LIBERTY
COLUMBIA
BROOKLYN
CEMENT CITY
50
127
106
52
99
94
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127
124
Jackson County
Hazard Mitigation Plan
Base Map
Legend
Governments
Municipalities
Jackson County
Roads
State Highways
County Primary Roads
Hydrology
Rivers
Lakes
Map Date: 4/2/19
Region 2
Planning Commission
Miles
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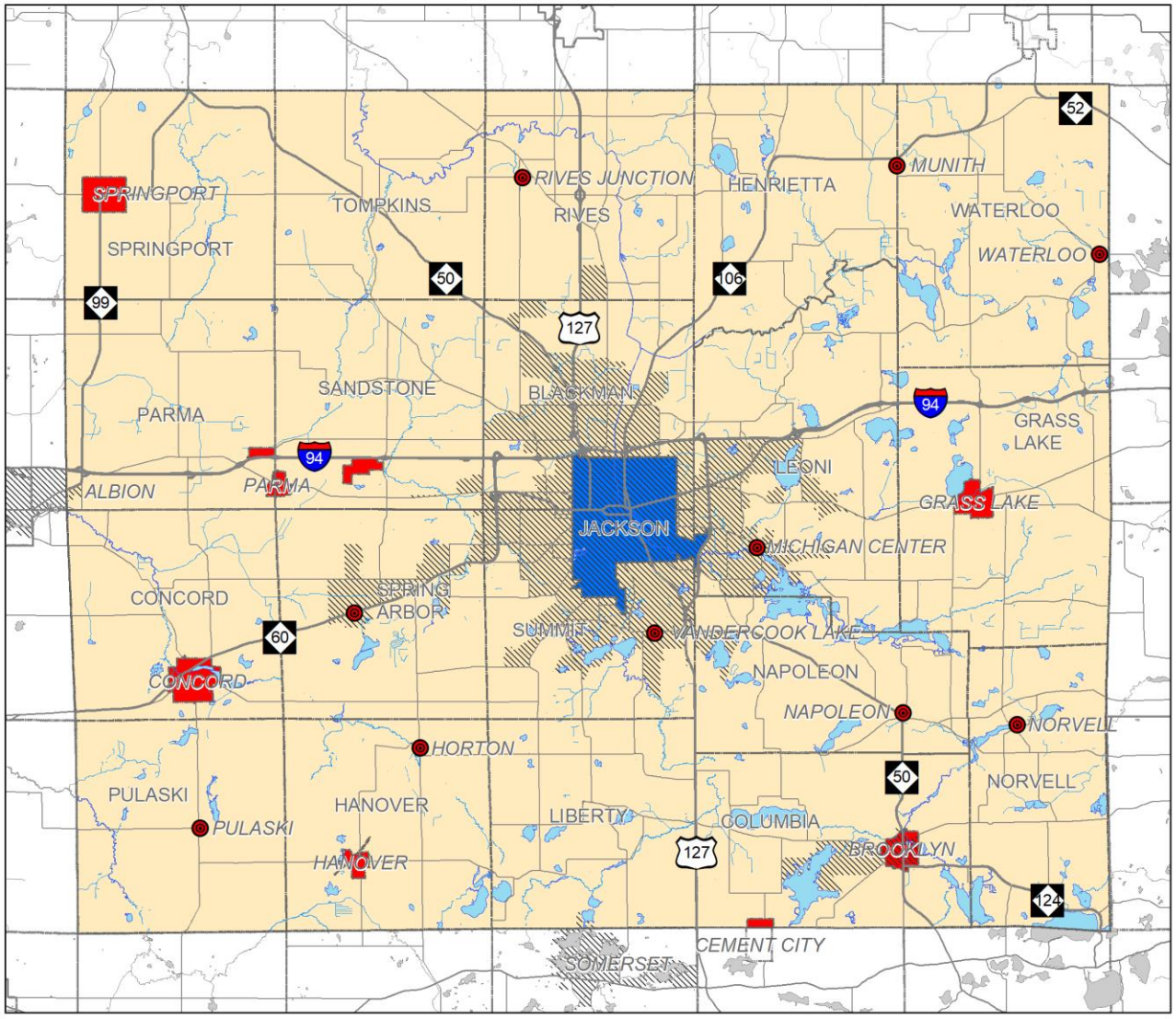
4
6



Jackson County Hazard Mitigation Plan

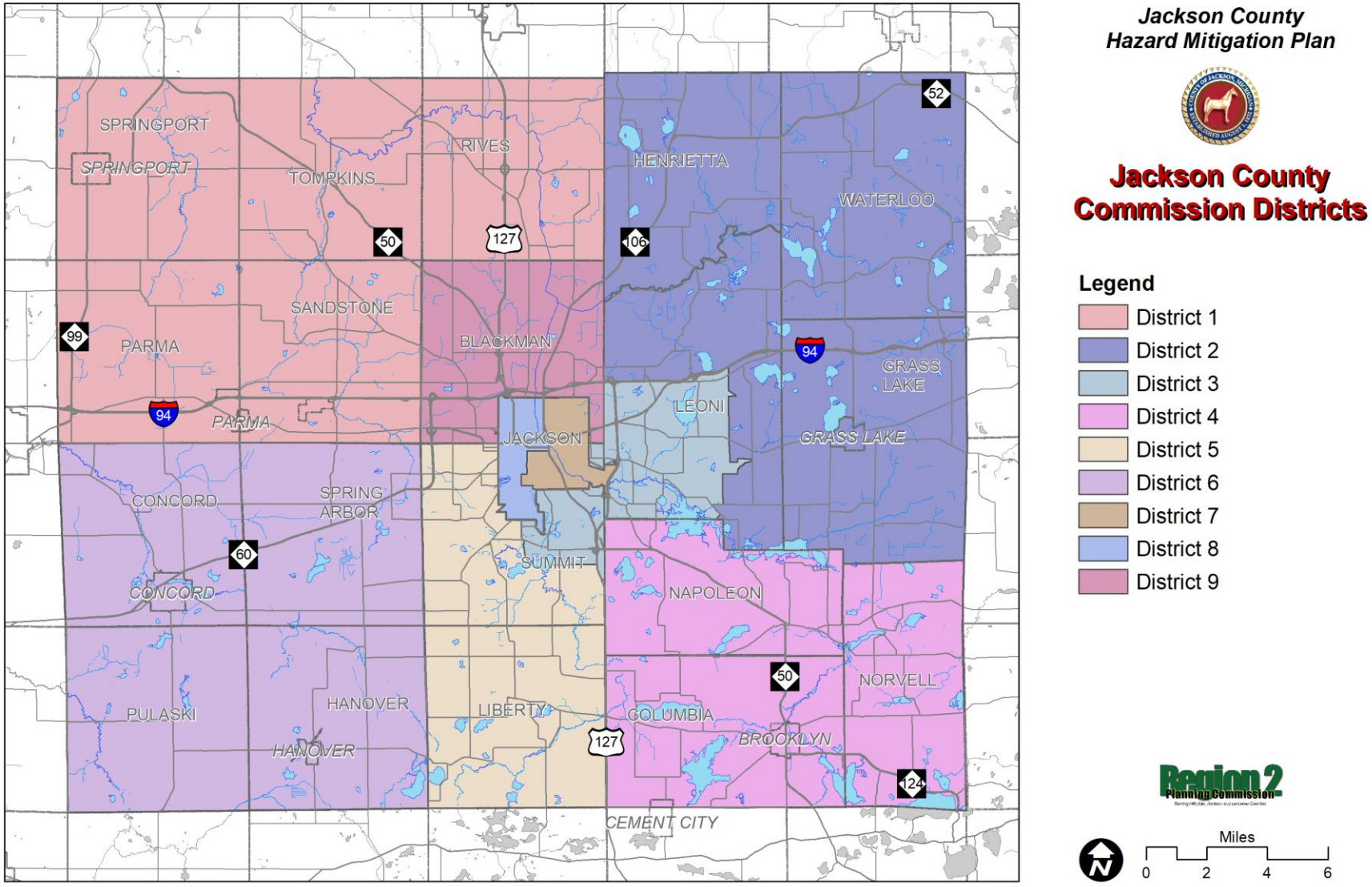
Municipalities and Places

Legend

- Townships
- City of Jackson
- Incorporated Villages
- Other Places
- Urban Areas/Clusters

Region 2 Planning Commission

Miles
0 1.5 3 4.5


Jackson County
Hazard Mitigation Plan
Jackson County
Commission Districts
Legend
District 1
District 2
District 3
District 4
District 5
District 6
District 7
District 8
District 9
SPRINGPORT
SPRINGPORT
RIVES
TOMPKINS
HENRIETTA
WATERLOO
SANDSTONE
PARMA
BLACKMAN
PARMA
JACKSON
LEONI
GRASS LAKE
GRASS LAKE
CONCORD
SPRING ARBOR
CONCORD
SUMMIT
NAPOLEON
NORVELL
PULASKI
HANOVER
HANOVER
LIBERTY
COLUMBIA
BROOKLYN
CEMENT CITY
Region 2 Planning Commission
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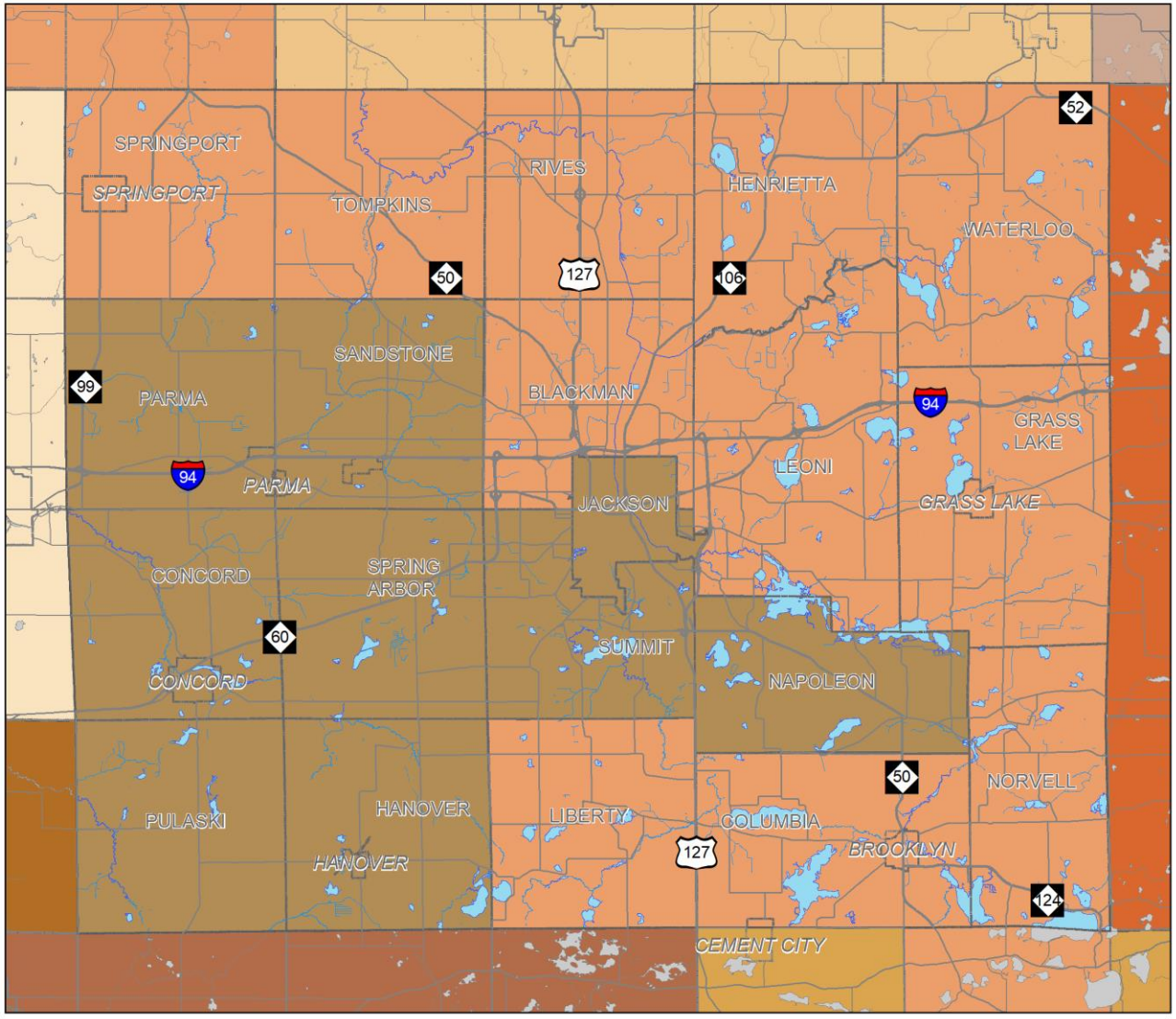

Jackson County Hazard Mitigation Plan

Michigan House Districts

Legend

- District 47
- District 52
- District 57
- District 58
- District 62
- District 63
- **District 64**
- **District 65**
- District 67

Region 2 Planning Commission

Miles
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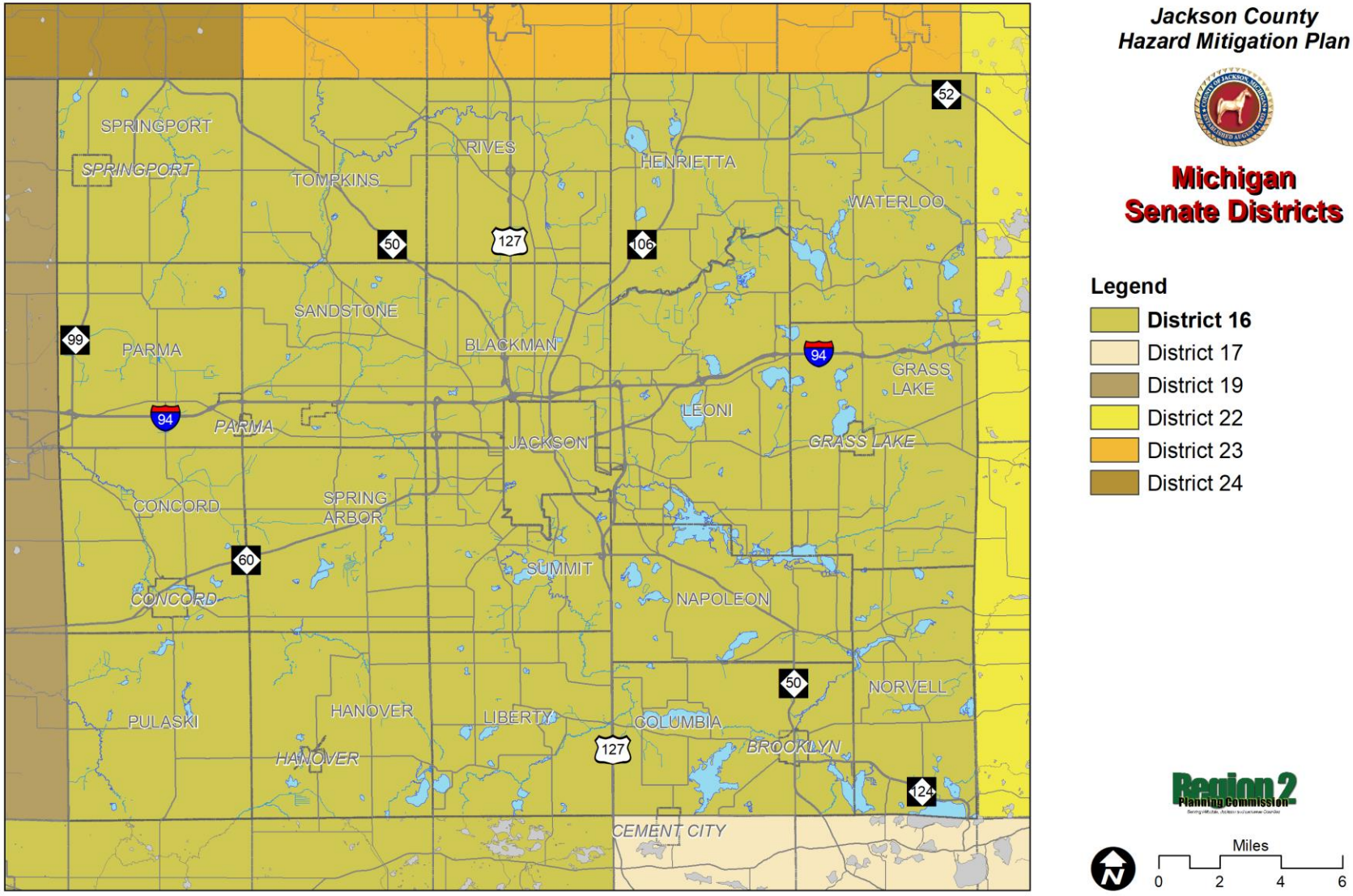

Jackson County Hazard Mitigation Plan

Michigan Senate Districts

Legend

- **District 16**
- District 17
- District 19
- District 22
- District 23
- District 24

Region 2 Planning Commission

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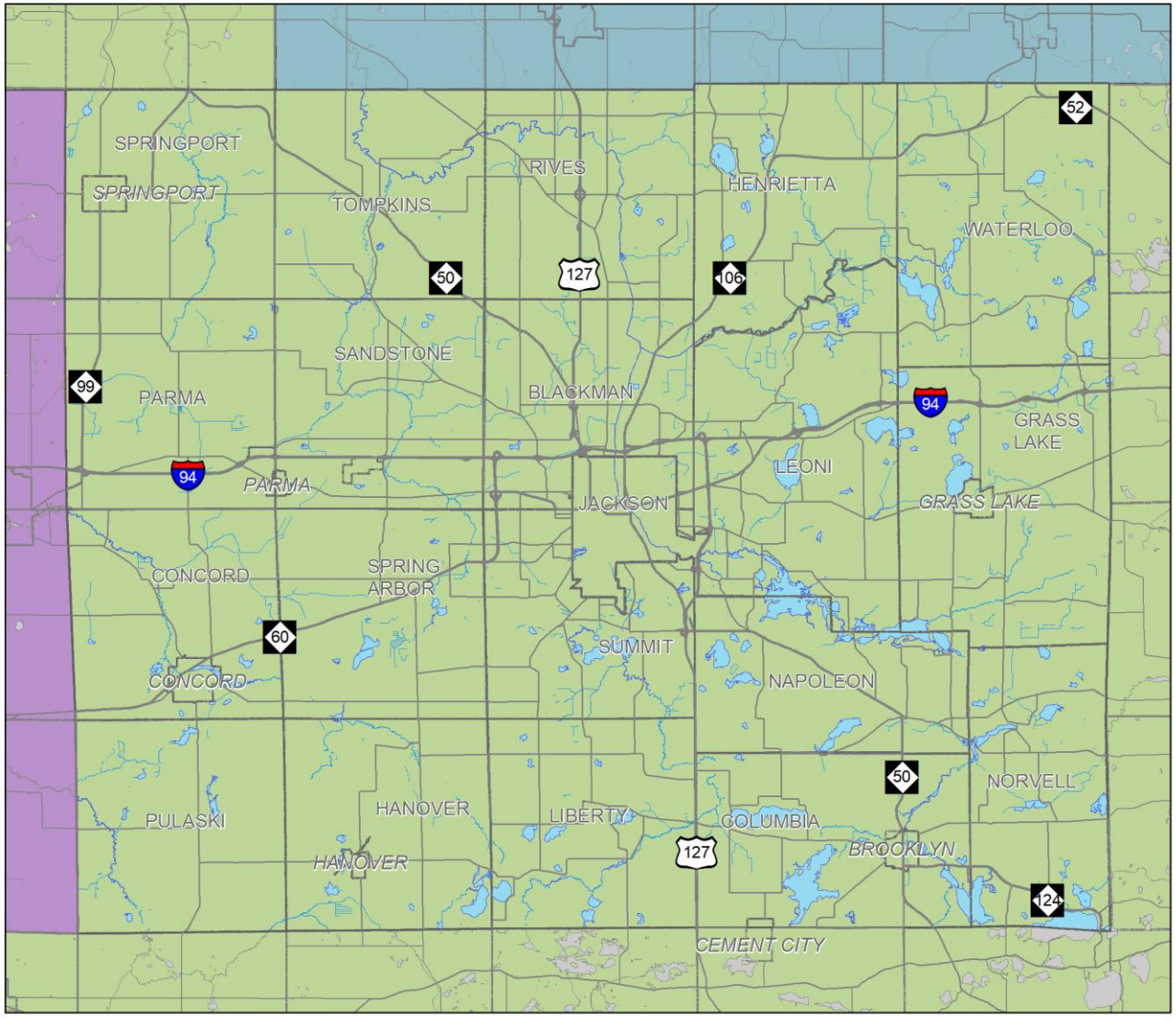

Jackson County Hazard Mitigation Plan

United States House Districts

Legend

- District 3
- **District 7**
- District 8

Region 2 Planning Commission

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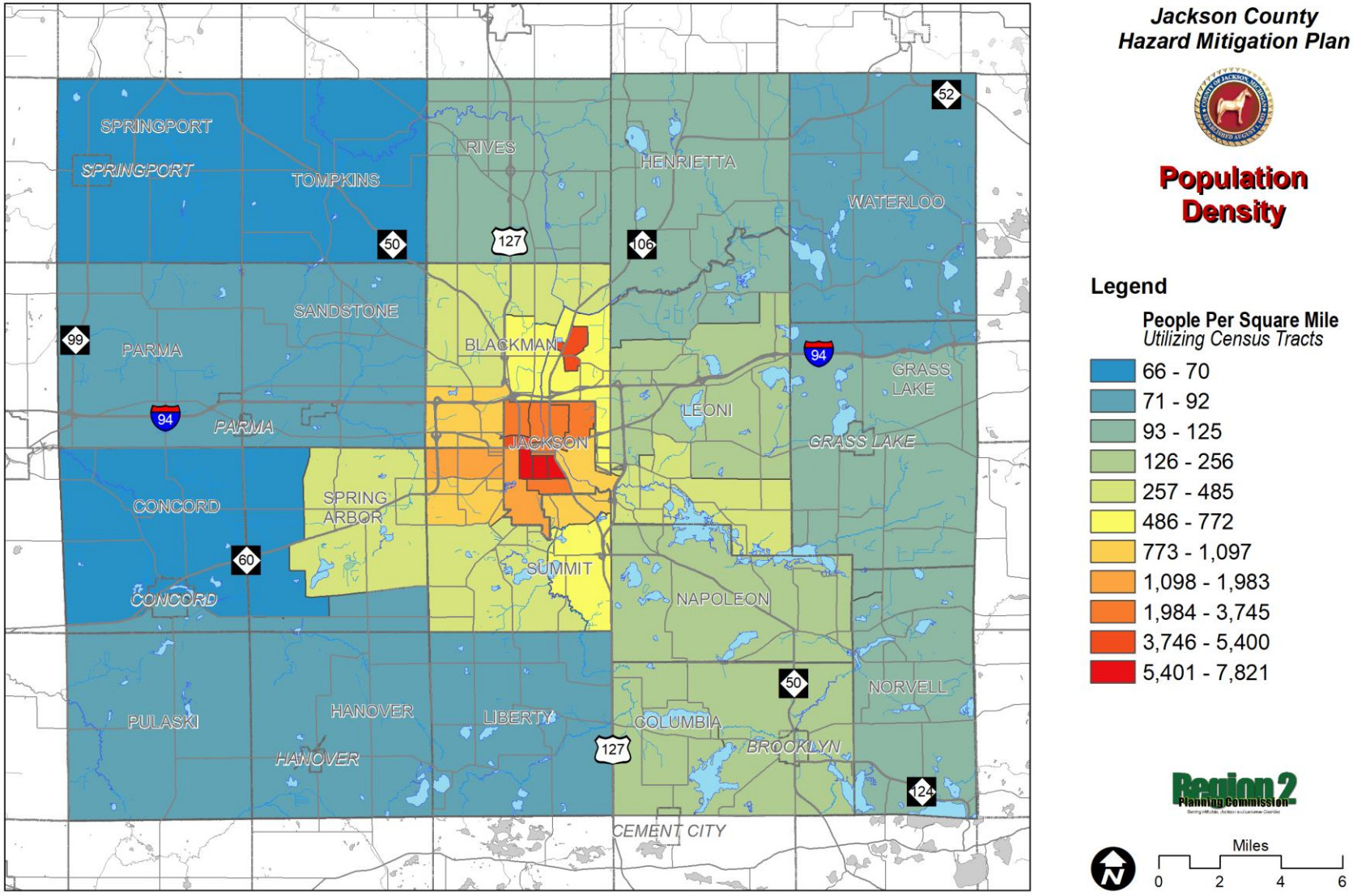
Jackson County
Hazard Mitigation Plan
Population
Density
Legend
People Per Square Mile
Utilizing Census Tracts
66 - 70
71 - 92
93 - 125
126 - 256
257 - 485
486 - 772
773 - 1,097
1,098 - 1,983
1,984 - 3,745
3,746 - 5,400
5,401 - 7,821
SPRINGPORT
SPRINGPORT
TOMPKINS
RIVES
HENRIETTA
WATERLOO
SANDSTONE
PARMA
PARMA
BLACKMAN
JACKSON
LEONI
GRASS LAKE
GRASS LAKE
CONCORD
CONCORD
SPRING ARBOR
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NAPOLEON
NORVELL
PULASKI
HANOVER
HANOVER
LIBERTY
COLUMBIA
BROOKLYN
CEMENT CITY
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Region 2
Planning Commission
Miles
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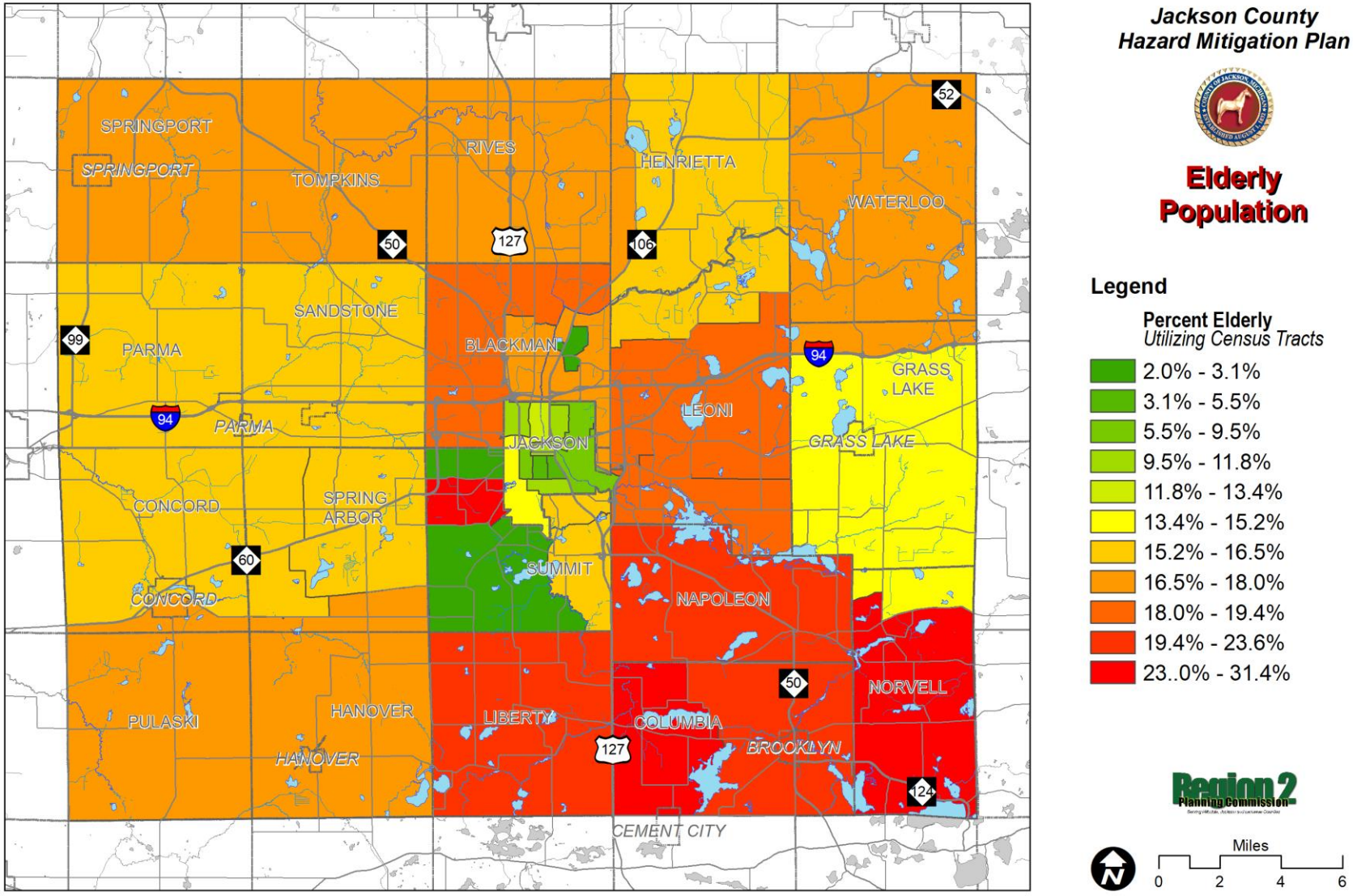
Jackson County
Hazard Mitigation Plan
Elderly
Population
Legend
Percent Elderly
Utilizing Census Tracts
2.0% - 3.1%
3.1% - 5.5%
5.5% - 9.5%
9.5% - 11.8%
11.8% - 13.4%
13.4% - 15.2%
15.2% - 16.5%
16.5% - 18.0%
18.0% - 19.4%
19.4% - 23.6%
23..0% - 31.4%
Region 2
Planning Commission
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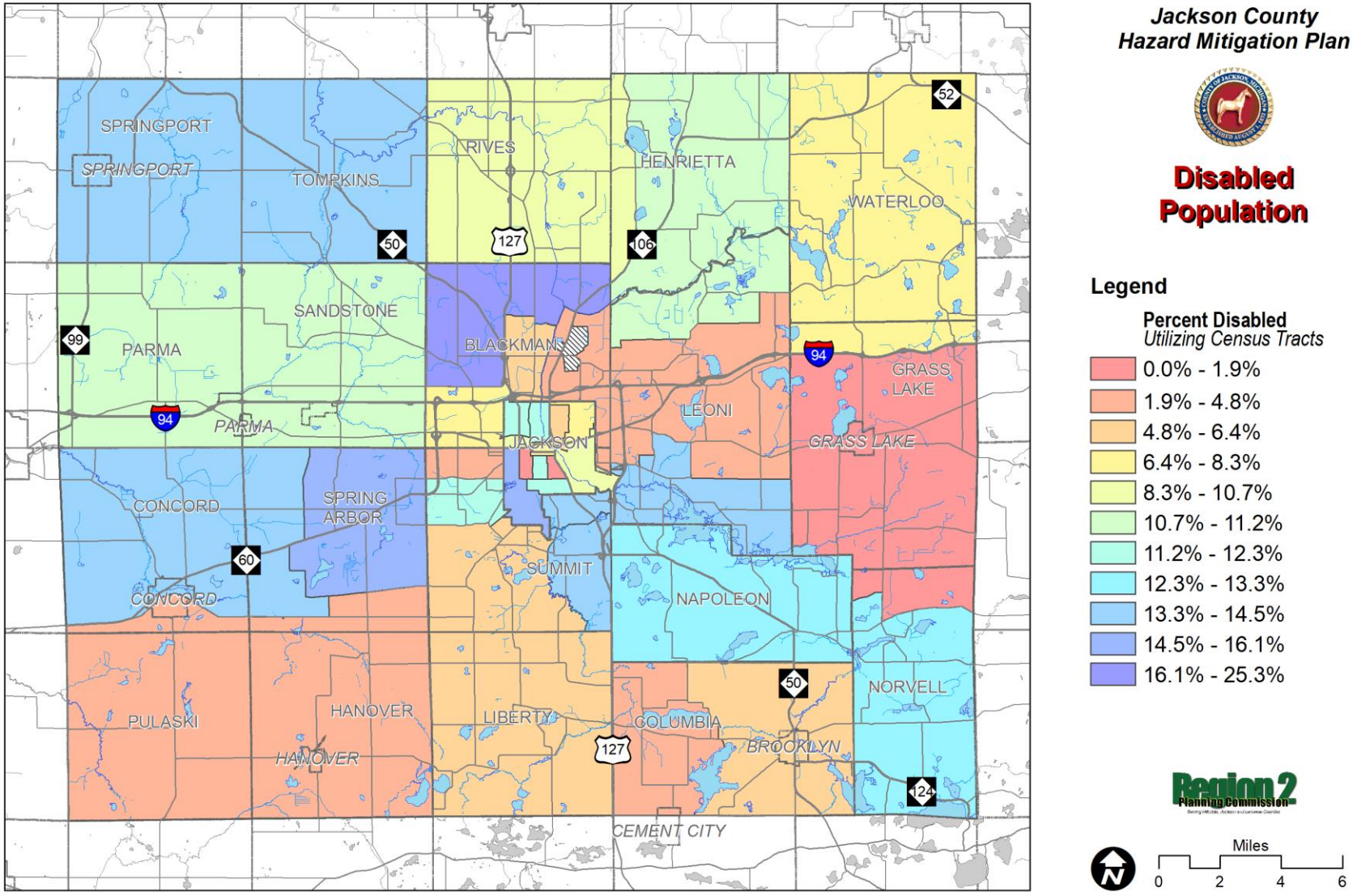
Jackson County
Hazard Mitigation Plan
Disabled
Population
Legend
Percent Disabled
Utilizing Census Tracts
0.0% - 1.9%
1.9% - 4.8%
4.8% - 6.4%
6.4% - 8.3%
8.3% - 10.7%
10.7% - 11.2%
11.2% - 12.3%
12.3% - 13.3%
13.3% - 14.5%
14.5% - 16.1%
16.1% - 25.3%
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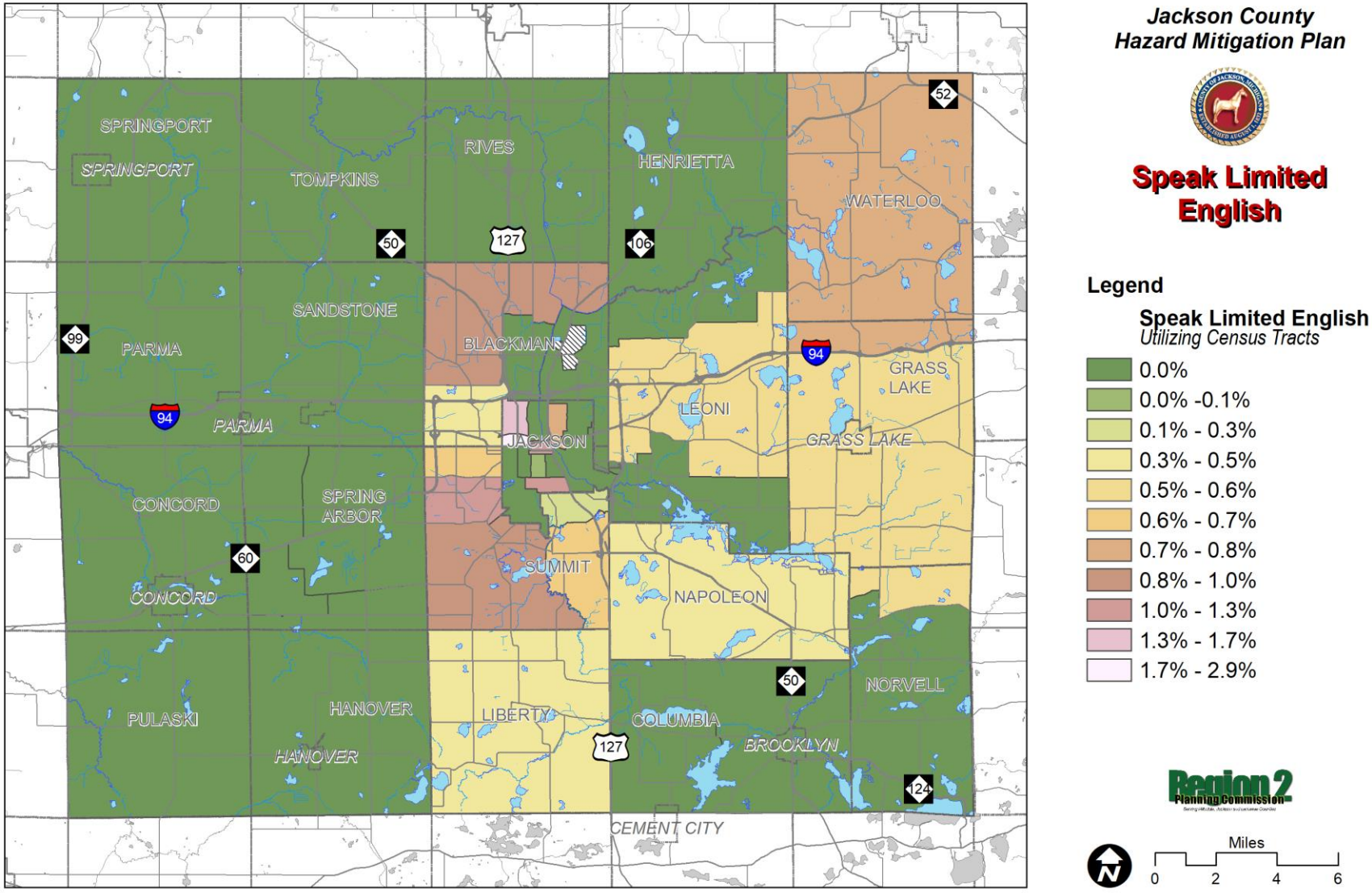

Jackson County Hazard Mitigation Plan

Speak Limited English

Legend

Speak Limited English
Utilizing Census Tracts

- 0.0%
- 0.0% -0.1%
- 0.1% - 0.3%
- 0.3% - 0.5%
- 0.5% - 0.6%
- 0.6% - 0.7%
- 0.7% - 0.8%
- 0.8% - 1.0%
- 1.0% - 1.3%
- 1.3% - 1.7%
- 1.7% - 2.9%

Region 2 Planning Commission

Miles
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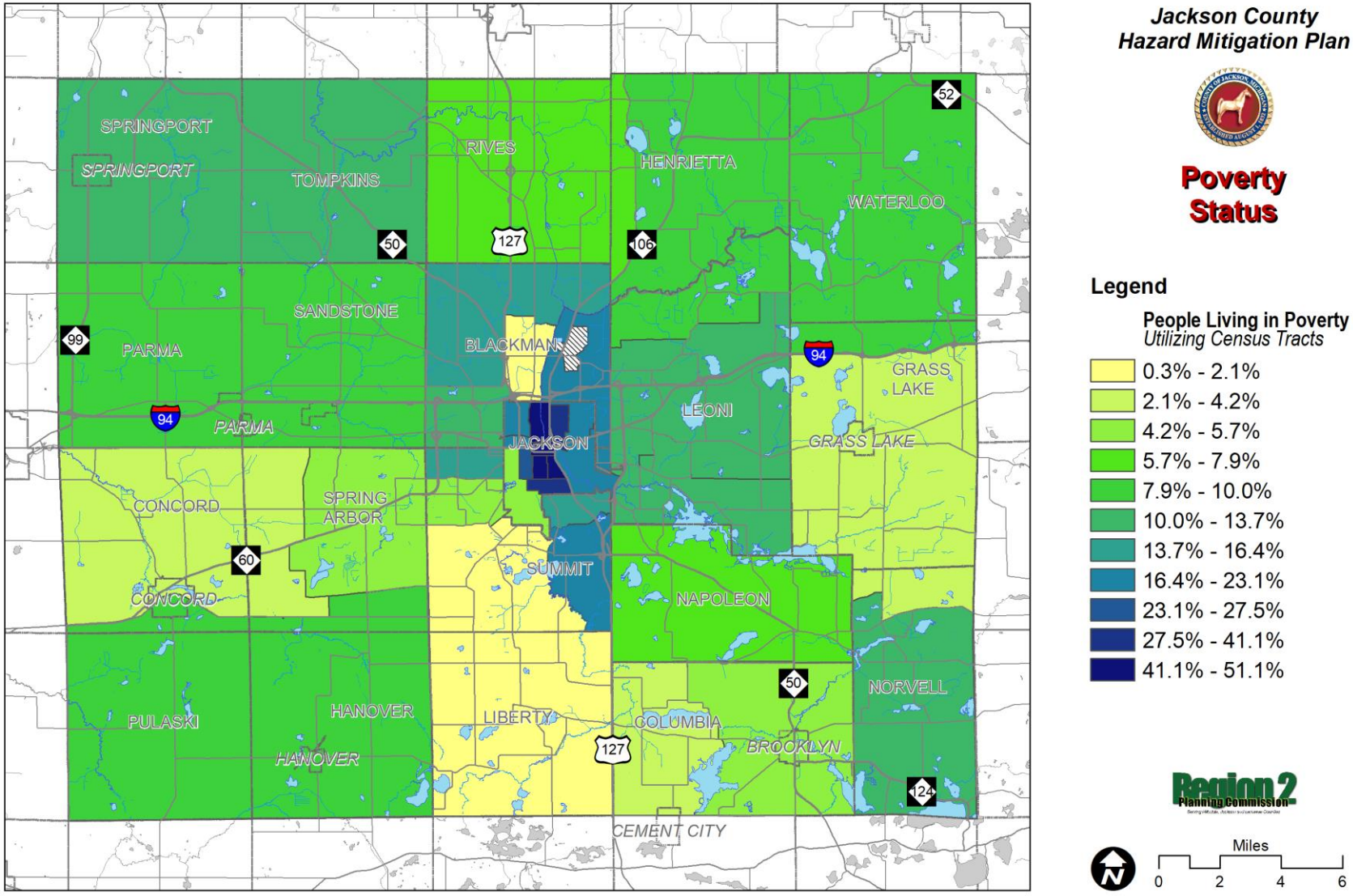
Jackson County
Hazard Mitigation Plan
Poverty
Status
Legend
People Living in Poverty
Utilizing Census Tracts
0.3% - 2.1%
2.1% - 4.2%
4.2% - 5.7%
5.7% - 7.9%
7.9% - 10.0%
10.0% - 13.7%
13.7% - 16.4%
16.4% - 23.1%
23.1% - 27.5%
27.5% - 41.1%
41.1% - 51.1%
SPRINGPORT
SPRINGPORT
TOMPKINS
RIVES
HENRIETTA
WATERLOO
SANDSTONE
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JACKSON
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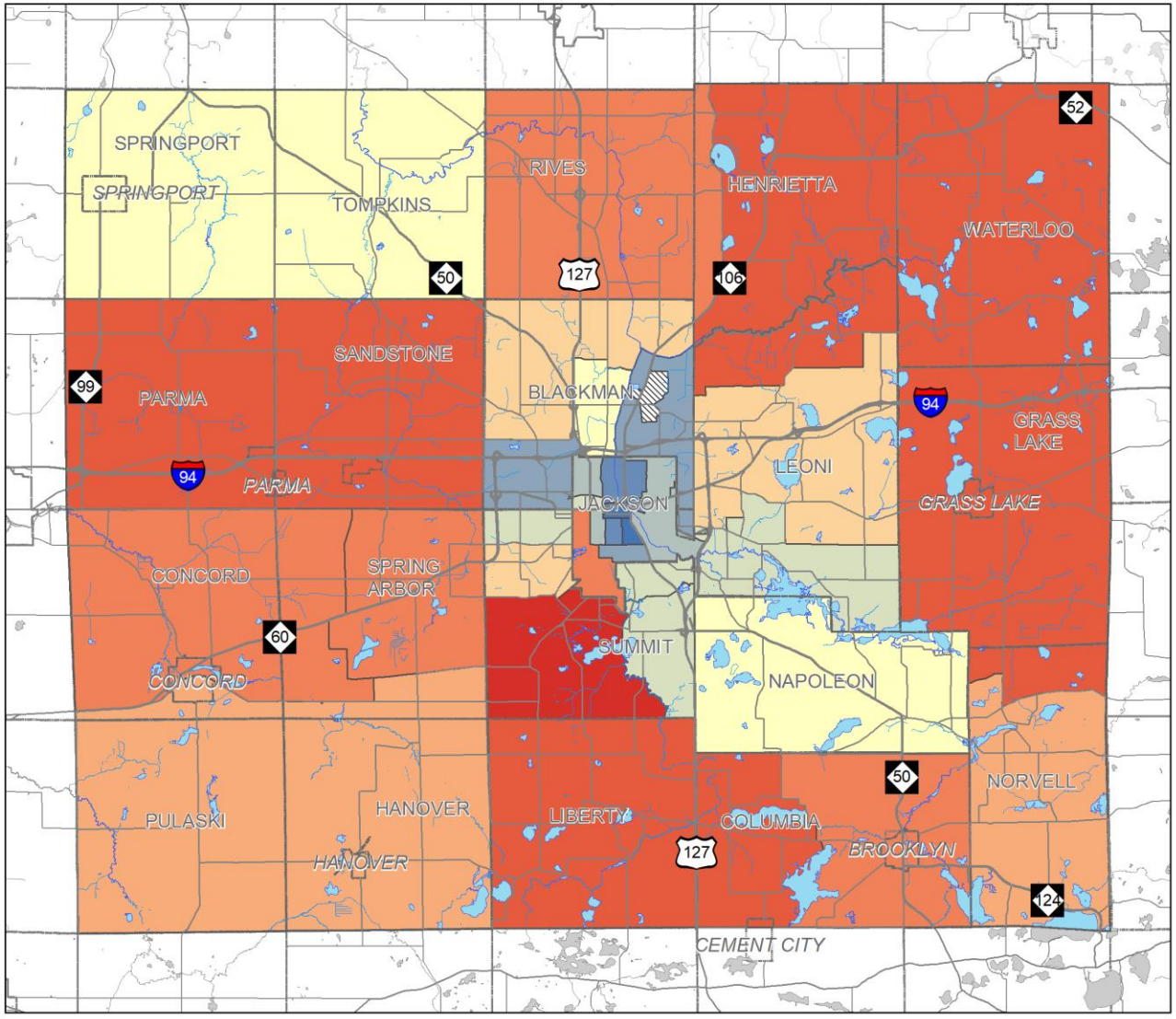


Jackson County Hazard Mitigation Plan

Median Household Income

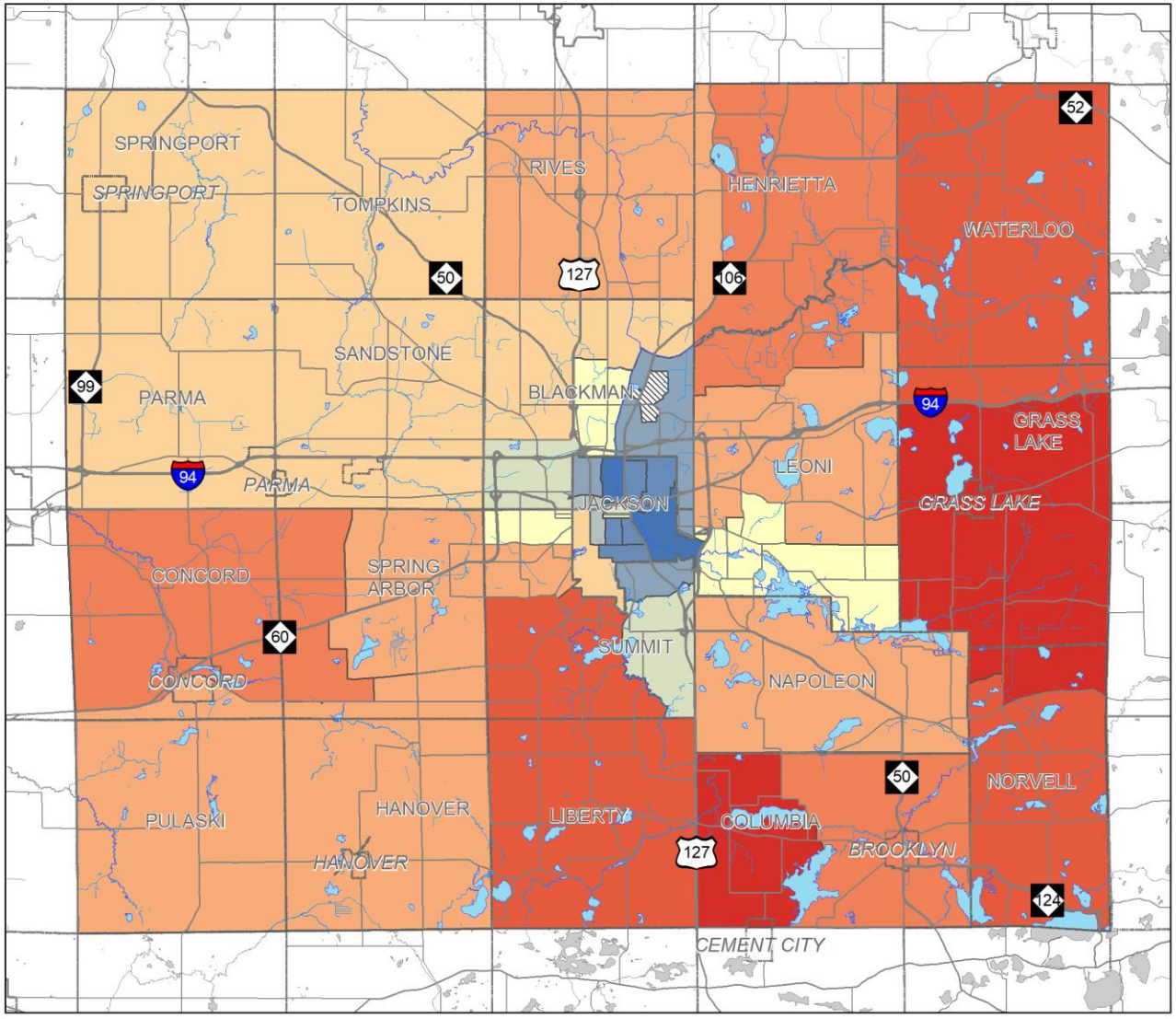
Legend

Median Household Income
Utilizing Census Tracts

- $12,125 - $16,126
- $16,127 - $23,750
- $23,751 - $29,969
- $29,970 - $38,750
- $38,751 - $47,384
- $47,385 - $54,648
- $54,649 - $56,469
- $56,470 - $58,750
- $58,751 - $64,902
- $64,903 - $75,089
- $75,090 - $90,129

Region 2 Planning Commission

Miles
0 2 4 6



Jackson County Hazard Mitigation Plan

Median Home Value

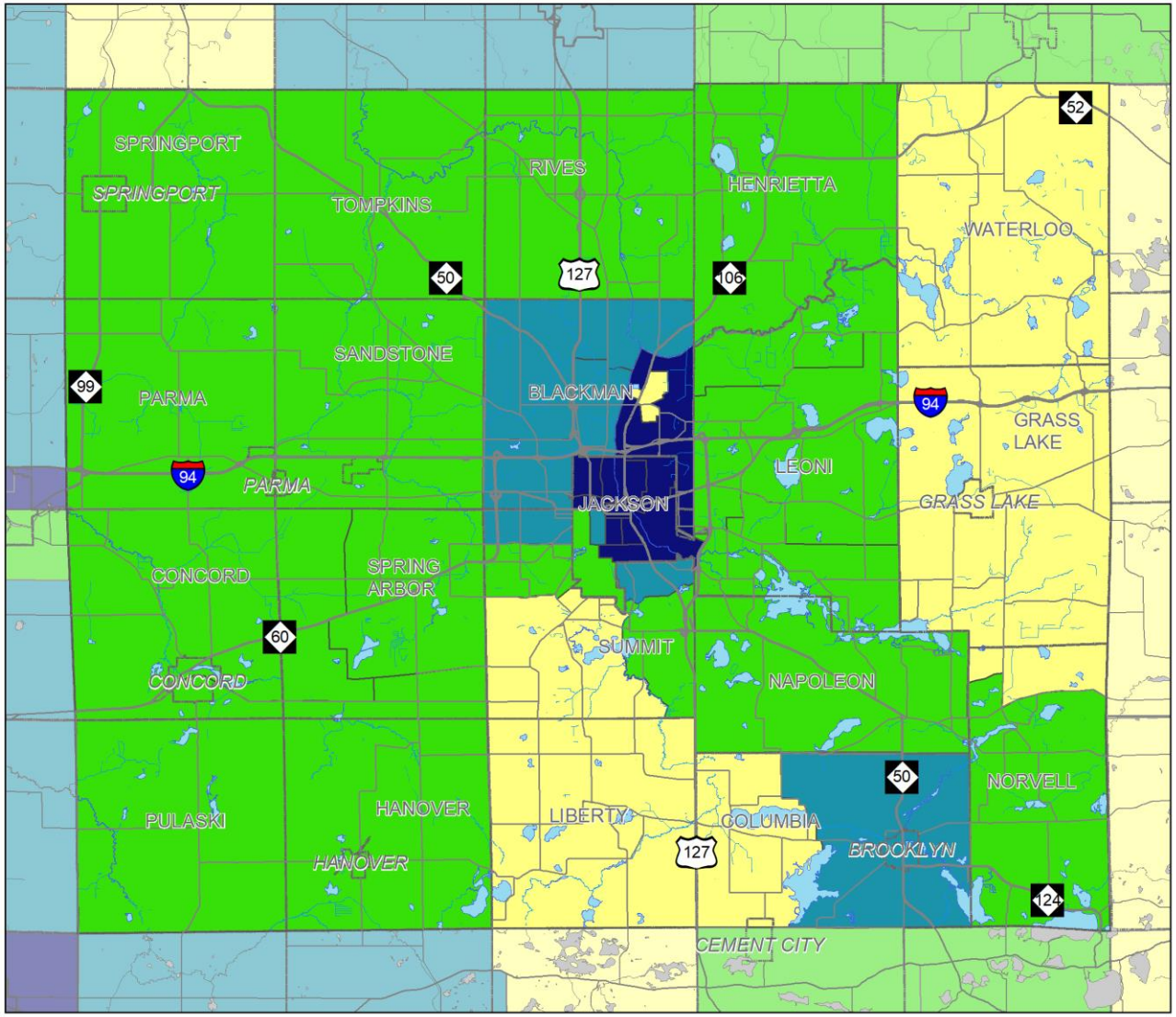
Legend

Median Home Value
Utilizing Census Tracts

- $39,600 - $47,400
- $47,401 - $59,100
- $59,101 - $67,700
- $67,701 - $77,000
- $77,001 - $98,000
- $98,001 - $117,400
- $117,401 - $129,500
- $129,501 - $149,300
- $149,301 - $162,600
- $162,601 - $181,800
- $181,801 - $213,200

Region 2 Planning Commission

Miles
0 2 4 6



Jackson County Hazard Mitigation Plan

Social Vulnerability

Legend

Social Vulnerability Index
Utilizing Census Tracts

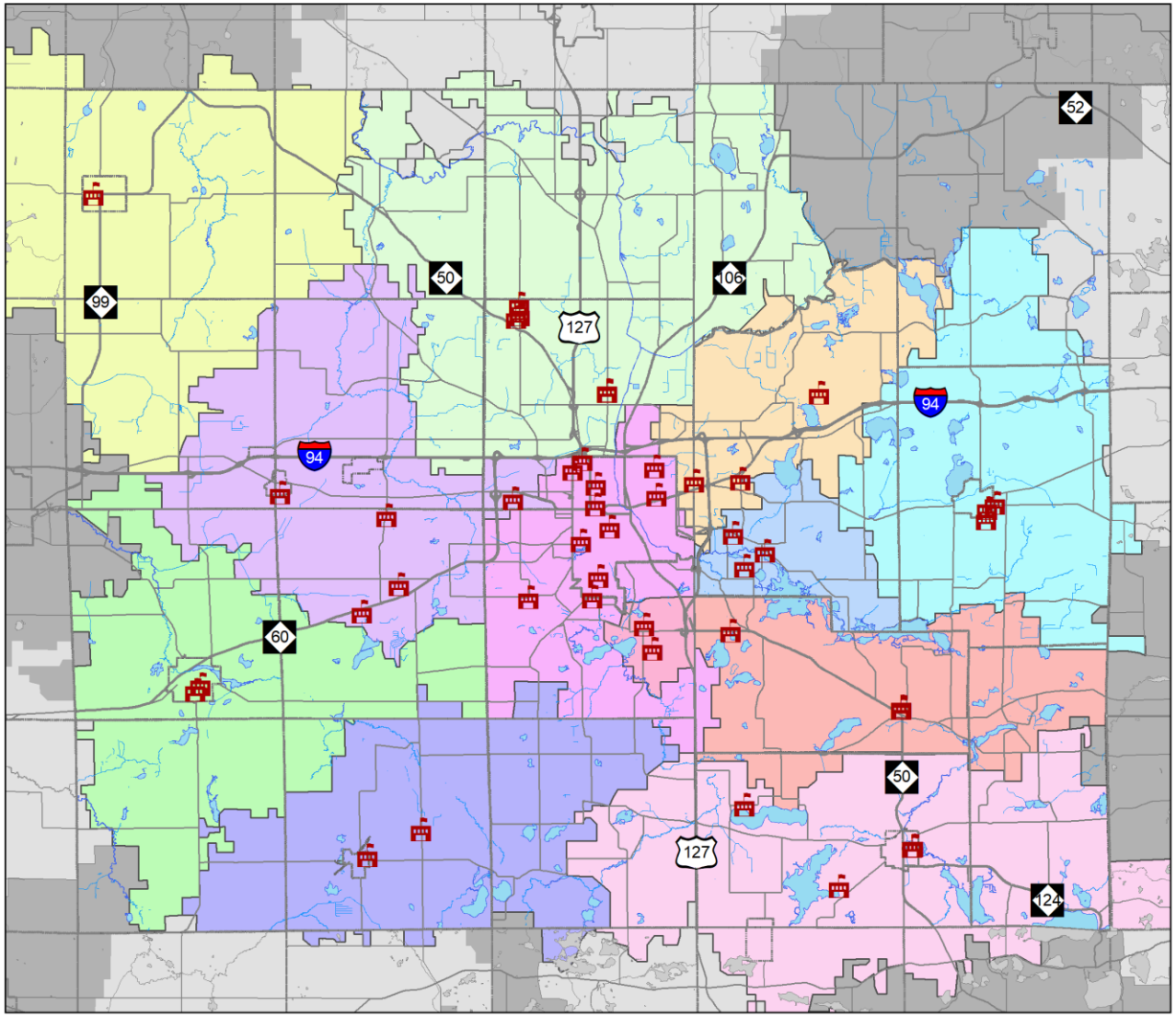
- Lowest
- Highest

Social Vulnerability Source

Centers for Disease Control and Prevention/ Agency for Toxic Substances and Disease Registry/ Geospatial Research, Analysis, and Services Program. Social Vulnerability Index 2018 Database Michigan. data-and-tools-download.html. Accessed on 2020.

Region 2 Planning Commission

Miles
0 2 4 6



Jackson County Hazard Mitigation Plan

Jackson ISD School Districts and Schools

Legend

- Columbia School District
- Concord Commmunity Schools
- East Jackson Community Schools
- Grass Lake Community Schools
- Hanover-Horton Schools
- Jackson Public Schools
- Michigan Center School District
- Napoleon Community Schools
- Northwest School District
- Springport Public Schools
- Vandercook Lake Public Schools
- Western School District
- School Districts in Other ISDs

Region 2 Planning Commission

Miles
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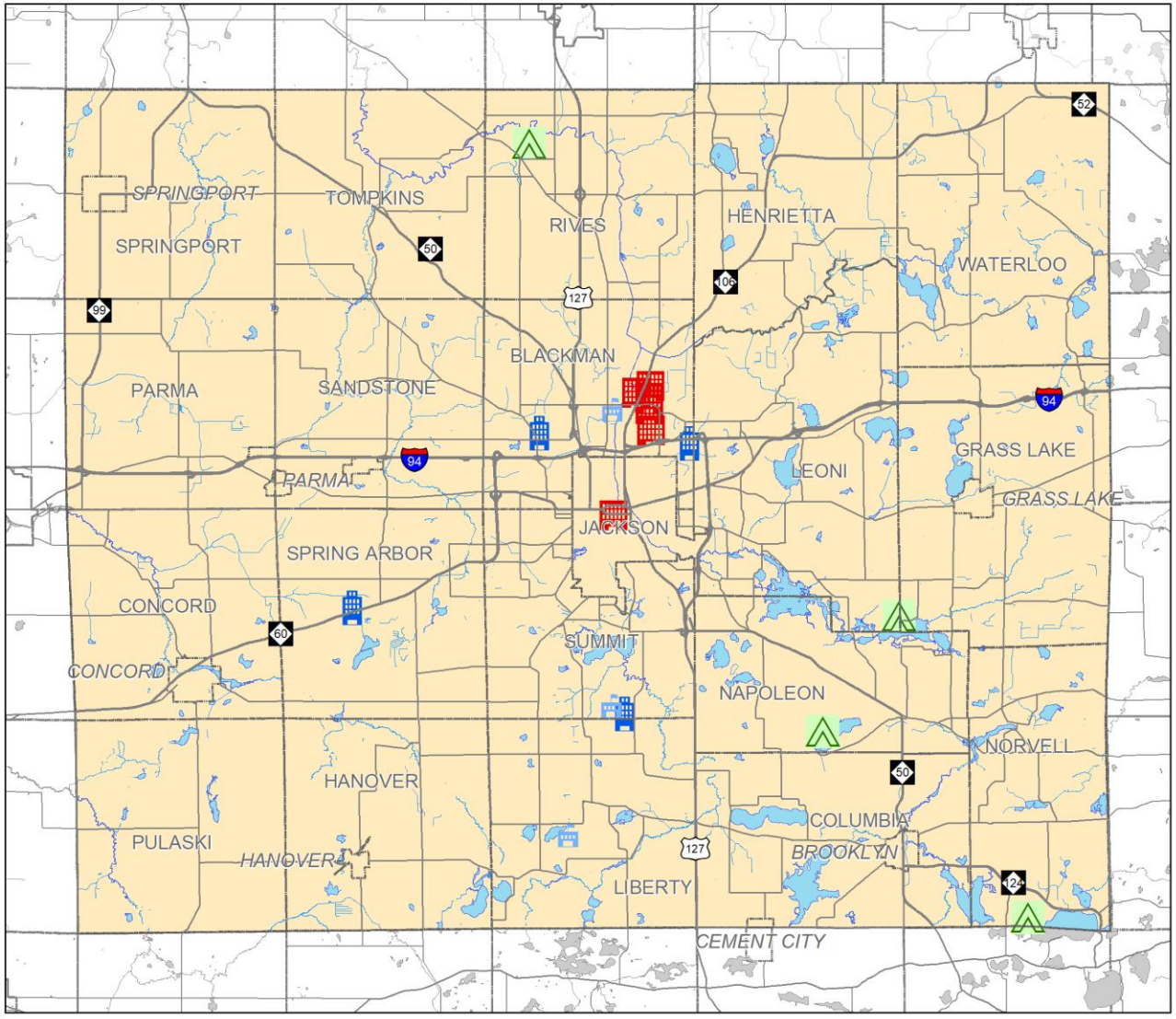

Jackson County Hazard Mitigation Plan

Community Facilities and Temporary Lodging

Legend

- Jackson ISD
- Colleges and Universities
- Camps and Temporary Lodging
- Prisons and Jails

Region 2 Planning Commission

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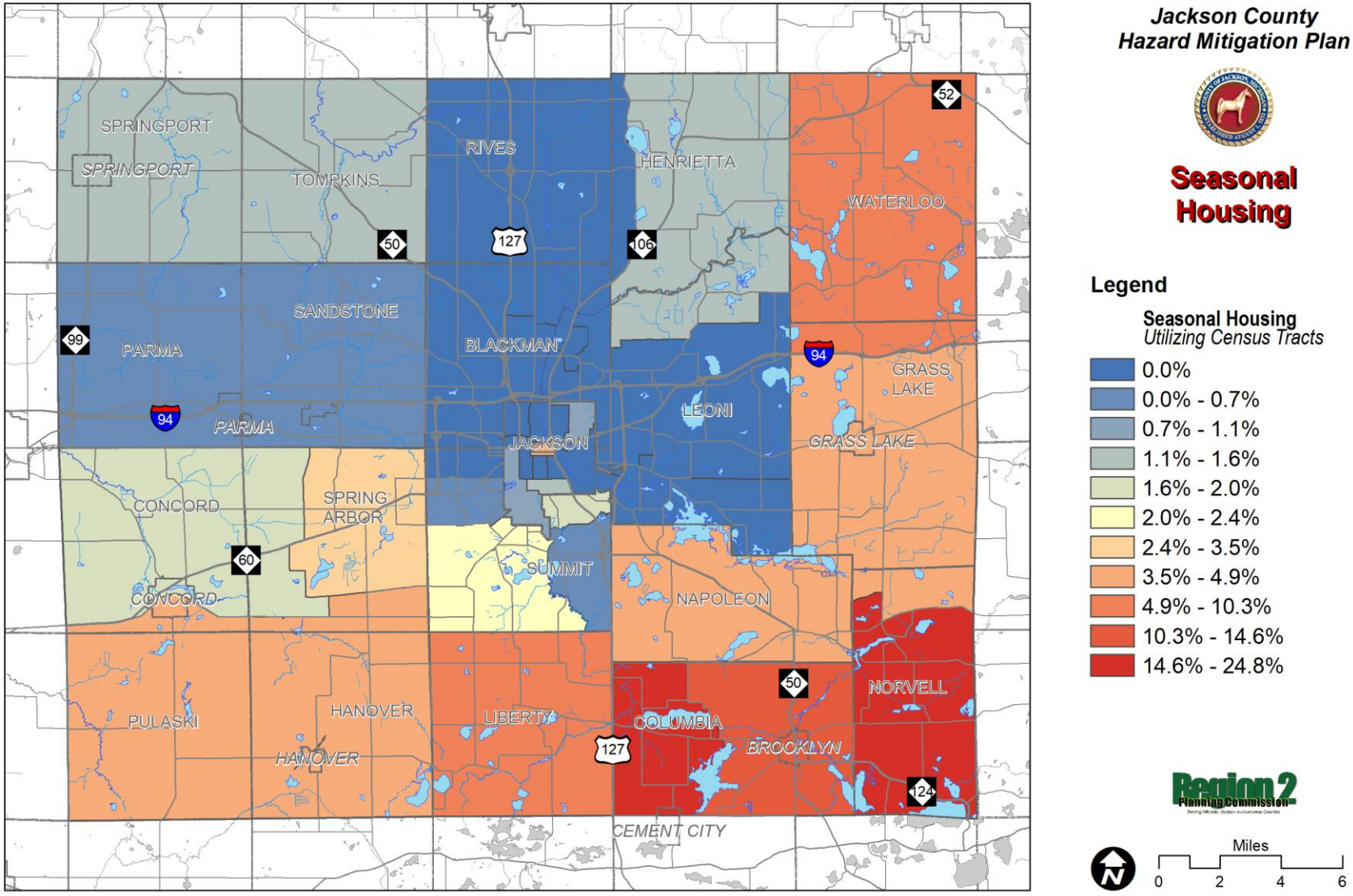
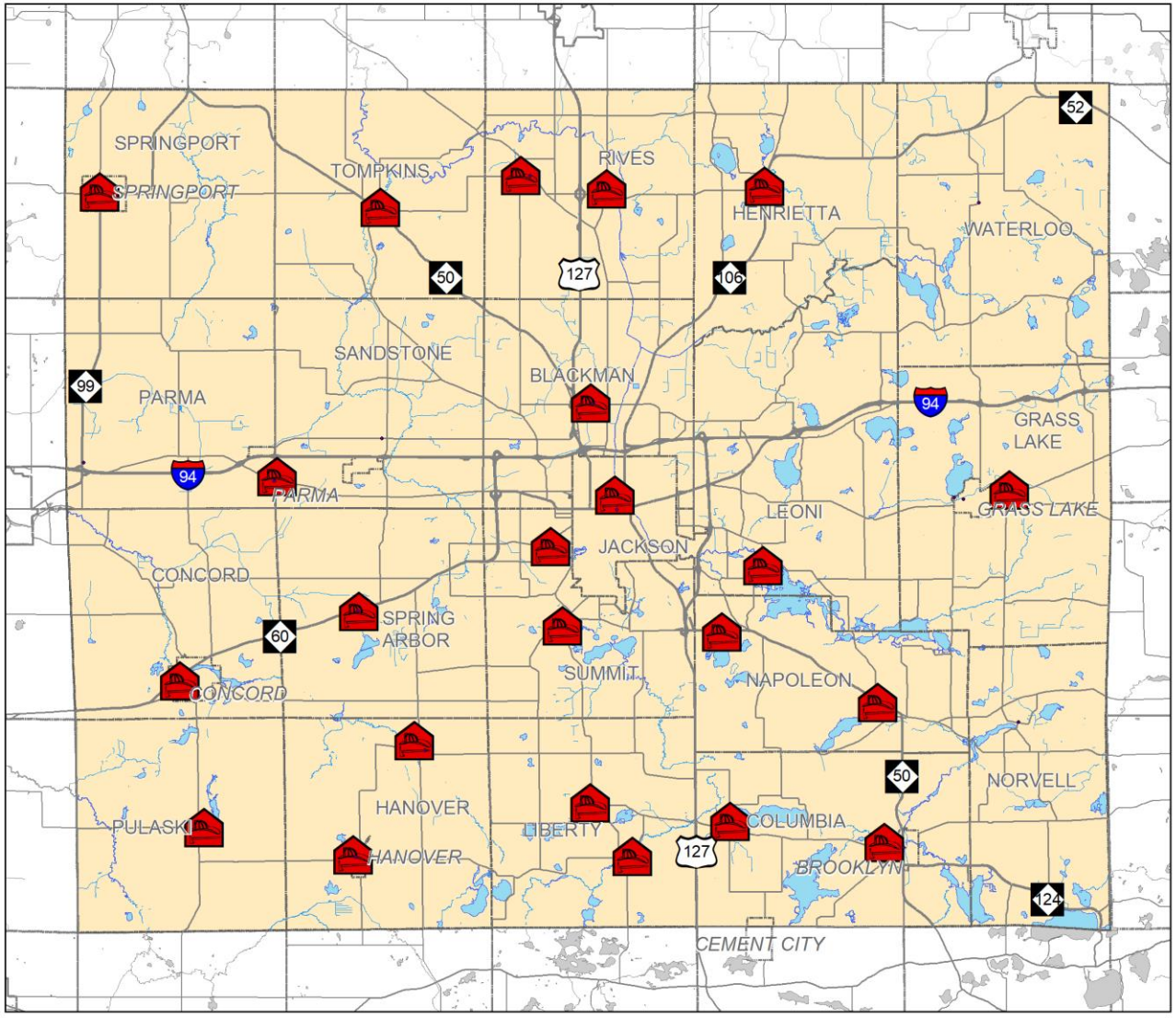

Jackson County
Hazard Mitigation Plan
Seasonal
Housing
Legend
Seasonal Housing
Utilizing Census Tracts
0.0%
0.0% - 0.7%
0.7% - 1.1%
1.1% - 1.6%
1.6% - 2.0%
2.0% - 2.4%
2.4% - 3.5%
3.5% - 4.9%
4.9% - 10.3%
10.3% - 14.6%
14.6% - 24.8%
Region 2
Planning Commission
Miles
0
2
4
6
SPRINGPORT
SPRINGPORT
TOMPKINS
RIVES
HENRIETTA
WATERLOO
SANDSTONE
PARMA
PARMA
BLACKMAN
JACKSON
LEONI
GRASS LAKE
GRASS LAKE
CONCORD
CONCORD
SPRING ARBOR
SUMMIT
NAPOLEON
PULASKI
HANOVER
HANOVER
LIBERTY
COLUMBIA
BROOKLYN
NORVELL
CEMENT CITY
50
127
106
52
99
94
94
60
50
127
124



Jackson County Hazard Mitigation Plan

Fire Stations

Legend

Fire Stations

Region 2 Planning Commission

Miles

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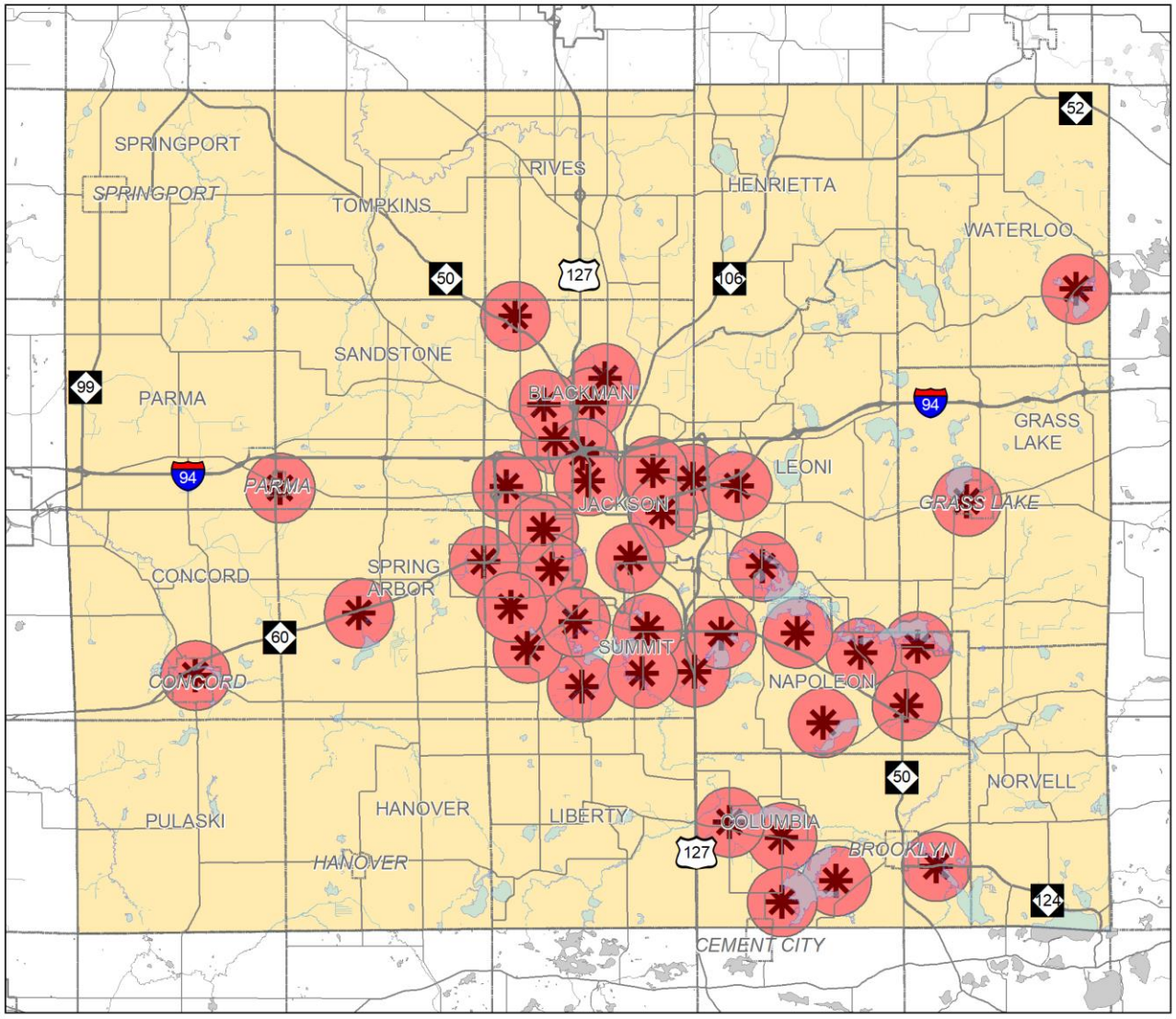

Jackson County Hazard Mitigation Plan

Emergency Siren Coverage

Legend

Warning Sirens

1-Mile Buffer

Region 2 Planning Commission

Miles

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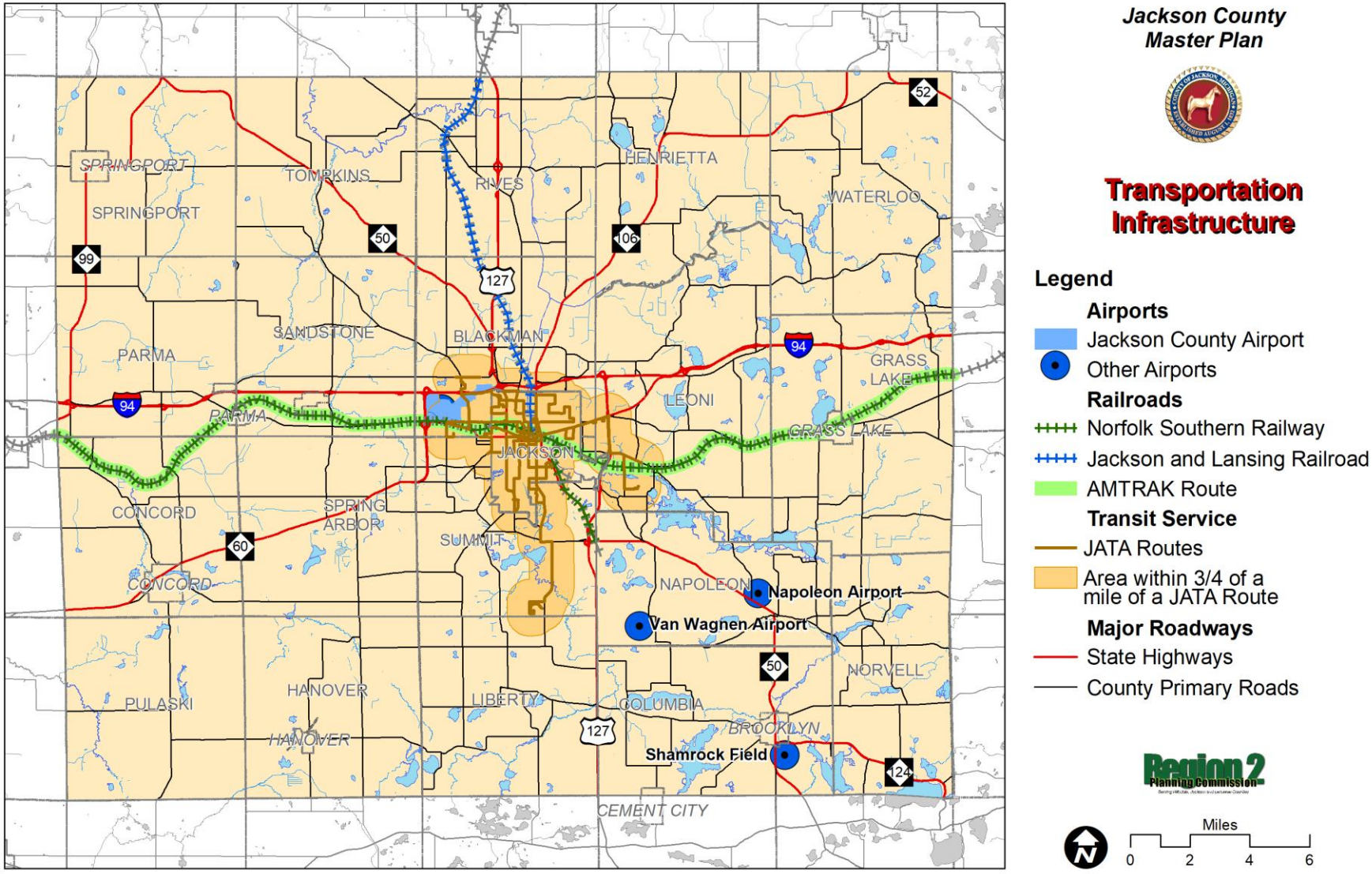
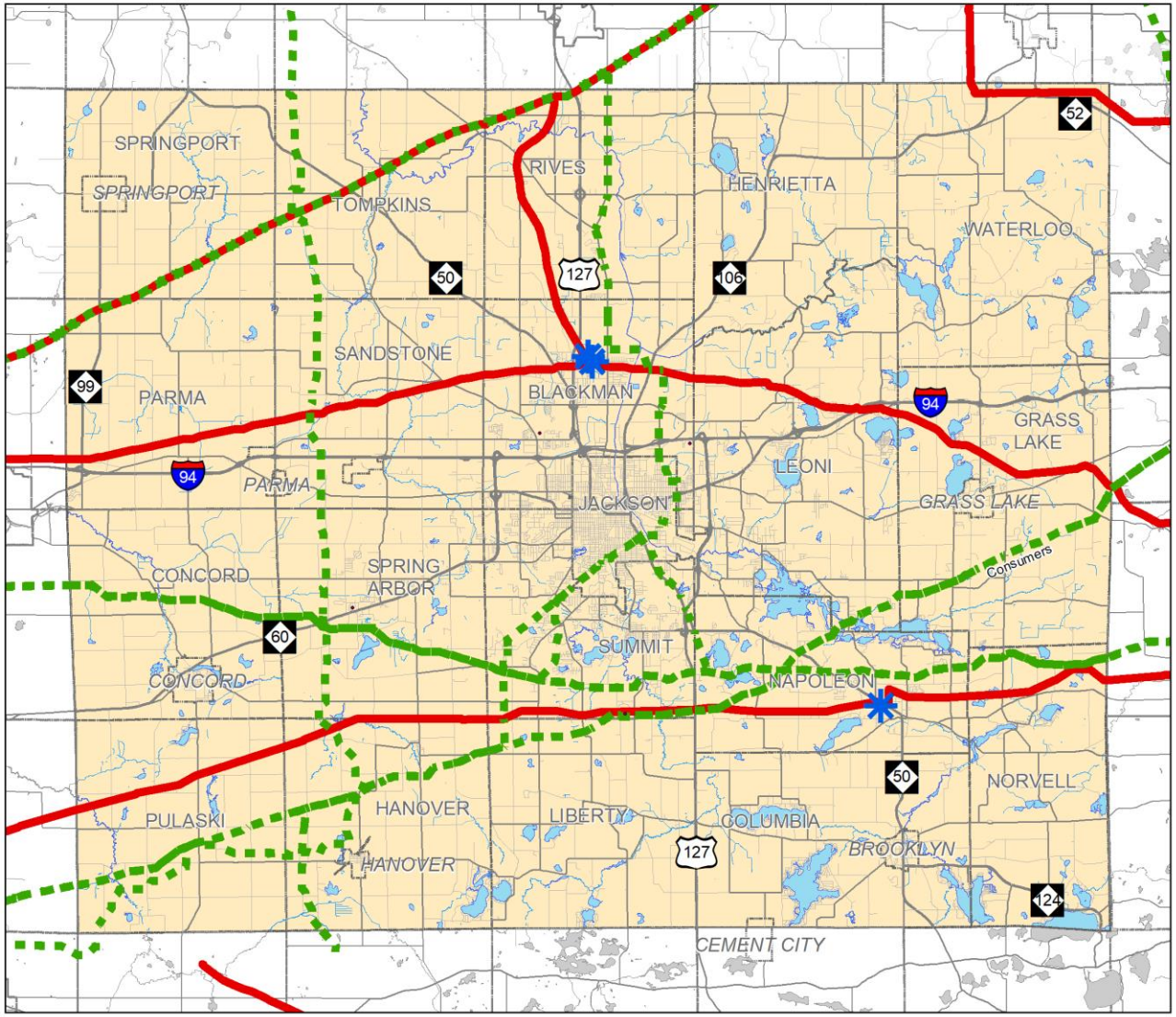

Jackson County
Master Plan
Transportation
Infrastructure
Legend
Airports
Jackson County Airport
Other Airports
Railroads
Norfolk Southern Railway
Jackson and Lansing Railroad
AMTRAK Route
Transit Service
JATA Routes
Area within 3/4 of a mile of a JATA Route
Major Roadways
State Highways
County Primary Roads
Napoleon Airport
Van Wagnen Airport
Shamrock Field
SPRINGPORT
TOMPKINS
RIVES
HENRIETTA
WATERLOO
SANDSTONE
BLACKMAN
PARMA
GRASS LAKE
LEONI
JACKSON
CONCORD
SPRING ARBOR
SUMMIT
NAPOLEON
NORVELL
PULASKI
HANOVER
LIBERTY
COLUMBIA
BROOKLYN
CEMENT CITY
Region 2 Planning Commission
Miles
0
2
4
6



Jackson County Hazard Mitigation Plan

Gas and Liquid Pipelines

Legend

- Liquid Pipelines
- Gas Pipelines
- Pipeline Depots

Region 2 Planning Commission

Miles
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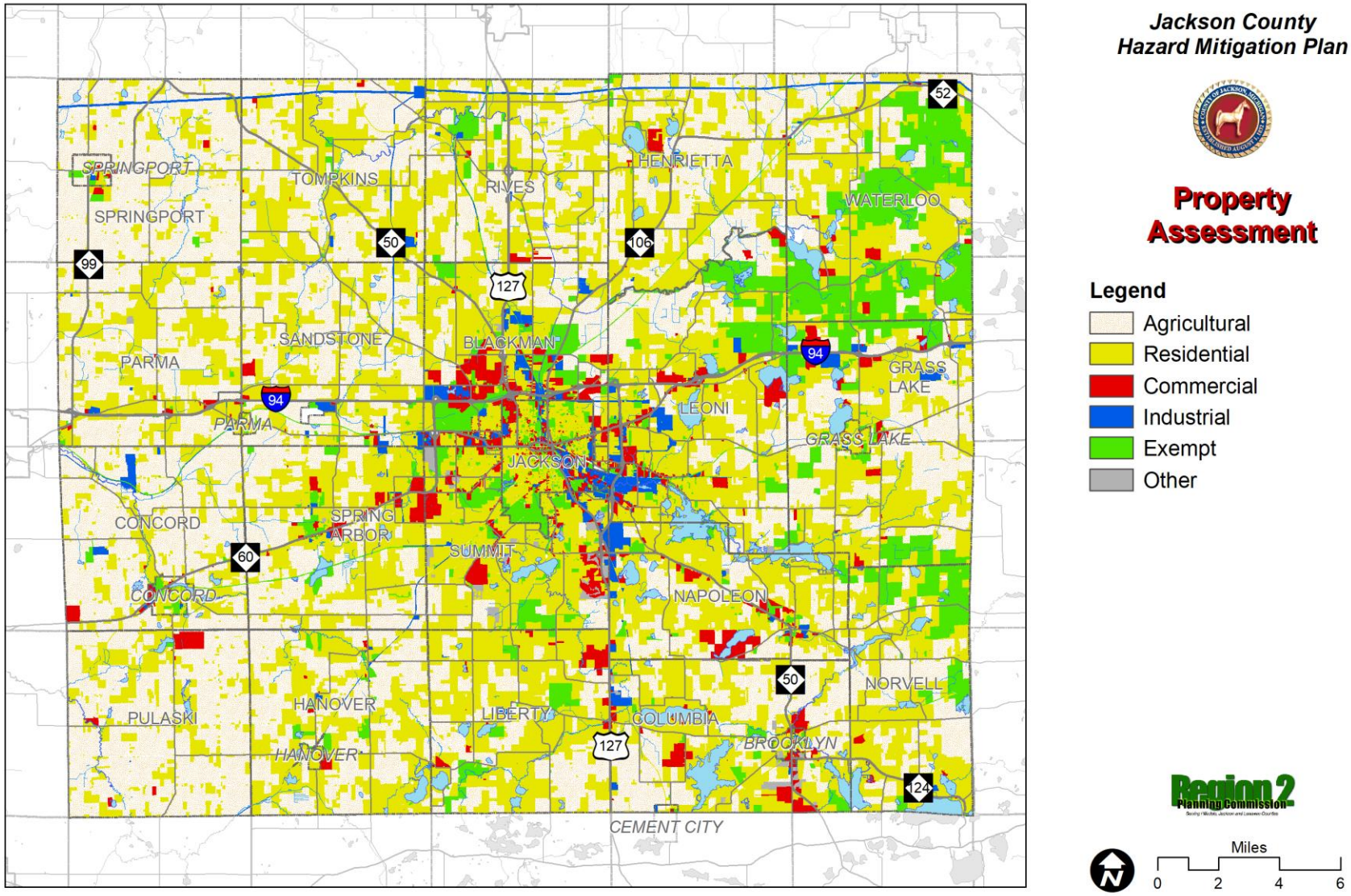
Jackson County
Hazard Mitigation Plan
Property
Assessment
Legend
Agricultural
Residential
Commercial
Industrial
Exempt
Other
SPRINGPORT
TOMPKINS
RIVES
HENRIETTA
WATERLOO
SPRINGPORT
50
106
52
99
127
SANDSTONE
BLACKMAN
PARMA
94
GRASS
LAKE
LEONI
PARMA
GRASS LAKE
JACKSON
CONCORD
SPRING
ARBOR
SUMMIT
60
CONCORD
NAPOLEON
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NORVELL
PULASKI
HANOVER
LIBERTY
COLUMBIA
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BROOKLYN
HANOVER
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CEMENT CITY
Region 2
Planning Commission
Miles
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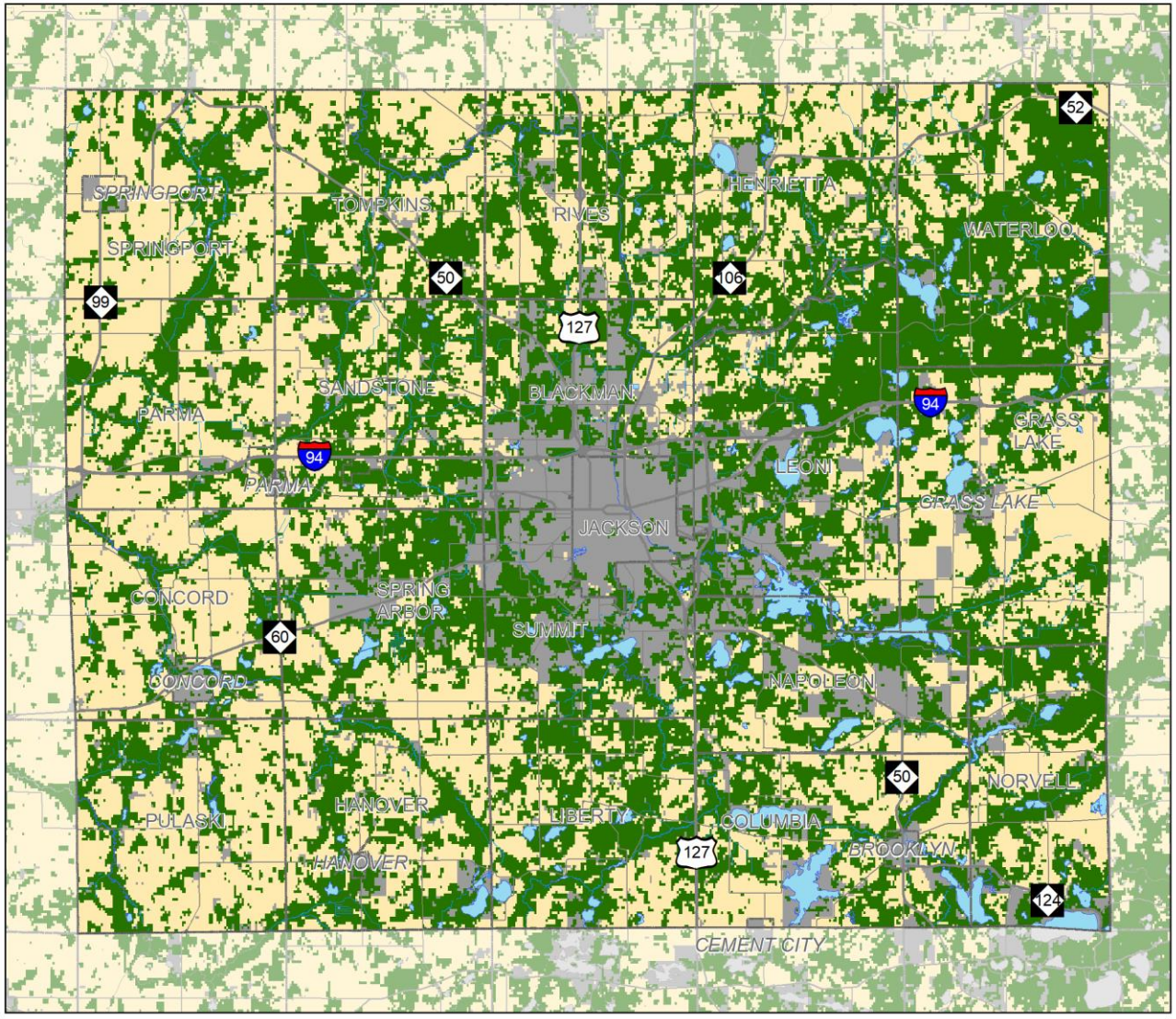

Jackson County Hazard Mitigation Plan

Land Use and Land Cover

Legend

- Forests
- Developed Areas

Notes and Data Source

The land use data is owned (and was developed) by the American Farmland Trust (AFT) and Conservation Science Partners for the Farms Under Threat program (as directed by the AFT).

This map represents the major land uses in 2016, 'Forests' include 'Forestland', 'woodland', and 'federal lands' (with and without grazing). 'Woodland' is 'forestland' associated or adjacent to farmland.

Region 2 Planning Commission

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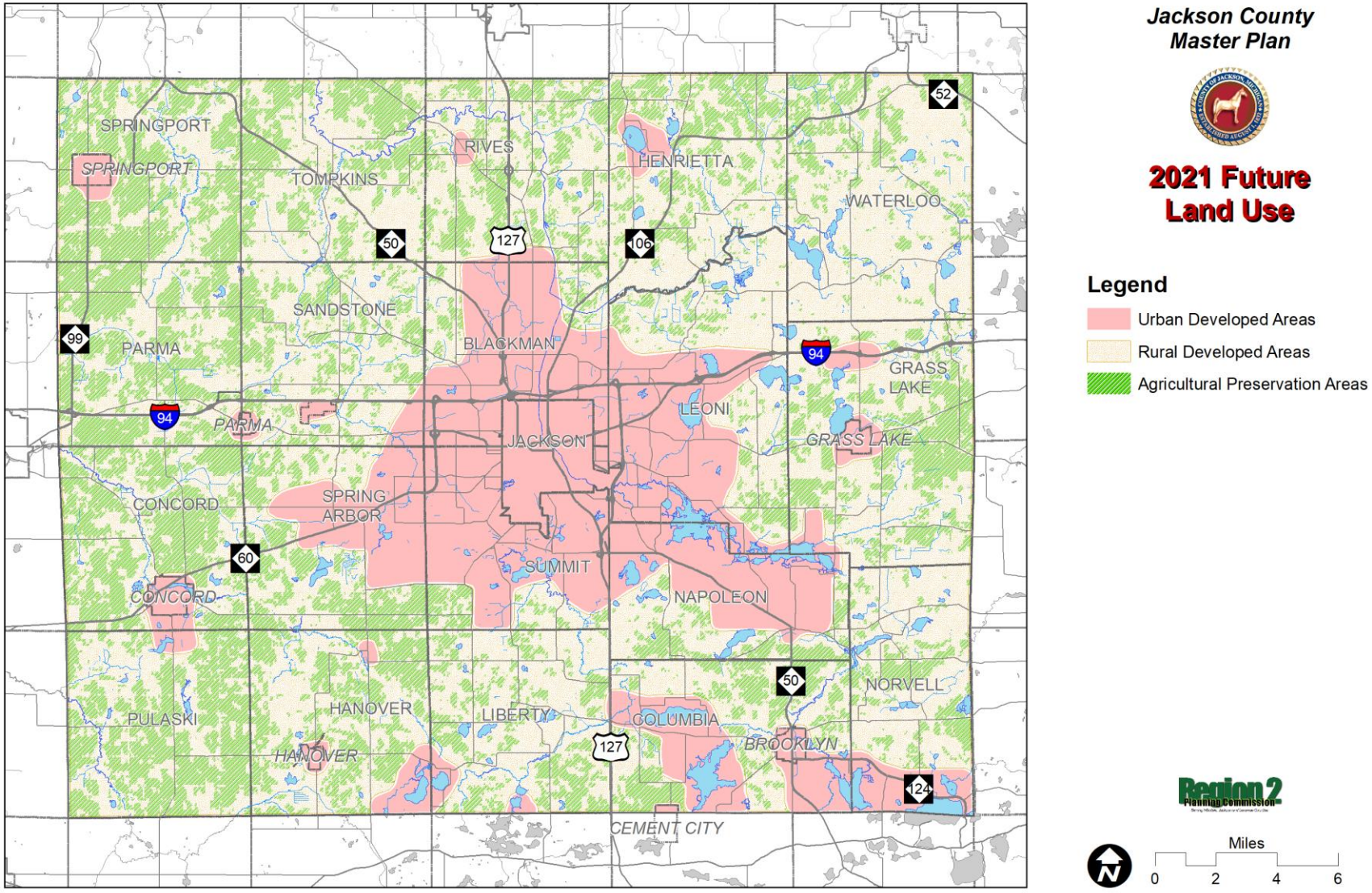
Jackson County
Master Plan
2021 Future
Land Use
Legend
Urban Developed Areas
Rural Developed Areas
Agricultural Preservation Areas
SPRINGPORT
SPRINGPORT
RIVES
TOMPKINS
HENRIETTA
WATERLOO
SANDSTONE
PARMA
BLACKMAN
PARMA
LEONI
GRASS
LAKE
GRASS LAKE
JACKSON
CONCORD
SPRING
ARBOR
SUMMIT
CONCORD
NAPOLEON
NORVELL
PULASKI
HANOVER
LIBERTY
COLUMBIA
BROOKLYN
HANOVER
CEMENT CITY
52
50
127
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127
124
Region 2
Planning Commission
Miles
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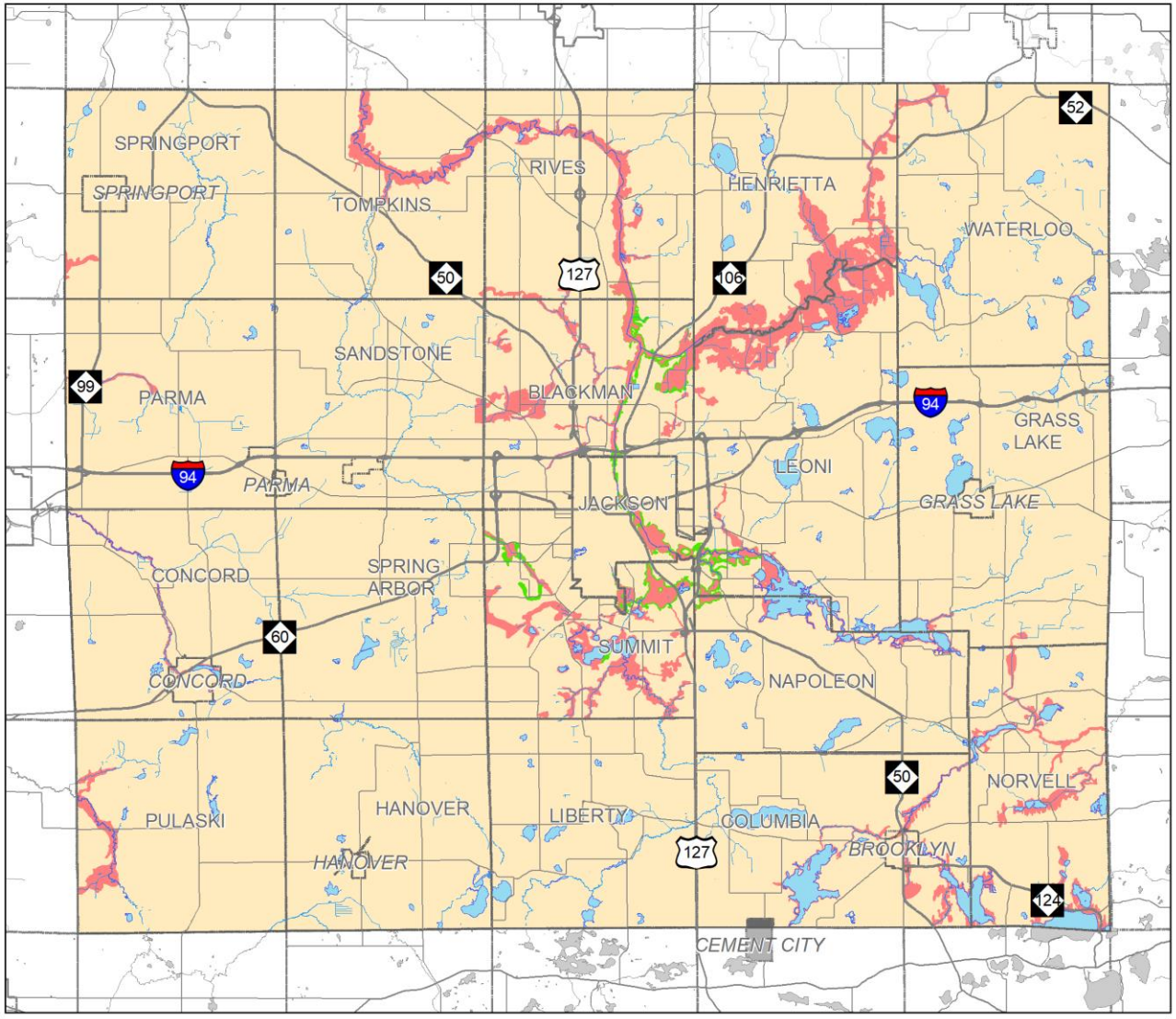

Jackson County Hazard Mitigation Plan

Flood Zones

Legend

Flood Zones

- 100-Year Flood Zone
- 500-Year Flood Zone
- Not Mapped

Region 2 Planning Commission

Miles
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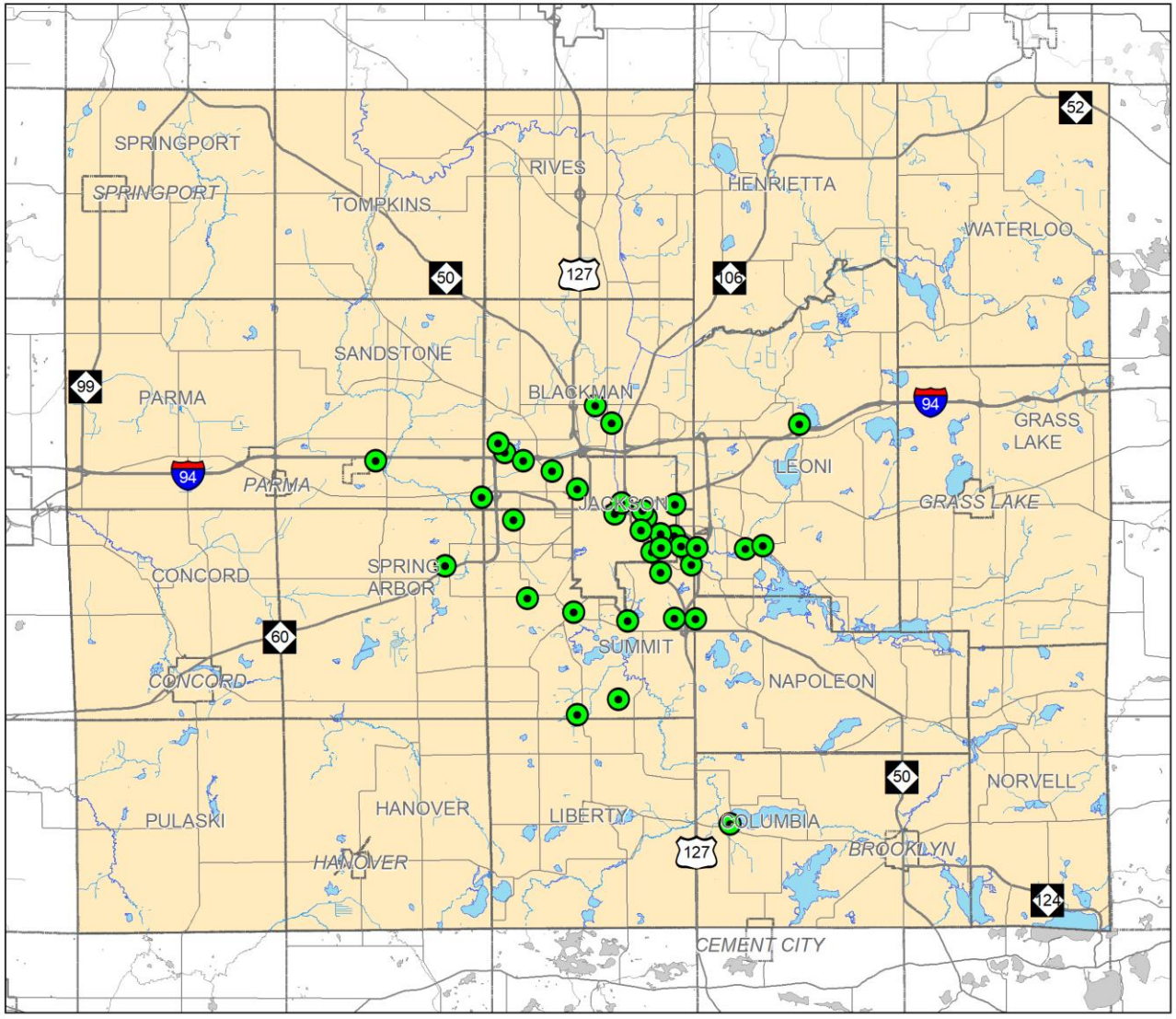

Jackson County Hazard Mitigation Plan

Sara Title III Sites

Legend

- Sara Title III Sites

Region 2 Planning Commission

Miles
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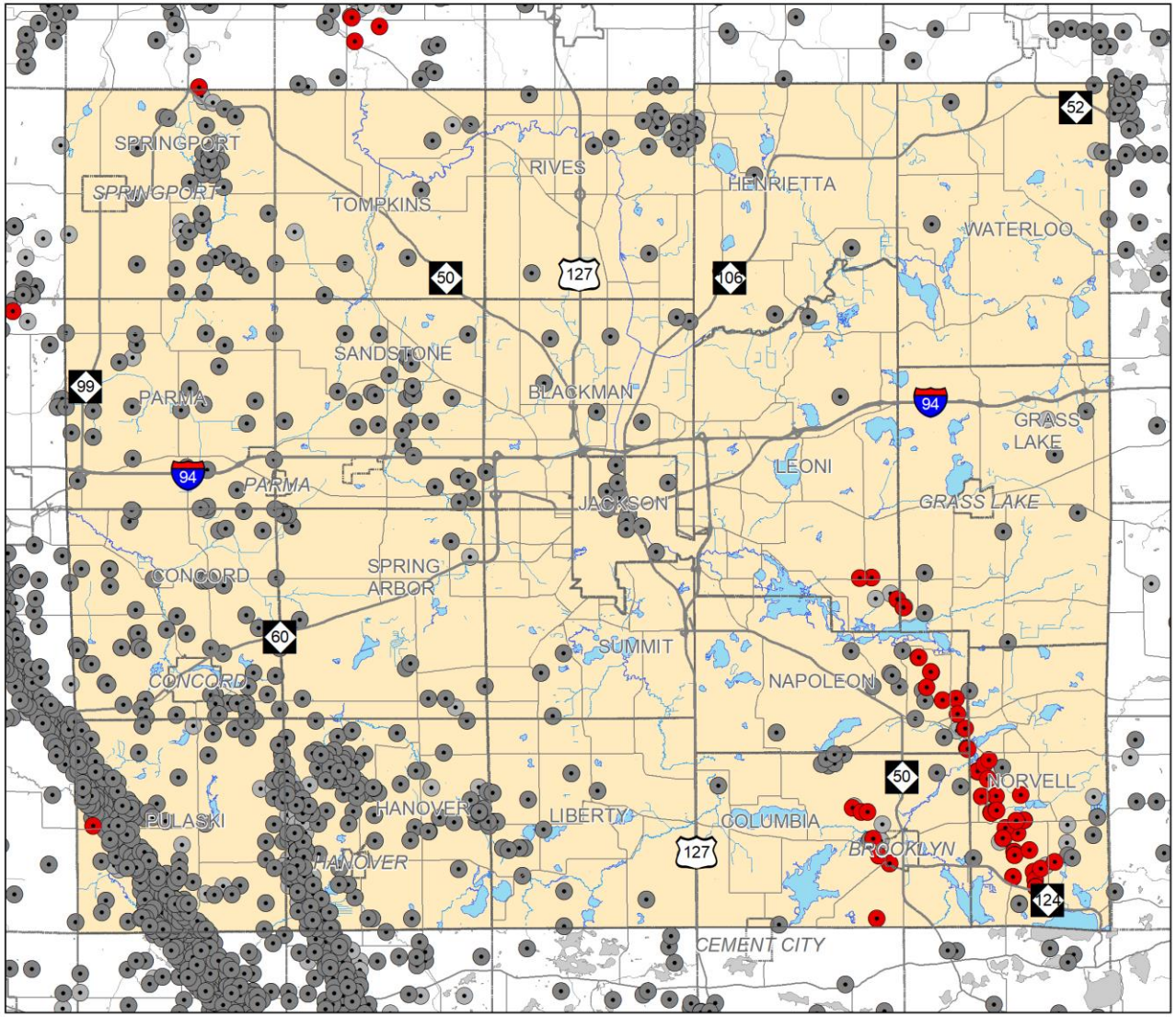

Jackson County Hazard Mitigation Plan

Oil and Gas Test Wells

Legend

- Producing
- Plugging Approved
- All Others

Source: Michigan's GIS Open Data for September 4, 2020

Surface locations (wellhead) of all oil & gas test wells whether directionally drilled or straight (vertical) holes. These are extracted from the Michigan EGLE Oil, Gas & Minerals RBDMS database.

Region 2 Planning Commission

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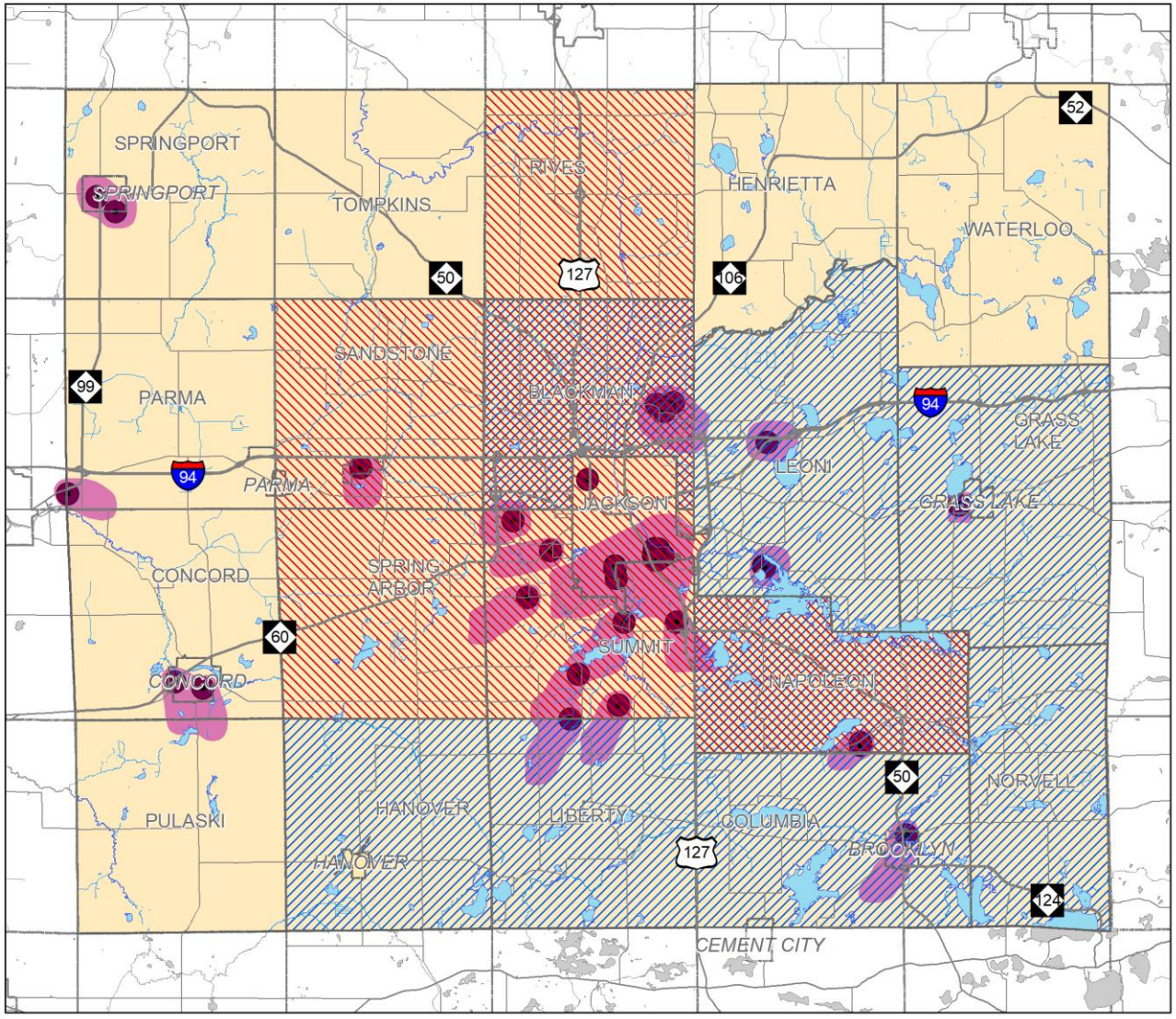

Jackson County Hazard Mitigation Plan

Wastewater Plants and Municipal Wells

Legend

Wastewaster Service*

City of Jackson Service Area

Leoni Township Service Area

Municipal Water Service

Municipal Wellheads

Wellhead Protection Areas

* Only properties able to connect to wastewater service lines are served. Consequntly, substantial portions of the townships within the service areas do not have access to the infrastructure.

Region 2 Planning Commission

Miles

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This is the end of the document

Jackson County Hazard Mitigation Plan
2022 Edition Plan Element

American 1 Community Events Center | Keeley County Park

Progress Since 2011 Appendix

Pertinent strategies from the 2011 edition of the Jackson County Hazard Mitigation Plan are listed below along with notations on progress made since the adoption of that edition of the plan.

Mitigation Strategies to Address All Hazards

The following mitigation strategies are intended to be implemented to address any hazard facing the Jackson Community.

1. Implement an enhanced public information and education program, aimed at Jackson County citizens, regarding potential emergencies and how to prepare and respond. As result of the preparation of this plan, and the comprehensive view of hazards facing the community, it was determined that there is a need to develop an enhanced public information and education program to inform citizens about the potential hazards facing the Jackson Community. A knowledgeable citizen base can do much to minimize the potential for damage and threat to human life.

2. Incorporate hazard mitigation planning in community master planning. As a means of mitigating the hazards facing the Jackson Community, there is a need to incorporate hazard mitigation planning into the Community master planning process. The protection of the public, health, safety and welfare is central to governmental planning. The incorporation of hazard mitigation planning as an elemental part of the community planning process will assure a review of the hazard mitigation plan at least once every five years when the Community Master Plan is reviewed and updated.

3. Update the hazard mitigation plan every five years, or as deemed necessary. An update of the hazard mitigation plan every five years will offer an opportunity to reassess the hazards facing the community and adjust mitigation strategies as necessary. This review and adjustment will result in a maximization of the use of limited resources, and a reduction of the impacts of the hazards.

4. Enhance fire department communication, cooperation, and consolidation. The City of Jackson, and the surrounding three townships of Blackman, Leoni, and Summit have, in recent years, enhanced fire protection services through improved cooperation and communication. The four units of government have implemented an automatic aid system whereby multiple units respond to structure fires within the boundaries of these four units of government. This arrangement assures that adequate equipment and personnel are available to address structure fires. The arrangement is viewed favorably by the local units of government, the firefighters, and the public. In addition, these local units of government have expanded cooperation in the area of training and the purchase of equipment. This has resulted in efficiencies and more effective service to the community. In addition, each of these steps has moved the departments closer to some type of consolidation arrangement. A study was prepared by the Region 2 Planning Commission at the request of the four units of government to determine the feasibility of establishing an authority for fire protection in the four units of government. While it is not likely that such an authority will be established in the near future, the study did result in a number of recommendations to improve safety and efficiency, and to move the local units of government closer to some type of cooperative system. These recommendations are now under review for possible implementation and are incorporated as a part of this plan (See Appendix A).

In addition, the fire departments of local units of government in the rural areas of the county have a history of working together. In some cases, local units of government have joined to construct the station and provide fire protection services.

5. Determine the feasibility of constructing of a County Sheriffs/City Police Department building to enhance communication and cooperation in police services. Jackson County and the City of Jackson are currently studying the feasibility of constructing a single building to house both the County Sheriff Department and the City Police Department. This arrangement would result in better communication between the two departments, and could lead to further cooperation and, perhaps, consolidation at some point in the future.
6. Jackson County's Emergency Management Center should be reviewed to determine adequacy. If the review justifies the construction of a new emergency management center to facilitate emergency warning and response, local officials must determine where the center could be located and how construction and necessary equipment could be financed.

Ice and Snowstorm Emergencies

The Jackson Community has experienced ice and snow storm emergencies in the past. These emergencies are associated with large amounts of snowfall, or ice storms in which the accumulation of ice results in slips and falls, transportation hazards due to impassable or slippery conditions, downed trees and tree limbs, and energy failures associated with fallen tree limbs and the sheer weight of ice on power lines and poles. Mitigation strategies for ice and snow storms are as follows.

1. Pre-plan for debris management staging and storage areas. In anticipation of downed trees, tree limbs, and snow accumulation, strategies must be in place to predetermine locations for the collection and processing of snow in urban areas, and tree limbs. The establishment of such staging areas will facilitate the clearing of roads and handling of debris and snow. (Medium Priority.)
2. Identify local schools and other public buildings throughout the county which could be designated as warming shelters where vulnerable residents could go to escape the effects of loss of heat in their homes due to power outages. Once identified, a public awareness campaign should be initiated to inform citizens of the availability of these shelters. The identification of potential shelters will be completed in 2010. (Medium Priority.)

Tornadoes

Jackson County has experienced deaths and substantial property damage from tornadoes in the past. While no serious tornado damage has been experienced over the past several years, tornado events are possible and could result in loss to human life and substantial property damage in the community. Mitigation strategies to address the potential effects from tornadoes are as follows:

1. Public early warning systems will be assessed to determine their function, adequacy, and coverage. Sirens will be installed where warranted, and those in operation will be repaired or replaced where necessary. (High Priority.)

2. There is a need to ensure that anchoring required in building codes and the HUD manufacturing code for manufactured housing is provided and properly installed. The responsibility for this review rests with local units of government.
3. Shelter areas – certain areas should have tornado shelters that are accessible to nearby residents and the public. Local officials will meet with mobile home park owners to determine the feasibility of installing tornado shelters for park residents where none currently exist. Where there is a need for such shelters funding alternatives should be determined and park operators should be encouraged to construct the shelter.

Flooding

As noted in this plan, flooding in Jackson County has not resulted in extreme citizen hardship or financial loss. In addition, flooding has not received a high priority for action by the public or community leaders. Still, there is a potential for flooding which could result in a serious public health and safety emergency and high cost to the community. The following mitigation strategies are established:

1. Newly prepared, preliminary Flood Insurance Rate Maps will be reviewed to determine whether the designated 100 year flood plains could result in substantial flood losses. In the event such losses are determined possible, flood prevention measures will be identified and implemented to the extent of financial feasibility. Map revisions may be sought, where necessary. (Top Priority.)
2. Floodplain regulations to promote floodplain management will be developed or updated in each community which has an identified flood hazard in the Flood Insurance Study for Jackson County. (Top Priority.)
3. Local units will maintain catch basins and storm sewers to reduce the potential for flooding due to clogged systems. (Medium Priority)
4. Four bridges crossing the North Branch of the Kalamazoo River in the Village of Concord have the potential to cause constriction. These include the Spring Arbor Road, Spring Street, Main Street, and railroad bridges. At the time these are replaced, their replacement will include consideration to reduce their potential constrictive character in a cost effective manner.
5. Wetlands and lakes act as natural retention basins, temporarily storing runoff and releasing it slowly. Local units of government will consider the importance of wetlands and lakes in this process as they prepare and implement local land use plans. (High Priority.)