

AGENDA

CANFIELD CITY COUNCIL **REGULAR MEETING** June 4, 2025-5:30 P.M.

FRANCIS J. McLAUGHLIN MUNICIPAL BUILDING

1. Call to Order.
2. Pledge of Allegiance.
3. Roll Call: Quorum is Present - Meeting is in Session.
4. Proclamations & Presentations.
5. Approval of Minutes.
6. Reading of Communications.
7. Reports of Committees, Boards, Mayor's Report, City Manager, Finance Director, Chief of Police, Zoning Inspector and Public Works Superintendent.
8. Public questions from residents (or representative) related to the above referenced reports. Questions may be limited to three (3) minutes.
9. Recognition of Persons Desiring to Appear Before Council.

10. OLD BUSINESS

Note: After each item is placed on the table for action, public comments from residents (or representative) as to that business item are received. May be limited to three (3) minutes per person and thirty (30) minutes total.

11. NEW BUSINESS

Note: After each item is placed on the table for action, public comments from residents (or representative) as to that business item are received. May be limited to three (3) minutes per person and thirty (30) minutes total.

- A. A **Resolution** Approving and Adopting the 2024-2028 Mahoning County Hazards Mitigation Plan as Prepared by RFG Associates Inc and Declaring an Emergency.

Description: This Resolution adopts the Mahoning County Hazards Mitigation Plan.

Action Needed: Passage of this Resolution

Attachment(s): The Mahoning County Hazard Mitigation Plan.
Public Comments

- B. A **Motion** Making Appointments to Boards, Commissions & Committees.

Description: There is a vacancy on the Millennial Moment JEDD Board and Council is empowered to make this appointment.

Action Needed: Elect a member and passage of the motion.

Attachment(s): None.
Public Comments

12. Council Comments.

13. Adjournment

RESOLUTION

A RESOLUTION APPROVING AND ADOPTING THE 2024-2028 MAHONING COUNTY HAZARDS MITIGATION PLAN AS PREPARED BY RFG ASSOCIATES INC AND DECLARING AN EMERGENCY

WHEREAS, the Board of Mahoning County Commissioners have approved the plan by resolution and,

WHEREAS, the Plan will fulfill the mandates of the Federal Disaster Mitigation Act of 2000, satisfies the requirements of FEMA and Ohio EMA, and meets the needs of Mahoning County.

NOW, THEREFORE, BE IT RESOLVED, by the Council of the City of Canfield, Mahoning County, Ohio:

Section 1: That the City of Canfield hereby adopts the Mahoning County Hazards Mitigation Plan, as prepared by RFG Associates Inc., and approved by the Mahoning County Commissioners.

Section 2: This Resolution is hereby declared an emergency measure necessary for the immediate preservation of the public peace, health, safety, convenience and welfare of the City of Canfield and the inhabitants thereof, for the reason that this legislation is required to obtain additional funds from FEMA for the Sawmill Creek Improvement Project.

Section 3: That this Resolution and all deliberations relating to the passage of this Resolution were held in open meetings of this Council, all pursuant to Section 121.22 of the Ohio Revised Code and Section 3.11 of the Charter of the Municipality of Canfield.

PASSED IN COUNCIL THIS _____ DAY OF _____ A.D. 2025

PRESIDENT OF COUNCIL

ATTEST:

CLERK OF COUNCIL

Certification of Publication

I, the undersigned Clerk of Council of the City of Canfield, Ohio, hereby certify that the foregoing Resolution was posted in a prominent place at the Municipal Building, Canfield, Ohio for seven continuous days, to-wit: _____

CLERK OF COUNCIL

APPROVED AS TO FORM:

MUNICIPAL ATTORNEY

Introduced by: _____

Motion No. _____

A MOTION MAKING APPOINTMENTS TO
BOARDS, COMMISSIONS & COMMITTEES

WHEREAS, City Council is empowered by the Charter to appoint members to said Boards, Commissions and Committees; and

WHEREAS, a vacancy exists on the Millennial Moments JEDD Board; and

WHEREAS, Council desires to make these appointments.

NOW, THEREFORE IT IS HEREBY MOVED BY COUNCIL OF THE CITY OF CANFIELD, OHIO:

Section 1: The following individual is hereby appointed to fill the unexpired term on the designated Boards, Commissions or Committees for the term as indicated:

NAME	COMMITTEE	TERM EXPIRES
	Millennial Moments JEDD Board	12/31/2027

Section 2: That this Motion and all deliberations relating to the passage of this Motion were held in open meetings of this Council, all pursuant to Section 121.22 of the Ohio Revised Code and Section 3.11 of the Charter of the Municipality of Canfield.

PASSED IN COUNCIL THIS _____ DAY OF _____ A.D., 2025

CLERK OF COUNCIL

Certification of Publication

I, the undersigned Clerk of Council of the City of Canfield, Ohio, hereby certify that the foregoing Motion was posted in a prominent place at the Municipal Building, Canfield, Ohio for seven continuous days, to-wit: _____

CLERK OF COUNCIL

APPROVED AS TO FORM:

MUNICIPAL ATTORNEY

MINUTES
CANFIELD CITY COUNCIL
REGULAR MEETING
MAY 21, 2025-5:30 P.M.

The meeting was called to order by Mark Graham, Acting President of Council, followed by the Pledge of Allegiance. The Clerk called the roll to which a quorum responded as follows: Mr. Dragish, Mr. Graham, and Mr. Tieche.

Absent: Mrs. Oliver and Mr. Neff.

Staff present: Charles Colucci, Chief of Police; John Rapp, Public Works Superintendent and Tyler Thorn, Zoning Inspector.

Absent: Christine Stack-Clayton, Finance Director and City Attorney Mark Fortunato.

Under **PRESENTATIONS AND PROCLAMATIONS:**

MR. GRAHAM: Mr. Mayor, any Presentation or Proclamations?

MR. DRAGISH: I believe I do. An Auxiliary Officer and a Peace Officer will be sworn in. Chief Colucci, would you like to kick it off and introduce before I get started.

CHIEF COLUCCI: Thank you, Mayor. Hello, my name is Chuck Colucci. I'm the Chief of Police of the Canfield Police Department. I'm blessed to be a chief here, blessed to be an officer, employed by such a great city. Is everybody here for the swearing in? We'll make this quick and move on to our city council meeting. We thought it would be a good idea to start swearing in our new officers in the presence of council, our city manager, Judge David D'Apolito and the rest of our city staff. It's more than a commitment that you're making to yourself, your family, it's a commitment that you're making to our community, to our elected officials, our appointed officials. It's a tremendous honor to wear a badge and wear our patch. We work really hard to give our department a good reputation and make our city proud. One mistake could ruin a lot of that hard work. We do our best to try and find the best people that we can. We've successfully been able to hire 5 or 6 officers during the last 7 or 8 months. It's a very challenging time to find qualified police officers. A lot of departments are hiring. In fact, when I was going for a full-time job in the mid-90's, I think there were 2 full time jobs throughout our entire county that year. It was a tremendous challenge to be able to get a job. Now, they're easier to get. Unfortunately, some standards have dropped. We've modified a few of our standards. The standards as far as, professionalism, education, integrity, good morals and values, that's never going to change. One thing that will never change about our department is our culture. Our culture is very simple. Simply put, we have to give our residents, who have a lot of faith and trust and spend a lot of hard-earned money on taxes, to give them the service they want. I was just talking to the city manager about this earlier today. Primarily, Canfield is a bedroom community. We don't have much industry. We don't have much business. But our

schools, our safety services, police and fire and our dispatchers, that's what they're here for. That's what they count on and that's what they like. They like to go to bed at night and feel safe. They like to be able to allow their kids out in the yard, or go to the neighbors house and feel safe. One of my rules and I think I've talked to Austin about this and I'm sure Matthew knows about this, in the summer, I don't like to see police officers driving around with the window up and the air conditioning on. I don't know how you're connected to the community with your windows up. You can have the air on, keep the windows down. In the winter, it's more of a challenge, I respect that. But there is a lot less going on in the winter. Getting back to why we're here tonight, so first off, Austin Dozier stand up here. Austin just finished the police academy and took his state test today. Lieutenant Ruiz gave me a call early this afternoon to let me know Austin passed. I had a conversation with Austin, he passed, we had no doubt he would pass. He just finished the police academy and he's eager to start his career. Another thing about the new waive of police officers, we're hiring a lot of 21, 22-year old's. Austin is not 21 or 22. He's still a young guy. It took him a little while to figure out exactly what he wanted to do. I know that I wasn't ready to be a cop when I was 21. It's a maturity thing. Austin just finished up the academy, he's a hardworking young man. Austin went through a lot to get this job. We do an initial interview, they do a CVSA Exam which is a computerized voice stress analysis, truth verification. Some of you may be aware of polygraph, it kind of took the place of a polygraph. We ask him a lot of questions that tell us a lot about the person and who they are and if they're willing to be truthful or not. Then we do a background investigation. Our background investigators, Lieutenant Cris Ruiz and detective Scott Bennett, they go out and talk to prior employers, football coaches, wrestling coaches, teachers, neighbors. At that point, we'll go to a conditional job offer. Then we're allowed to get into the medical areas, psychological assessment, urine analysis, make sure they're fit for duty, making sure the doctor is acceptable with them fulfilling the aspect of our job description. It's not one of those aspects that I just spoke of that gets a person hired, it's everything put together. It starts from the moment we get introduced to the individual to the very end, we put it all together and it adds up and makes sense, we think they're the best match, best fit for the community, and we have the job available we'll give you the opportunity. That is where Austin is at. There have been cops that have went through the whole process, there have been public works people that we just looked at that wasn't the best fit. So, we're doing everything we can to make sure we give our community the best civil service. We felt that Austin was a great match for this town. You'll have to excuse me, I went to Florida and came back with a sinus infection. Usually you leave with a sinus infection and it gets cleared up down there. I'm really excited to get Austin in here tonight. It's a team effort. I think you're starting to feel that. Some of you might have seen the news last night, we had a police chase and crash. We had a lot of resources, the highway patrol sent a helicopter up here from Columbus. I heard Austin's number on the radio, although he wasn't in uniform, not a sworn officer, he was with our people and he did get the experience. I'm sure he was really itching to get out there. I'm very proud of Austin. I met his wife Kelsey and Emma. You guys should be very proud of Austin. I know he's very proud of you. One of the things that stood out is family comes first with this guy. Family is priority. He's going to work very hard to represent you and this community. We're super excited to bring Austin on. Austin, we all wish you the best of luck. It's more than wearing the badge, being issued the gun and patch, when you wear all of that, you represent the City of Canfield, our businesses, our

schools, our residents. They have a certain expectation. Every community is different. Ours is no different. You were probably told at the Academy you get no crime out here in Canfield. If you want to do real policing go work somewhere else. It's not the case. We're busy and we do a darn good job. I'm very proud of our people. I think we have the best. I love working here and working with them. I'm glad you're ready to take on the challenge. I will say that Austin had a job offer from a neighboring agency, one of the best agencies in the county, an agency that I would like to work for myself, but Canfield got in the way of that. I'm pretty proud of you for picking us. I think it's going to be a good fit for you and your family. Austin wasn't selfish about wanting to be on a department that gets sent on call after call. He made a long-term decision for himself and his family and that meant a lot to all of us. All the decision makers, especially the city manager who signed his appointment letter. The Mayor will swear him in.

Matthew if you could stand up. Come on up here, please. An interesting story with Matthew, Matthew is 21?

MATTHEW: 20.

CHIEF OF POLICE: Matthew is being sworn in as an Auxiliary Officer, it's technically not a sworn position, this is more ceremonial. One of the things that we looked at about a year ago, how could we prepare better for the future, succession management. One of the things we looked at was utilizing our auxiliary program. Instead of having retired people help us on parades, maybe use that tool to get new people. Matthew was somebody that I actually coached in flag football. Why did you want to do this job?

MATTHEW: My dad (inaudible).

CHIEF OF POLICE: Anyway, I'm super proud of Matthew. He's a very hard worker. He's one of the most determined young men that I've met. I knew Matthew as a little wide receiver that would run down the field and we'd heave the ball to him and he'd catch it. He's matured quite a bit. He runs his own business. He's about ready to graduate from college. In fact, I think with this internship, and we'll be sending him to the police academy in the fall. With that, he'll receive his bachelor's degree. He's accomplished a lot in a short amount of time. We do the same type of background check and CVSA on Matthew. Again, Matthew, I encourage you, although that shirt color is different, you're not getting a gun just yet, you represent our elected officials, you represent our appointed authority, you represent your family and the community. On and off duty, you guys have to carry that heavy load. It's not that heavy. This is what you want. This is what you want your career to be. Let's get it done. Hold yourself to high integrity. You know what the right thing is. I don't think I forgot anything, Scott?

SCOTT WEAMER: No.

CHIEF OF POLICE: So, the Mayor will swear them in. Real quick, this is our City Manager, Judge David D'Apolito. Do you want to say anything?

MR. D'APOLITO: No, I think you've said enough. (Laughter)

CHIEF OF POLICE: This to me is special because of the families out here. Mayor, if you have anything to say, then let's swear these guys in.

MAYOR DRAGISH: I do this every time that we've done this but he brings up that this is a family, this is the Canfield family and after you get sworn in, you become part of our family and that community. Like he said, just keep yourselves high in the community. We respect you guys and you respect us too. We are looking forward to you being a part of our family.

MAYOR DRAGISH: Austin Dozier was sworn in by Mayor Dragish and Matthew David Hunter was sworn in by Mayor Dragish.

Under **APPROVAL OF MINUTES**, the Minutes of the Regular Meeting on May 7, 2025 were approved as presented.

Under **READING OF COMMUNICATIONS**, there were none.

Under **REPORTS** of Committees, Boards, Mayor's Report, City Manager, Finance Director, Chief of Police, Zoning Inspector and Public Works Superintendent.

MR. TIECHE: The Parks Board met earlier this month and the minutes of that meeting have been distributed.

MR. DRAGISH: I have my Mayor's Monthly Statement to Council. Our net collections to the city is \$125.01.

MR. GRAHAM: I have no report this evening.

PUBLIC WORKS SUPERINTENDENT: Thank you. Not too much today. We've been really busy prepping for Memorial Day. We're trying to beat the rain. We got it looking good. Let's hope that the cold weather keeps it down. Also, we did a couple water taps out at Saybrook. We've been pretty consumed with Memorial Day. We got the flags up today. That's all I have.

MR. GRAHAM: Thank you.

MR. TIECHE: The lead and copper test that we just did, was there any sample that did not meet standards?

PUBLIC WORKS SUPERINTENDENT: No. We are half way through it right now, 20 of 40. We did submit a request for reduced monitoring. It looks like we wouldn't be eligible until February 2026. We'll revisit that. Right now, for the past two years, we've been doing 80 samples a year. I appreciate all the help from all the residents. I know it's tough if we call on you but we really need the support because they only take certain years, I think it's 1983 and 1989. Other

samples are not a tier 1 sample. They turn out to be a tier 2 sample. We want all the tier 1 samples that we can.

MR. TIECHE: Does that mean, since my house is older, I shouldn't be getting a sample.

PUBLIC WORKS SUPERINTENDENT: No, it doesn't mean that. It's just the preferred years with the EPA is a tier 1. A tier 2 is acceptable, if we run out of tier 1's; which we do. Amazingly, there aren't a lot of houses built in that time period or people that aren't willing to help us with samples.

MR. TIECHE: I know that Sebring ran into a whole lot of problems over there because they had a lot of older homes and they still had lead piping. I'm not sure if they got a grant to make changes in those residential structures. That's been a year ago.

PUBLIC WORKS SUPERINTENDENT: One thing I can tell you is, we have not run into any lead in our system, service lines. We'll call them metal pipes, steel, but then we have to dig down and verify there is no lead attached to those. We haven't had any hits on lead, so far.

MR. TIECHE: In 1965, the Board of Public Affairs established a policy that all service lines would be copper.

PUBLIC WORKS SUPERINTENDENT: Thank goodness they did that. The EPA wanted to see that or we'd be digging up everybody's service to the City of Canfield.

MR. TIECHE: I think maybe I need to put an asterisk on that, plastic is okay.

PUBLIC WORKS SUPERINTENDENT: Plastic is okay. There are rules with the type of plastic. We did change that, sorry. It's all copper now. But plastic main lines are okay.

MR. GRAHAM: Thank you. Our Zoning Inspector, Mr. Thorn.

ZONING INSPECTOR: Thank you, Mr. Graham. For the month of May, we issued 7 zoning permits, 1 beekeeping permit. This year's total we have 48 permits that we've written. Lately, letters have been going out for property maintenance violations for high grass. In our ordinance, the grass must be kept up. Aside from the ordinance, just be a good neighbor and cut your grass. That is all I have for tonight.

MR. GRAHAM: Thank you. Our clerk.

CLERK: No report.

MR. GRAHAM: Our Chief of Police.

CHIEF OF POLICE: Thank you, Mr. Graham. On May 14th, we received a complaint from a resident on Callahan that had unauthorized charges on a credit card. During the investigation, Detective's Bennett and Wells determined the suspect, he was charged, Kyanite Thomas (spelled phonetically) during the investigation they were able to identify 21 other city residents that were victims. Mr. Thomas has been in cases throughout the area. Stolen credit card information that he received and creating clone credit cards through skimmers that you hear about on T.V. that they install at the gas stations and mac machines. That's how he was able to get his information. The additional 21 charges, the victims, we'll be presenting that case to the Grand Jury. I thought our detectives did a great job, not just getting the original complaint solved, but got 21 additional victims and solved their crimes as well. Some of you may have heard about this one, on Friday, May 23rd, there was an accident on the north end of the square by the courthouse. It was a 1 car accident. There was no police chase. It was just a car accident. The car hit a pole and all 4 people fled the vehicle. Our officers were able to apprehend 2. They were determined to be illegal aliens. Supposedly, the others were as well. Nobody knew each other. The car had an Illinois license plate. Supposedly, they were coming from Columbus. The two that we were able to catch have since been deported by ICE. We're looking for the other two but it's going to be difficult. Most of the time, they really don't know each other. They don't know who they are traveling with. Our people did a good job. We took the call and got to the scene and apprehended two.

Last night, you might have seen on the news or heard that we had a police chase that ended in a crash. So, what happened is, a vehicle was coming into the city east from the direction of Boardman, our FLOCK Camera on the east end of town picked up the vehicle. It was hit as a stolen vehicle. We had a funeral procession coming through town right at the same time. It was coming from Hubbard and it was a military veteran who passed away. We knew it was coming. We had a lot of extra people out to shut down our intersections. They were headed towards the Ellsworth area. So, we had extra people out. Officer Dalton Moore just happened to be in town for court, he had his radio on. Some officers, I've seen over the years, they don't always turn their radio on in court or even bring them. He heard it, he left, he saw the car on North Broad. He initiated a traffic stop on Herbert Road and 46. The car fled. Pulled into Star Extruded Shapes, pulled out of there and eventually crashed at the intersection of Herbert and Turner Road. There were some conflicting stories on how many people left the car. There were 3 suspects that fled, we were ultimately able to apprehend one. We were close to getting the other two. We had assistance from the Mahoning County Sheriff's Department, Austintown Police, Columbiana sent other K9's and we had our drones up in the air. These individuals are well known throughout the county. It was said that the person that we did catch has a permanent bed at juvenile hall. That is where his head lies right now. We're working leads on the two other individuals as we speak. What was impressive is the Highway Patrol sent a helicopter up from Columbus to help us. I said to the city manager, what are we dealing with that they sent a helicopter up from Columbus. I'm not sure. I know a lot of police officers live out this way and federal agents. One FBI Agents house cameras caught one of the suspects walking through their yard. We got a lot of good footage on who they are. We're pretty confident that we'll find them and bring them to justice. We had a lot of officers out for funeral detail but I'll tell you that, Sgt. Aaron Young and his K9 partner Nix, Aaron has an Apple watch

and an app that tracks his steps, him and his partner went 7.4-mile search. They ended up on Berry Blossom; which is off of Turner, I believe. I know they made it through Summer Winds. They were north of Summer Winds. The Austintown Police set up a good perimeter. It's such a wooded area. There are a lot of tree stands back in there, there are creek beds, there are a lot of places to hide. It's very rural. Our people did an amazing job. I'm going to ask the city manager that we replace one of our officers shoes, he ruined brand new tennis shoes. I remember a chase years ago an officer lost reading glasses during a chase and we replaced those. We'll see if he goes for it.

MR. D'APOLITO: They get a clothing allowance but anyway..... (Laughter)

CHIEF OF POLICE: To the officers credit, he did say that, we get a clothing allowance but I like taking care of them, we'll see.

MR. D'APOLITO: We will depreciate them.

CHIEF OF POLICE: All in all, a tremendous team effort. We work so well with the Sheriff and his group, we share the township and the city and often take each other's calls. Columbiana sent their K9 out and Austintown was great to work with. We had the FBI out, Marshalls. It was a tremendous team effort to catch these guys. We were joking, but literally, the YSU Police Academy they are told, if you don't want to do police work, go to the Canfield Police Department, I take offense to that. I taken a stand on that and I'm sending people to Kent State next fall. I'm a huge YSU guy. I graduated twice from YSU. I'm an Alumni, I support that group but to say that. Our guys did a heck of a job. We had a murder a few years ago. The County Prosecutor was out with us every step of the way and they were very impressed with what we did. We don't deal with murders all the time. I love our guys. I love our group. I love the city. They did an amazing job last night. I kept the city manager up to speed and alerted him as to what was going on. I'm super proud of them. Thanks again, for allowing us to swear those two in. Thank you, very much, appreciate it.

MR. DRAGISH: I got calls yesterday, the one call I got was from a friend of mine, they're like, what's going on. There has to be 30 cops cars. I'm like, I don't know, I'll find out.

CHIEF COLUCCI: On the news clips there were at least 6 or 7 of our cars. It was shift change, it happened at 4. We had extra people out for the funeral procession. It looked like we were a little bit bigger than we really are. We only have 2 or 3 out usually but they keep moving. I want them to look like we have 10.

MR. TIECHE: I was going to say, don't tell anybody anything different.

MR. GRAHAM: Thank you. Anything else, Chuck?

CHIEF OF POLICE: No.

MR. GRAHAM: The City Manager, Mr. D'Apolito.

MR. D'APOLITO: Thank you, Mr. Graham. Just to expound on what Chief said, briefly. My phone has been ringing off the hook, usually it's Mr. Rapp regarding water breaks, lately it's been the police department. It's been a very active week. On May 13th, that incident happened on the Village Green and then last night. I just wanted to really tell the Chief what a great job our police department does and our fire department, they're out there as well. Just acknowledge the efforts that these folks make on our behalf. Moving on, for everyone who is concerned and who has issues with the remediation of their yards from the installation of fiber this past fall, I just want everyone to know that we have compiled a list of addresses that need to be attended to. We have sent that list to the company that installs the fiber. Hopefully, they're going to come back and repair those property's. If not, the city will take some action. If anyone saw the white truck driving down the middle of the street a couple of weeks ago with a camera on it, that was our PMG truck. They're the company that we hired to access our streets. That was done and I can't wait to see the results of that. Finally, in a different way, the most exciting thing that I want to tell council and the community about tonight is that I got a call last week from the township administrator and they had a situation where they purchased a rock-climbing wall, they got sent the wrong wall, they notified the company, they said, just get rid of the one that we sent you, don't worry about it. They were kind enough to contact us and offer the wall to us, which we accepted gracefully. I really hope that there is a new dynamic between us and the township. Since I got here, I wanted to build a new relationship with Trustees. I hope that, that is happening. I want that relationship to be a friendship and hopefully it could become a partnership on future projects. I want to acknowledge the Trustees, Marie Cartwright, Brian Governor and Joe Paloski and well as Township Administrator Keith Rogers. I want to thank them on behalf of the city. We will get that rock wall up. Public Works is already working on it.

MR. DRAGISH: I did run into Mr. Paloski today, I said, thanks for becoming part of our... and he said, whatever we can do to help the city. Whatever we're doing, keep doing it.

MR. D'APOLITO: I think I mentioned at our last meeting that they are going to be co-sponsoring our summer events. I just want the Canfield community to know that we're trying to work with them.

MR. TIECHE: Where is the rock wall going to be installed?

MR. D'APOLITO: We think the best place is going to be on the pirate ship. It's going to be a new entrance. You'd have to climb the rock wall to get into the pirate ship.

MR. TIECHE: So, over at Fair Park.

MR. D'APOLITO: Yes, sir.

MR. TIECHE: At our next Parks Board meeting why don't you bring that up.

MR. D'APOLITO: I will.

MR. GRAHAM: Thank you. Any further questions on the reports? Hearing none.

Under **Persons Desiring to Speak Before Council**, there was none.

Under **OLD BUSINESS**, there was none.

Under **NEW BUSINESS**:

ITEM A: A Resolution Authorizing the City Manager to Submit Applications and to Execute Contracts and Act as Chief Executive Officer for the Ohio Department of Natural Resources Natureworks Grant Program and Declaring an Emergency.

MR. GRAHAM: As per the provisions of Section 4.05 of the Charter of the City of Canfield, I move that Council dispense with the requirement of two readings of the proposed Resolution and authorize adoption of the same upon its first reading.

MR. TIECHE: Second.

ROLL CALL ON MOTION:	3 Votes-Yes
	0 Votes-No
	Motion passes.

MR. GRAHAM: As per the provisions of Section 4.05 of the Charter of the City of Canfield, I move that Council dispense with the requirement of a full reading of the proposed Resolution and authorize reading by title only.

MR. DRAGISH: Second.

ROLL CALL ON MOTION:	3 Votes-Yes
	0 Votes-No
	Motion passes.

MR. GRAHAM: Mr. Tieche will you read Item A.

MR. TIECHE: Yes, sir. I have a Resolution authorizing the City Manager to Submit Applications and to Execute Contracts and Act as Chief Executive Officer for the Ohio Department of Natural Resources Natureworks Grant Program and Declaring an Emergency. I move for passage.

MR. DRAGISH: Second.

MR. GRAHAM: Any questions?

MR. D'APOLITO: This will be for the Pickleball Courts that we want to resurface this year. That is one of the top priorities. The two middle courts have been damaged over the winter. They need to all be resurfaced and we are applying for the grant from Natureworks to have that done. It will be a 75%.

MR. GRAHAM: Very good.

ROLL CALL ON RESOLUTION:

3 Votes-Yes

0 Votes-No

Resolution passes.

Resolution 2025-03.

Under **COUNCIL COMMENTS:**

MR. TIECHE: There was a memo or something that said we had to fill out an application for the program at Fair Park for the bike trail.

MR. D'APOLITO: Yes, the Parks Board is aware of it. They want to put in a bike trail connecting the bike path from the county to Fair Park pump track. The application has been submitted.

MR. TIECHE: Oh, it has been submitted.

MR. D'APOLITO: I saw something back from First Energy asking further questions.

MR. TIECHE: I guess maybe that's what I saw.

MR. D'APOLITO: That's probably what you saw. The email was just sent regarding verification on the right of way and what areas specifically.

MR. TIECHE: Are we all aware that the residents that live in that area were pretty opposed to that?

MR. D'APOLITO: I'm very aware of it. I just want to see how far it goes. The city is not committed to it. It's exploratory at this point.

MR. TIECHE: Very good.

MR. GRAHAM: Any other business?

MR. TIECHE: I move that we adjourn.

MR. DRAGISH: Second.

MR. GRAHAM: Meeting adjourned.

PRESIDENT OF COUNCIL

ATTEST:

CLERK OF COUNCIL

**MAHONING COUNTY
MULTI-JURISDICTIONAL
HAZARD MITIGATION PLAN UPDATE 2024-2028**

6/29/24



**PREPARED BY
RFG Associates Inc. Zanesville OH**

June 2024



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1.0 INTRODUCTION

PURPOSE

The purpose of the mitigation plan is to identify risks and vulnerabilities from Natural Hazards that affect Mahoning County, Ohio to prevent or reduce the loss of life and injury and to limit future damage costs by developing methods to mitigate or eliminate damage from various hazards.

SCOPE

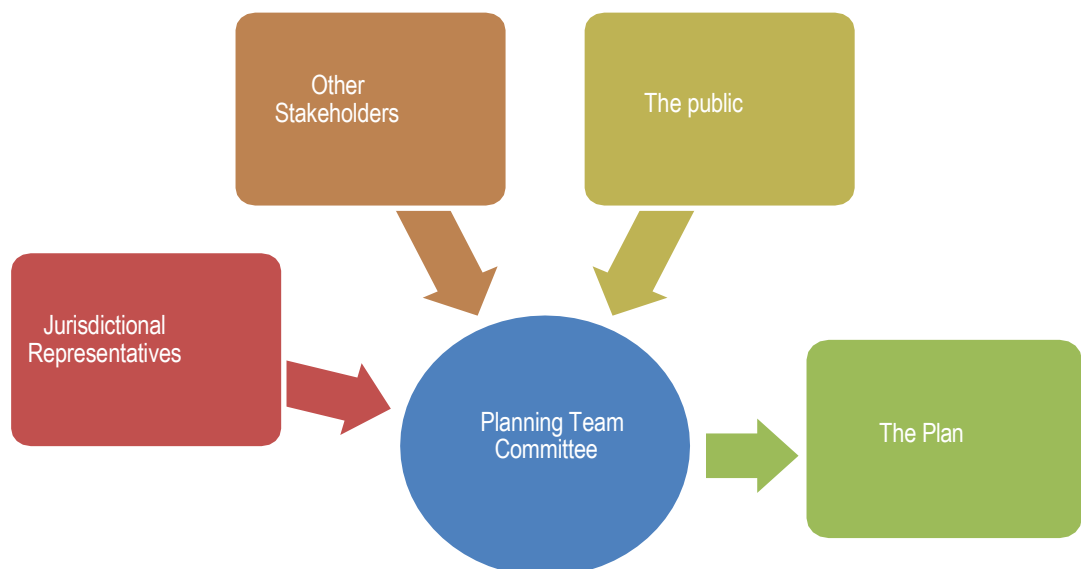
The *Mahoning County Hazard Mitigation Plan* follows a planning methodology that includes public involvement, a risk assessment for various identified hazards, an inventory of critical facilities and at-risk residential areas, a mitigation strategy for high-risk hazards, and a method to maintain and update the plan.

PLAN AUTHORITY

The Mahoning County Hazard Mitigation Plan is a multi-jurisdictional plan meaning that it includes several jurisdictions within the plan. The plan has been prepared in accordance with federal requirements outlined in the Disaster Mitigation Act of 2000 (DMA, 2K) which requires counties to formulate a hazard mitigation plan to be eligible for mitigation funds made available by the Federal Emergency Management Agency (FEMA). Section 322 of the Robert T. Stafford Act requires that all states and local jurisdictions develop and submit mitigation plans designed to meet the criteria outlined in 44 CFR Parts 201a.

The Planning Team

The Planning Team oversaw establishing the goals for the plan, developing and reviewing content, and reaching out to the other groups. The Planning Team included the *jurisdictional representatives* of the cities, villages, and townships; this group was responsible for providing background information on hazards specific to their area as well as status narratives for previous projects and new mitigation projects for the plan. Additionally, the Planning Team included *other stakeholders* (institutions, organizations, and agencies) that would have an interest in the content of the plan and included surrounding emergency management agencies, large employers, and higher education institutions. Finally, the *public* had the opportunity to participate by attending meetings and providing their input. The jurisdictional representatives, other stakeholders, and the public provided valuable information for the development of this plan.



Jurisdictional Representatives

Jurisdictional representatives for the cities, villages, and townships of Mahoning County gathered several times throughout the process to provide valuable information for the plan. This group consists of the townships represented via the Mahoning County Township Association, and the cities and villages, which provided one or two people to represent the jurisdiction. The following table outlines the representatives from each jurisdiction who participated in the update of this plan and how they contributed to the process.

HAZARD MITIGATION PLAN JURISDICTIONAL REPRESENTATIVES			
<i>Jurisdiction</i>	<i>Contact(s)</i>	<i>Title(s)</i>	<i>How the Jurisdiction Participated</i>
Campbell	Steve Dubic	Fire Chief	Attended meetings, completed jurisdictional survey, provided new and updated mitigation projects,
Canfield City	David D'Apolito	City Manager	Completed jurisdictional survey, provided information to consultant via phone or email.
Struthers	Mike Agnone	Fire Chief	Attended jurisdictional meeting, completed jurisdictional survey, provided new or updated mitigation projects.
Youngstown	Barry Finley Nick Dalesio	Fire Chief Water Compliance	Attended jurisdictional meeting, completed jurisdictional survey, provided new or updated mitigation projects.
Beloit	Eric Augustein	Mayor	Completed jurisdictional survey.
Craig Beach	James Becker	Mayor	Attended jurisdictional meeting, completed jurisdictional survey, provided new or updated mitigation projects.
Lowellville	Al Boggia	Fire Chief	Attended jurisdictional meeting, completed jurisdictional survey, provided new or updated mitigation projects.
New Middletown	Lee Ingold	Fire Chief	Attended meetings, Completed jurisdictional survey.
Poland Village	Tim Sicafuse	Mayor	Completed jurisdictional survey.
Sebring	Tim Gabrelcik	City Manager	Completed jurisdictional survey, provided new or updated mitigation projects
Mahoning County	Robin Lees Jeff Murphy Adam Guerrieri Anthony Trafficanti	EMA Director Assist. Prosecutor EMA Specialist County Commissioner	Attended meetings, provided local planning leadership, jurisdiction outreach, completed jurisdictional survey, and provided new and updated mitigation projects

Although many jurisdictions actively participated in meetings, some were unable to attend scheduled meetings but provided pertinent information in other ways. The consultant reached out to each jurisdiction individually throughout the process via surveys, email, and phone calls; these focused on the problem areas they face due to hazards, mitigation project updates and new projects, and completing the capabilities survey. All the cities and villages completed the jurisdictional survey which gave the jurisdictions an opportunity to provide information about their existing plans and departments as well as their willingness and capacity to plan for and execute mitigation actions. All the jurisdictions received periodic emails about the planning process and were given the opportunity to provide feedback at any time through the consultant or the steering committee.

Other Stakeholders

The steering committee involved other stakeholders within and outside the county for their input for the plan. Committee members or the consultant contacted each of the agencies or organizations directly to ask a few questions about hazards that related to them.

Stakeholder	Contact(s)	Title(s)	How the Stakeholder Participated
ODOT	Nick Kratsas Larry Paage	County Manager TM-2	Attended meeting, provided mitigation input.
Ohio Edison	Brandon Papa Troy Rhoades	Manager Operations	Attended meetings and provided meaningful info on mitigation utility recovery.
Mahoning Co Public Health	Ryan Tekac Susan Kovach	Health Comm. ERC	Attended meeting, provided mitigation input
Mahoning Valley Sanitary District	Mike McNinch	Chief Engineer	Attended meeting, provided mitigation input
Youngstown State Univ.	Julie Gentile Joe Nuskiewicz	EHS Director EHS Specialist	Attended meeting, provided mitigation input
Mahoning Soil and Water Dist.	Kathleen Vrable- Bryan	Dist. Admin	Attended meeting, provided mitigation input
Mahoning County Planning Commission	Chrystaline Speidel	Flood Plain Admin	Attended meeting, provided mitigation input
Mercy Health	Robert Martin	Asst Chief	Attended meeting, provided mitigation input
Akron Childrens Hospital	Rebecca Wrightsmarm	EP Coordinator	Attended meeting, provided mitigation input

The public also provided input for the plan through participation in all planning meetings. All meetings in this process were advertised and open to the public. Public attendees include the Vindicator, CBS/FOX WKBN/WYFX, and WRMJ.

When the final draft was completed, the Mahoning County Emergency Management Agency uploaded a digital version of the plan to the county website on April 24, 2024; this gave the public a chance to review the document and provide comments via an email address. Once this plan receives final approval, the county will replace the draft with the final document on the website.

1.1 The Process and Timeline

In total, the Planning Team committee held six (6) meetings to update the plan, and the public was invited to all six (6) meetings.

The timeline for completion of this plan was short; it began in December 2023 with the signing of the contract between Mahoning County Emergency Management Agency and RFG Associates Inc, the firm hired to complete this plan update. The process formally ended in May 2024 with the submission of the plan to the Ohio Emergency Management Agency (OEMA) for approval and subsequently to the Federal Emergency Management Agency (FEMA). The following description outlines progress at each meeting.

1.1.1 Determination of Hazards - Meeting 1-Kick-Off Meeting Update Meeting 12/14/23 (Planning Team)

The kick-off meeting presented the Planning Group with the process to be followed in the update of the Plan. Overall goals of the plan for Mahoning County were discussed and the Planning Group began a process to determine which hazards to focus on. This included a Hazard Identification and Risk Assessment (HIRA) based on historic disaster events data from the National Center for Environmental Information (NCEI), the new FEMA National Risk Index (NRI) for Highland County, OH, a summary of NCEI/NRI data prepared by the Consultant, and planning committee member insights about local hazard events. The initial list of critical hazards was established looking at the National Center for Environmental Information (NCEI) tables and the FEMA National Risk Index that illustrated which hazards in Highland County have produced the largest amount of damage based on human or monetary losses. The Planning Group also used the collective knowledge they had coupled with the vast amount of local experience and history to determine which hazards to address in their Mitigation Plan. This resulted in a listing of priority hazards to address including 1. Strong Winds, 2. Flooding Storms, 3. Winter Weather 4. Dam/Levee Failure, 5. Cold Wave, 6. Summer Storm, 7. Tornadoes, 8. Epidemics and 9. Earthquakes, 10. Land Slides, 11. Drought/Extreme Heat, and 12. Wildfire. The HIRA information is shown in Appendix B.

In addition to these, the prior Mahoning County Hazard Mitigation Plan included HaMat, epidemics, and invasive species. These were removed from the current update and included in the THIRA Assessment/Plan.

The committee then used all the noted data and summary information to select hazards for priority ranking. The Consultant collected the scores and tabulated the results for Meeting #2.



Appendix F includes the historic National Center for Environmental Information (NCEI) event data, FEMA National Risk Index (NRI) for Mahoning County, OH and event data summary. Appendix B includes the HIRA data, summary, and Hazard Priorities summary for Mahoning H County.

During the initial meeting, other county and local planning efforts were requested for review by the consultant.

Additionally, by the end of the first meeting, Planning Group members had exchanged contact information, identified some additional data which needed to be collected for the plan, established a priority list of hazards, and discussed the general process and timeline of the project.

Please see Appendix C for Meeting 1 Sign in sheet, Agenda, and other materials as presented.

1.1.2 Determination of Problem Statements and Overall Goals – Meeting 2 1/18/24 Update Meeting (Planning Team)

The second meeting of the Planning Group focused on reviewing and approving the HIRA Hazard Priority list and reviewing prior plan progress and accomplishments.

The Committee also reviewed US Census Data regarding poverty areas in the county (by census tract) and new federal data regarding the impact of climate change on extreme heat, drought, wildfires, and flooding. This information was useful in finalizing hazard priorities and improving specific mitigation actions. Appendix I includes this data and research.

Based on the review of all data, the Planning Committee approved the following prioritization for Mahoning Co Natural Hazards for the 2024-2028 Plan:

1. Strong Winds, 2. Flooding Storms, 3. Winter Weather 4. Dam/Levee Failure, 5. Cold Wave, 6. Summer Storm, 7. Tornadoes, 8. Epidemics and 9. Earthquakes, 10. Land Slides, 11. Drought/Extreme Heat, and 12. Wildfire

Please see Appendix C for Meeting 2 Sign in sheet, Agenda, and other materials as presented. Appendix D provides written input (survey format) from each participating jurisdiction.

1.1.3 Determination of Alternatives and Evaluation Criteria – Meeting 3 2/15/24

The third meeting with the Planning Group focused on the goals and action items and establishing priorities.

Each individual community was also encouraged to identify an alternative or alternatives that they wanted to support and implement within their community.

A good bit of participating jurisdiction survey work was completed at this session and initial input for the THIRA Plan was also collected.

The committee further discussed underserved populations at risk of hazards in the community. This focused on Census data and representation of minority and low-income residents on current census maps.



At this session, Cold Wave was combined with Winter Weather, as there is limited events, damage, or documented deaths and injuries due to Cold Waves in Mahoning County.

The remaining steps in the mitigation planning process were reviewed, which included setting a date for a public meeting.

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1.1.4 Review of Current/Expiring Plan

During meetings 2 and 3, the Planning Team reviewed each Action Item in the current/expiring plan.

The Consultant color coded each Action as green-completed, yellow-underway, red-not accomplished, and white-include in revised plan.

Status and Accomplishments of Current Mahoning Co HMP (2018-2023) Green-Completed White- continue or ongoing Red-Delete

Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Timeline	Lead Agency	Status
1	Beloit	Flood	Consider rejoining the NFIP as the village currently does not participate.	1	No additional funding necessary.	3 years	Floodplain Manager & Council	Continue (3.1.11)
2	Beloit	Drought	Consider developing ordinances to prioritize or control water use and encourage residents to take water-saving measures such as installing low flow shower heads and toilets during new construction. (Strat.1E.1.1)	2	No additional funding necessary.	2 years	Village Council, water distribution systems	Continued (10.1.1)
3	Campbell	Severe winds	Require new construction and retrofits to adhere to current building code standards to with and stand severe winds.	1	No additional funding necessary.	3 years	City Council	Completed in Mahoning Co Building Code
4	Campbell	Heavy snow	Purchase adequate snow removal equipment.	2	Local funding Cost will depend on type and amount of equipment	3 years	City Street Department	Continued (4.1.1)
5	Campbell	Flood	Replace problem-area sections of the stormwater system at Wilson Avenue.	3	CDBG Cost will depend on scope	5 years	City Council	Continued (3.1.2)
6	Campbell	Severe winds	Identify and demolish old vacant homes that have been condemned to reduce the risk from severe winds.	4	Local funding	5 years	City Council	Continued (2.1.1)

Mahoning County Hazard Mitigation Plan 2024-2028

Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Timeline	Lead Agency	Status
7	Canfield	Flood	Conduct a drainage study of Briarcliff and Bradford area to address persistent flooding issues	1	Planning Grant Water Resource Restoration Sponsor Program	4 years	City Council	Continue (underway)
8	Craig Beach	Wind	Work with the power company to replace old wires and poles that cause problems during emergencies.	1	Partnerships would require no additional funding.	1 year, ongoing	Village Council	Delete based on power company feedback that they have a PM plan they follow
9	Craig Beach	Dam Failure	Continue to inspect and maintain the Lake Milton dam. Purchase rescue boat.	2	ODNR	1 year, ongoing	Ohio DNR	Completed
10	Craig Beach	Dam Failure	Regulate future development in the hydrological shadow of Berlin Lake Dam and Lake Milton Dam. (Strategy 1F.1.1)	3	Part of current budget for the village.	Immediately	Village, County Zoning Department	Continue (5.1.1)
11	Lowellville	Heavy snow	Purchase adequate snow equipment and vehicles for first responders	1	Local funding	5 years	Safety Department	Continue (4.1.1)
12	Lowellville	Flood	Employ techniques of erosion control within the watershed area (i.e., proper bank stabilization, techniques such as planting of vegetation on slopes, creation of terraces on hillsides, use of riprap boulders and geotextile fabric, etc.). (Strategy 1G.1.1)	2	Up to \$65,000 to \$150,000	5 years	Floodplain coordinator, Village Council	Ongoing (3.1.4)
13	Mahoning County	Earthquake	Perform an annual re-assessment of the vulnerability of county facilities to natural disasters based on past year experience to determine mitigation needs. (Strategy 3.2.1)	1	Local Funding, PDM	Annually	EMA	Continue as 5 years required assessment. (8.1.1)

Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Status	Lead Agency	Status
14	Mahoning County	Flood	Educate local officials on sources of information that can be used to monitor flooding, storm and other weather information (IFLOWS, U.S.G.S. gage data, etc.). (Strategy 4.1.3)	2	Local funding Up to \$3,000	1 Year	Soil and Water	Boardman-education, monitoring, and billboards- Continue. ABC Stormwater District- Continue MVSD Plan- Continue Poland/ Struthers (3.1.5)
15	Mahoning County	Severe wind and tornado	Reduce the risk of mobile home damage by suggesting the use of tie-downs with ground anchors appropriate for the soil type. (Strategy 7.2.2)	3	Encouragement would require no significant additional funding. \$75/tie down	As needed	EMA	Completed
16	Mahoning County	All hazards	Trim or remove trees on roads and power line right of ways	4	Utility Company	Ongoing	Ohio Edison	AEP scheduled ROW trimming. Will not do emergency storm cleanup (local responsibility) Add new action plan for local storm cleanup Revised /Continue (2.1.3)
17	Mahoning County	Dam Failure	Coordinate with the ODNR, Division of Dam Safety Section, in accordance with ORC Section 1512.062, to periodically inspect and update /reclassify any dam within Mahoning County as a result of a change in circumstances to ensure adequate safety according to the potential for downstream damage. (Strategy 1.1.1)	4	ODNR quite possibly has items such as this budgeted as this project would fall under the responsibilities of ODNR personnel.	As needed	ODNR	Continue (5.1.2)

Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Timeline	Lead Agency	Status
18	Mahoning County	Dam Failure	Coordinate with the ODNR, Dam Safety Engineering Program to conduct regular safety inspections of existing dams in Mahoning County. (Strategy 1.1.3)	6	ODNR	Annually	Affected jurisdiction's water department, engineer.	Delete included with Item 17
19	Mahoning County	Flood	Integrate site specific disaster mitigation issues into storm water planning initiatives. (Strategy 4.3.1)	6	CDBG, HMGP Up to \$60,000	1 year	County Floodplain Administrator	Delete as too general. New, more specific actions at 3.1.1, 3.1.2, and 3.1.9
20	Mahoning County	Tornado	Add additional tornado siren warning system capacity (need for 20 sirens). Update siren system(s) to be used for warnings for all hazards. (Strategy 7.1.2)	6	USDA Rural Development Up to \$25k/siren	5 years	EMA	Continue, but revised 7.1.1
21	Mahoning County	Flood	Participate in the Community Rating System (CRS) on a countywide basis to reduce flood insurance rates. (Strategy 4.3.2)	9	No additional funding necessary, but may require additional staffing.	5 years	Planning	Continue (3.1.6)
22	Mahoning County	Flood	Consider installing, re-routing, or increasing the capacity of existing storm drainage systems, which may involve detention and retention ponds. (Strategy 4.5.1)	9	CDBG, HMGP, PDM Up to \$250K?	5 years	MC Sanitary Engineer	Deleted as too general. More specific actions at 3.1.1, 3.1.2, and 3.1.9
23	Mahoning County	Land and mine	Coordinate with the Ohio Department of Natural Resources, Division of	11	Coordination should require no significant additional	As Needed	Affected jurisdiction's engineering or	Continue (9.1.1)

Mahoning County Hazard Mitigation Plan 2024-2028

		subsid nce	Mineral Resources Management, Office of Abandon Mine Lands and Reclamation to undertake reclamation projects if subsidence occurs at a specific location. (Strategy 5.1.1)		funding; however, a project would require significant funding, primarily from ODNR through the AML&R program Up to \$2M.		public works, ODNR	
Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Timeline	Lead Agency	Status
24	Mahoning County	Dam Failure	Develop a notification system that can be utilized to notify residents and businesses downstream of large dams of actions to take before a dam failure, if lead time exists. (i.e., similar to reverse 911 system). (Strategy 1.1.4)	11	HMGP, PDM, ODNR \$35K-\$100K depending on system	3 years	ODNR, Dam owner	IPAWS system implemented. Completed
25	Mahoning County	Tornado	Identify ideal location and build residential and community storm shelters.	13	HMGP	2 years	MC EMA Director	Continue: Fairgrounds, Lake Milton, Berlin Lake (1.1.5)
26	Mahoning County	Dam Failure	During all new dam construction, encourage the completion of a critical flood engineering analysis by a professional engineer licensed in the State of Ohio (Strategy 1.1.2).	14	Local funding \$50-\$75K for consultant	During new dam construction	Dam owner	Completed by ODNR
27	Mahoning County	Terrorism	Establish a critical infrastructure protection program. (Strategy 10.1.5)	14	PDM, HMGP, Local funding Up to \$2,500	3 years	MC EMA & local law enforcement agencies.	Deleted and moved to THIRA plan

Mahoning County Hazard Mitigation Plan 2024-2028

Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Timeline	Lead Agency	Status
28	Mahoning County	Dam Failure	Work with Class I dam owners to obtain or develop Emergency Action Plans, to include a detailed assessment of the vulnerability of structures and critical facilities near the hydrological shadow of the dams as well as inundation studies. (Strategy 1.1.5)	16	Local funding Up to \$45K for all dams	Update every 5 years	Dam owner	Continue but with revisions: Integrate utility company and critical facility planning to assure priority recovery/restoration of power after hazard events (5.1.3)
29	Mahoning County	Flood	Confirm status of repetitive loss structures and develop community specific plans to flood proof, relocate, or buyout to eliminate future risks. (Strategy 4.3.3)	16	No additional funding necessary.	2 years	All city and village councils	Continue (3.1.7)
30	Mahoning County	Severe wind and tornado	Coordinate with the County Building Inspector to annually assess County building codes to determine possible enhancements for reducing tornado risks that supplement Ohio building code requirements for commercial and apartments with four or more dwellings. (Strategy 7.2.1)	16	Local funding Up to \$4K	Annually	County Building Inspector, Home Builders Association,	Ongoing/Continue (7.1.3)
31	Mahoning County	Severe wind and tornado	Purchase mobile 35kw generators or (gen-sets) that can be transported to shelters throughout Mahoning County. (Strategy 7.2.3)	19	PDM, HMGP, Local Funding \$10K-\$15K/generator	2 years	Mahoning County Commission	Completed 2 units purchased during plan period. Continue: Purchase 2 additional units (7.1.4)

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Strategy	Jurisdiction	Hazard of concern	Project/ Strategy	Priority	Funding Source/ Cost Estimate	Timeline	Lead Agency	Status
32	Mahoning County	All hazards	Coordinate with those communities in the county that lack zoning, to determine if zoning or other approaches may be useful to reducing natural hazard risks unique to them. (Strategy 11.4.1)	20	Cost paid through in-kind services	3 years	County Planning Commission, County Engineer, & EMA	Delete Every jurisdiction interested in Zoning has it in place
33	Mahoning County	Earthquake	Install sensory systems that immediately shut off the flow of gas throughout the county as soon as earth movements are felt. (Strategy 3.3.1)	21	PDM, HMGP, Local funding Up to \$3K /sensor	3 years	Utility providers MC EMA	Continue (8.1.2)
34	Mahoning County	Flooding	Remove brush and clean Garfield Ditch	22	Local funding	3 years	Goshen Twp council	Completed
35	New Middletown	Drought	Purchase a new water storage tank to be utilized by the Village of New Middletown. Encourage water systems to develop system interconnects to increase water distribution capacities. (Strategy 1H.1.1)	1	PDM, HMGP Up to \$110K	3 years	Village Council, Water Distribution Systems	A 1-million-gal water tan has been restored by Aqua Ohio Completed
36	Poland	Flood	Encourage residents to control and secure debris yard items, or store objects (i.e., including oil, gasoline, and propane tanks, etc.) out of floodplains that may be swept away, damaged, or pose a hazard when flooding occurs. (Strategy 1I.1.1)	1	N/A	6 months	Residents, Village Council, Floodplain Coordinator	Delete as not necessary

1.2 THE PLANNING AREA

The geographical planning area for this plan includes the cities and villages, as well as the townships within the borders of Mahoning County, Ohio. The following pages describe Mahoning County's geography, climate, demographics, economy, education, health, transportation, utilities, media, tourism, and attractions to completely describe the characteristics of the county. The cities and villages within the county are briefly described and a list of disaster declarations affecting Mahoning County is included.



1.2.1 Geography

Location

Mahoning County is one of 88 counties in the State of Ohio and is located in the northeastern portion of the state. It is bordered on the north by Trumbull County, OH; on the northeast by Mercer County, PA; on the east by Lawrence County, PA; on the south by Columbiana County, OH; on the southwest by Stark County, OH; and on the northwest by Portage County, OH.

Rivers and Lakes

Rivers and streams are prominent features in the Mahoning County landscape. All of the streams flow generally north or south through the county. The Mahoning River flows through the northeast corner of the county passing near or through Youngstown, Campbell, Struthers, and Lowellville. Yellow Creek and Mill Creek are major tributaries of the Mahoning River in the eastern half of the county. Meander Creek and Little Beaver Creek drain the middle portion of the county.

Mahoning County also has several lakes; some of the largest include Berlin Lake, the Meander Creek Reservoir, Lake Milton, Evans Lake, and Pine Lake. The Berlin Lake is mostly in Portage County to the west, and the Meander Creek Reservoir is partly in Trumbull County to the north.

Terrain

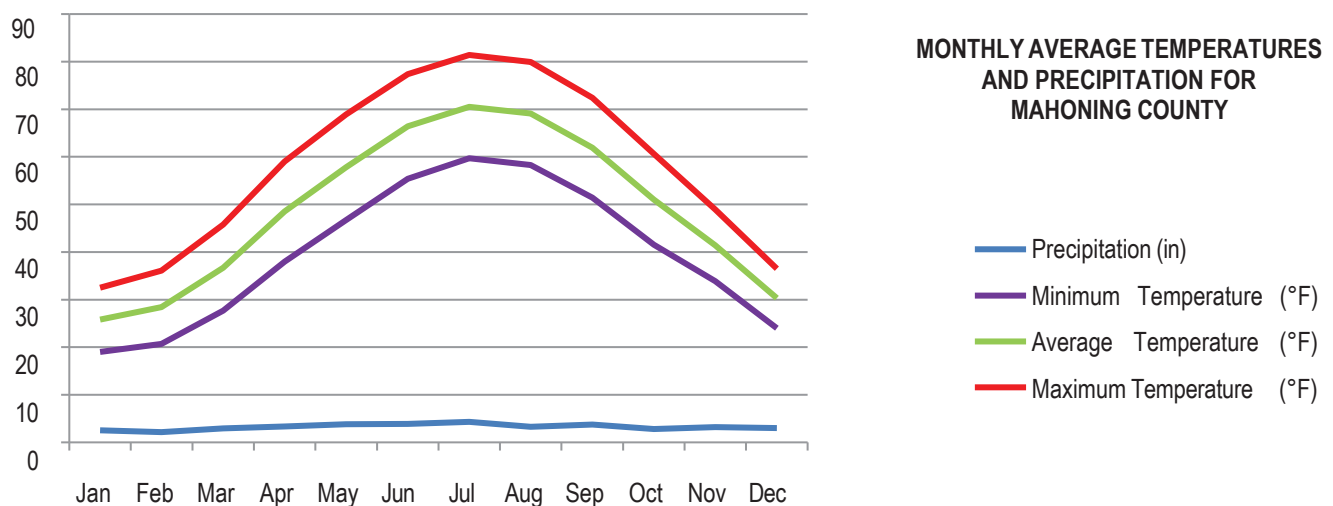
According to the U.S. Census, the county has a total area of 423 square miles, with approximately 415 square miles of land area and eight square miles of water. Mahoning County varies in elevation from a low of 796 feet above sea level, to a high of 1,318 feet above sea level, yielding a maximum relief of 522 feet.

The topography of Mahoning County is characterized as gently rolling with occasional water gaps. The county is located in an area known as the Glaciated Allegheny Plateaus; glaciers covered northeast Ohio during the Wisconsinian glaciations, and as the glaciers receded approximately 14,000 years ago they formed the current landscape.

1.2.2 Climate Change

A large portion of Mahoning County's land area is forested: nearly 30.62% of the total land cover is that of forest. Agricultural cropland makes up another 13.26% of the land cover. Mahoning County's topography is that of flat and open to gently sloping, offering limited protection against strong straight-line winds or tornadoes. These high winds can be damaging to both structural and agricultural assets

Mahoning County has a continental-type climate, influenced by air from the west. There is considerable variation in seasonal temperatures, with none of the temperatures being considered severe. The climate of Mahoning County is seasonal in nature, with wet stormy springs, warm summers, colorful falls, and cold snowy winters. The average temperature in January is 25.8°F; the July average temperature is 7.05°F. Precipitation is evenly distributed throughout the year, with an annual average of approximately 37 inches. Data from the National Weather Service (NWS) indicate that the area experiences approximately 64 inches of snowfall per year, usually during the December to March winter season.



1.2.3 Demographics

Planning for incidents or events requires knowledge of the area's population; because the inhabitants of the county are constantly changing; it is necessary to have base-line data about the diversity in the location. For example, different ethnicities which practice certain traditions, international or migrant populations that speak different languages, visitors who are unfamiliar with the area, elderly populations who have difficulties with mobility, poor or unemployed populations who may have additional hardships preparing or responding to incidents, etc. are important to know. All these aspects can influence how the population receives and understands general information or warnings about events or incidents.

Population Influx and Variables

There are many events that can bring outside populations to Mahoning County. One of those types of events are the festivals which take place typically during the summer and fall months.

FESTIVALS IN MAHONING COUNTY		
<i>Festival</i>	<i>Location</i>	<i>Time of Year</i>
Boardman Rotary Oktoberfest	Boardman Township Park	Fall
Canfield Fairgrounds	7265 Columbiana-Canfield Rd.	Late summer to early fall
Greater Youngstown Italian Fest	Downtown Youngstown	Summer
Pride Youngstown Festival	3135 Belmont Ave.	Summer
Various Religious and Ethnic Festivals	Various locations throughout the county	Summer
Steel Valley Super Nationals	Canfield Fairgrounds	Summer
Summer Festival of the Arts	Youngstown State University	Summer

Source: The Public Library of Youngstown and Mahoning County

Another constant yet changing population in Mahoning County is the student and faculty population at Youngstown State University (YSU). YSU has a student population of over 11,000 with a 17:1 student-faculty ratio.

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Description	DEMOGRAPHIC DATA FOR MAHONING COUNTY										
	Mahoning County	Campbell	Canfield	Struthers	Youngstown.	Beloit Beach	Craig	Lowellville.	New Poland	Sebring	Middletown
Population*	225,636	7,743	7,608	9,928	59,144	883	1,076	1,129	1,405	2,578	4,185
Median Age	43.2	40.3	47.8	38.9	39. 8	43.4	35.9	45.8	51	44.2	55.7
Educational attainment: Percent high school graduate of higher*	91.4%	83.6%	95.4%	92.2	84.9%	92.95%	91.4%	88.7%	96.2%	97.7%	87.4%
Total housing units*	108,002	4,047	3,399	4,838	28,675	456	591	543	712	1,160	2,422
Median household income*	\$54,274	\$43,176	\$100,219	\$48,125	\$34,295	\$68,035	\$71,750	\$51,458	\$48,466	\$82,204	\$46,376
Foreign-born population	2.4%	3.4%	3.8%	1.8%	2.8%	0%	.6%	.5%	.1%	3.5%	1.2%
Individuals below poverty level*	19.2%	28.27%	2.2%	16.8%	34.5%	7.69%	15.8%	20.4%	9.3%	4.9%	17.9%
Veterans*	13,362	294	539	601	3,323	13.3%	16.7%	7.9 %	9.2%	6&	10.9%
White alone	80.2%	57.4%	91.3%	85.2%	44.1%	96.4%	91%	95%	78.4%	94.3%	95.2%
Black or African American	15.7%	19.9%	2.4%	4.9%	41.8%	.44%	1.1%	.5%	11.8%	1.1%	.2%
American Indian or Alaska Native	.3%	.3%	.1%	.3%	.6%	0%	0%	0%	0%	0%	0
Two or more races	2.8%	13.2	4.5%	6.6%	9.3%	3.16%	6.9%	1%	6.6%	3.1%	1%
Hispanic or Latino	6.9%	26.6%	3.3%	7.7%	11.2%	0%	1.4%	3.5 %	4.3%	1.3%	3.3%
Asian alone	1%	0	1.5%	1.4%	.6%	0%	.9%	0	.8%	0.2%	0.5%
Land area (square miles)	411.49	3.71	5.135	3.74	33.9	0.98	1.78	1.4	0.87	21.2	2.5

1.2.4 Economy

Mahoning County has a diverse employment sector. According to 2021 Economic Census information from the Ohio Department of Development (2021), the largest areas of employment are service, transportation/utilities, and education and health services. Total employment is currently 98,100 persons. The county's unemployment rate is approximately 4.8%. In 2016, a total of 282 new businesses opened while 448 other businesses closed. The total active businesses are 4,650, a decline of 10.8% from 2012.

In 2012 (the earliest available record), the Ohio Development Services Agency considered Mahoning County to be distressed economically. Since 2013, the entire county has no longer been considered in distress, but the City of Youngstown continues to be. Distressed means that a city or county meets one or more of the following three criteria (Ohio Development Services Agency, 2018):

Unemployment of 125% or greater than the most recent U.X. 5-year average rate.

Per capita income is at or below 80% of the U.S. per capita income.

Poverty is defined for counties as a percentage of transfer payment income to total county income equal to or greater than 25%. For cities, it is 20% or greater of persons with incomes below the federal poverty level.

Mahoning Co Unemployment Rate History

2000	2010	2020	Dec 2023
4.6%	10.4%	7.5%	3.9%

All USDOL data as of December 31, unless noted.

The 10 largest employers in Mahoning County

Business	Number of Employees
Mercy Health	3,000
Youngstown City Schools	1,791
Mahoning County	1,600
Youngstown State Univ	1,200
VXI Global Solutions	1,100
City of Youngstown	1,063
Infocision Management	1,050
Windsor House Assisted Living	850
Austintown Local School District	800
Akron Children's Hospital	800

Source: Mahoning Co Comprehension Annual Financial Report June 2021

1.2.5 Education

The education system in Mahoning County consists of approximately 70 public schools, including 13 school districts, as well as Youngstown State University (YSU). Based on *Best Colleges, US News*, YSU is ranked as the 101st best University in the Midwest and enrolls about 11,000 students. The 4-year graduation rate is currently at 24%.

There are also two other colleges or universities in the county: University of Mount Union in Alliance with an enrollment of around 2,200 students, and Eastern Gateway Community College (EGCC) in Youngstown with an enrollment of around 2,300 students (Collegeboard.org, n.d.). TDDS Technical Institute is also located within the county near Craig Beach and Lake Milton.

1.2.6 Health

Several health care facilities are located in Mahoning County. Evacuation of these facilities during an emergency situation could be a concern due to the large number of vulnerable populations that fill them. The Mahoning County Health Department is a public health agency that serves most of the communities and townships in the county. The following table lists these health care facilities.

HEALTH CARE IN MAHONING COUNTY	
<i>Hospitals</i>	<i>Nursing Homes</i>
Akron Children's Hospital – Mahoning Valley	Hampton Woods Nursing Center
Greenbriar Rehabilitation Hospital	Heritage Manor
Mercy Health – Saint Elizabeth Boardman Hospital	Park Vista Retirement Community
Mercy Health – Saint Elizabeth Youngstown Hospital	Beeghly Oaks Center for Rehabilitation
Select Specialty Hospital – Youngstown	Oasis Center for Rehab and Healing
Surgical Hospital at Southwoods	Masternick Memorial Health Care Center
Vibra Hospital of Mahoning Valley	Greenbriar Center
Northside Regional Medical Center (Steward Health Care)	Omni Manor Nursing Home
Youngstown Community Health Center (One Health Ohio at Youngstown)	Shepherd of the Valley – Boardman
	Humility House
	Caprice Health Care Center
	Campus Health Care Center
	Briarfield Manor
	Assumption Village
	Ivy Woods Manor
	Vista Center of Boardman
	Center for Rehabilitation at Hampton Woods
	Windsor Health Care Center
	Crandall Medical Center
	Meridian Arms Living Center
	Shepherd of the Valley – Poland
	Austinwoods Rehab Health Care
	Camelot Arms Care Center
	Briarfield at Ashley Circle

As is the makeup of the county's demographics, so is the overall health of the population important. There are instances where the health of an individual can hinder their ability to remain safe or find safety during an emergency.

Based on the *2023 County Health Ranking and Roadmaps Report for Mahoning County*, the County ranks 77 of 88 Ohio counties overall for health. Health Outcomes rank in the lowest quartile. Health Factors rank in the lower middle range quartile. The following charts show other health indicators in the report for Mahoning Co vs Ohio.

Health Outcomes

Health Outcome Measure	Mahoning Co	Ohio
Premature Death	10,100	8,700
Poor to Fair Health	17%	15%
Poor Physical Health Days	3.5	3.2
Poor mental health days	5.1	5
Low Birthweight	11%	9%

Health Factors

Health Factor	Mahoning Co	Ohio
Adult Smoking	23%	20%
Adult Obesity	36%	36%
Physical Inactivity	29%	24%
Excessive Drinking	17%	19%
Teen Births	24	21
Flu Vaccinations	53%	53%
Children in Poverty	29%	53%
Children in single parent households	35%	27%
Social Assistance	12.9%	10.8%
High School Completion	61%	61%

1.2.7 Transportation

Highway infrastructure

Mahoning County's transportation infrastructure is comprised of highway, railway, and air elements. The county contains approximately 55 miles of interstate highway, 25 miles of turnpike highway, 58 miles of U.S. Highway, and 175 miles of state highway. Interstates 76, 80, 680; U.S. Routes 62, 224, 422; and State Routes 11 and 14 are the principal arterial routes through the county. Many sections of these roadways are four-lane, divided highways. There are several bridges and culverts located throughout Mahoning County, which are vital components of the transportation infrastructure.

Mahoning County's highway infrastructure include the following federal and state routes:

-   [I-76](#)   [I-76 / Ohio Turnpike](#)   [I-80 / Ohio Turnpike](#)
-  [I-80](#)  [I-680](#)
-  [US 62](#)  [US 224](#)  [US 422](#)  [SR 7](#)  [SR 11](#)
-  [SR 14](#)  [SR 45](#)  [SR 46](#)  [SR 164](#)  [SR 165](#)
-  [SR 170](#)  [SR 193](#)  [SR 289](#)  [SR 446](#)  [SR 534](#)
-  [SR 616](#)  [SR 617](#)  [SR 625](#)  [SR 626](#)  [SR 630](#)

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Railway Infrastructure

Railway lines are also a part of the county's transportation infrastructure. There are a variety of railroad companies that operate in and through Mahoning County. These rails pass through or near the municipalities of Beloit, Campbell, Sebring, Struthers, and Youngstown.

- CSXT
- Genesee & Wyoming
- Mahoning Valley Railway
- Norfolk Southern
- Ohio & Pennsylvania Railroad
- Youngstown & Austintown Railroad
- Youngstown & Southeastern Railroad
- Youngstown Belt Railroad

Airway / Waterway Infrastructure

Airways also play a part in the county's transportation infrastructure. There are several international and regional airports within close proximity to Mahoning County Cleveland Hopkins International Airport (CLE),

- Pittsburgh International Airport (PIT),
- Youngstown-Warren Regional Airport (YNG),
- Akron-Canton Regional Airport (CAK), and
- Erie International Airport (ERI).

The Youngstown-Warren Regional Airport is located in Vienna Township in neighboring Trumbull County and is home to the 910th Airlift Wing (AW) of the US Air Force. There are three heliports in the county. There are also several small public and private airstrips throughout the county.

Mahoning County is approximately 50 miles south of the Lake Erie ports of Ashtabula and Conneaut, and 60 miles north of the Ohio River ports of Wellsville and Yellow Creek.

Public Transportation

The Western Reserve Transit Authority (WRTA) has fixed-route bus service in the northeastern part of the county that includes the City of Youngstown into the neighboring townships of Austintown, Canfield, Boardman, Beaver, Poland, and Campbell.

1.2.8 Utilities

Utilities are an important element that influences the quality of life; access to these can sometimes be critical to survival, especially during long-lasting emergencies causing outages.

UTILITIES IN MAHONING COUNTY	
<i>Utility Type</i>	<i>Utility Name</i>
Cable/Internet	AT&T Armstrong Level 3 Communications Time Warner Spectrum Viasat Xfinity
Electric	Ohio Edison

UTILITIES IN MAHONING COUNTY	
<i>Utility Type</i>	<i>Utility Name</i>
Gas	Dominion
Telephone	AT&T Ohio UTO dba Century Link
Water/Sewer	Aqua Ohio – Struthers

Sources: Ohio Public Utilities Commission, www.highspeedinternet.com, Just Energy

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Media

There are a variety of media outlets in and near Mahoning County; they include radio stations, newspapers, and television stations, based mainly in Youngstown. The following table outlines the variety of stations and newspapers.

MEDIA IN MAHONING COUNTY		
Radio Stations		
Station	Frequency	City
WDJQ	92.5 FM	Alliance
WDPN	1310 AM	Alliance
WRMU-FM	91.1 FM	Alliance
WGFT	1330 AM	Campbell
WQXK	105.1 FM	Salem
WSOM	600 AM	Salem
WKTL	90.7 FM	Struthers
WBBW	1240 AM	Youngstown
WHOT-FM	101.1 FM	Youngstown
WKBN	570 AM	Youngstown
WMXY	98.9 FM	Youngstown
WNCD	93.3 FM	Youngstown
WNIO	1390 AM	Youngstown
WYSU	88.5 FM	Youngstown
WYTN	91.7 FM	Youngstown
Newspapers		
Newspaper Name	Frequency	City
Austintown Neighbors	Weekly	Youngstown
Austintown Town Crier	Weekly	Warren
Boardman Neighbors	Weekly	Youngstown
Boardman News	Weekly	Boardman
Boardman Town Crier	Weekly	Warren
Buckeye Review	Weekly	Youngstown
Business Journal	Daily	Youngstown
Canfield Neighbors	Weekly	Youngstown
Canfield Town Crier	Weekly	Warren
Catholic Exponent	Bi-weekly	Youngstown
Daily Legal News	Daily	Youngstown
Hometown Journal	Weekly	Struthers
Jambar (YSU newspaper)	Twice a week	Youngstown
Mahoning Valley Parent	Monthly	Warren
Metro Monthly	Monthly	Youngstown
The News Outlet		Youngstown
Poland Neighbors	Weekly	Warren
Radio Stations		
Station	Frequency	City
Poland Town Crier	Weekly	Niles
Review Newspapers	Weekly	Niles
Senior News	Weekly	Youngstown
Shale Sheet	Online	Youngstown
Youngstown Vindicator	Daily	Youngstown
Television Stations		
Station	Channel	City
WFMJ Channel 21	NBC	Youngstown
WKBN Channel 27	CBS	Youngstown
WYFX	Fox	Youngstown
WYTV Channel 33	ABC	Youngstown
MyYTV	MyNetworkTV	Youngstown

1.2.9 Tourism and Attractions

Mahoning County is the home of several tourist attractions, including the Arms Family Museum, Berlin Reservoir, Boardman Park, Canfield Fairgrounds, Covelli Centre, Edward W. Powers Auditorium, Greater Youngstown Italian Fest, Lake Milton State Park, McDonough Museum of Art, Mill Creek Metro Parks, Noah's Lost Ark Exotic Animal Sanctuary, Poland Forest, Stambaugh Auditorium, TP Auto Collection, War Vet Museum, Western Reserve Village/Canfield Fair, Tyler History center, the Butler Museum, Hollywood Gaming at Mahoning Valley, and the Youngstown Historical Center of Industry and Labor.

1.2.10 County Land Use

Mahoning County Existing Land Use

Between 2010 and 2020, Ohio County Profile data, prepared by the Ohio Office of Research, identified the following changes in land use:

Mahoning County Land Use

Land Use/Land Cover	2010%	2020%	% Change
Developed, Lower intensity	25.00	23.18	- 7.30
Developed, Higher intensity	4.64	4.99	+ 7.54
Baron	.42	.64	+52.38
Forest	30.06	31.65	+ 5.23
Shrub/Grasslands	3.33	1.22	- 63.40
Pasture/Hay	15.02	19.20	+27.83
Cultivated Crops	16.71	13.25	- 20.70
Wetlands	2.17	3.49	+60.82
Open Water	2.66	2.38	-10.52

This table shows a significant statistical increase in baron lands (+52.38%) and in wetlands (+60.82%) but these lands make up a small fraction of county land use. Still, any increase in these land uses can better absorb rain events and reduce potential flooding. The 5.23% increase in forests can lead to more forest fires and the 27.83% increase in pasture/hay lands could result in a greater wildfire threat in times of drought. Further, the slight reduction 4.3% in overall Mahoning County population from the 2010 Census (238,823 population) to the 2020 Census (228,614 population), further indicates a slightly lower, or same level, general risk for a majority of natural hazards. The one (1) exception to this is the 3.7% increase in residents +65 years old from 2010 to 2020. This older population may be more vulnerable to extreme heat and cold waves. (Source: 2020 Census and the 2024 SOHMP).

Over the past five (5) years, no Mahoning Co jurisdiction has seen any meaningful growth or development that will either increase or decrease any of the community's vulnerability to natural hazards.

1.2.11 Vulnerable Populations in Mahoning County

2020 US Census Tract data identifies Mahoning County jurisdictions as follows:

Jurisdiction	US Census Tracts (CT)
Beloit	8130
Cambell	8101,8102, 8103
Canfield	8122, 8121.02, 8125
Craig Beach	8128
Lowellville	8111
New Middletown	8136.01
Poland	8112
Sebring	8132
Struthers	8106., 8107, 8108
Youngstown	8040,8041,8137, 8138, 8139, 8140, 8142

1.2.12 Jurisdictions

The following subheadings outline the characteristics of the jurisdictions in Mahoning County. However, some jurisdictions that are partially within Mahoning County limits are not outlined herein because they are included in other counties' mitigation plans. The excluded jurisdictions are the City of Alliance (contemplated in the Stark County Hazard Mitigation Plan), and the cities of Columbiana, Salem, and Washingtonville (considered in Columbiana County). In addition to the cities and villages, Mahoning County has 14 townships.

Mahoning County

The county was established in March of 1846 and named for a Native American word meaning "at the salt licks." The county contains ten incorporated municipalities including the Villages of Beloit, Craig Beach, Lowellville, New Middletown, Poland, and Sebring as well as the Cities of Campbell, Canfield, Struthers, and Youngstown which functions as the county seat. Mahoning County has a total population of 238,823 (2020 U.S Census) and is part of the Youngstown-Warren-Boardman, OH-PA Metropolitan Statistical Area (MSA) along with all its jurisdictions. Metropolitan cities located within proximity to Mahoning County include Cleveland, OH (65 miles) and Pittsburgh, PA (61 miles).

The population in Mahoning County has been declining since the 1970 US Census.

Census Year	Population	% Change
1970	303,424	--
1980	289,487	-4.6
1990	264,806	-8.8
2000	257,555	-2.7
2010	238,823	-7.3
2020	228,614	-4.3

Ohio Department of Development Office of Research

Mahoning County Population Changes over the past 2 US Census Counts

Population by Age	2010 Census	2020 Census	Overall % change
Under 5 years	11,964	12,009	+0.4
5-17 years	35,961	34,843	-3.1
18-24 years	20,398	19,983	-2.0
25-44 years	52,591	52,484	-.02
45-64 years	67,491	65,500	-3.0
65 years and more	44,610	46,245	+3.7
Total Population	238,823	228,614	-4.3

The change in population chart shows a declining overall population in Mahoning County over the past 10 years, as well as an increase in those residents over 65 years old.

This trend is expected to continue. Older residents are more likely at risk of natural hazards as they are less mobile to get out of harm's way during most potential disasters

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The City of Campbell

The city of Campbell is located in northeastern Mahoning County in Coitsville Township between the Cities of Youngstown and Struthers approximately five miles from the Pennsylvania border. The City of Campbell was formerly known as the village of East Youngstown, and this designation still appears on real estate deeds for the city. The city was renamed for local industrialist James A. Campbell, then chairman of the Youngstown Sheet and Tube Company. The form of what was to become the City of Campbell began in 1902 when the Youngstown Iron, Sheet, and Tube Company established operations on the banks of the Mahoning River in Coitsville Township.

The character of the city came from the young immigrants who poured into the Mahoning Valley to work in the growing steel industry. The original boom town ultimately matured and officially became known as the City of Campbell in 1926 and was officially incorporated in 1970. Residents generally pronounce the city's name as "camel," with a silent "PB." Campbell is sometimes referred to as the "City of Churches," because of the wide variety of religious structures found throughout the community.

The City of Campbell, along with the communities of Struthers and Lowellville and the Townships of Poland and Coitsville have formed a community improvement organization, the CASTLO CIC, to encourage other types of manufacturing and service-oriented industries to locate in the valley. Community residents and businesses enjoy the excellent commercial and industrial services afforded by the close relationship of Campbell to the Greater Youngstown area. Campbell is outlined by State Routes 289, 616, and U.S. Route 422, with easy access to Interstate 680 (I-680) which, in turn, provides access to State Route 11, I-80, I-76, and the Beaver Valley Expressway. Rail services are provided by the Mahoning Valley Railway Company, Chessie, and Three Rivers Railroads.

Roosevelt Park, located in the northeast quadrant of the city, offers Campbell residents 64 acres of park for picnicking and ice skating. Facilities are also available for baseball, softball, soccer, and tennis. Other recreational opportunities in or near Campbell include Gordon Park, the

JURISDICTIONS IN MAHONING COUNTY	
Name	Type
Alliance (part)*	City
Campbell	City
Canfield	City
Columbiana (part)*	City
Salem (part)*	City
Struthers	City
Youngstown	City
Beloit	Village
Craig Beach	Village
Lowellville	Village
New Middletown	Village
Poland	Village
Sebring	Village
Washingtonville (part)*	Village
Austintown	Township
Beaver	Township
Berlin	Township
Boardman	Township
Canfield	Township
Coitsville	Township
Ellsworth	Township
Goshen	Township
Green	Township
Jackson	Township
Milton	Township
Poland	Township
Smith	Township
Springfield	Township

Mahoning River, and McKelvey Lake. An Industrial Park was created at the site of the former Youngstown Sheet & Tube Struthers Works that includes 120 acres and eleven buildings totaling 600,000 square feet. Currently space at the park is being utilized by 17 companies.

Canfield City

Canfield is an affluent suburban city located in central Mahoning County in Canfield Township at the intersection of U.S. Route 224 and State Route 46/U.S. Route 62, about ten miles southwest of Youngstown. Canfield, in 1798, became Township No. 1 in range No. 3 by the purchase from the Connecticut Land Company. This 16,324-acre tract was located on the southeastern border of the Connecticut Western Reserve Territory. It was purchased by six gentlemen; most of the land was owned by Judson Canfield. Canfield was originally a part of Trumbull County until 1846, when the counties in the area were redefined and Mahoning County emerged as a new county. Canfield made plans to be the county seat, and because of it being the geographical center it was made such in 1846, while Youngstown grumbled that it should have had that honor. Thus, a fierce issue was raised, and it began a debate that would last three decades. The bill for removal of the county seat from Canfield to Youngstown was voted upon by the legislature in Columbus in 1874 and upheld.

Canfield is a relatively affluent suburb of Youngstown, with strict zoning regulations that prohibit large signage and overgrown lawns. A tree-lined “Village Green” sits at the heart of the New England-style village, which resembles many communities established in the days of the Connecticut Western Reserve. Canfield continues to grow; new housing developments are spreading throughout the city.

The Canfield Fairgrounds have existed at their present location on State Route 46 since 1851. Every year in late August for six days the Canfield Fair “Ohio’s largest county fair” takes place, the fair attracts many Ohio citizens. Canfield is also home to several light manufacturing companies including; Canfield Metal Coating, Converse All Steel Services, Star Extruded Aluminum Shapes, Lifetime Truck Products, Canfield Manufacturing Company, and United Extrusion, Leebaw Manufacturing, Betts Spring Manufacturing, Canfield Industries, and Canfield Plastics.

Struthers City

The City of Struthers is located in northeastern Mahoning County in Poland Township just to the south of Campbell and Youngstown. The city is located 60 miles from both Cleveland and Pittsburgh. Struthers can be accessed utilizing Interstates 680, 80 (Ohio Turnpike) 76; and State Routes 11, 170, and 616. The Youngstown-Warren Regional Airport, Cleveland Hopkins Airport, and Pittsburgh International Airport are all nearby.

John Struthers, from Washington County, Pennsylvania, purchased 400 acres of Poland Township land in 1798. This land would later be known as the present-day City of Struthers. In 1800 Struthers built a grist mill on his property, the first in Poland Township and later added a sawmill to this. The community’s early history centers on Yellow Creek, which was the site for the first iron blast furnace built west of Pittsburgh. The furnace was built in 1803 by Daniel Eaton. Several furnaces were built along the creek during the first decade of the 1700s. The land on the Yellow Creek would lay dormant for more than 50 years until 1865 when Thomas Struthers, son of John Struthers, bought back the land his father had lost following the War of 1812. Thomas Struthers laid out the village that year and gave it his family’s name. With the steel industry booming in the early part of the 1900s, immigrants from throughout Europe flooded into Struthers. A village in 1902 when it was officially incorporated, Struthers quickly

became a city in 1920. The steel industry allowed the city to flourish until 1977 when several area plants closed their doors for good. The city padded the loss of thousands of jobs by using its industrial infrastructure to lure non-steel making jobs, but population losses have continued throughout the start of the new century.

The CASTLO Industrial Park, a nonprofit Community Improvement Corporation, offers commercial and industrial space in Struthers.

Youngstown City

The City of Youngstown is located in the northeastern portion of Mahoning County and extends into Trumbull County. The city is situated along the Mahoning River, approximately 65 miles southeast of Cleveland, 61 miles northwest of Pittsburgh, and is midway between New York City and Chicago via Interstate 80 (I-80). Youngstown is in the Mahoning Valley on the Glaciated Allegheny Plateau. At the end of the last Ice Age, the glaciers left behind a uniform plain with valleys caused by the Mahoning River crossing the plain. Youngstown has its own metropolitan area but is often included in commercial and cultural depictions of the Pittsburgh Tri-State area and Greater Cleveland. The city functions as the county seat of Mahoning County.

The city was named for John Young, an early settler from Whitestown, New York, who surveyed the area in 1796, and established the community's first sawmill and gristmill. Youngstown was founded in 1796, incorporated as a village in 1848, and chartered as a city in 1867. The area constituting present-day Youngstown was part of the Connecticut Western Reserve, a section of the Northwest Territory reserved for settlers from the State of Connecticut.

The discovery of coal by the community in the early 19th century paved the way for the Youngstown area's inclusion on the network of the famed Erie Canal. The Pennsylvania and Ohio Canal Company was organized in 1835, and the canal was completed in 1840. The arrival of the railroad in 1856 smoothed the path for further economic growth. Endowed with large deposits of coal and iron as well as "old growth" hardwood forests needed to produce charcoal, the Youngstown area eventually developed a thriving steel industry. The area's first blast furnace was established to the east of town in 1803 by James and Daniel Heaton. In time, the availability of fossil fuels contributed to the development of other coal-fired mills, including the Youngstown Rolling Mill Company, which was established in 1846. By the mid-19th century, Youngstown was the site of several iron industrial plants, notable David Tod's Brier Hill Iron & Coal Company. Between the 1920s and 1960s, the city was known as an important hub that featured the massive furnaces and foundries of such companies as Republic Steel and U.S. Steel. At the same time, Youngstown never became economically diversified, as did larger industrial cities such as Chicago, Pittsburgh, Akron, or Cleveland. Hence, when economic changes forced the closure of plants throughout the 1970s, the city was left with few substantial economic alternatives. The September 19, 1977, announcement of the closure of a large portion of Youngstown Sheet and Tube, an event still remembered by many Youngstowners' as "Black Monday," is widely regarded as the death knell of the old area steel industry.

Youngstown is still the site of several steel and metalworking operations, though nothing on the scale seen during the "glory days" of the "Steel Valley." The largest current employer in the city is Youngstown State University (YSU), an urban public campus that serves about 11,000 students, located just north of downtown. The largest industrial employers within the

Youngstown city limits are Vallourec Star Steel Company, Mercy Health, Youngstown State University, and Exal Corporation.

Attractions in the Youngstown area include the Covelli Centre, the Butler Institute of American Art, the McDonough Museum of Art, The Clarence R. Smith Mineral Museum, Arms Family Museum of Local History, the Youngstown Historical Center of Industry and Labor, Mill Creek Park, Fellows Riverside Gardens, and a long tradition of semi-professional sports.

Village of Beloit

The Village of Beloit is located in the southwestern corner of Mahoning County in Smith Township, just to the east of Sebring Village. The village can be accessed using State Route 165 and 173. The Youngstown Belt Railroad, which is owned by Norfolk Southern, passes near the village.

Village of Craig Beach

The Village of Craig Beach is located in the northwestern corner of Mahoning County in Milton Township. The village has a total area of 1.7 square miles, of which 0.9 square miles (55%) of it is land, and 0.8 square miles (45%) of it is water. Craig Beach Village along with Milton Township are known as the community of Lake Milton which is also an Ohio State Park. Craig Beach borders the lake on the northwest corner and includes the area known as the swim beach, the Lake Milton Dam, a boat ramp at Robinson Point, a large picnic/recreation area, a children's playground, basketball and volleyball courts, and the newest addition to the area the lake Milton Nature Arts Amphitheater.

The City of Youngstown used the Mahoning River in the early 1900's as both an industrial and domestic water supply. However, around 1906 the city started experiencing water shortages. They decided to create a reservoir upstream thus enabling them to have some control over the flow of the Mahoning River. Between 1911 and 1913, Youngstown was able to acquire 3,416 acres that would eventually become Lake Milton. The venture worked for Youngstown until 1925 when the water of the Mahoning River was labeled as unsafe for human consumption. In 1931 a group decided to form a municipality that would become known as Craig Beach Village. During WWII a guard was posted at the dam to ensure the nation's steel production was not interrupted. Over the next 40 years the United States Army Corp of Engineers and later the Ohio Department of Natural Resources (ODNR) oversaw inspections and upgrades to the dam to ensure its stabilization. In 1984 there was little doubt the dam was failing. The dam was breached in 1986 and lush green growth began to fill its bed. Youngstown relinquished control of the dam to the ODNR. They began construction of a new dam that was completed in 1988. Lake Milton was officially named Ohio's 72nd State Park in June of 1988. Craig Beach can be accessed using Interstate 76 which runs east west to the south of the village, and State Route 534 which runs north south to the east of the village.

Village of Lowellville

Lowellville Village is located in eastern Mahoning County in Poland Township in the "Steel Valley" area of the northeast part of Ohio, southeast of Youngstown. The Village is an older, predominantly Italian-American, working-class community built along the banks of the Mahoning River in the foothills of the Alleghenies and centered around the once productive Sharon Steel works.

Although settlers from the eastern United States arrived in Lowellville as early as 1800, the village was not platted until the 1830s, when talk of a canal in the Mahoning Valley inspired action. The Pennsylvania & Ohio Canal did not arrive until the 1840s, but it was modern transportation for its day and Lowellville was in place to make use of it. In the 1850s, limestone from Lowellville quarries was being used extensively throughout the Mahoning Valley thanks to the canal, and later to the railroad. Coal and iron ore were also abundant in the Lowellville hills and in the 1840s a blast furnace arrived from Pittsburgh, the first stack in the valley to burn bituminous coal as fuel. By 1900 the local supplies of coal and iron ore were fairly well depleted, but now Lowellville, which was not incorporated until 1890, could import the raw materials necessary for making iron via the railroad. After the 1900, the village's population grew markedly due both to the influx of immigrants to man the new Youngstown Sheet & Tube steel-making operation upstream in East Youngstown and to the new interurban electric line from Youngstown, thus connecting the village's industries with those of the rest of the valley's growing industrial district.

Village of New Middletown

The Village of New Middletown is located in southeastern Mahoning County in Springfield Township. New Middletown has a unique history that can be traced back nearly 200 years to 1820, the village was incorporated in 1972. The large class I dam of Evans Lake is located just to the west of the village. New Middletown can be accessed via Interstates 680, and 76, as well as U.S. Route 224; and State Routes 170 and 630.

Village of Poland

The Village of Poland is located in eastern Mahoning County in Poland Township. The village can be accessed via I-680, U.S. Route 224, and State Routes 170 and 616. A large recreational lake, Lake Hamilton, is located just to the north and east of the village.

In 1796, Poland Township was the first chartered township in the Connecticut Western Reserve. It was settled by people from Connecticut, who were given land grants in the northeastern portion of Ohio, of which Poland Township was the southeastern most portion, or Town One, Range One. The township was founded by Jonathan Fowler, who fell in love with Yellow Creek which flows through Poland. The Village of Poland was founded in 1866.

Village of Sebring

The Village of Sebring is located in the southwestern portion of Mahoning County in Smith Township, just to the west of Beloit Village. The main transportation routes that can be utilized to access Sebring include U.S. Route 62, and State Routes 165, and 173.

The Village of Sebring was founded by the Sebring brothers, a family from East Liverpool, Ohio. They owned and operated many pottery businesses. The Sebring family dreamed of building their own pottery town, one that would bear their name and stand as a memorial to their work and ideals. The Sebring's made frequent excursions through Ohio, Indiana, and Pennsylvania in search of a desirable site to build not only pottery but a new town. They finally decided upon an area in Mahoning County, 80 miles west of Pittsburgh and five miles east of Alliance. In April of 1898, work began on the factories, stores, and homes that would become known as "Sebring".

The five beginning potteries employed approximately 3,300 workers. The pottery industry flourished for many years, and at one time Sebring was known as the "Pottery Capital of The

World.” In 1912, Sebring became the site of a factory which produced a motor car, far ahead of its time. The Sebring Six was one of the first automobiles to be manufactured. The F.A. Sebring Community Center is maintained by the Parks and Recreation Board. It offers a wide range of activities and programs for young and old alike.

1.2.13 Asset Inventory

This plan identifies potentially vulnerable community assets such as critical facilities, critical infrastructure, historic properties, commercial/industrial facilities, etc. "Assets" contribute directly to the quality of life in the community as well as ensure its continued operation.

Critical Facilities

All the critical facilities within Mahoning County (schools, hospitals, water treatment plants, airports, police and fire stations, nursing homes, entertainment facilities, and any other facility deemed a critical facility for their county are summarized below.

Mahoning Co EMA maintains this information in their Resource Document, which is for government use only.

Ohio Revised Code (ORC) Section 149.433 Exempting Security and Infrastructure Records, requires that sensitive infrastructure information not be made public.

ORC 149.433 states,” Security record means any of the following:

(2) Any record assembled, prepared, or marked by a public office or public body to prevent, mitigate, or respond to an act of terrorism.

B (1) Except as otherwise provided in (B) (4) of this Section, a record kept by a public office that is a security record is not a public record under Section 149.43 of the Revised Code and is not subject to mandatory release or disclosed under that section”.

Natural Environment

Resources that are important to community identity and quality of life in the community, as well as those that support the local economy through agriculture, tourism, and recreation. Examples include areas that can provide protective functions that reduce the magnitude of hazard events and critical habitat areas and other environmental features that are important to protect.

The following chart shows a summary of the county and jurisdictional assets identified in Mahoning County.

Critical Facilities in Planning Area

Property	Count
Airports	7
Cultural Resources	26
Dialysis Centers	9
Fire EMS	44
Government Buildings	24
Hospitals	8
Industries	30
Libraries	15
Nursing Homes	37
Police	23
Post Offices	23
Radio/TV	20
Schools	64
Wastewater Plant	2
Water Plant	6
Total Critical Facilities	338

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1.2.14 Disaster Declarations

When a hazard incident occurs in a state, and the capabilities exceed those of the state, after the preliminary damage assessment, the Governor can request that the President declare an emergency or a disaster.

1.2.14.1 Emergency Declarations

The President can declare an emergency for any occasion or instance when the President determines federal assistance is needed. Emergency declarations supplement State and local or Indian tribal government efforts in providing emergency services, such as the protection of lives, property, public health, and safety, or to lessen or avert the threat of a catastrophe in any part of the United States. The total amount of assistance provided for in a single emergency may not exceed \$5 million. If the emergency exceeds this amount, the President shall report to Congress.

1.2.14.2 Major Disaster Declarations

The President can declare a major disaster for any natural event if the damage is of such severity that it is beyond the capabilities of state and local governments to respond. These can include any hurricane, tornado, storm, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, or drought, or, regardless of cause, fire, flood, or explosion. A major disaster declaration provides a wide range of federal assistance programs for individuals and public infrastructure, including funds for both emergency and permanent work. Assistance available under a major disaster declaration includes individual, public, and hazard mitigation.

The following table summarizes the disaster declarations that included Mahoning County since 1990. There have been no disaster declarations in the county since 2005 (FEMA). For detailed information on the events for each declaration, refer to the hazard profiles in [Section 2.4 Hazard Profiles](#).

DISASTER DECLARATIONS IN MAHONING COUNTY				
Declaration Number	Event Type Declaration	Dates of Event	Events in Mahoning County (NCEI)	Public (P) or Individual (I) Assistance
DR-870	Severe storm, tornadoes, and flooding	May 28, 1990 – July 15, 1990	Thunderstorm wind	N/A
DR-951	Severe storms, tornadoes, flooding	July 12, 1992 – August 1, 1992	Thunderstorm wind	N/A
DR-1478	Severe storms and flooding	July 4, 2003 – July 11, 2003	Thunderstorm wind and hail	\$1,980,992.81 approved (I)
DR-1484	Severe storms, tornadoes, and flooding	July 21, 2003 – August 25, 2003	Thunderstorm wind, tornado, flood, and flash flood	\$74,781,195.51 approved (I)
DR-1519	Severe storms and flooding	May 18, 2004 – June 21, 2004	Thunderstorm wind, flash flood, and hail	\$19,193,921.30 approved (I) \$ 10,647,960.09 approved (P)
DR-1556	Severe storms and flooding	August 27, 2004 – September 27, 2004	Hail, flood, flash flood, and strong wind	\$23,662,227.318 approved (I)

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1.3 CAPABILITIES

1.3.1 Existing Plans and Ordinances

Mahoning County itself and the municipalities therein have a number of capabilities that can support mitigation efforts including comprehensive plans, building codes, subdivision and land use ordinances, zoning ordinances, and floodplain regulations. The county's consultant worked through the steering committee members with jurisdictional representatives to complete a "capabilities assessment." Representatives answered questions about the following plans, codes, and ordinances from the perspectives of their home jurisdictions.

Comprehensive Plans

Comprehensive plans promote sound land use and regional cooperation among local governments to address planning issues. These plans serve as the official policy guide for influencing the location, type, and extent of future development by establishing the basic decision-making and review processes on zoning matters, subdivision and land development, land uses, public facilities, and housing needs over time.

Building Codes

Building codes regulate construction standards for new construction and substantially renovated buildings. Standards can be adopted that require resistant or resilient building design practices to address hazard impacts common to a given community.

Subdivision and Land Use Development Ordinances

Subdivision and land development ordinances (SALDOs) are intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Within these ordinances, guidelines on how land will be divided, the placement and size of roads and the location of infrastructure can reduce exposure of development to hazard events.

Zoning Ordinances

Zoning ordinances allow for local communities to regulate the use of land in order to protect the interests and safety of the general public. Zoning ordinances can address unique conditions or concerns within a given community. They may be used to create buffers between structures and high-risk areas, limit the type or density of development and/or require land development to consider specific hazard vulnerabilities.

National Flood Insurance Program (NFIP) Participation and Floodplain Management Ordinances

Through administration of floodplain ordinances, municipalities can ensure that all new construction or substantial improvements to existing structures located in the floodplain are flood-proofed, dry-proofed, or built above anticipated flood elevations. Floodplain ordinances may also prohibit development in certain areas altogether. The National Flood Insurance Program (NFIP) establishes minimum ordinance requirements which must be met in order for that community to participate in the program. However, a community is permitted and encouraged to adopt standards which exceed NFIP requirements.

The following table summarizes the jurisdictional capabilities of Mahoning County according to the completed online surveys.

Community	Comprehensive Plan	Building Codes)	Subdiv. Regs	Zoning Ord.	Partic. in NFIP	Capital/Public Works budget for Mitigation	Other Mitigation /Sustainability Efforts
Cambell		Y	Y	Y	N	N	N
Canfield	Y	Y	Y	Y	Y	N	N
Struthers	Y	Y	N	Y	Y	N	N
Youngstown	Y	Y	Y	Y	Y	N	N
Beloit	N	N	N	N	N	N	N
Craig Beach	N	Y	Y	Y	N	N	Y
Lowellville	Y	Y	Y	Y	Y	N	N
New Middletown		Y	N	Y	Y	N	N
Poland	Y	Y		Y	Y	N	N
Sebring	N	N		Y	Y	N	N
Mahoning Co	Y	Y	Y	Y	N	N	Y

1.3.2 Capability Assessment

Each of the participating local jurisdictions have agreed to work to implement their specific Action Plan Items. They have committed, via their Community Resolution, to contribute the resources and to cooperate with other entities to implement their projects. This will include additional local funding, efforts to secure grants as noted in the Action Plan and coordinating with other organizations and agencies.

To address the capacity of each of jurisdiction to accomplish this, we have divided them into three (3) categories;

Full Capacity: Jurisdictions with staff, expertise, and access to resources to implement their action items.

Medium Capacity; Jurisdictions with some staff capacity and expertise, with access to some resources to implement their action items. They will likely need to partner in some way with the county and other agencies.

Limited Capacity: Jurisdictions without paid staff or expertise and limited access to needed resources to implement their action items. These jurisdictions will rely heavily on the County and other community and state agencies/resources to implement their action items.

Jurisdiction	Full Capacity	Medium Capacity	Limited Capacity
Mahoning County	X		
Cities			
City of Cambell		X	
City of Canfield		X	
City of Struthers		X	
City of Youngstown	X		
Villages			
Beloit			X
Craig Beach			X
Lowellville			X
New Middletown			X
Poland			X
Sebring			X

To assist these different jurisdiction capacities, Mahoning County EMA will do their best to assist Medium Capacity and Limited Capacity jurisdictions expand/improve their capabilities regarding plans, functions, funding, and regulations, by conducting a Strengths, Weaknesses and Gap Assessment with these jurisdictions, as well as provide technical assistance to help them to secure resources for projects, and to help implement their specific action items. There is also a need for these jurisdictions to better integrate existing and forthcoming plans into the hazard mitigation planning process. These actions are addressed in Section 3, Goals and Action Items.

Fiscal Capability

The decision and capacity to implement mitigation-related activities is often strongly dependent on the presence of local financial resources. While some mitigation actions are less costly than others, it is important that money is available locally to implement policies and projects. Financial resources are particularly important if communities are trying to take advantage of state or federal mitigation grant funding opportunities that require local-match contributions. Federal programs which may provide financial support for mitigation activities include, but are not limited to:

- Community Development Block Grant (CDBG),
- Disaster Housing Program,
- Emergency Conservation Program,
- Emergency Management Performance Grants (EMPG),
- Emergency Watershed Protection Program,
- Hazard Mitigation Grant Program (HMGP),
- Flood Mitigation Assistance Program,
- Non-Insured Crop Disaster Assistance Program,
- Pre-Disaster Mitigation Program,
- Repetitive Flood Claims Program (RFC),
- Section 108 Loan Guarantee Programs,
- Severe Repetitive Loss (SRL) Program, and

- Weatherization Assistance Program.

State programs that may support mitigation include (but are not limited to):

- Ohio Department of Development (job ready sites and CDBG funds for economic development),
- Ohio Department of Natural Resources (land and water conservation efforts),
- Ohio Environmental Protection Agency (loans and capital improvements), and
- Ohio Emergency Management Agency (funds to support emergency preparedness, response, and overall resilience).

Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to mitigate hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. In many cases, mitigation may not generate interest among local officials when compared with competing priorities. Therefore, the local political climate must be considered when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions.

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1.3.3 Studies, Reports, and Technical Information

The research conducted for the development of this plan included data from federal, state, and higher education studies, reports and technical information.

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

REFERENCED DOCUMENTS		
<i>Document Type</i>	<i>Document Citation</i>	<i>How Incorporated into Plan</i>
Plan	Eastgate Regional Council of Governments (2018). <i>2040 Metropolitan transportation plan update</i> . Regional organization: Youngstown, OH.	Used for guidance on development trends and background information on Mahoning County
Plan	Mahoning County Planning Commission (2016). <i>Development and land use plan 2016-2026</i> . County Government: Youngstown, OH.	Used for guidance on development trends and background information on Mahoning County
Plan	Mahoning County Emergency Management Agency (2010). <i>Emergency Operations Plan</i> . County Government: Youngstown, OH.	Used for guidance on capabilities in Mahoning County
Plan	City of Youngstown (2010). <i>Youngstown 2010 Citywide Plan</i> . Local Government: Youngstown, OH.	Used for guidance on development trends and background information on Mahoning County
Plan	Eastgate Regional Council of Governments (May, 2015). <i>Yellow Creek Watershed Action Plan</i> . Regional organization: Youngstown, OH.	Used for guidance on development trends and background information on Mahoning County
Plan	Eastgate Regional Council of Governments (2022.). <i>Regional Economic Coordination Plan</i> Eastgatecog.org/projects	Used for guidance on development trends and background information on Mahoning County
Plan	Eastgate Regional Council of Governments (2018). <i>Interface Comprehensive Economic Development Strategy</i> . Regional Organization: Youngstown, OH	Used for guidance on development trends and background information on Mahoning County
Plan	Cleveland State University (2021) Levin Report: Opportunities for Youngstown in Supply Chains in NE Ohio and Pittsburg Economies	Used for guidance on development trends and background information on Mahoning County and Youngstown area in particular
Plan	Mahoning Co Subdivision Regulations Revised 6/24/2007	Subdivision design guidance and impact on mitigation

Each of these plans were reviewed and relevant information was incorporated into this Hazard Mitigation Plan. The Planning Team also learned how important it can be to integrate all planning efforts to maximize coordination and impact on the community. While this integration has been fairly limited in the past, it is included in Action Item 1.1.6 Section 3: Mitigation Strategies in this plan. Moving forward, Mahoning County and participating jurisdictions will engage in a more serious effort regarding the integration of local planning mechanisms, as identified throughout this plan, to enhance development capacities where applicable.

1.4 TRENDS AND PROJECTIONS

1.4.1 Population

Demographic information is an integral part of community and mitigation planning. Awareness of changes in population projections helps decision makers anticipate needs before they arise. Mahoning County's population has been declining since the 1970's. This decline can be attributed partially to the county's location in the nation's former industrial belt, and one of its economic foci was steel manufacturing. Industrial and extractive industries were important in the development of the county. Underneath the county surface, there are coal, limestone and clay mines. Steel and other related industries were the driving factors behind Mahoning County's economy. While the region is working to transition manufacturing to newer technologies (EV and solar), population and job decline continues.

The Ohio Department of Development projects continued population loss in Mahoning County from 228,614 in 2020 to 177,308 in 2050 (-22.44% population loss).

The highest concentration of residents live in the cities of Struthers, Campbell, and Youngstown. Several large townships also have high population concentrations including Boardman, Coitsville, and Poland. The most heavily populated area is the urbanized northeastern portion of the county. The southern and western rural areas are less densely populated; however, unincorporated areas account for approximately 44% of the county's total population. The population density within what is termed "rural area" can vary significantly as well. For instance, subdivision or unincorporated communities may include clusters of persons and homes that result in very small, dense areas located sporadically throughout rural Mahoning County.

1.4.2 Economic and Business Development

Mahoning County contains the governmental, educational, cultural, and employment center of Youngstown. Mahoning County has a diverse economic base from its history as a steel and manufacturing hotspot and continues to benefit from its strategic logistical location. However, the region has experienced long-term economic distress, including pockets of high unemployment and low per-capita income compared to state and national levels.

The City of Youngstown and the Office of Community Planning and Economic Development (CPED) actively develop business and industrial parks in the region with competitive incentives. A Community Reinvestment Area (CRA) is a targeted area of land designated by the City of Youngstown on which property owners can receive tax incentives for constructing new or renovating existing buildings. The CRA Program permits municipalities, townships, or counties to designate areas where investment has been lagging to encourage revitalization of the existing housing stock and the development of new structures; residential, commercial, and industrial projects are all eligible (City of Youngstown, n.d.).

Throughout the years, CPED has begun and/or completed a variety of projects. Information is available on their website and includes some of the following projects. The following table outlines only projects that explicitly describe creating five or more new jobs since 2018, the last time this list has been updated.

DEVELOPMENT CREATING JOBS IN YOUNGSTOWN			
<i>Project Name</i>	<i>Project Description</i>	<i>Investment</i>	<i>Jobs Created</i>
Empyra.com, Inc. (2012)	Local software development and consulting company	\$582,000	8 new full-time jobs
Green Haines Sgambati Co., LPA (2012)	Consolidate and relocate its existing Austintown and Wick Avenue office.	\$115,000	Retain 17 Youngstown positions and relocate 15 employees to the city
Iron City Wood Products, Inc.	Relocate their operations and renovate the existing building to construct a manufacturing/warehousing facility.	\$900,000	Relocate 43 employees to the City of Youngstown and hire 14 new full-time jobs
SKA Limited, LLC of Nevada (2012)	A new upscale pub	\$264,000	4 full-time jobs and 18 part-time jobs within three years.
Dooney's Downtown, LLC dba Warehouse 50 (2013)	Expansion of their business.	\$112,561	22 new jobs within three Years
Hudson Fasteners, Inc. (2013)	Expansion of their business	\$256,217	5 new full-time employees within three years
Potential Development Program, Inc. (2013)	Expansion of their business.	\$365,750	30 full-time jobs within three years
Team Steel Fabricators, LLC (2013)	Expansion of their business	\$143,283	9 full-time jobs within three years
The Learning Egg (2013)	Expansion of their business	\$514,750	32 new full-time jobs within three years
VB Companies, LLC dba Hot Head Burritos (2013)	Façade Renovation	\$20,353	20 new jobs over 3 years
DNV Energy, LLC (2014)	expansion of their business with the purchase of new equipment	\$1,149,927	11 new jobs within three years

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DEVELOPMENT CREATING JOBS IN YOUNGSTOWN			
<i>Project Name</i>	<i>Project Description</i>	<i>Investment</i>	<i>Jobs Created</i>
Saleskatz, Inc. (2014)	Purchase of new equipment, development of new software, and additional staff	\$577,500	40 new jobs within three years
Suzie's Dogs and Drafts, LLC (2014)	Demolition and replacement of existing façade; installation of sectional doors, relocation of the front entry door, installation of exterior ceramic tile and trim, and installation of new windowsills	\$53,396.00	42 new jobs within three years
The Happy Campers Learning Center, LLC (2014)	Renovation of the existing structure	\$86,089.00	5 new jobs within three years
M. J. Joseph Development Corporation (2015)	Build a beverage and technology complex in Youngstown that will produce the world's first and only self-chilling beverage can	\$20,000,000	257 new jobs
Noble Creature Cask House, LLC (2015)	Convert the existing building into a Micro-Brewery	\$123,000	6 new jobs within 3 years
Youngstown Edison Incubator Corporation (2015)	Acquire and renovate the building	\$5,100,000	Retain 12 positions and create 5 new jobs
Youngstown Stambaugh Hotel, LLC (2015)	Historic renovation of the Stambaugh Building into a 134 room Doubletree Hotel	\$25,750,000	25 new jobs within the first 12 months

Source: City of Youngstown CPED

The Ohio Development Services Agency (ODSA) recognizes eleven target industries important for the state's economic future. The industries are advanced manufacturing, automotive, food processing, logistics, polymers and chemicals. The Community Economic Development Strategy (CEDS) (2018) plan outlines various projects that are vital to the economic development of Mahoning, Trumbull, and Ashtabula Counties. Specifically, the goal is to "move the needle" on the six defined themes of economic competitiveness in the region: workforce/training and education; innovation and entrepreneurship; access to capital; infrastructure and site development; industry and business climate; and quality of life and community vitality (Eastgate, 2018).

According to the *2040 Metropolitan Transportation Plan Update* (Eastgate, 2018), a plan which includes Mahoning and Trumbull Counties, a program called the Travel Demand Model inputs projections provided by ODSA to determine where people may reside and work over a twenty-year horizon. Locations for where people may live and/or work are divided into four zones: Central Business District (CBD), Urban, Suburban, and Rural. Given the overall decline in population, except for CBDs, each of the zones will see a further decline in residents and jobs over the projected twenty-year horizon. The number of jobs is forecasted to incrementally grow in the areas of utilities and primary metal manufacturing. Presently, Utilities are in Niles, Weathersfield, and Youngstown. primary metal manufacturing is located along the Mahoning River Corridor and in Lordstown.

Transportation

The *2040 Metropolitan Transportation Plan Update* (Eastgate, 2018) provides recommended strategies and projects to maintain and develop the region's transportation system through 2040. The plan includes Mahoning and Trumbull Counties. It can be found at <https://eastgatecog.org>

1.4.4 Land Use

Mahoning County Development and Land Use Plan 2016 – 2026 describes the concept for growth of the majority of the townships in Mahoning County. Mainly, the townships aim to maintain their existing land uses by limiting or encouraging the development of businesses and residential areas in certain regions. The following table briefly outlines select objectives about future land use for the townships and their potential hazard risk impacts.

LAND USE PROJECTS IN THE TOWNSHIPS	
Township	Objectives
Austintown Township	• Redeveloping existing commercial corridors using smart growth techniques • Preserving existing low-density residential neighborhood and promote future low-density residential development. • Potential Hazard Risk Impact: No increased density will result in no change in current hazard risks.
Beaver Township	• Retaining and protecting the agricultural and rural character • Establishing residential areas at densities that are consistent with the township's ability to provide essential services and carrying capacity of the natural environment. • Promote land use practices that contribute to the preservation and improvement of the environmental quality of the watersheds. • Potential Hazard Risk Impact: Improved water shed quality can reduce the risks of flooding.
Berlin Township	• N/A
Boardman Township	• Encourage well-planned light industry and development of industrial parks, so that the integrity of the surrounding land uses are not destroyed. Potential Hazard Risk Impact: Increased light industrial development will increase the risk of flooding as more land become less permeable.
Canfield Township	• Discourage ribbon or strip highway commercial development. • Potential Hazard Risk Impact: Reduces the potential for future natural hazards like flooding.
Coitsville Township	• Discourage ribbon or strip highway commercial development. • Potential Hazard Risk Impact: Reduces the potential for future natural hazards like flooding.
Ellsworth Township	• Encourage business and industry within defined areas. • Potential Hazard Risk Impact: Increased business and industrial development will increase the risk of flooding as more land become less permeable.
Goshen Township	• N/A
Green Township	• Discourage ribbon or strip highway commercial development. • Potential Hazard Risk Impact: Reduces the potential for future natural hazards like flooding.
Jackson Township	• Encourage land management techniques that serve to protect agricultural land. • Encourage well-planned light industry and the development of industrial parks, so that the integrity of surrounding land uses are not destroyed. • Potential Hazard Risk Impact: Protecting agricultural uses can reduce potential flooding risks but could lead to more wildfires during periods of drought.
Milton Township	• Discourage ribbon or strip highway commercial development. • Potential Hazard Risk Impact: Reduces the potential for future natural hazards like flooding.

Poland Township	• Encourage commercial centers. • Encourage well-planned light industry and the development of industrial parks, so that the integrity of surrounding land uses are not destroyed. • Potential Hazard Risk Impact: Any new development reduces permeable surface area for water migration, thus increasing the risk for flooding.
Smith Township	• Encourage land management techniques that serve to protect agricultural land. • Encourage well-planned light industry and the development of industrial parks, so that the integrity of surrounding land uses are not destroyed. • Potential Hazard Risk Impact: Protecting agricultural uses can reduce potential flooding risks but could lead to more wildfires during periods of drought.
Springfield Township	• N/A

Source: Mahoning County Development and Land Use Plan 2016 – 2026

1.4.5 Planned Development and Hazard Areas

When planning for new development, it is vital to consider the areas where new development will be located to avoid damage from hazardous events in the future. In Mahoning County, the cities and villages plan to expand their transportation, commerce, and residential areas; to that end, the Mahoning County Planning Commission has developed a map where development is planned in the near future. The following page shows a map of these development areas.

It is important, then, to understand where the hazards identified in this plan affect the planned development areas. To illustrate this, three maps will show the juxtaposition of the planned development locations (residential, commercial, and industrial) and the hazard areas for mine subsidence, where underground mines are located throughout the county, floodplains, and the soils in the county that are prone to subsidence.

Planners chose to show these three hazards because they are site-specific hazards with known risk areas that developers can explicitly plan for; the effects of weather events such as tornadoes, hail, and severe winter storms and human-caused events such as violent disturbances, are widespread and can be unpredictable and therefore planners should always consider the non-site-specific hazards.

1.4.6 Mahoning County Hazard Maps

The following Mahoning County Hazard Maps were prepared by the Mahoning County Planning Commission.

These maps include:

- Land use Development.
- Subsidence Risk Areas.
- Flood Hazard areas.
- Abandoned Mines.

MAHONING COUNTY HAZARD MITIGATION PLAN

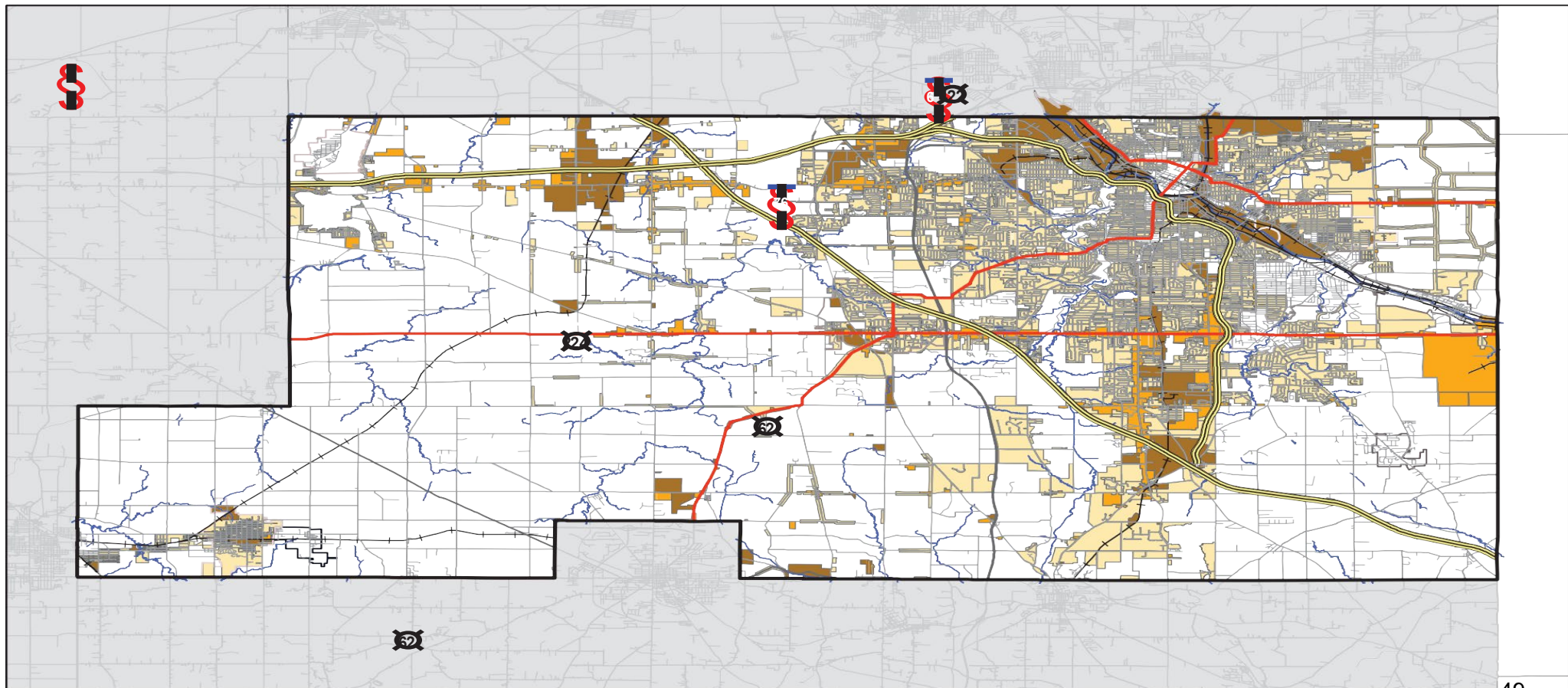
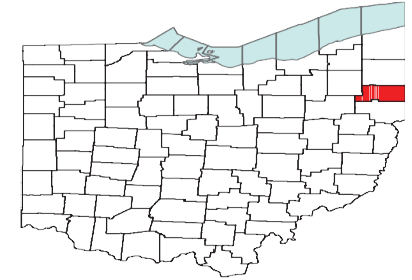
Planned Development Map

Data Source(s):
Mahoning County Planning
Commission

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



-  Zoned Business/Commercial
-  Zoned Industrial/Manufacturing
-  Zoned Residential



MAHONING COUNTY HAZARD MITIGATION PLAN

Planned Development - Subsidence Risk Areas Overlay

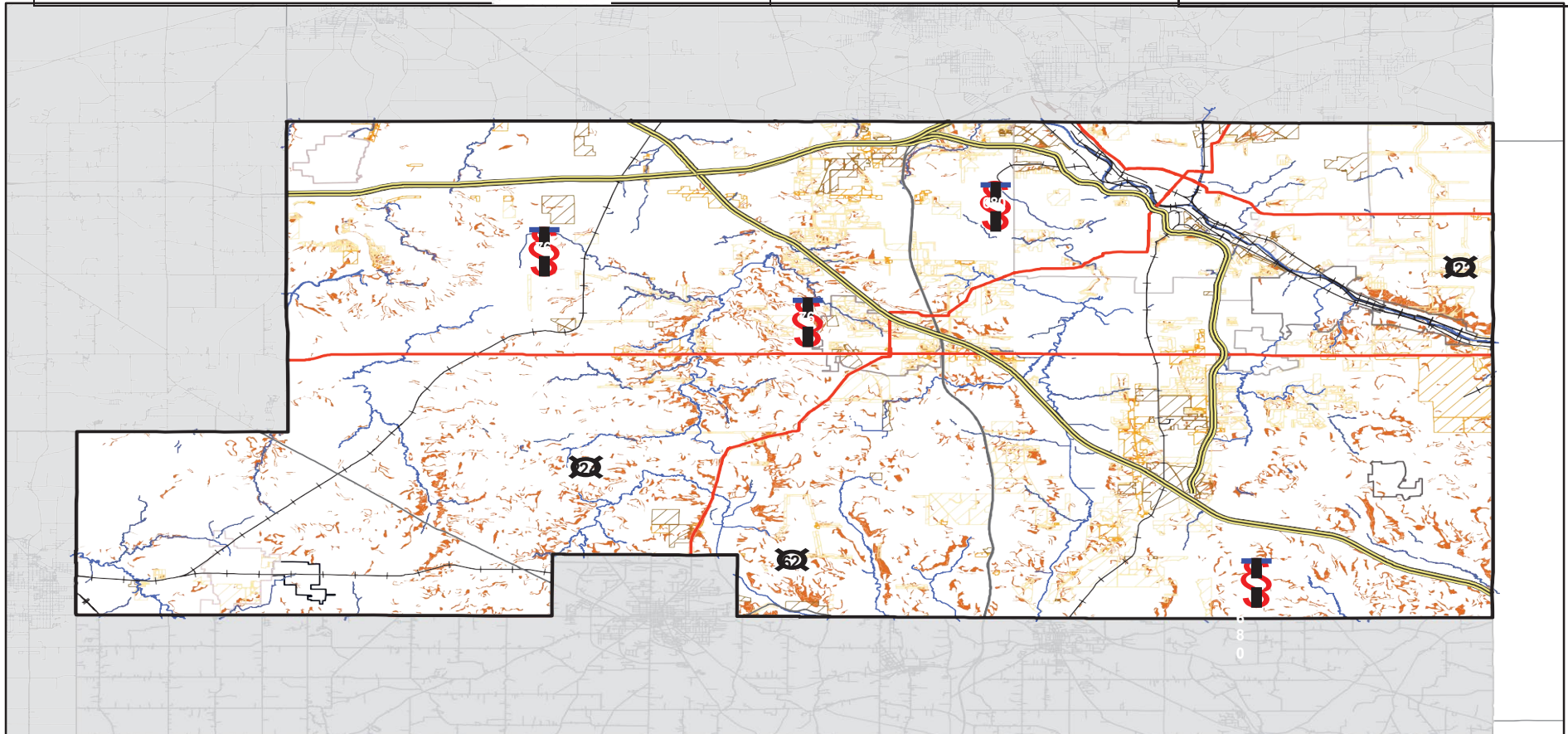
Data Source(s):

Mahoning County Planning Commission, ODNR

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



-  Ind./Man. w/ Other Subsidence Risks
-  Business/Commercial w/ Other Subsidence Risks
-  Residential w/ Other Subsidence Risks
-  Remote, Critical Subsidence Risk Areas



MAHONING COUNTY HAZARD MITIGATION PLAN

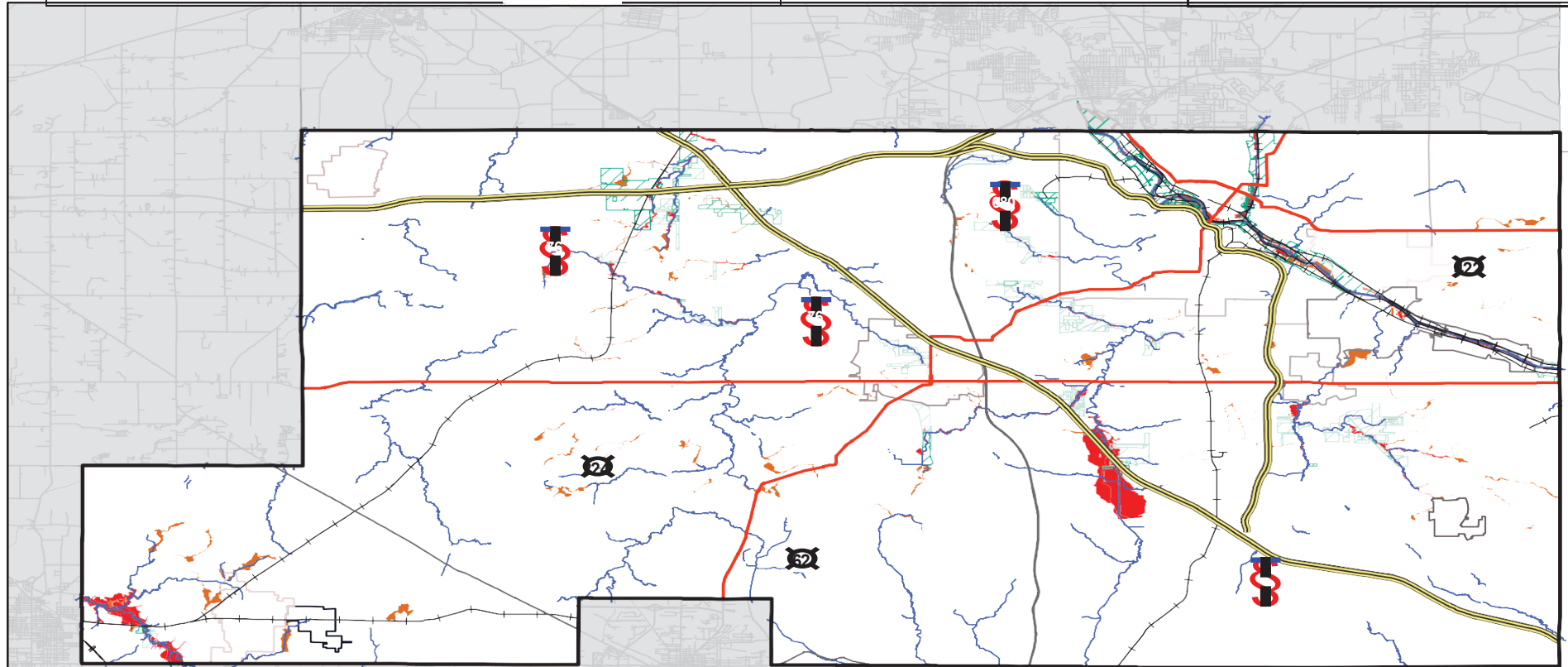
Planned Development - Special Flood Hazard Areas Overlay

Data Source(s):
DHS/FEMA, Mahoning County Planning Commission

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



-  Ind./Man. w/ Flood
-  Business/Commercial w/ Flood
-  Residential w/ Flood
-  High Risk (100-yr)
-  Medium Risk (500-yr)



MAHONING COUNTY HAZARD MITIGATION PLAN

Planned Development - Abandoned Mines Overlay

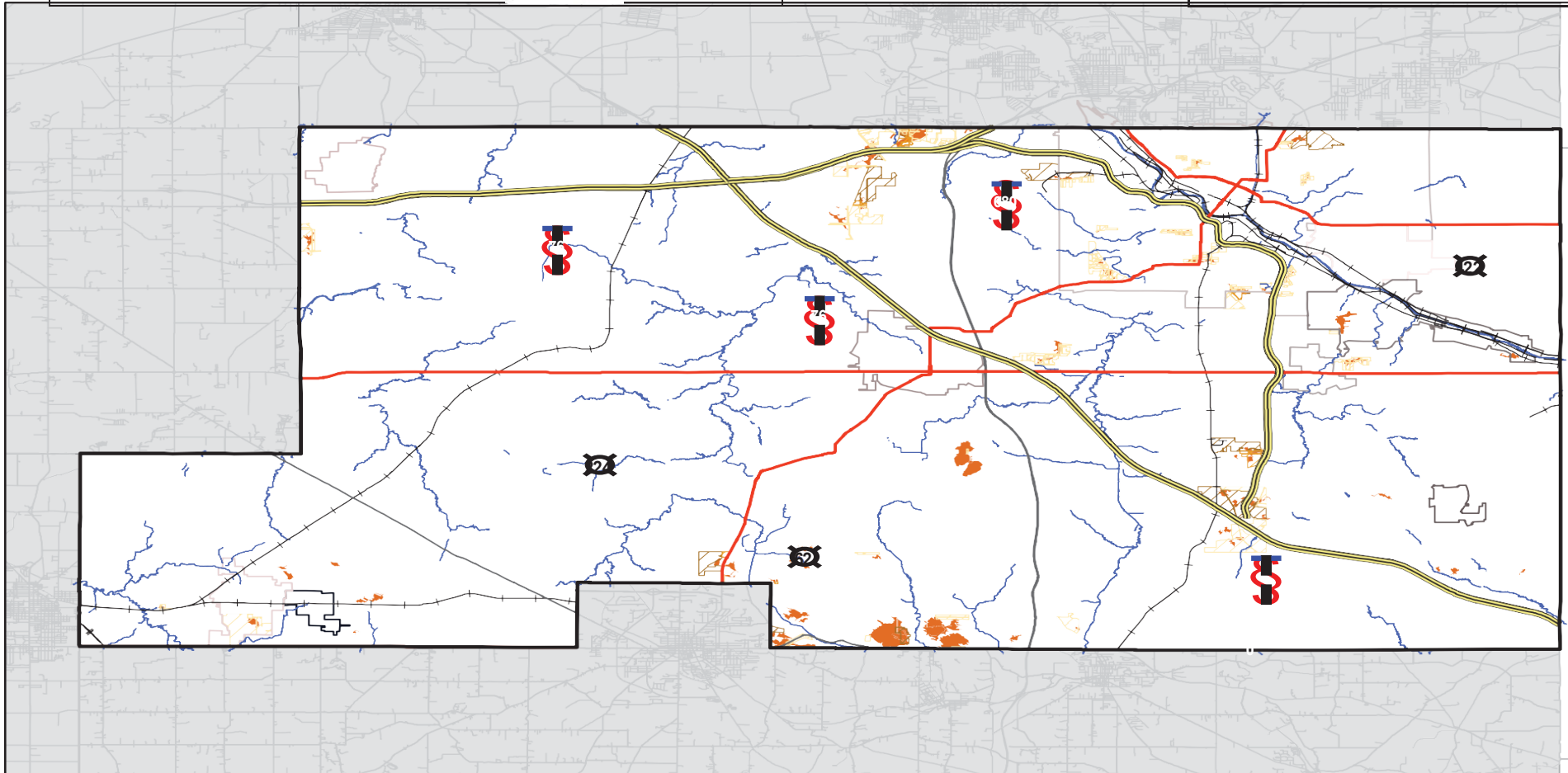
Data Source(s):

Mahoning County Planning Commission, ODNR

DISCLAIMER: Data is meant for use as reference only. Some sources may be intended to be used at national or regional scales and are thus used beyond their original intent for demonstrative purposes.



-  Residential w/ Abandoned Mines
-  Business/Commercial w/ Abandoned Mines
-  Ind./Man. w/ Abandoned Mines
-  Abandoned Mine Areas



2.0 RISK ASSESSMENT

A risk assessment analyzes “the potential for damage, loss, or other impacts created by the interaction of hazards with community assets” (FEMA, 2013). The risk assessment section contains information on identified hazards that threaten the region in profiles and the vulnerability of the area as it relates to its assets.

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2.1 HAZARDS IDENTIFICATION

Historically, Mahoning County has been vulnerable to a number of natural and technological or non-weather-related hazards that disrupt lives and damage or destroy property. The committee considered a variety of human-caused and natural hazards that had the potential to affect the county. This mitigation plan takes the following list of hazards into consideration for further analysis.

<i>Hazard</i>	HAZARD INCLUSIONS AND EXCLUSIONS		
	<i>Type</i>	<i>Status</i>	<i>Definition</i>
Avalanche	Natural	Not Included	A mass of snow, ice, or rocks falling rapidly down a mountainside. Avalanches happen mainly in the western United States and Canada (Keller, Devecchio, 2015 p. 229).
Coastal Erosion	Natural	Not Included	The process of local sea level rise, strong wave action, and coastal flooding that wear down or carry away rocks, sand, and soils along a coast. The Atlantic East Coast, where coastal erosion is nearest, is approximately 350 miles away and the Pacific West Coast is approximately 2,200 miles away (Google Earth).
Dam/Levee Failure	Natural	Included	The uncontrolled release of impounded water resulting in downstream flooding. See Section 2.8
Drought	Natural	Included	A prolonged period of abnormally low rainfall, leading to a shortage of water. See Section 2.14
Earthquake	Natural	Included	A sudden shaking of the ground caused by a passage of seismic waves through Earth's rocks. See Section 2.12
Epidemic	Natural and Human-Caused	Not included	A widespread occurrence of an infectious disease in a community at a particular time. Integrated with Mahoning Co THIRA Plan
Extreme Temperatures	Natural	Included	Unusually high or low temperatures for a given area can have a significant impact on human health and communities. See Section 2.14 heat 2.9 cold
Flood	Natural	Included	The covering or submerging of normally dry land with a large amount of water. See Section 2.6
Hail	Natural	Included	Pellets of frozen rain which fall from cumulonimbus clouds. See Section 2.10
Hurricanes	Natural	Not Included	A storm with violent wind, of at least 12 on the Beaufort scale, with winds equal to or exceeding 64 knots. The Atlantic East Coast, where hurricane paths are nearest, is approximately 350 miles away and the Pacific West Coast is approximately 2,200 miles away (Google Earth).
Land & Mine Subsidence	Natural	Included	The gradual or sudden sinking of the ground because of underground material movement. See Section 2.13
Lightning	Natural	Included	The occurrence of natural electrical discharge of very short duration and high voltage, between a cloud and the ground, or within a cloud. It is typically accompanied by a bright flash of light and thunder. See Section 2.10

Sea Level Rise	Natural	Not Included	An elevation in the average surface level of coastal water from which heights of such elevations can be measured. Sea level rise occurs in the ocean; the Atlantic East Coast is approximately 350 miles away and the Pacific West Coast is approximately 2,200 miles away (Google Earth).
Storm Surge	Natural	Not Included	The rising of the sea as a result of atmospheric pressure changes and wind associated with a storm. Storm surges occur in the ocean; the Atlantic East Coast is approximately 350 miles away and the Pacific West Coast is approximately 2,200 miles away (Google Earth).
Tornado	Natural	Included	A violent rotating column of air touching the ground along a narrow path over land, usually attached to the base of a thunderstorm. See Section 2.11
Tsunamis	Natural	Not Included	A series of waves in a water body caused by the displacement of a large volume of water, generally in an ocean. The Atlantic East Coast, where tsunamis would be closest, is approximately 350 miles away and the Pacific West Coast is approximately 2,200 miles away (Google Earth).
Wind	Natural	Included	The perceptible natural movement of the air, especially in the form of a current of air blowing from a particular direction. See Section 2.5
Winter Weather	Natural	Included	A variety of adverse weather conditions that can occur during the winter season including snow, blizzards, sleet, cold winds, freezing rain, or ice. See Section 2.7
Wildfire	Natural	Included	A large destructive fire that spreads quickly over woodland or brush. See Section 2.15
Volcanoes	Natural	Not Included	A mountain or hill, typically conical, having a crater or vent through which lava, rock fragments, hot vapors, and gas are being, or have been, erupted from the earth's crust. The closest monitored volcano is in Yellowstone National Park in Wyoming (USGS) and is approximately 1,550 miles away (Google Earth).

The Planning Team determined that the list that they currently have from the last plan (dam failure, drought, earthquake, flooding, land and mine subsidence, severe thunderstorm and hail, severe wind and tornado, severe winter weather, temperature extreme and epidemics) accurately portrayed the hazards the communities face on a regular basis. However, they did regroup the hazards into: Strong Winds, Flood, Winter Weather, Dam/Levee Failure, Summer Storms, Tornadoes, Earthquakes, Landslides/Subsidence, Drought/Heat Wave and Wildfire.

Further, Invasive Species was removed from the list, as non-relevant to the county. Epidemics and Terrorism have been moved to the Mahoning Co THIRA Plan, now under development.

Committee members, jurisdictions, and the public considered the hazardous materials (hazmat) hazard to the county, but the committee determined that they would not include this hazard in this plan because of the following reasons.

The county has a well-equipped, very capable level II hazmat team that has been in operation for several years and the county is undergoing a THIRA assessment to address any gaps. The committee feels that there is little to do mitigation-wise regarding hazmat incidents, making them more of a response operation than a mitigation hazard. Further, the Mahoning County Emergency Operations Plan contains an annex specifically for hazmat.

2.2 RISK

One of the components of the risk assessment is to determine the risk of a hazard, determined by the probability of occurrence and the potential severity of the event. This process helps identify which hazards pose the most significant risk to Mahoning County and its municipalities. The probability of an event happening is determined based on the number of events that have occurred within a certain timeframe. The timeframe is based on information available from different sources and varies depending on the data. Different sources provide data on the number of events throughout a period of years. This data is used to calculate probability.

Although some hazards have zero recorded occurrences, the risk still exists. Since non-natural hazards generally do not depend on weather patterns to occur, they are not informed by this type of historical data. Non-natural and technological hazards are nearly impossible to assign a measurement of probability. When a hazard in this plan does not have historical occurrences, the profile will detail how the probability was calculated.

The severity of an event is based on three main factors: 1) the historical deaths, injuries, and property/crop damage; 2) the extent of potential secondary and/or cascading impacts of the hazard and; 3) the potentially impacted geographic area as determined through risk mapping. Generally, the severity estimations will be less exact than probability estimations.

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2.3 VULNERABILITY

Vulnerability is the “measure of propensity of an object, area, individual, group, community, country, or other entity to incur the consequences of a hazard” (Coppola, 2015, p. 33). There are many aspects that contribute to the vulnerability of a people; these can include income disparity, class, race or ethnicity, gender, age, disability, health, and literacy (Thomas & Phillips, 2013, p. 2, 3). The following is a brief description of how each of the aspects can contribute to vulnerability to disasters.

- **Income Disparity:** Income disparities produce different outcomes from disasters that can cause more human suffering and require more external support.
- **Class:** Lower-income families tend to live in housing that suffers disproportionately during disasters.
- **Race or Ethnicity:** Warning messages tend to be issued in the dominant language with an expectation that people will take the recommended action immediately.
- **Gender:** Domestic and stranger violence increases after a disaster. Although women tend to be the ones most likely to secure relief aid for the family, they are underrepresented and underused in recovery efforts.
- **Age:** Elderly populations are frequently reluctant to seek assistance before and secure aid after a disaster out of concern that they may lose their independence.
- **Disability:** People with disabilities experience challenges in acquiring transportation to evacuate areas as well as to access appropriate shelters and post-disaster housing.
- **Health:** Disasters can disrupt access to care. Individuals on health services are faced with life threatening circumstances if these services cannot be accessed. Disasters tend to exasperate chronic and mental health conditions.
- **Literacy:** Many emergency preparedness materials are available in written form. Few options exist for people with low reading levels, other languages, or cognitive abilities.

2.3.1 Complicating Variables

Direct consequences of disasters can include fatalities, injuries, and damage to humans, animals or property. However, disasters do not end there; there are several indirect effects, both tangible and intangible, associated with disasters. Some examples of these include loss of livelihood and income, loss of community and population, mental and psychosocial impacts, costs of rebuilding, repair or replacement, loss of inventory, wages and tax revenue, etc. (Coppola, 2015). All of these also have a cost associated with them but it is much more difficult to assign a specific dollar value and quantify accurately. For this analysis, the primary focus of loss estimates will be direct consequences of the given hazard.

A number of situations could occur that would result in a disruption to a number of critical systems throughout Mahoning County. Some hazards are complicated by a series of loosely related variables; these are often considered *cascading hazards*. For example, high winds may cause sporadic damage throughout the county, but often do not become a significant countywide concern until a large number of residents are without power. In addition to weather-related power outages, cascading hazards in Mahoning County could include (but not be limited to) the following:

- Damage to infrastructure (i.e. roads, bridges, tunnels, pipes, utility poles etc.) and to residences following flooding.
- Flooding of downstream areas in the event of a dam failure
- Drinking water supply shortages and contamination following severe and prolonged drought conditions or floods
- Power outages, ruptured gas lines, etc. following earthquakes or severe weather.
- Public health concerns following flooding conditions.
- Road closures and damage to residences resulting from land subsidence.

The complicated variables related to each hazard are described within the profiles. The information presented is based on worst-case scenario events; a single event may not always reach all impacts described. However, it is important to understand that the impacts of hazards go beyond what is seen immediately after the event. The effects of one event can last months or even years, especially where public health, social, economic, environmental and infrastructure impacts are concerned.

2.3.2 Hazards and Climate Change

Many natural hazards are related to climate such as droughts, severe weather, and floods. There is an important distinction between weather and climate. Weather refers to the atmospheric conditions of a geographical region over a short period of time, such as days or weeks. Climate, in contrast, refers to the atmospheric conditions of a geographical area over long periods of time, such as years, or even decades (Keller, Devecchio, 2015, pp. 406- 407).

According to the U.S. Global Change Research Program (2016), there are several weather and climate changes that have already been observed in the United States.

Since recordkeeping began in 1895, the average U.S. temperature has increased by 1.3°F to 1.9°F with most of the increase happening since 1970. In addition, the first decade of the 2000s has been the warmest on record.

The average precipitation across the U.S. has increased since 1900 with some areas experiencing higher than the national average and some lower. Heavy downpours are increasing, especially over the last 30-50 years.

Drought events have increased in the west. Changes in precipitation and runoff, combined with changes in consumption and withdrawal, have reduced surface and groundwater supplies in many areas.

Some types of severe weather events have experienced changes; heat waves are more frequent and intense, and cold waves have become less frequent and intense overall.

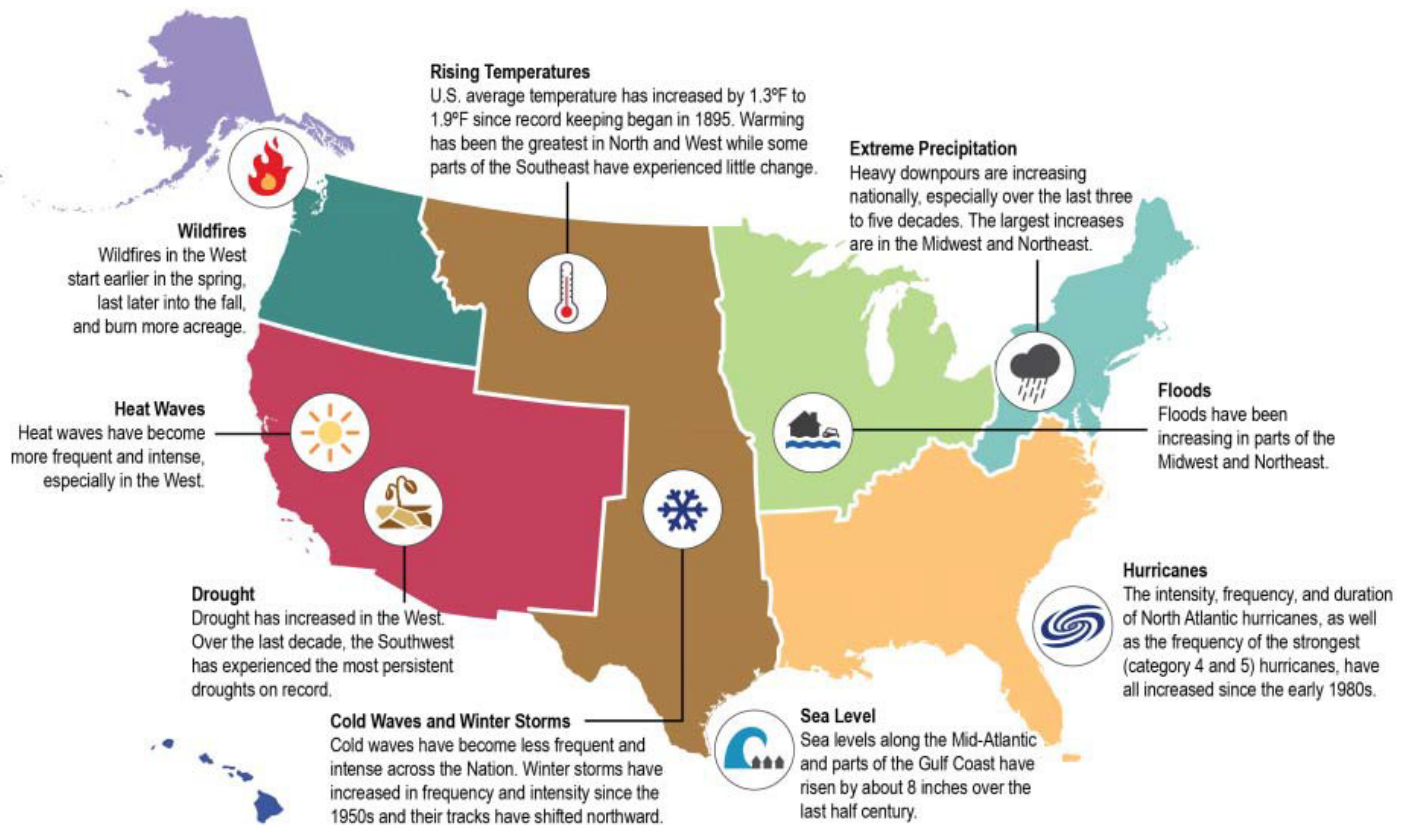
The intensity, frequency, and duration of North Atlantic hurricanes have increased since the early 1980s.

Climate change can have a significant impact on human health and the environment. The changes mentioned above can affect the environment by leading to changes in land- use, ecosystems, infrastructure conditions, geography and agricultural production. Extreme heat, poor air quality, reduced food and water supply and quality, changes in infectious agents and population displacement can lead to public health concerns such as heat-related illnesses, cardiopulmonary illnesses, food, water and vector-borne diseases and have consequences on mental health and stress (USGCRP, 2016).

The National Climate Assessment (NCA) defined climate trends for national U.S. regions in 2014. The major trends are seen to be:

- Wildfires and heat waves on the west coast,
- Rising temperatures and increased severity and frequency of winter storms in the middle of the country,
- More rain and flooding in the Midwest and northeastern parts of the country, and
- An increase in sea levels in the mid-Atlantic with an increase of hurricane activity in the southeastern states.

In Ohio, the trend will be an increase in flooding which will lead to more events of hazards such as land subsidence, and possible dam failures or epidemics.



The US Clime Resilience Tool kit data identifies specific climate related anticipated changes regarding the extreme heat, drought, wildfire, and flooding in Mahoning County. This data is reflected in each hazard risk assessment section.

Data from the National Risk Index is included for each impacted natural hazard in Mahoning County in 2.4 Hazard Profile section.

2.4 HAZARD PROFILES

Mahoning County has experienced many natural disasters in the past 100 years. These disasters have ranged from tornadoes and blizzards, to flooding and droughts. The purpose of this document is to identify the number and frequency of disasters in Mahoning County to better prepare and deal with them when they do occur. The following sections describe the process of determining upon which hazards to focus, general background information on each hazard as well as hazard events that have occurred in Mahoning County.

2.4.1 Initial Hazard Assessment

To properly evaluate the natural hazards to which Mahoning County may be susceptible, a four-step process was utilized. This four-step process was completed to “narrow-down” the hazards for which Mahoning County should prepare, and potentially mitigate, in the future. The five (5) steps are described in the following paragraphs.

Step 1 - FEMA’s new **National Risk Index (NRI)** for Mahoning County was generated on 12/3/23. This new tool provides a comprehensive review of overall hazard risk, expected annual loss resulting from a disaster, a Social Vulnerability score, and a Community Resilience score. Hazards covered in this report include Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado Wildfire, and Winter Weather. Additional covered hazards, but not relevant to Highland County, include Avalanche, Coastal Flooding, Tsunami, and Active Volcano.

Step 2 - The **National Centers for Environmental Information (NCEI)** data was reviewed for historic hazard event information all the way down to the County level. The NCEI website presented each type of hazard and the historical information associated with it for each county, offering several hazard search parameters. These parameters included: droughts, dust storm, flooding, flash flooding, fog, hail, lightning, tornadoes, wild/forest fires, heavy rain, winter storms, blizzards, snow and ice storms, temperature extremes (hot and cold), thunderstorms and strong and high winds.

Because NCEI information did not address earthquakes or dams and dam safety, other sources were contacted for this data. The information pertaining to earthquake susceptibility was attained from **United States Geographical Survey (USGS)** data and the Ohio Earthquake Program Manager at OEMA. Dam and dam safety information was gathered from the **ODNR Division of Dam Safety**.

Step 3- Analyze the impact of climate change projections on local natural hazard impacts. Projected model information for Extreme Heat, Drought Wildfire and Flooding is provided by the **US Climate Resilience Toolkit**, which has been developed with input and data from the US Census Bureau, CEQ, Esri, FEMA, MMLC, NOAA and the UCSD. (<https://cmra-reports.s3.amazonaws.com/county/39071.html>).

Step 4 – Input from the Core Group was sought to address any known gaps not recorded in the data. Typically, this involves more recent events or damage estimates that have not yet found their way to the national database.

2.4.2 Risk Assessment Ranking

The research compiled during the initial hazard assessment was provided to the Planning Committee for their review and assessment. The Core Group evaluated all the hazards being considered and ranked them based on the number of historic events and cumulative damage that has occurred.

The following list shows the Core Group's ranking of hazards with number one being the hazard of the most concern for the 2024-2028 Hazard Mitigation Plan:

- Strong Wind (strong/high winds)
- Flooding
- Winter Weather (Blizzards, heavy snow, cold/chill, extreme cold, winter storm, ice storm)
- Dam/Levee Failure
- Cold Wave (Combined with Winter Weather)
- Summer Storms (Thunderstorms, wind, hail, lightning)
- Tornadoes
- Epidemic
- Earthquakes
- Landslide/Land and Mine Subsidence
- Drought/Heatwave
- Wildfires

Natural hazards of coastal flooding, avalanche, tsunami, and volcanos are not applicable to the Highland County area.

2.4.3 Social Vulnerability and Community Resilience

Based on the National Risk Index for Mahoning County, the county scored as follows on Social Vulnerability and Community Resilience:

Assessment	Mahoning Co/100	Ohio/100	US/100
Social Vulnerability (Relatively High)	63.8	34.28	38.35
Community Resilience (Relatively High)	78.4	56.84	54.59

Social Vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.

Community Resilience is the ability of a community to prepare for anticipated natural hazards, adapting to changing conditions, and withstand and recover rapidly from disruptions.

2.5 Strong Wind

2.5.1 Extent

Strong Winds/ (High Winds)

Wind events in Mahoning County have a high likelihood of occurring on a yearly basis. Strong winds are defined as damaging winds, often originating from thunderstorms, that are classified as exceeding 58mph.

Strong Wind in Mahoning County has caused cumulative property and crop damage with estimated total losses of property \$6.936M and \$110,000 in agricultural losses, over 36 events, based on the NCEI database. High Winds caused \$195,000 in property damage over 6 events.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Strong Wind	Relatively Moderate/73.9	1986-2021	2	Relatively Moderate/70.3	\$294,261/\$2,512	,03

2.5.2 Historic Occurrence

Documented NCEI high wind events causing more than \$50,000 in damage include the following events. Specific locations are notated if they were included in the NCEI database.

- 3/25/1996 resulted in \$70,000 worth of property damage (50kts).
- 10/30/1996 resulted in \$75,000 worth of property damage and \$100,000 crop damage (50kts).
- 12/11/2000 resulted in \$200,000 worth of property damage.
- 3/9/2022 resulted in \$1.25M worth of property damage.
- 11/12/2003 resulted in \$150,000 worth of property damage (50kts EG).
- 3/5/2004 resulted in \$75,000 worth of property damage (50kts EG).
- 9/14/2008 resulted in \$3M worth of property damage (52kts EG)
- 2/12/2009 resulted in \$750,000 worth of property damage (52kts EG).
- 12/09/2009 resulted in \$400,000 worth of property damage (52kts EG).
- 2/24/2012 resulted in \$150,000 worth of property damage (50kts EG).
- 10/30/2012 resulted in \$75,000 worth of property damage (50kts EG).
- 11/24/2014 resulted in \$200,000 worth of property damage (52kts EG).
- 2/24/2019 resulted in \$175,000 worth of property damage (50kts EG).

Strong Wind events, also resulting in \$50,000 or more of damage, are recorded as follows:

- 3/8/2003 resulted in \$50,000 worth of property damage (43kts EG).
- 9/9/2004 resulted in \$75,000 worth of property damage (40kts EG).

2.5.3 Frequency/Probability of Future Occurrence

The probability of future occurrences is moderate, and the likelihood of severe damage based on past events is moderate. One reason that the County would not expect to suffer severe damage is because most of the County is sparsely populated. The County is more affected by straight-line winds, which are not categorized as a tornadic event but can do just as much damage.

Based on 42 strong and high wind events over the past 50 years, a wind event is likely almost annually based on NCEI data. NRI data suggests 2 events per year.

2.5.4 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Strong Wind	2	\$669,821	\$373,049	\$2,512	\$294,261	0.03

*Based on NCEI data

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Agriculture Value
Strong Wind	\$1/19.53k	1/9.01m	\$1/31.33k

MAHONING COUNTY NRI STRONG WINDS EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099812200	\$ 1,477,856,673	6570	\$ 116,928	\$ 12,307	\$ 9,152	\$ 4	\$ 21,462
39099811002	\$ 1,488,462,348	7506	\$ 2,025,183	\$ 11,139	\$ 9,396	\$ 60	\$ 20,596
39099812001	\$ 1,598,232,043	5622	\$ 4,438	\$ 12,669	\$ 7,614	\$ 0	\$ 20,284
39099812101	\$ 1,414,799,349	6143	\$ 393,762	\$ 11,542	\$ 8,364	\$ 13	\$ 19,920
39099814000	\$ 2,006,283,704	2908	\$ 23,308	\$ 14,989	\$ 3,634	\$ 1	\$ 18,623
39099812500	\$ 1,504,735,737	4952	\$ 223,202	\$ 11,239	\$ 6,187	\$ 7	\$ 17,433
39099813000	\$ 1,246,856,314	4117	\$ 8,416,109	\$ 10,383	\$ 5,735	\$ 278	\$ 16,396
39099812900	\$ 1,198,191,752	4101	\$ 11,961,404	\$ 9,978	\$ 5,712	\$ 395	\$ 16,085
39099812102	\$ 1,190,460,182	4231	\$ 3,021,010	\$ 9,885	\$ 5,872	\$ 99	\$ 15,856
39099813601	\$ 1,090,328,952	5839	\$ 4,117,638	\$ 8,160	\$ 7,309	\$ 122	\$ 15,591
39099813502	\$ 1,090,574,664	4058	\$ 7,338,374	\$ 8,756	\$ 5,423	\$ 236	\$ 14,415
39099813400	\$ 1,061,243,740	3420	\$ 9,542,842	\$ 8,837	\$ 4,764	\$ 315	\$ 13,916

Mahoning County Hazard Mitigation Plan 2024-2028

39099811902	\$ 1,303,296,697	3292	\$ 37,840	\$ 9,754	\$ 4,121	\$ 1	\$ 13,876
39099812302	\$ 761,039,925	6482	\$ -	\$ 5,685	\$ 8,099	\$ -	\$ 13,783
39099811500	\$ 747,828,672	5824	\$ 6,541	\$ 5,943	\$ 7,681	\$ 0	\$ 13,624
39099813300	\$ 1,049,911,713	3101	\$ 10,878,953	\$ 8,743	\$ 4,320	\$ 359	\$ 13,422
39099811901	\$ 1,000,875,300	4289	\$ -	\$ 7,491	\$ 5,369	\$ -	\$ 12,860
39099813501	\$ 1,053,906,557	3537	\$ 1,593,992	\$ 8,117	\$ 4,592	\$ 50	\$ 12,759
39099813200	\$ 750,024,956	4171	\$ 137,217	\$ 6,246	\$ 5,810	\$ 5	\$ 12,060
39099812800	\$ 965,124,425	3560	\$ 3,807,092	\$ 7,402	\$ 4,534	\$ 117	\$ 12,053
39099812604	\$ 792,565,362	4884	\$ 44,319	\$ 5,920	\$ 6,102	\$ 1	\$ 12,024
39099810700	\$ 667,920,009	5233	\$ 3,001	\$ 5,022	\$ 6,582	\$ 0	\$ 11,603
39099813700	\$ 957,127,710	3506	\$ 23,859	\$ 7,174	\$ 4,394	\$ 1	\$ 11,568
39099812601	\$ 684,583,548	4745	\$ 468	\$ 5,113	\$ 5,929	\$ 0	\$ 11,042
39099812002	\$ 668,173,203	3882	\$ 485,554	\$ 5,564	\$ 5,407	\$ 16	\$ 10,988
39099812602	\$ 569,453,727	5212	\$ -	\$ 4,253	\$ 6,512	\$ -	\$ 10,765
39099812700	\$ 1,030,072,005	2124	\$ 5,037,105	\$ 7,743	\$ 2,690	\$ 152	\$ 10,585
39099812400	\$ 950,774,743	2742	\$ 12,069	\$ 7,102	\$ 3,426	\$ 0	\$ 10,528
39099811600	\$ 606,285,014	3479	\$ -	\$ 5,046	\$ 4,842	\$ -	\$ 9,888
39099811001	\$ 574,122,895	4002	\$ 375,161	\$ 4,301	\$ 5,016	\$ 11	\$ 9,328
39099810100	\$ 524,443,884	4213	\$ 10,278	\$ 3,944	\$ 5,299	\$ 0	\$ 9,243
39099814100	\$ 766,588,892	2303	\$ 69,976	\$ 5,726	\$ 2,877	\$ 2	\$ 8,605
39099811301	\$ 433,696,834	4199	\$ -	\$ 3,263	\$ 5,282	\$ -	\$ 8,545
39099812301	\$ 466,039,372	3888	\$ -	\$ 3,481	\$ 4,858	\$ -	\$ 8,339
39099813602	\$ 670,841,406	2468	\$ 5,452,866	\$ 5,020	\$ 3,090	\$ 162	\$ 8,272
39099812605	\$ 532,541,726	3134	\$ 556,094	\$ 3,978	\$ 3,916	\$ 16	\$ 7,910
39099811302	\$ 668,444,129	2139	\$ -	\$ 5,026	\$ 2,690	\$ -	\$ 7,716
39099802701	\$ 471,455,533	3232	\$ -	\$ 3,521	\$ 4,038	\$ -	\$ 7,560
39099811200	\$ 567,925,899	2393	\$ 702	\$ 4,250	\$ 2,996	\$ 0	\$ 7,246
39099810600	\$ 494,813,030	2784	\$ 27,532	\$ 3,721	\$ 3,502	\$ 1	\$ 7,224
39099811400	\$ 407,781,283	3218	\$ 702	\$ 3,046	\$ 4,021	\$ 0	\$ 7,068
39099811700	\$ 395,152,616	2622	\$ -	\$ 3,283	\$ 3,648	\$ -	\$ 6,931
39099802800	\$ 450,052,033	2665	\$ \$2,570	\$ 3,362	\$ 3,330	\$ 0	\$ 6,691
39099810200	\$ 556,338,737	1974	\$ 47,300	\$ 4,184	\$ 2,483	\$ 1	\$ 6,668
39099801000	\$ 631,089,035	1467	\$ -	\$ 4,746	\$ 1,845	\$ -	\$ 6,591
39099810900	\$ 525,611,318	2021	\$ 2,545,599	\$ 3,953	\$ 2,542	\$ 76	\$ 6,571
39099813800	\$ 338,625,705	3024	\$ 165,108	\$ 2,546	\$ 3,804	\$ 5	\$ 6,355
39099802702	\$ 370,099,686	2818	\$ 468	\$ 2,764	\$ 3,521	\$ 0	\$ 6,285
39099802400	\$ 386,591,129	2531	\$ -	\$ 2,888	\$ 3,162	\$ -	\$ 6,050
39099801600	\$ 410,614,070	2336	\$ -	\$ 3,074	\$ 2,928	\$ -	\$ 6,001
39099804000	\$ 448,672,200	2080	\$ -	\$ 3,358	\$ 2,600	\$ -	\$ 5,958
39099813900	\$ 532,730,116	1571	\$ -	\$ 3,979	\$ 1,963	\$ -	\$ 5,942
39099801100	\$ 293,764,858	2335	\$ -	\$ 2,209	\$ 2,937	\$ -	\$ 5,146
39099802900	\$ 298,621,097	2233	\$ -	\$ 2,231	\$ 2,790	\$ -	\$ 5,020

39099810800	\$ 323,601,600	2046	\$ 18,575	\$ 2,433	\$ 2,574	\$ 1	\$ 5,007
39099804200	\$ 335,679,127	1934	\$ -	\$ 2,507	\$ 2,416	\$ -	\$ 4,924
39099801300	\$ 263,454,268	2141	\$ 14,645	\$ 1,981	\$ 2,693	\$ 0	\$ 4,675
39099811800	\$ 285,215,746	1629	\$ -	\$ 2,302	\$ 2,209	\$ -	\$ 4,510
39099801400	\$ 244,903,897	2104	\$ -	\$ 1,842	\$ 2,647	\$ -	\$ 4,488
39099814200	\$ 288,463,682	1722	\$ 123,987	\$ 2,169	\$ 2,166	\$ 4	\$ 4,339
39099801500	\$ 259,258,487	1818	\$ -	\$ 1,942	\$ 2,278	\$ -	\$ 4,220
39099800501	\$ 200,649,900	2116	\$ 17,050	\$ 1,509	\$ 2,662	\$ 1	\$ 4,171
39099801700	\$ 369,538,032	928	\$ -	\$ 2,763	\$ 1,161	\$ -	\$ 3,924
39099810300	\$ 223,174,786	1665	\$ -	\$ 1,678	\$ 2,094	\$ -	\$ 3,773
39099803000	\$ 187,937,523	1875	\$ -	\$ 1,404	\$ 2,343	\$ -	\$ 3,746
39099804100	\$ 280,767,732	1300	\$ -	\$ 2,097	\$ 1,624	\$ -	\$ 3,721
39099802600	\$ 205,016,927	1604	\$ -	\$ 1,531	\$ 2,004	\$ -	\$ 3,535
39099800600	\$ 265,980,246	1194	\$ 6,073	\$ 2,000	\$ 1,502	\$ 0	\$ 3,502
39099800502	\$ 267,614,386	959	\$ 4,457	\$ 2,012	\$ 1,206	\$ 0	\$ 3,219
39099802500	\$ 204,306,658	1312	\$ 468	\$ 1,526	\$ 1,639	\$ 0	\$ 3,165
39099801200	\$ 167,738,201	1477	\$ -	\$ 1,261	\$ 1,858	\$ -	\$ 3,119
39099811100	\$ 247,323,965	996	\$ 7,295	\$ 1,860	\$ 1,253	\$ 0	\$ 3,113
39099804300	\$ 234,377,583	900	\$ 572	\$ 1,756	\$ 1,125	\$ 0	\$ 2,881
39099802100	\$ 186,179,016	892	\$ -	\$ 1,391	\$ 1,114	\$ -	\$ 2,505
39099802300	\$ 137,739,609	787	\$ -	\$ 1,029	\$ 983	\$ -	\$ 2,012
Grand Total	\$ 48,322,567,878	228579	\$ 78,699,686	\$ 373,049	\$ 294,261	\$ 2,512	\$669,821

The census tracts (CTs) facing the highest risk for wind caused building damage are 8140 (Youngstown) and 8127 (N. Jackson). The census tracts with the greatest risk for agriculture loss caused by wind include the rural CTs of 8107, 8129, 8133, 8134, and 8136. Beloit (8130) also has a high agricultural risk level.

2.6 Flooding

2.6.1 Extent

Floods are a naturally recurring event for a river or stream and are caused by weather phenomena and events that deliver more precipitation to a drainage basin that can be readily absorbed or stored within the basin. Flooding is a localized hazard that is a result of heavy or continuous rainfall exceeding the absorptive capacity of soil and the flow capacity of rivers and streams. Floods can be generally considered in two categories: flash floods, the product of heavy localized precipitation in a short time over a given location; and riverine floods, caused by precipitation over a longer time period and over a given river basin.

Riverine flooding refers to periodic flooding of lands adjacent to non-tidal rivers and streams. It is a natural and inevitable occurrence. When stream flow exceeds the capacity of the normal watercourse, some of the above-normal stream flow spills over onto adjacent lands within the floodplain. Riverine flooding is a function of precipitation levels and water runoff volumes within

the watershed of the stream or river. The recurrence interval of a flood is defined as the average time interval, in years, expected to take place between the occurrence of a flood of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval.

Climate Change Impact:

Based on the US Climate Resilience Toolkit, Mahoning County is expected to see an increase in the number of hot weather days and fewer days of rain, but with greater annual precipitation.

The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Avg. annual precipitation	37"	38"	39"
Days with precipitation	211	207	207
Max period of consecutive wet days	13	13	13
Annual days with total precipitation >1 inch	2	3	3
Annual days that exceed 99 % precipitation	4	5	6

2.6.2 Special zone flood (100-year Floodplain)

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

Mahoning County has special zone floodplains identified within the County. The best way to combat a disaster happening within these special zone flood hazard areas is through public awareness. The following list gives the incorporated jurisdictions that are in compliance with state floodplain management standards and participate in the NFIP, and the date in which they entered the program.

JURISDICTIONS PARTICIPATING IN NFIP*				
Jurisdiction	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Rea-Emer Date
Mahoning County	12/27/1974	02/15/1979	11/18/2009	02/15/1979
Campbell	03/01/1974	11/18/2009	11/18/2009	09/03/1979
Canfield	04/17/1974	11/01/1978	11/18/2009	11/01/1978
Struthers	03/15/1974	11/19/1980	11/18/2009	11/19/1980
Youngstown	04/05/1974	07/18/1977	11/18/2009	07/18/1977
Craig Beach	04/18/1975	01/17/1978	11/18/2009	04/17/1978
Lowellville	04/15/1974	09/03/1979	11/18/2009	09/03/1979
New Middleton	N/A	11/18/2009	11/18/2009	03/18/2010
Poland	04/09/1976	11/18/2009	11/18/2009	11/18/2009
Sebring	08/08/1975	08/11/1978	11/18/2009	08/11/1978

Source: FEMA NFIP * The Village of Beloit does not currently participate in the NFIP

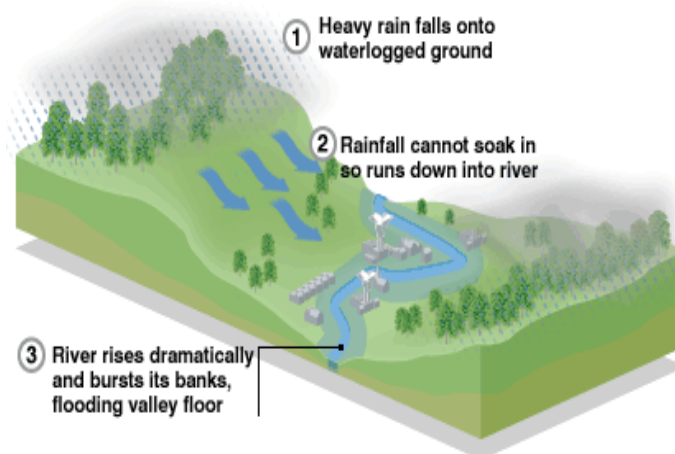
2.6.3 Flash or Localized Flooding

Diagram illustrating how flash floods occur.

Photo courtesy of British Broadcasting Corporation (BBC) News.

Flash floods occur within a few minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam. Flash floods can destroy buildings and bridges, uproot trees, and scour out new drainage channels. Heavy rains that produce flash floods can also trigger mudslides. Most flash flooding is caused by slow-moving thunderstorms, repeated thunderstorms in a local area, or by heavy rains from hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urban areas where much of the ground is covered by impervious surfaces. Roads and buildings generate greater amounts of runoff than typical forested land. Fixed drainage channels in urban areas may be unable to contain the runoff that is generated by relatively small, but intense, rainfall events. Flash flooding can be intensified by:

HOW FLASH FLOODS OCCUR



- Changing land use such as the development in catchments (increasing the rate and volume of run-off; sediment movement that has changed river cross-sections and affected flood levels).
- Lacking proper maintenance of flood defense systems, watercourses, culverts (including the flood relief areas around them) and road gullies, particularly where this leads to channel blockage.
- Increasing the rate of flow and decreasing the time taken for water to travel within a catchment by means of canalization, modification and diversion of rivers and watercourses.
- Building of structures (such embankments) which restrict flows over historical flood plains and thereby create additional flood risks both upstream and downstream.

Current professionals involved with flood management and administration in Mahoning County, based on the most recent Floodplain Management Local Contact List, ODNR, Division of Water Resources, include the following:

Jurisdiction/Location	Title
Mahoning County	Co. Planning Director
Beloit	Mayor
Cambell	City Administrator
Canfield	City Manager
Craig Beach	Mayor
Lowellville	Village Administrator
New Middletown	Consulting Engineer
Poland	Zoning Administrator
Sebring	Village Manager
Struthers	Safety Services Coordinator
Youngstown	Chief Building Official

2.6.4 Substantial Damage and Improvement Provisions

Communities that are participating in the National Flood Insurance Program (NFIP) are required to adopt and enforce regulations and codes that apply to new developments in Special Flood Hazard Areas (SFHAs). These local floodplain management regulations must contain, at a minimum, NFIP requirements and standards that apply not only to new structures, but also to existing structures which are Substantially Improved (SI), or Substantially Damaged (SD) from any cause, whether natural or human-induced hazards. According to 44 CFR 59.1, Substantial improvement means any reconstruction, rehabilitation, addition or other improvement to a structure, the total cost of which equals or exceeds 50 percent of the market value of the structure before the start of construction of the improvement. Likewise, substantial damage means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent of the market value of the structure before the damage occurred. SI/SD requirements are also triggered when any combination of costs to repair and improvements to a structure in an SFHA equals or exceeds 50 percent of the structure's market value (excluding land value).

Enforcing the SI/SD requirements is a very important part of a community's floodplain management responsibilities. The purpose of the SI/SD requirements is to protect the property owner's investment and safety, and, over time, to reduce the total number of buildings that are exposed to flood damage, thus reducing the burden on taxpayers through the payment of disaster assistance. SD/SI requirements are enforced by the local floodplain administrator and monitored by the Ohio Department of Natural Resources (ODNR) Floodplain Management Program (during Community Assistance Visits. If a local floodplain administrator is overwhelmed by the number of SD/SI inspections after a large event, ODNR has developed a network of building code officials that are trained in conducting SD/SI field determinations. Help with SD/SI inspections can be requested through the county emergency management agency director. For More information regarding Substantial Improvement and Substantial Damage, can be found at FEMA's Substantial Improvement/ Substantial Damage Desk Reference, P-758 or contact the ODNR Floodplain Management Program.

2.6.5 Repetitive Loss

In most counties there are areas that periodically suffer damage from floods. They are known as “Repetitive Loss” properties. Repetitive loss properties are defined as properties with structures that have had two or more insurance claims within a 10-year period.

The following data was provided by the Ohio Emergency Management Agency (OEMA).

Mahoning County Rep Loss and Severe Rep Loss Structures					
JURISDICTION Occupancy	Total RL/SRL Structures	RL Structures	SRL Structures	Total Losses	Total Paid
YOUNGSTOWN, CITY OF	4	3	1	14	\$545,612
Multi-Family Residential	1	1	0	2	\$3,513
Other Non-Residential	1	0	1	5	\$526,248
Single Family Residential	2	2	0	7	\$15,851
MAHONING COUNTY (UNINCORPORATED)	17	16	1	45	\$500,708
Business/Non-Residential	1	1	0	2	\$90,106
Multi-Family Residential	1	1	0	4	\$22,015
Other Non-Residential	3	3	0	7	\$98,454
Other Residential	7	6	1	21	\$241,393
Single Family Residential	5	5	0	11	\$48,740
CANFIELD, CITY OF	1	1	0	3	\$49,991
Single Family Residential	1	1	0	3	\$49,991
Countywide Total	22	20	2	62	\$1,096,311

2.6.6 Frequency/Probability of Future Occurrence/Flash Floods

Past floods are indications of what can happen in the future, but mitigation plans are based on the risk of future flooding. Flood studies interpret historical records to determine the statistical potential that storms and floods of certain magnitude will recur. Such events are measured by their recurrence interval.

According to the NCEI, Mahoning County has experienced 18 flash flood events over the past 50-year period with damage estimates totaling approximately \$26.075M. Specific locations are notated if they were included in the NCEI database.

14 of the 18-flash flood events caused property damage, but no injuries or deaths. Notable flash flood events include:

- 6/13/1996 resulting in \$50,000 worth of property damage (Western portion of Co).
- 6/24/1996 resulting in \$250,000 worth of property damage.
- 7/21/2003 resulting in \$750,000 worth of property damage.
- 7/22/2003 resulting in \$2M worth of property damage.
- 7/27/2003, resulting in \$8M worth of property damage.
- 8/9/2003 resulting in \$450,000 worth of property damage.

- 5/22/2004 resulting in \$1.7M worth of property damage.
- 9/8/2004 resulting in \$1.8M worth of property damage.
- 8/20/2007 resulting in \$75,000 worth of property damage (Sebring).
- 6/23/2015 resulting in \$2.2M worth of property damage (Boardman)
- 8/10/2018 resulting in \$1.1M worth of property damage (Coltsville Center).
- 5/28/2019 resulting in \$3M worth of property damage (Poland).
- 7/16/2021 resulting in \$200,000 worth of property damage (SE Airways ARP).
- 9/4/2022 resulting in \$4.5M worth of property damage (SE Airways ARP).

According to the NCEI, Highland County has experienced 19 flood events over the past 50-year period with damage estimates totaling approximately \$12.580M.

9 of the 19 flood events caused property damage, but no injuries or deaths. Notable flood events include:

- 6/13/2003 resulting in \$100,000 worth of property damage.
- 7/21/2003 resulting in \$10M worth of property damage.
- 9/8/2004 resulting in \$250,000 worth of property damage.
- 9/9/2004 resulting in \$500,000 worth of property damage.
- 9/17/2004 resulting in \$500,000 worth of property damage.
- 1/1/2005 resulting in \$800,000 worth of property damage.
- 8/5/2005 resulting in \$50,000 worth of property damage.
- 2/28/2011 resulting in \$200,000 worth of property damage (Scienceville)
- 8/10/2018 resulting in \$150,000 worth of property damage (Shively Corners).

MAHONING COUNTY NRI RIVERINE FLOODING EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099801000	\$ 73,510,702	0	\$ -	\$ 271,709	\$ 49	\$ -	\$ 271,757
39099813900	\$ 63,864,689	10	\$ -	\$ 236,055	\$ 1,206	\$ -	\$ 237,261
39099814000	\$ 51,671,502	2	\$ 2,852	\$ 190,987	\$ 249	\$ 33	\$ 191,269
39099804300	\$ 42,185,395	8	\$ 173	\$ 155,925	\$ 1,022	\$ 2	\$ 156,949
39099813700	\$ 41,546,857	1	\$ 7,431	\$ 153,565	\$ 62	\$ 87	\$ 153,714
39099811100	\$ 15,419,301	2	\$ 131	\$ 56,992	\$ 187	\$ 2	\$ 57,181
39099812400	\$ 9,223,037	69	\$ -	\$ 34,090	\$ 8,540	\$ -	\$ 42,630
39099804000	\$ 9,353,350	2	\$ -	\$ 34,572	\$ 191	\$ -	\$ 34,762
39099811700	\$ 7,738,334	46	\$ -	\$ 28,602	\$ 5,731	\$ -	\$ 34,333
39099813200	\$ 8,445,009	17	\$ 1,601	\$ 31,214	\$ 2,145	\$ 19	\$ 33,378
39099813501	\$ 8,091,984	9	\$ 117,155	\$ 29,909	\$ 1,148	\$ 1,373	\$ 32,430
39099812002	\$ 6,026,732	27	\$ 76,239	\$ 22,276	\$ 3,298	\$ 894	\$ 26,468
39099813000	\$ 5,647,236	17	\$ 89,650	\$ 20,873	\$ 2,110	\$ 1,051	\$ 24,034
39099812101	\$ 5,292,648	34	\$ 55	\$ 19,563	\$ 4,169	\$ 1	\$ 23,732
39099812800	\$ 5,324,614	16	\$ 50,810	\$ 19,681	\$ 1,957	\$ 596	\$ 22,233
39099812700	\$ 4,804,441	16	\$ 67,681	\$ 17,758	\$ 1,984	\$ 793	\$ 20,535
39099812900	\$ 4,599,770	16	\$ 75,438	\$ 17,002	\$ 1,927	\$ 884	\$ 19,813
39099812302	\$ 3,832,497	45	\$ -	\$ 14,166	\$ 5,609	\$ -	\$ 19,774
39099811902	\$ 4,996,496	9	\$ -	\$ 18,468	\$ 1,142	\$ -	\$ 19,610
39099812200	\$ 4,371,661	23	\$ -	\$ 16,158	\$ 2,879	\$ -	\$ 19,037
39099813400	\$ 1,994,942	9	\$ 238,372	\$ 7,374	\$ 1,071	\$ 2,794	\$ 11,238
39099802800	\$ 2,052,393	9	\$ 450	\$ 7,586	\$ 1,091	\$ 5	\$ 8,683
39099811002	\$ 1,956,273	9	\$ 11,535	\$ 7,231	\$ 1,137	\$ 135	\$ 8,503
39099813601	\$ 1,738,826	8	\$ 11,301	\$ 6,427	\$ 984	\$ 132	\$ 7,544
39099812601	\$ 1,841,730	6	\$ -	\$ 6,807	\$ 724	\$ -	\$ 7,532
39099812301	\$ 1,912,379	1	\$ -	\$ 7,068	\$ 109	\$ -	\$ 7,178
39099812001	\$ 1,700,899	7	\$ -	\$ 6,287	\$ 861	\$ -	\$ 7,147
39099810600	\$ 1,654,775	0	\$ 880	\$ 6,116	\$ -	\$ 10	\$ 6,127
39099811500	\$ 1,316,359	4	\$ -	\$ 4,865	\$ 483	\$ -	\$ 5,349
39099813602	\$ 1,030,776	8	\$ 47,036	\$ 3,810	\$ 937	\$ 551	\$ 5,299
39099812102	\$ 1,262,087	2	\$ 32,206	\$ 4,665	\$ 188	\$ 378	\$ 5,231
39099813502	\$ 1,066,527	1	\$ 70,995	\$ 3,942	\$ 161	\$ 832	\$ 4,935
39099810800	\$ 1,218,896	1	\$ 4,339	\$ 4,505	\$ 75	\$ 51	\$ 4,631
39099800600	\$ 868,678	0	\$ -	\$ 3,211	\$ 56	\$ -	\$ 3,267
39099800502	\$ 820,407	0	\$ 281	\$ 3,032	\$ 1	\$ 3	\$ 3,037
39099810900	\$ 651,151	1	\$ 11,156	\$ 2,407	\$ 155	\$ 131	\$ 2,692
39099811600	\$ 567,328	4	\$ -	\$ 2,097	\$ 464	\$ -	\$ 2,561

39099813300	\$ 485,095	1	\$ 43,851	\$ 1,793	\$ 138	\$ 514	\$ 2,445
39099811200	\$ 550,885	2	\$ -	\$ 2,036	\$ 187	\$ -	\$ 2,223
39099802701	\$ 421,597	2	\$ -	\$ 1,558	\$ 248	\$ -	\$ 1,806
39099810200	\$ 450,237	0	\$ 1,600	\$ 1,664	\$ -	\$ 19	\$ 1,683
39099814200	\$ 322,357	2	\$ 87	\$ 1,191	\$ 304	\$ 1	\$ 1,497
39099812602	\$ 183,440	2	\$ -	\$ 678	\$ 248	\$ -	\$ 926
39099802702	\$ 196,682	1	\$ -	\$ 727	\$ 155	\$ -	\$ 882
39099813800	\$ 125,581	1	\$ 702	\$ 464	\$ 92	\$ 8	\$ 565
39099812500	\$ 85,265	1	\$ 701	\$ 315	\$ 82	\$ 8	\$ 405
39099802400	\$ 71,034	0	\$ -	\$ 263	\$ 62	\$ -	\$ 324
39099810700	\$ 68,619	0	\$ 229	\$ 254	\$ 60	\$ 3	\$ 316
39099811001	\$ 23,201	0	\$ -	\$ 86	\$ 19	\$ -	\$ 104
39099802600	\$ 7,554	0	\$ -	\$ 28	\$ 4	\$ -	\$ 32
39099814100	\$ -	0	\$ 1,362	\$ -	\$ -	\$ 16	\$ 16
39099800501	\$ 3,717	0	\$ -	\$ 14	\$ 2	\$ -	\$ 16
39099802500	\$ -	0	\$ 468	\$ -	\$ -	\$ 5	\$ 5
39099801300	\$ -	0	\$ 333	\$ -	\$ -	\$ 4	\$ 4
39099812605	\$ -	0	\$ 327	\$ -	\$ -	\$ 4	\$ 4
Grand Total	\$ 402,595,945	450	\$ 967,428	\$ 1,488,066	\$55,704	\$ 11,340	\$ 1,555,110

The census tracts (CTs) facing the highest risk for flood caused building damage are 8010, 8137, and 9140 (Youngstown), 8111 (Lowellville), 8043 (Kensington), and 8124 (rural NW of Perkins Corner). No CTs have any large risk of agricultural flood caused damage.

2.6.7 Frequency/Probability of Future Occurrence/Flooding

Past floods are indications of what can happen in the future, but mitigation plans are based on the risk of future flooding. Flood studies interpret historical records to determine the statistical potential that storms and floods of certain magnitude will recur. Such events are measured by their recurrence interval.

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

Based on the NCEI data, the future probability of a flash flood is 0.36 events in a given year (18 events/50 years) and 0.38 events per year for flooding (19 events/50 years). This data is included in *Appendix F*.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Flooding (Riverine)	Relatively Moderate/79.3	1996-2019	1.2	Relatively Moderate/79.3	\$1.48M/\$11,340	0.00

There is a lower annual frequency risk correlation between NCEI (.36 flash flood/.38 flood) data and the NRI data (1.2). This may be caused by the NCEI data covering 50 years and the NRI data covering only 23 recent years.

If this assumption is correct, flooding has become almost 3x more frequent over the past 25 years vs the past 50 years.

2.7 Winter Weather

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

2.7.1 Climate Change Impact:

Based on the US Climate Resilience Toolkit, Mahoning County is expected to see an increase in the average number of cooling degree days, but a decrease in the days with temperatures below 32 degrees. The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Cooling degree days	622-degree days	913-degree days	957-degree days
Annual days with temperature below 32 degrees	33	24	23

The impact of this seems to indicate that the average temperature will be higher, with the reduction of cold weather days (sub-freezing) and the likely reduction of snow and hail events.

NCEI data from 1972 to 2023 reported three (3) winter weather events with one (1) causing any damage. This event, on 11/11/19, caused a total of \$500K worth of property damage, with no injury or deaths.

Additionally, 27 winter storm events were recorded, causing \$7.624M in damage, with two (2) injuries. Specific locations are notated if they were included in the NCEI database. This data is included in *Appendix F*. Notable events, causing at least \$50,000 in damage or injuries, include:

- 1/02/1999 resulting in \$15,000 worth of property damage and two (2) injuries.
- 12/13/2000 resulting in \$75,000 worth of property damage.
- 3/24/2002 resulting in \$75,000 worth of property damage.
- 12/05/2003 resulting in \$300,000 worth of property damage.
- 2/05/2004 resulting in \$150,000 worth of property damage.
- 12/22/2004 resulting in \$2.2M worth of property damage.
- 2/12/2008 resulting in \$75,000 worth of property damage.

- 3/04/2008 resulting in \$600,000 worth of property damage.
- 312/07/2008 resulting in \$1.2M worth of property damage.
- 1/9/2009 resulting in \$200,000 worth of property damage.
- 1/27/2009 resulting in \$400,000 worth of property damage.
- 2/05/2010 resulting in \$750,000 worth of property damage.
- 2/1/2011 resulting in \$300,000 worth of property damage.
- 2/21/2011 resulting in \$200,000 worth of property damage.
- 12/26/2012 resulting in \$75,000 worth of property damage.
- 11/26/2013 resulting in \$250,000 worth of property damage.
- 2/04/2014 resulting in \$125,000 worth of property damage.
- 1/12/2018 resulting in \$200,000 worth of property damage.
- 1/19/2019 resulting in \$100,000 worth of property damage.

2.7.2 Heavy Snow/Blizzards

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

According to the NCEI and local estimates, there has been eight (8) heavy snow events in Mahoning County since 1972. These events have caused \$2.325M in property damage with no deaths or injuries. There have been no recorded Blizzard events. Specific locations are notated if they were included in the NCEI database. This data is included in *Appendix F*. **Heavy Snow** events causing over \$50,000 in property damage include:

- 1/2/1996 event resulted in \$300,000 in property damage.
- 1/7/1996 event resulted in \$200,000 in property damage.
- 12/24/2002 event resulted in \$150,000 in property damage.
- 2/16/2003 event resulted in \$750,000 in property damage.
- 3/16/2004 event resulted in \$300,000 in property damage.
- 2/15/2016 event resulted in \$500,000 in property damage.
- 3/21/2018 event resulted in \$100,000 in property damage.

2.7.3 Ice Storms

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

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

According to the NCEI, there have been three (3) ice storm events since 1972 in Mahoning County causing a total of \$1.375 in property damage and no deaths or injuries. The data is included in *Appendix F*.

All three (3) events caused damage as follows:

- 1/5/2005 event resulted in \$1.2M in property damage.
- 3/15/2007 event resulted in \$75,000 in property damage.
- 3/18/2013 event resulted in \$100,000 in property damage.

2.7.4 Extreme Cold

Extreme cold can immobilize an entire region. Even areas that normally experience mild winters can be hit with extreme cold with a wind chill. The impacts include frostbite and hypothermia.

The wind chill temperature is how cold people and animals feel when outside. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature. On November 1, 2001, the National Weather Service (NWS) implemented a replacement Wind Chill Temperature (WCT) index. The reason for the change was to improve upon the current WCT Index which was based on the 1945 Siple and Passel Index.

Therefore, the wind makes it feel much colder. If the temperature is 0 degrees Fahrenheit and the wind is blowing at 15 mph, the wind chill is -19 degrees Fahrenheit. At this wind chill temperature, exposed skin can freeze in 30 minutes. The following chart lists wind chill values associated with degrees in Fahrenheit and wind in mph.

Therefore, the wind makes it feel much colder. If the temperature is 0 degrees Fahrenheit and the wind is blowing at 15 mph, the wind chill is -19 degrees Fahrenheit. At this wind chill temperature, exposed skin can freeze in 30 minutes. The following chart lists wind chill values associated with degrees in Fahrenheit and wind in mph.

Frostbite is a severe reaction to cold exposure that can permanently damage its victims. A loss of feeling and a white or pale appearance in fingers, toes, or nose and ear lobes are symptoms of frostbite.

Hypothermia is a condition brought on when the body temperature drops to less than 90 degrees Fahrenheit. Symptoms of hypothermia include uncontrollable shivering, slow speech, memory lapses, frequent stumbling, drowsiness, and exhaustion.

According to the NCEI, there have been seven (7) extreme cold or cold wind chill events recorded from 1972 – 2023 in Mahoning County. None of these events caused any damage, injury or death. The data is included in *Appendix F*.

2.7.5 Frequency/Probability of Future Occurrence

There have been 48 Winter storm events (3 Winter Weather, 27 Winter Storm, 8 Heavy Snow/Blizzard, 3 Ice, and 7 Extreme Cold) in Mahoning County causing a total of \$11,824,000 in damage with only two (2) injuries and no deaths, over 51 years. This averages out to about one (1) event per year with about \$231,843 in annual damages. The impact of climate change, with anticipated fewer cold days per year, will likely reduce winter storm hazard impacts over the next few decades.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Heavy Snow/Blizzards (Winter Weather)	92.8	2005-2021	2.8	Relatively High/92.8	\$426,000/\$259	.01
Ice Storm	80.9	1946-2014	0.6	Relatively Moderate 80.9	\$161,054/NA	.01
Extreme Cold (Cold Wave)	95.3	2005-2021	0.6	Relatively High 95.3	\$10,840/\$18,304	.10

The NRI data reflects a higher risk of Winter Weather, mainly due to the more timeliness of their data. NRI data more accurately reflects the risk of property damage, injury, and death than the NCEI data.

2.7.6 Vulnerability

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Blizzards	N/A	N/A	N/A	N/A	N/A	N/A
Heavy Snow	Included with winter weather	--	--	--	--	--
Cold/Extreme Cold	0.6	\$1,239,297	\$18,840	\$18,304	\$1,210,152	0.10
Winter Weather	2.8	\$493,776	\$426,000	\$259	\$67,516	0.01
Ice Storm	0.6	267,235	\$161,054	N/A	\$106,181	0.01

MAHONING COUNTY NRI ICE STORM EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Total)
39099814000	\$ 2,006,283,704	2908	\$ 9,817	\$ 1,975	\$ 11,791
39099812500	\$ 1,504,735,737	4952	\$ 7,502	\$ 3,435	\$ 10,936
39099812302	\$ 761,039,925	6482	\$ 3,794	\$ 4,496	\$ 8,290
39099812604	\$ 792,565,362	4884	\$ 3,951	\$ 3,387	\$ 7,339
39099812101	\$ 1,414,799,349	6143	\$ 4,356	\$ 2,675	\$ 7,031
39099811002	\$ 1,488,462,348	7506	\$ 4,123	\$ 2,892	\$ 7,015
39099812601	\$ 684,583,548	4745	\$ 3,413	\$ 3,291	\$ 6,704
39099812400	\$ 950,774,743	2742	\$ 4,740	\$ 1,902	\$ 6,642
39099812800	\$ 965,124,425	3560	\$ 4,277	\$ 2,270	\$ 6,547
39099812602	\$ 569,453,727	5212	\$ 2,839	\$ 3,615	\$ 6,454
39099812700	\$ 1,030,072,005	2124	\$ 4,999	\$ 1,390	\$ 6,389

39099812001	\$ 1,598,232,043	5622	\$ 4,294	\$ 2,076	\$ 6,370
39099812200	\$ 1,477,856,673	6570	\$ 3,859	\$ 2,387	\$ 6,246
39099811500	\$ 747,828,672	5824	\$ 2,741	\$ 3,108	\$ 5,849
39099814100	\$ 766,588,892	2303	\$ 3,822	\$ 1,597	\$ 5,419
39099813601	\$ 1,090,328,952	5839	\$ 3,020	\$ 2,250	\$ 5,270
39099812301	\$ 466,039,372	3888	\$ 2,323	\$ 2,697	\$ 5,020
39099811902	\$ 1,303,296,697	3292	\$ 3,610	\$ 1,268	\$ 4,878
39099813700	\$ 957,127,710	3506	\$ 3,157	\$ 1,708	\$ 4,865
39099812605	\$ 532,541,726	3134	\$ 2,655	\$ 2,174	\$ 4,829
39099812102	\$ 1,190,460,182	4231	\$ 3,187	\$ 1,588	\$ 4,775
39099813000	\$ 1,246,856,314	4117	\$ 3,256	\$ 1,496	\$ 4,752
39099812900	\$ 1,198,191,752	4101	\$ 3,129	\$ 1,490	\$ 4,619
39099802701	\$ 471,455,533	3232	\$ 2,350	\$ 2,242	\$ 4,592
39099811901	\$ 1,000,875,300	4289	\$ 2,772	\$ 1,653	\$ 4,425
39099813502	\$ 1,090,574,664	4058	\$ 2,909	\$ 1,510	\$ 4,419
39099811400	\$ 407,781,283	3218	\$ 2,032	\$ 2,231	\$ 4,262
39099813501	\$ 1,053,906,557	3537	\$ 2,876	\$ 1,337	\$ 4,213
39099802800	\$ 450,052,033	2665	\$ 2,244	\$ 1,848	\$ 4,092
39099813400	\$ 1,061,243,740	3420	\$ 2,771	\$ 1,243	\$ 4,014
39099813300	\$ 1,049,911,713	3101	\$ 2,742	\$ 1,127	\$ 3,868
39099802702	\$ 370,099,686	2818	\$ 1,845	\$ 1,955	\$ 3,800
39099813900	\$ 532,730,116	1571	\$ 2,656	\$ 1,090	\$ 3,746
39099802400	\$ 386,591,129	2531	\$ 1,927	\$ 1,755	\$ 3,683
39099813200	\$ 750,024,956	4171	\$ 1,959	\$ 1,515	\$ 3,474
39099812002	\$ 668,173,203	3882	\$ 1,745	\$ 1,410	\$ 3,155
39099804000	\$ 448,672,200	2080	\$ 1,766	\$ 1,382	\$ 3,148
39099802900	\$ 298,621,097	2233	\$ 1,489	\$ 1,549	\$ 3,038
39099804200	\$ 335,679,127	1934	\$ 1,674	\$ 1,341	\$ 3,015
39099811600	\$ 606,285,014	3479	\$ 1,590	\$ 1,274	\$ 2,864
39099811001	\$ 574,122,895	4002	\$ 1,448	\$ 1,392	\$ 2,840
39099813602	\$ 670,841,406	2468	\$ 1,858	\$ 951	\$ 2,809
39099801600	\$ 410,614,070	2336	\$ 1,616	\$ 1,128	\$ 2,744
39099811200	\$ 567,925,899	2393	\$ 1,573	\$ 922	\$ 2,495
39099811301	\$ 433,696,834	4199	\$ 1,026	\$ 1,419	\$ 2,445
39099810700	\$ 667,920,009	5233	\$ 1,136	\$ 1,232	\$ 2,368
39099804100	\$ 280,767,732	1300	\$ 1,400	\$ 902	\$ 2,301
39099801700	\$ 369,538,032	928	\$ 1,686	\$ 559	\$ 2,245
39099803000	\$ 187,937,523	1875	\$ 937	\$ 1,300	\$ 2,237
39099802600	\$ 205,016,927	1604	\$ 1,022	\$ 1,113	\$ 2,135
39099811700	\$ 395,152,616	2622	\$ 1,053	\$ 963	\$ 2,015
39099802500	\$ 204,306,658	1312	\$ 1,019	\$ 910	\$ 1,929
39099810100	\$ 524,443,884	4213	\$ 872	\$ 974	\$ 1,846
39099801500	\$ 259,258,487	1818	\$ 931	\$ 908	\$ 1,839
39099811302	\$ 668,444,129	2139	\$ 1,136	\$ 516	\$ 1,652

39099802100	\$ 186,179,016	892	\$ 928	\$ 619	\$ 1,547
39099810600	\$ 494,813,030	2784	\$ 822	\$ 644	\$ 1,466
39099811800	\$ 285,215,746	1629	\$ 814	\$ 644	\$ 1,458
39099804300	\$ 234,377,583	900	\$ 830	\$ 610	\$ 1,441
39099801000	\$ 631,089,035	1467	\$ 1,058	\$ 340	\$ 1,397
39099810200	\$ 556,338,737	1974	\$ 925	\$ 456	\$ 1,381
39099810900	\$ 525,611,318	2021	\$ 873	\$ 467	\$ 1,341
39099813800	\$ 338,625,705	3024	\$ 563	\$ 699	\$ 1,262
39099802300	\$ 137,739,609	787	\$ 687	\$ 546	\$ 1,233
39099801100	\$ 293,764,858	2335	\$ 488	\$ 540	\$ 1,028
39099810800	\$ 323,601,600	2046	\$ 540	\$ 475	\$ 1,015
39099801300	\$ 263,454,268	2141	\$ 438	\$ 495	\$ 933
39099801400	\$ 244,903,897	2104	\$ 407	\$ 486	\$ 893
39099814200	\$ 288,463,682	1722	\$ 479	\$ 398	\$ 877
39099800501	\$ 200,649,900	2116	\$ 333	\$ 489	\$ 823
39099810300	\$ 223,174,786	1665	\$ 371	\$ 385	\$ 756
39099800600	\$ 265,980,246	1194	\$ 442	\$ 276	\$ 718
39099800502	\$ 267,614,386	959	\$ 445	\$ 222	\$ 666
39099811100	\$ 247,323,965	996	\$ 411	\$ 231	\$ 642
39099801200	\$ 167,738,201	1477	\$ 279	\$ 341	\$ 620
Grand Total	\$48,322,567,878	228579	\$ 161,054	\$ 106,181	\$267,235

There are no Mahoning County census tracts (CTs) facing a highest risk for Ice Storm building damage or agricultural damage based on this NRI data.

MAHONING COUNTY NRI COLDWAVE EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099811002	\$1,488,462,348	7506	\$ 2,025,183	\$ 334	\$ 39,739	\$ 471	\$ 40,544
39099812200	\$1,477,856,673	6570	\$ 116,928	\$ 332	\$ 34,783	\$ 27	\$ 35,142
39099812302	\$ 761,039,925	6482	\$ -	\$ 171	\$ 34,317	\$ -	\$ 34,488
39099812101	\$1,414,799,349	6143	\$ 393,762	\$ 317	\$ 32,523	\$ 92	\$ 32,931
39099813601	\$1,090,328,952	5839	\$ 4,117,638	\$ 245	\$ 30,913	\$ 958	\$ 32,115
39099811500	\$ 747,828,672	5824	\$ 6,541	\$ 168	\$ 30,834	\$ 2	\$ 31,003
39099812001	\$1,598,232,043	5622	\$ 4,438	\$ 359	\$ 29,764	\$ 1	\$ 30,124
39099810700	\$ 667,920,009	5233	\$ 3,001	\$ 150	\$ 27,705	\$ 1	\$ 27,855
39099812602	\$ 569,453,727	5212	\$ -	\$ 128	\$ 27,594	\$ -	\$ 27,721
39099812500	\$1,504,735,737	4952	\$ 223,202	\$ 338	\$ 26,217	\$ 52	\$ 26,607
39099812604	\$ 792,565,362	4884	\$ 44,319	\$ 178	\$ 25,857	\$ 10	\$ 26,045
39099812601	\$ 684,583,548	4745	\$ 468	\$ 154	\$ 25,121	\$ 0	\$ 25,275
39099812900	\$1,198,191,752	4101	\$11,961,404	\$ 269	\$ 21,712	\$ 2,782	\$ 24,763
39099813000	\$1,246,856,314	4117	\$ 8,416,109	\$ 280	\$ 21,796	\$ 1,957	\$ 24,034

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39099813502	\$1,090,574,664	4058	\$ 7,338,374	\$ 245	\$ 21,484	\$ 1,707	\$ 23,435
39099812102	\$1,190,460,182	4231	\$ 3,021,010	\$ 267	\$ 22,400	\$ 703	\$ 23,370
39099811901	\$1,000,875,300	4289	\$ -	\$ 225	\$ 22,707	\$ -	\$ 22,932
39099810100	\$ 524,443,884	4213	\$ 10,278	\$ 118	\$ 22,305	\$ 2	\$ 22,425
39099811301	\$ 433,696,834	4199	\$ -	\$ 97	\$ 22,231	\$ -	\$ 22,328
39099813200	\$ 750,024,956	4171	\$ 137,217	\$ 168	\$ 22,082	\$ 32	\$ 22,282
39099811001	\$ 574,122,895	4002	\$ 375,161	\$ 129	\$ 21,188	\$ 87	\$ 21,404
39099812002	\$ 668,173,203	3882	\$ 485,554	\$ 150	\$ 20,552	\$ 113	\$ 20,815
39099812301	\$ 466,039,372	3888	\$ -	\$ 105	\$ 20,584	\$ -	\$ 20,689
39099813400	\$1,061,243,740	3420	\$ 9,542,842	\$ 238	\$ 18,106	\$ 2,220	\$ 20,564
39099812800	\$ 965,124,425	3560	\$ 3,807,092	\$ 217	\$ 18,847	\$ 885	\$ 19,949
39099813501	\$1,053,906,557	3537	\$ 1,593,992	\$ 236	\$ 18,726	\$ 371	\$ 19,333
39099813300	\$1,049,911,713	3101	\$10,878,953	\$ 236	\$ 16,417	\$ 2,530	\$ 19,183
39099813700	\$ 957,127,710	3506	\$ 23,859	\$ 215	\$ 18,562	\$ 6	\$ 18,782
39099811600	\$ 606,285,014	3479	\$ -	\$ 136	\$ 18,419	\$ -	\$ 18,555
39099811902	\$1,303,296,697	3292	\$ 37,840	\$ 292	\$ 17,429	\$ 9	\$ 17,730
39099802701	\$ 471,455,533	3232	\$ -	\$ 106	\$ 17,111	\$ -	\$ 17,217
39099811400	\$ 407,781,283	3218	\$ 702	\$ 91	\$ 17,037	\$ 0	\$ 17,129
39099812605	\$ 532,541,726	3134	\$ 556,094	\$ 119	\$ 16,592	\$ 129	\$ 16,841
39099813800	\$ 338,625,705	3024	\$ 165,108	\$ 76	\$ 16,010	\$ 38	\$ 16,124
39099814000	\$2,006,283,704	2908	\$ 23,308	\$ 450	\$ 15,396	\$ 5	\$ 15,851
39099802702	\$ 370,099,686	2818	\$ 468	\$ 83	\$ 14,919	\$ 0	\$ 15,002
39099810600	\$ 494,813,030	2784	\$ 27,532	\$ 111	\$ 14,739	\$ 6	\$ 14,857
39099812400	\$ 950,774,743	2742	\$ 12,069	\$ 213	\$ 14,517	\$ 3	\$ 14,733
39099813602	\$ 670,841,406	2468	\$ 5,452,866	\$ 150	\$ 13,066	\$ 1,268	\$ 14,485
39099802800	\$ 450,052,033	2665	\$ 2,570	\$ 101	\$ 14,109	\$ 1	\$ 14,211
39099811700	\$ 395,152,616	2622	\$ -	\$ 89	\$ 13,881	\$ -	\$ 13,970
39099802400	\$ 386,591,129	2531	\$ -	\$ 87	\$ 13,400	\$ -	\$ 13,486
39099811200	\$ 567,925,899	2393	\$ 702	\$ 127	\$ 12,669	\$ 0	\$ 12,797
39099812700	\$1,030,072,005	2124	\$ 5,037,105	\$ 231	\$ 11,245	\$ 1,172	\$ 12,648
39099801600	\$ 410,614,070	2336	\$ -	\$ 92	\$ 12,367	\$ -	\$ 12,459
39099801100	\$ 293,764,858	2335	\$ -	\$ 66	\$ 12,362	\$ -	\$ 12,428
39099814100	\$ 766,588,892	2303	\$ 69,976	\$ 172	\$ 12,193	\$ 16	\$ 12,381
39099802900	\$ 298,621,097	2233	\$ -	\$ 67	\$ 11,822	\$ -	\$ 11,889
39099811302	\$ 668,444,129	2139	\$ -	\$ 150	\$ 11,324	\$ -	\$ 11,474
39099810900	\$ 525,611,318	2021	\$ 2,545,599	\$ 118	\$ 10,700	\$ 592	\$ 11,410
39099801300	\$ 263,454,268	2141	\$ 14,645	\$ 59	\$ 11,335	\$ 3	\$ 11,397
39099800501	\$ 200,649,900	2116	\$ 17,050	\$ 45	\$ 11,203	\$ 4	\$ 11,252
39099801400	\$ 244,903,897	2104	\$ -	\$ 55	\$ 11,139	\$ -	\$ 11,194
39099804000	\$ 448,672,200	2080	\$ -	\$ 101	\$ 11,012	\$ -	\$ 11,113
39099810800	\$ 323,601,600	2046	\$ 18,575	\$ 73	\$ 10,832	\$ 4	\$ 10,909
39099810200	\$ 556,338,737	1974	\$ 47,300	\$ 125	\$ 10,451	\$ 11	\$ 10,587
39099804200	\$ 335,679,127	1934	\$ -	\$ 75	\$ 10,239	\$ -	\$ 10,314
39099803000	\$ 187,937,523	1875	\$ -	\$ 42	\$ 9,927	\$ -	\$ 9,969

39099801500	\$ 259,258,487	1818	\$ -	\$ 58	\$ 9,625	\$ -	\$ 9,683
39099814200	\$ 288,463,682	1722	\$ 123,987	\$ 65	\$ 9,117	\$ 29	\$ 9,210
39099810300	\$ 223,174,786	1665	\$ -	\$ 50	\$ 8,815	\$ -	\$ 8,865
39099811800	\$ 285,215,746	1629	\$ -	\$ 64	\$ 8,624	\$ -	\$ 8,688
39099802600	\$ 205,016,927	1604	\$ -	\$ 46	\$ 8,492	\$ -	\$ 8,538
39099813900	\$ 532,730,116	1571	\$ -	\$ 120	\$ 8,317	\$ -	\$ 8,437
39099801000	\$ 631,089,035	1467	\$ -	\$ 142	\$ 7,767	\$ -	\$ 7,908
39099801200	\$ 167,738,201	1477	\$ -	\$ 38	\$ 7,820	\$ -	\$ 7,857
39099802500	\$ 204,306,658	1312	\$ 468	\$ 46	\$ 6,946	\$ 0	\$ 6,992
39099804100	\$ 280,767,732	1300	\$ -	\$ 63	\$ 6,883	\$ -	\$ 6,945
39099800600	\$ 265,980,246	1194	\$ 6,073	\$ 60	\$ 6,321	\$ 1	\$ 6,382
39099811100	\$ 247,323,965	996	\$ 7,295	\$ 55	\$ 5,273	\$ 2	\$ 5,330
39099800502	\$ 267,614,386	959	\$ 4,457	\$ 60	\$ 5,077	\$ 1	\$ 5,138
39099801700	\$ 369,538,032	928	\$ -	\$ 83	\$ 4,913	\$ -	\$ 4,996
39099804300	\$ 234,377,583	900	\$ 572	\$ 53	\$ 4,765	\$ 0	\$ 4,818
39099802100	\$ 186,179,016	892	\$ -	\$ 42	\$ 4,722	\$ -	\$ 4,764
39099802300	\$ 137,739,609	787	\$ -	\$ 31	\$ 4,167	\$ -	\$ 4,197
Grand Total	\$ 48,322,567,878	228579	\$78,699,686	\$ 10,840	\$1,210,152	\$ 18,304	\$1,239,297

There are no Mahoning County census tracts (CTs) facing a high risk for Cold Wave building damage or agricultural damage based on this NRI data. The data does show a slight risk for population risk in CT 8121 and CT 8122 (Canfield).

MAHONING COUNTY NRI WINTER WEATHER EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Building)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099814000	\$ 2,006,283,704	2908	\$ 23,308	\$ 17,687	\$ 859	\$ 0	\$ 18,546
39099812001	\$ 1,598,232,043	5622	\$ 4,438	\$ 14,090	\$1,661	\$ 0	\$ 15,750
39099811002	\$ 1,488,462,348	7506	\$ 2,025,183	\$ 13,122	\$2,217	\$ 7	\$ 15,346
39099812200	\$ 1,477,856,673	6570	\$ 116,928	\$ 13,028	\$1,941	\$ 0	\$ 14,969
39099812500	\$ 1,504,735,737	4952	\$ 223,202	\$ 13,265	\$1,463	\$ 1	\$ 14,729
39099812101	\$ 1,414,799,349	6143	\$ 393,762	\$ 12,473	\$1,814	\$ 1	\$ 14,288
39099811902	\$ 1,303,296,697	3292	\$ 37,840	\$ 11,490	\$ 972	\$ 0	\$ 12,462
39099813000	\$ 1,246,856,314	4117	\$ 8,416,109	\$ 10,992	\$1,216	\$ 28	\$ 12,236
39099812900	\$ 1,198,191,752	4101	\$ 11,961,404	\$ 10,563	\$1,211	\$ 39	\$ 11,814
39099812102	\$ 1,190,460,182	4231	\$ 3,021,010	\$ 10,495	\$1,250	\$ 10	\$ 11,754
39099813601	\$ 1,090,328,952	5839	\$ 4,117,638	\$ 9,612	\$1,725	\$ 14	\$ 11,350
39099813502	\$ 1,090,574,664	4058	\$ 7,338,374	\$ 9,614	\$1,199	\$ 24	\$ 10,837
39099813400	\$ 1,061,243,740	3420	\$ 9,542,842	\$ 9,356	\$1,010	\$ 31	\$ 10,397
39099813501	\$ 1,053,906,557	3537	\$ 1,593,992	\$ 9,291	\$1,045	\$ 5	\$ 0,341
39099813300	\$ 1,049,911,713	3101	\$ 10,878,953	\$ 9,256	\$ 916	\$ 36	\$ 10,208
39099811901	\$ 1,000,875,300	4289	\$ -	\$ 8,823	\$1,267	\$ -	\$ 10,090

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39099812700	\$ 1,030,072,005	2124	\$ 5,037,105	\$ 9,081	\$ 627	\$ 17	\$ 9,725
39099812800	\$ 965,124,425	3560	\$ 3,807,092	\$ 8,508	\$1,052	\$ 13	\$ 9,572
39099813700	\$ 957,127,710	3506	\$ 23,859	\$ 8,438	\$1,036	\$ 0	\$ 9,473
39099812400	\$ 950,774,743	2742	\$ 12,069	\$ 8,382	\$ 810	\$ 0	\$ 9,192
39099812302	\$ 761,039,925	6482	\$ -	\$ 6,709	\$1,915	\$ -	\$ 8,624
39099812604	\$ 792,565,362	4884	\$ 44,319	\$ 6,987	\$1,443	\$ 0	\$ 8,430
39099811500	\$ 747,828,672	5824	\$ 6,541	\$ 6,593	\$1,720	\$ 0	\$ 8,313
39099813200	\$ 750,024,956	4171	\$ 137,217	\$ 6,612	\$1,232	\$ 0	\$ 7,844
39099814100	\$ 766,588,892	2303	\$ 69,976	\$ 6,758	\$ 680	\$ 0	\$ 7,439
39099812601	\$ 684,583,548	4745	\$ 468	\$ 6,035	\$1,402	\$ 0	\$ 7,437
39099810700	\$ 667,920,009	5233	\$ 3,001	\$ 5,888	\$1,546	\$ 0	\$ 7,434
39099812002	\$ 668,173,203	3882	\$ 485,554	\$ 5,890	\$1,147	\$ 2	\$ 7,039
39099813602	\$ 670,841,406	2468	\$ 5,452,866	\$ 5,914	\$ 729	\$ 18	\$ 6,661
39099812602	\$ 569,453,727	5212	\$ -	\$ 5,020	\$1,539	\$ -	\$ 6,560
39099811302	\$ 668,444,129	2139	\$ -	\$ 5,893	\$ 632	\$ -	\$ 6,525
39099811600	\$ 606,285,014	3479	\$ -	\$ 5,345	\$1,028	\$ -	\$ 6,372
39099811001	\$ 574,122,895	4002	\$ 375,161	\$ 5,061	\$1,182	\$ 1	\$ 6,245
39099801000	\$ 631,089,035	1467	\$ -	\$ 5,564	\$ 433	\$ -	\$ 5,997
39099810100	\$ 524,443,884	4213	\$ 10,278	\$ 4,623	\$1,244	\$ 0	\$ 5,868
39099811200	\$ 567,925,899	2393	\$ 702	\$ 5,007	\$ 707	\$ 0	\$ 5,714
39099812605	\$ 532,541,726	3134	\$ 556,094	\$ 4,695	\$ 926	\$ 2	\$ 5,622
39099810200	\$ 556,338,737	1974	\$ 47,300	\$ 4,905	\$ 583	\$ 0	\$ 5,488
39099812301	\$ 466,039,372	3888	\$ -	\$ 4,108	\$1,148	\$ -	\$ 5,257
39099810900	\$ 525,611,318	2021	\$ 2,545,599	\$ 4,634	\$ 597	\$ 8	\$ 5,239
39099810600	\$ 494,813,030	2784	\$ 27,532	\$ 4,362	\$ 822	\$ 0	\$ 5,185
39099813900	\$ 532,730,116	1571	\$ -	\$ 4,696	\$ 464	\$ -	\$ 5,160
39099802701	\$ 471,455,533	3232	\$ -	\$ 4,156	\$ 955	\$ -	\$ 5,111
39099811301	\$ 433,696,834	4199	\$ -	\$ 3,823	\$1,240	\$ -	\$ 5,064
39099802800	\$ 450,052,033	2665	\$ 2,570	\$ 3,968	\$ 787	\$ 0	\$ 4,755
39099804000	\$ 448,672,200	2080	\$ -	\$ 3,955	\$ 614	\$ -	\$ 4,570
39099811400	\$ 407,781,283	3218	\$ 702	\$ 3,595	\$ 951	\$ 0	\$ 4,545
39099801600	\$ 410,614,070	2336	\$ -	\$ 3,620	\$ 690	\$ -	\$ 4,310
39099811700	\$ 395,152,616	2622	\$ -	\$ 3,484	\$ 774	\$ -	\$ 4,258
39099802400	\$ 386,591,129	2531	\$ -	\$ 3,408	\$ 748	\$ -	\$ 4,156
39099802702	\$ 370,099,686	2818	\$ 468	\$ 3,263	\$ 832	\$ 0	\$ 4,095
39099813800	\$ 338,625,705	3024	\$ 165,108	\$ 2,985	\$ 893	\$ 1	\$ 3,879
39099801700	\$ 369,538,032	928	\$ -	\$ 3,258	\$ 274	\$ -	\$ 3,532
39099804200	\$ 335,679,127	1934	\$ -	\$ 2,959	\$ 571	\$ -	\$ 3,531
39099810800	\$ 323,601,600	2046	\$ 18,575	\$ 2,853	\$ 604	\$ 0	\$ 3,457
39099802900	\$ 298,621,097	2233	\$ -	\$ 2,633	\$ 660	\$ -	\$ 3,292
39099801100	\$ 293,764,858	2335	\$ -	\$ 2,590	\$ 690	\$ -	\$ 3,279
39099814200	\$ 288,463,682	1722	\$ 123,987	\$ 2,543	\$ 509	\$ 0	\$ 3,052
39099811800	\$ 285,215,746	1629	\$ -	\$ 2,514	\$ 481	\$ -	\$ 2,996
39099801300	\$ 263,454,268	2141	\$ 14,645	\$ 2,323	\$ 632	\$ 0	\$ 2,955

39099804100	\$ 280,767,732	1300	\$ -	\$ 2,475	\$ 384	\$ -	\$ 2,859
39099801500	\$ 259,258,487	1818	\$ -	\$ 2,286	\$ 537	\$ -	\$ 2,823
39099801400	\$ 244,903,897	2104	\$ -	\$ 2,159	\$ 621	\$ -	\$ 2,780
39099800600	\$ 265,980,246	1194	\$ 6,073	\$ 2,345	\$ 353	\$ 0	\$ 2,698
39099800502	\$ 267,614,386	959	\$ 4,457	\$ 2,359	\$ 283	\$ 0	\$ 2,643
39099811100	\$ 247,323,965	996	\$ 7,295	\$ 2,180	\$ 294	\$ 0	\$ 2,475
39099810300	\$ 223,174,786	1665	\$ -	\$ 1,967	\$ 492	\$ -	\$ 2,459
39099800501	\$ 200,649,900	2116	\$ 17,050	\$ 1,769	\$ 625	\$ 0	\$ 2,394
39099804300	\$ 234,377,583	900	\$ 572	\$ 2,066	\$ 266	\$ 0	\$ 2,332
39099802600	\$ 205,016,927	1604	\$ -	\$ 1,807	\$ 474	\$ -	\$ 2,281
39099803000	\$ 187,937,523	1875	\$ -	\$ 1,657	\$ 554	\$ -	\$ 2,211
39099802500	\$ 204,306,658	1312	\$ 468	\$ 1,801	\$ 388	\$ 0	\$ 2,189
39099801200	\$ 167,738,201	1477	\$ -	\$ 1,479	\$ 436	\$ -	\$ 1,915
39099802100	\$ 186,179,016	892	\$ -	\$ 1,641	\$ 263	\$ -	\$ 1,905
39099802300	\$ 137,739,609	787	\$ -	\$ 1,214	\$ 232	\$ -	\$ 1,447
Grand Total	48,322,567,878	228579	\$ 78,699,686	\$ 426,000	67,516	\$ 259	\$493,776

There are no Mahoning County census tracts (CTs) facing a high risk for Winter Storm building, agricultural, or population harm based on this NRI data.

2.8 Dam/Levee-Failure

Dam failure is a catastrophic type of structural failure characterized by a sudden, rapid, and uncontrolled release of impounded water, or the likelihood of such an uncontrolled release. Because of the rapid and unexpected manner in which dam failures can occur, they are classified in the same general magnitude as earthquakes and tornadoes.

Because of the many dams existing in Mahoning County, the Planning Team chose to discuss dam safety in this Mitigation Plan. The Planning Team is especially concerned with the development occurring downstream of these dams.

Climate Change Impact:

Based on the US Climate Resilience Toolkit, Mahoning County is expected to see a decrease in the number of days of rain, but with slightly greater annual precipitation. The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Avg. annual total precipitation	37"	38"	39"
Days with precipitation	211	207	207

The impact of this will be slightly more intense summer storms with more potential rain and flooding during some events. The increase in heat may also intensify storm conditions. All of this could create flash flooding putting more stress on existing dams.

2.8.1 Extent

Dams in Ohio

A dam is an artificial barrier usually constructed across a stream channel to impound water. Timber, rock, concrete, earth, steel or a combination of these materials may be used to build the dam. In Ohio, most dams are constructed of earth. Dams must have spillway systems to safely convey normal stream and flood flows over, around, or through the dam. Spillways are commonly constructed of non-erosive materials such as concrete. Dams also have a drain or other water-withdrawal facility to control the pool or lake level and to lower or drain the lake for normal maintenance and emergency purposes.

Most dams in Ohio are small and are constructed by farmers and other private individuals for water supply, recreation, swimming and fishing. Numerous other, usually larger, dams are built by cities and industry to form reservoirs for water supply or liquefied waste storage. Ownership of dams is diverse and maintained by both public and private interests. The federal government owns and operates over 30 dams for flood control, recreation and water supply. The state of Ohio has more than 100 dams, primarily located in state park and wildlife areas for recreational purposes. Flood control and some water supplies are provided by dams owned by watershed conservancy districts.

2.8.2 Classification of Dams in Ohio

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

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

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

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

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

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

Class IV: When failure of the dam would result in property losses restricted mainly to the dam and rural lands, and not loss of human life or hazard to health is envisioned, the dam may be placed in Class IV.

Dams which are twenty-five feet or less in height and have a storage volume of fifty acre-feet or less, may be placed in Class IV. No proposed dam shall be placed in Class IV unless the applicant has submitted the preliminary design report required by Rule 1501:21-5-02 of the Administrative Code. Class IV dams are exempt from the permit requirements of Section 1521.06 of the Revised Code pursuant to paragraph (A) of Rule 1501:21-19-01 of the Administrative Code.

(water.ohiodnr.gov/safety/dam-safety)

There are more than 50,000 dams identified in Ohio. A great majority of these dams are small and do not fall under the jurisdiction of Ohio's Dam Safety Laws.

According to the ODNR, Mahoning Highland County has 92 dams within its boundaries. The number of dams and their classifications, as of September 2023, are as follows:

- Class I - 6
- Class II - 6
- Class III - 9
- Other - 17

All six (6) Class One Dams in Mahoning Co with an Emergency Action Plans (EAP). These plans is on file with the Mahoning Co EMA office.

In addition, Mahoning County has one (1) unclassified dam and 53 exempt dams, which have been determined by the ODNR's Chief of the Division of Water to not constitute a hazard to life, health, or property in the event of a failure.

Mahoning County Dams (Class I, II, and III)

DAMS IN MAHONING COUNTY				
<i>Dam Name</i>	<i>Dam Class</i>	<i>Owner Type</i>	<i>Dam Type</i>	<i>River</i>
Arrowhead Lake Dam No. 1	Class II	Private	Earth	Tributary to Mill Creek
Berlin Dam*	Class I	Federal	Gravity, Earth	Mahoning River
Burgess Lake Dam	Class II	Public Utility	Earth	Burgess Run
Evans Lake Dam	Class I +	Public Utility	Earth	Yellow Creek
King's Lake Dam	Class III	Private	Earth	Coffee Run
Lake Cohasset Dam	Class II	Local Government	Masonry	Mill Creek
Lake Glacier Dam	Class III	Local Government	Masonry	Mill Creek
Lake Hamilton Dam	Class I +	Public Utility	Concrete	Yellow Creek
Lake Milton Dam	Class I +	State	Earth	Mahoning River
Lake Park Dam	Class III	State	Concrete, Earth	Tributary to Mahoning River
Lower Diehl Lake Dam.	Class III	Private	Earth	West Branch Meander Creek

2.8.3 Historic Occurrence

History of Dam Safety in Ohio

Construction of dams in Ohio dates to the early 1800 when reservoirs such as Buckeye Lake and Grand Lake St. Mary's were built to supply water to the canal system, which provided a means of transportation for agricultural trade and commerce. Dam construction continued at a modest pace for about the next 100 years with relatively few dams built by private entities. In the early part of the nineteenth century, several large municipally owned dams and reservoirs were built for public water supply. Severe floods

also prompted the formation of conservancy districts which constructed dams for flood control. Although the true forerunner of current dam safety laws in Ohio was enacted in 1963, legislation pertaining to the construction of dams was enacted as early as 1937. This early set of laws aimed to encourage construction of dams for the storage of water in response to recent drought periods in Ohio and the "dust bowl" days on the Great Plains. The regulatory agency responsible for the enforcement of these early dams was the Div. of Conservation and Natural Resources in the State Dept. of Agriculture.

Due to the availability of large earthmoving equipment after World War II, Ohio saw a significant increase in the number of dams built by individuals and private companies. Although the water storage and recreational capabilities provided by these dams were important benefits, concern about the adequacy of design and construction was prompted by the loss of life and property damage resulting from dam failures, which led to a greater interest in dam safety.

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

Mahoning County Dam History

Mahoning County does not have a significant history of dam failure. The State of Ohio Dam Safety Program is in place to monitor and provide dam owners in Mahoning County pertinent information to support their dam's maintenance requirements. The Dam Safety Program regulates the construction, operation and maintenance of Ohio's dams, dikes, and levees to protect life and property from damage due to failure. This regulation is accomplished through periodic inspection, new dam construction permits and regulation of improvements, maintenance, and operation of existing dams.

There have been zero historical dam failures in Mahoning County; consequently, the average loss to be expected based on past occurrences would be \$0. However, if a dam or levee failed, the damages would amount to the sum of the cost to replace the dam or levee and losses of property from the failure. Although there is no data supporting any historical occurrences of incidents or failures, it is safe to estimate that there could be an incident in a Mahoning County dam due to the number of class I dams.

ODNR NID High and Significant dams in Mahoning Co are identified as follows:

Dam Name	Owner Names	Owner Types	Hazard Potential Classification ODNR/NID	Purpose	EAP Prepared
Berlin Dam	USACE- Pitts. Div	Gov	1- High	Flood Risk Reduction	Yes
McKelvey Dam	City of Youngstown	Gov	1- High	Water Supply	Yes
Lake Hamilton	Aqua Ohio Inc.	Private	1- High	Recreation	Yes

Lake Milton Dam	ODNR	Gov	1- High	Recreation	Yes
Evans Lake Dam	Aqua Ohio Inc.	Private	1- High	Water Supply	Yes
Youngstown Upground Reservoir	Mahoning Valley Sanitary Dist.	Gov	1- High	Water Supply	Yes
Pike Lake Dam	Aqua Ohio Inc.	Private	1- High	Water Supply	Yes
Burgess Lake Dam	Aqua Ohio Inc.	Private	2- Significant	Water Supply	Yes
Lake Cohasset Dam	Mill Creek Metro Park Dist.	Gov	2- Significant	Recreation	Yes

2.8.4 Previous and ongoing Dam Mitigation Activities

Eastgate Regional Council of Governments is currently supporting the U.S. Army Corps of Engineers project to remove nine dams along the Mahoning River; dam and sediment removal will allow the river to flow naturally. To date, only two of the nine dam removals have been funded. After the dams are removed, communities will enjoy the restoration of the connection to the river. The entire project will cost over \$100 million.

2.8.5 Risk Assessment for Dam Failure

There are several current limitations to doing risk assessment for dam failure in Mahoning County. First, there is an effort, as described above, to remove dams in the county. Second, at present, there is limited information or data available for downstream inundation area risk and damage. Third, with the low probability of dam failure, as per local experts and historical data, there is no immediacy to conduct expensive risk assessments. Resultingly, HHPD requirements are not being pursued in this plan and the plan will/can be amended if any projects require HHPD eligibility.

2.8.6 Frequency/Probability of Events

The probability of future dam failure occurrences is quite low. The likelihood of severe damage of a Class I or a Class II Dam failure would not be very high. With limited data to support any frequency or probability of dam failure, for the purpose of this analysis the committee suggests one (1) possible class I or II dam failure every 50 years. According to the GIS map with an overlay of dams and assets, there would be no risk to assets from the predetermined list.

The dam failure map shows the locations of the dams in Mahoning County. The majority of the county is at the lowest risk of dam failure. However, some locations may be at a slightly higher risk due to the dam location, the topography, and the population downstream that may be at risk.

2.9 Cold Wave

As there are no documented damage, death, or injury from Cold Wave events in Mahoning County, Wave (Extreme Cold/Wind Chill and Cold/Wind Chill) has been integrated with “2.7 Winter Weather”.

2.10 Summer Storm (Thunderstorms, Hail, Lightning)

2.10.1 Extent

Hazards that fit into the severe summer storm category include thunderstorm winds, hail, and lightning. Severe storms can do damage but are often the precursor for much more severe weather to follow. One example is the direct association of tornados with thunderstorms.

A severe thunderstorm watch is issued by the NWS when the weather conditions are such that damaging winds of 58 mph or more, or hail 3/4 of an inch in diameter or greater, are likely to develop. Citizens should locate a safe place in the home and tell family members to watch the sky and monitor their phone, radio, or television for more information. A severe thunderstorm warning is issued when a severe thunderstorm has been sighted or indicated by weather radar. At this point, danger is imminent, and citizens should move to a safe place, turn on a battery-operated radio or television, and wait for the "all clear" by the authorities.

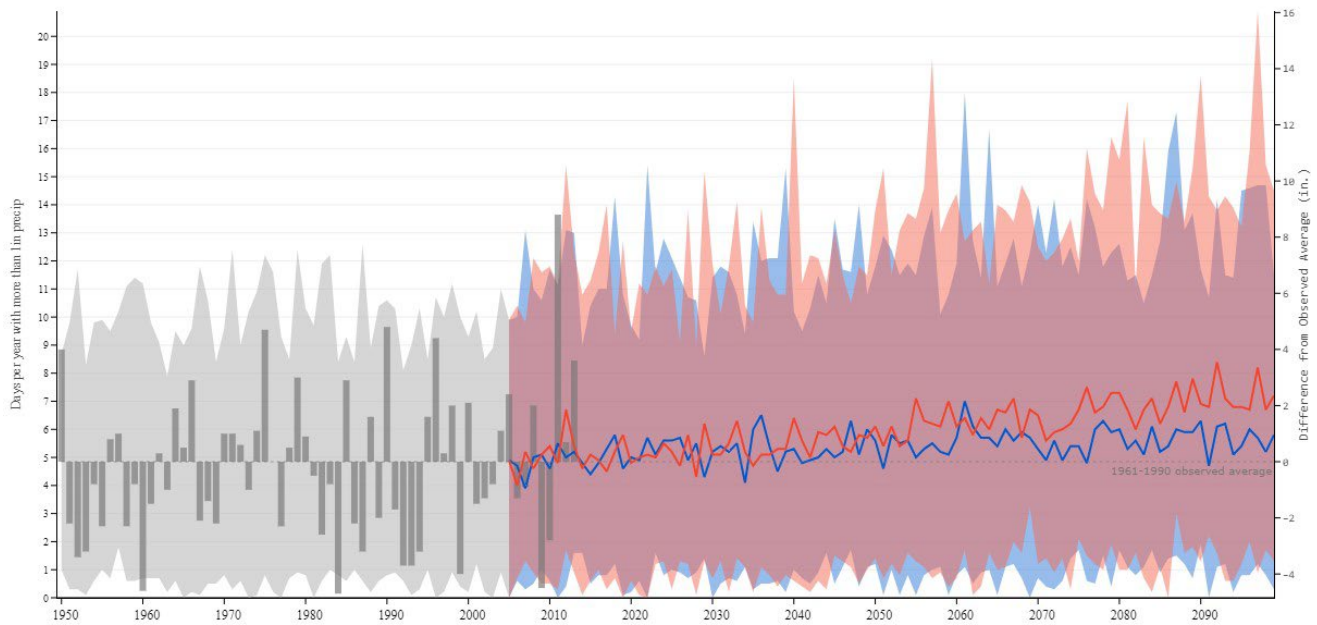
Severe storms are also associated with other hazards such as tornadoes and severe flooding. Since tornadoes and flash flooding are spawned by thunderstorms, people should review what action to take under a tornado warning or a flash flood warning when a "severe thunderstorm warning" is issued. When thunderstorms are forecasted to bring heavy rains (which can cause flash flooding), strong winds, hail, lightning and tornadoes, people should get inside a sturdy building and stay tuned to a battery-operated radio for weather information. People should also be aware that lightning and high winds are also major threats during thunderstorms.

Climate Change Impact

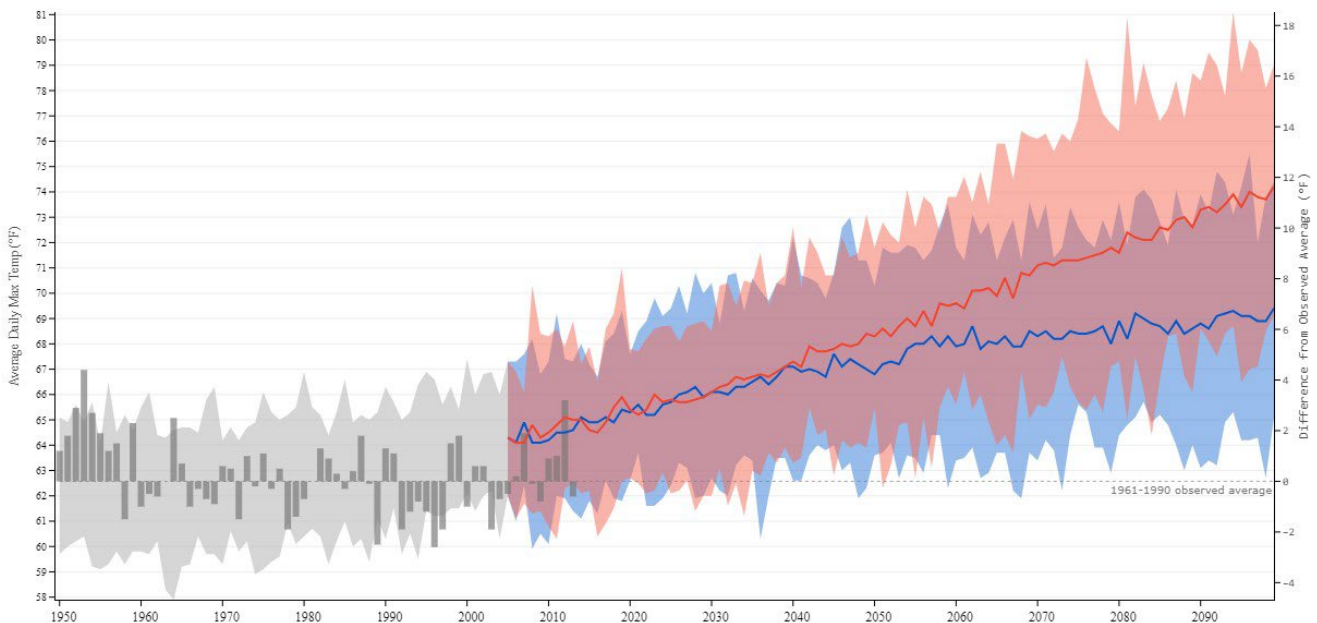
Based on the US Climate Resilience Toolkit, Mahoning County is expected to see an increase in the number of hot weather days and fewer days of rain, but with greater annual precipitation. The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Annual Days > 90°F	6	23	26
Annual Days > 95°F	1	5	7
Annual Days > 100°F	0	1	1
Annual days with temperature below 32 degrees	33	24	23
Avg. annual total precipitation	37"	38"	39"
Days with precipitation	211	207	207

The impact of this will be slightly more intense summer storms with more potential rain and flooding during some events. The increase in heat may also intensify storm conditions.



Data provided from the Ohio EMA shows the increase in average days of rain of more than 1 inch.



Data provided from the Ohio EMA showing the projected increase in average daily temperature, showing an overall increase in average daily temperatures over the next 70 years.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Thunderstorms	N/A	N/A	N/A	N/A	N/A	N/A
Hail	58.9	1986-2021	4.8	Relatively Low/58.9	\$70,607/\$25,366	0.0
Lightning	95.6	1991-2012	55.1	Relatively High/95.6	\$3,414/NA	.09

2.10.2 Historical Occurrences

NCEI data records Thunderstorm Wind events, Hail, and Lightning events. The data for each of these hazards covers 1950 to 2023.

Thunderstorm Wind

245 Thunderstorm Wind events are recorded in the NCEI database, which resulted in \$4.5M in damage, One (1) death and 15 injuries. 154 of these events that caused some damage, many within \$1,000 to \$10,000. Events resulting in over \$50,000 in damage or a death or injury are summarized below. If a location is included in the NCEI data, it is recorded here.

- 6/18/1984 resulted in one (1) death and eight (8) injuries (50kts).
- 8/31/1993 resulted in \$50,000 in damages in Sebring.
- 7/16/1996 resulted in \$100,000 in damages in Goshen Twp (60 kts).
- 7/21/1998 resulted in \$50,000 in damages to the central portion of the county.
- 7/09/1999 resulted in \$75,000 in damages and one (1) injury.
- 10/13/1999 resulted in \$60,000 in damages and six (6) injuries.
- 1/10/2000 resulted in \$50,000 in damages in Youngstown.
- 7/08/2003 resulted in \$100,000 in damages in Canfield (50 kts).
- 7/27/2003 resulted in \$110,000 in damages in Austintown (50 kts).
- 8/26/2003 resulted in \$50,000 in damages in Boardman (50 kts).
- 5/21/2004 resulted in \$300,000 in damages (52kts).
- 6/02/2007 resulted in \$50,000 in damages in Youngstown (50 kts).
- 6/08/2007 resulted in \$100,000 in damages in Austintown (50 kts).
- 7/22/2008 resulted in \$50,000 in damages in Cambell (50kts).
- 7/22/2011 resulted in \$50,000 in damages in Youngstown (50 kts).
- 5/29/2012 resulted in \$200,000 in damages in Canfield (50 kts).
- 7/18/2012 resulted in \$75,000 in damages in Berlin Center (50 kts).
- 6/11/2015 resulted in \$250,000 in damages in Canfield (50 kts).
- 4/30/2017 resulted in \$500,000 in damages in Boardman (61 kts).
- 5/01/2017 resulted in \$150,000 in damages in Boardman (70 kts).
- 5/01/2017 resulted in \$250,000 in damages in Struthers (50 kts).
- 11/05/2017 resulted in \$500,000 in damages in Southern Airways ARP (83 kts).

Overall, the total of NCEI recorded 245 thunderstorm wind events over 73 years (1950 to 2023) equates to a frequency of 3.36 events per year. NRI has no thunderstorm data for comparison.

Hail

Hail events are recorded in the NCEI database, which resulted in \$5.325M in damages and no deaths or injuries. 15 of these events caused some damage, with most under \$5,000. Two (2) events are worth noting. If a location is included in the NCEI data, it is recorded here.

9/25/1994 resulted in \$5M in property damage in the southern portion of the County (1.75-inch hail).

6/08/2007 resulted in \$250,000 in property damage in West Austintown (1.5-inch hail).

Overall, the total of NCEI recorded 74 hail events over 73 years (1950 to 2023) equates to a frequency of about one (1) per year. NRI records indicate 4.8 hail events per year. This difference may be attributed to the NRI data covering 1986 to 2021 (35 most recent years). This would suggest that hail events are occurring more frequently.

Lightning

Only three (3) Lightning events are recorded in the NCEI database from 8/1/1950 to 7/31/2023. These events resulted in \$30,000 in damages and two (2) deaths and three (3) injuries. These include:

- 6/12/1996 event causing no damage but one (1) death and two (2) injuries in Ellsworth Township.
- 4/16/1998 event causing \$30,000 in damage in Youngstown.
- 6/08/2007 event causing no damage but one (1) death in North Lima.

These three (3) limited events over 73 years (1950 to 2023), a frequency of 0.04 events per year, are in great contrast to the NRI data base which recorded 1,212 lightning events over 21 years from 1991 to 2012, or 57.7 events per year. Based on other Ohio county lightning event records, we believe that the NRI data is more accurate.

2.10.3 Frequency/Probability of Future Occurrence

There is a low annual frequency risk correlation between NCEI data and the NRI data.

This may be the result of the high number of lightning events reported in NRI vs NCEI and the shorter time span of the NRI data. Based on the limited NCEI data, the NRI projections of frequency and probability are likely more accurate.

2.10.4 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Thunderstorms	NA	NA	N/A	N/A	N/A	N/A
Hail	4.8/yr.	\$ 131,978	\$70,607	\$25,366	\$ 0	0
Lightning	55.1/yr.	\$ 1,081,672	\$ 3,414	N/A	\$1,078,258	0.09

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Agriculture Value
Thunderstorms	NA	NA	NA
Hail	\$1/\$684.39k	1/73.64m	\$1/3.10k
Lightning	\$1/14.15m	1/24.97m	NA

MAHONING COUNTY NRI HAIL EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099812900	\$1,198,191,752	4101	\$11,961,404	\$ 1,911	\$ 709	\$ 4,004	\$ 6,624
39099813300	\$ 1,049,911,713	3101	\$10,878,953	\$ 1,675	\$ 536	\$ 3,642	\$ 5,853
39099813000	\$ 1,246,856,314	4117	\$ 8,416,109	\$ 1,989	\$ 711	\$ 2,817	\$ 5,518
39099813400	\$ 1,061,243,740	3420	\$ 9,542,842	\$ 1,693	\$ 591	\$ 3,195	\$ 5,478
39099813502	\$ 1,090,574,664	4058	\$ 7,338,374	\$ 1,670	\$ 669	\$ 2,383	\$ 4,723
39099811002	\$ 1,488,462,348	7506	\$ 2,025,183	\$ 2,107	\$ 1,151	\$ 602	\$ 3,859
39099813601	\$ 1,090,328,952	5839	\$ 4,117,638	\$ 1,543	\$ 895	\$ 1,223	\$ 3,662
39099812102	\$ 1,190,460,182	4231	\$ 3,021,010	\$ 1,894	\$ 728	\$ 1,009	\$ 3,631
39099812200	\$ 1,477,856,673	6570	\$ 116,928	\$ 2,358	\$ 1,135	\$ 39	\$ 3,532
39099812101	\$ 1,414,799,349	6143	\$ 393,762	\$ 2,210	\$ 1,037	\$ 131	\$ 3,378
39099812001	\$ 1,598,232,043	5622	\$ 4,438	\$ 2,413	\$ 941	\$ 1	\$ 3,356
39099812700	\$ 1,030,072,005	2124	\$ 5,037,105	\$ 1,479	\$ 333	\$ 1,534	\$ 3,346
39099814000	\$ 2,006,283,704	2908	\$ 23,308	\$ 2,859	\$ 449	\$ 7	\$ 3,315
39099812800	\$ 965,124,425	3560	\$ 3,807,092	\$ 1,415	\$ 561	\$ 1,181	\$ 3,156
39099812500	\$ 1,504,735,737	4952	\$ 223,202	\$ 2,147	\$ 765	\$ 67	\$ 2,979
39099813602	\$ 670,841,406	2468	\$ 5,452,866	\$ 950	\$ 378	\$ 1,620	\$ 2,948
39099813501	\$ 1,053,906,557	3537	\$ 1,593,992	\$ 1,541	\$ 565	\$ 508	\$ 2,614
39099811902	\$ 1,303,296,697	3292	\$ 37,840	\$ 1,845	\$ 505	\$ 11	\$ 2,361
39099811500	\$ 747,828,672	5824	\$ 6,541	\$ 1,137	\$ 951	\$ 2	\$ 2,090
39099812302	\$ 761,039,925	6482	\$ -	\$ 1,086	\$ 1,001	\$ -	\$ 2,087
39099811901	\$ 1,000,875,300	4289	\$ -	\$ 1,417	\$ 657	\$ -	\$ 2,074
39099813200	\$ 750,024,956	4171	\$ 137,217	\$ 1,196	\$ 721	\$ 46	\$ 1,963
39099812002	\$ 668,173,203	3882	\$ 485,554	\$ 1,066	\$ 671	\$ 163	\$ 1,899
39099812604	\$ 792,565,362	4884	\$ 44,319	\$ 1,131	\$ 755	\$ 13	\$ 1,899
39099813700	\$ 957,127,710	3506	\$ 23,859	\$ 1,337	\$ 532	\$ 7	\$,876
39099812400	\$ 950,774,743	2742	\$ 12,069	\$ 1,356	\$ 424	\$ 4	\$ 1,784
39099810900	\$ 525,611,318	2021	\$ 2,545,599	\$ 719	\$ 299	\$ 731	\$ 1,749
39099812601	\$ 684,583,548	4745	\$ 468	\$ 977	\$ 733	\$ 0	\$ 1,710
39099810700	\$ 667,920,009	5233	\$ 3,001	\$ 915	\$ 776	\$ 1	\$ 1,692
39099812602	\$ 569,453,727	5212	\$ -	\$ 812	\$ 805	\$ -	\$ 1,618
39099811600	\$ 606,285,014	3479	\$ -	\$ 967	\$ 601	\$ -	\$ 1,567
39099811001	\$ 574,122,895	4002	\$ 375,161	\$ 807	\$ 608	\$ 110	\$ 1,525

Mahoning County Hazard Mitigation Plan 2024-2028

39099814100	\$ 766,588,892	2303	\$ 69,976	\$ 1,094	\$ 356	\$ 21	\$ 1,470
39099812605	\$ 532,541,726	3134	\$ 556,094	\$ 760	\$ 484	\$ 166	\$ 1,410
39099810100	\$ 524,443,884	4213	\$ 10,278	\$ 717	\$ 624	\$ 3	\$ 1,345
39099812301	\$ 466,039,372	3888	\$ -	\$ 665	\$ 601	\$ -	\$ 1,266
39099811301	\$ 433,696,834	4199	\$ -	\$ 604	\$ 634	\$ -	\$ 1,239
39099811302	\$ 668,444,129	2139	\$ -	\$ 916	\$ 318	\$ -	\$ 1,233
39099802701	\$ 471,455,533	3232	\$ -	\$ 673	\$ 499	\$ -	\$ 1,172
39099811200	\$ 567,925,899	2393	\$ 702	\$ 804	\$ 367	\$ 0	\$ 1,171
39099810600	\$ 494,813,030	2784	\$ 27,532	\$ 677	\$ 412	\$ 8	\$ 1,097
39099811700	\$ 395,152,616	2622	\$ -	\$ 629	\$ 452	\$ -	\$ 1,081
39099801000	\$ 631,089,035	1467	\$ -	\$ 864	\$ 217	\$ -	\$ 1,081
39099811400	\$ 407,781,283	3218	\$ 702	\$ 582	\$ 497	\$ 0	\$ 1,079
39099810200	\$ 556,338,737	1974	\$ 47,300	\$ 761	\$ 292	\$ 14	\$ 1,067
39099802800	\$ 450,052,033	2665	\$ 2,570	\$ 642	\$ 412	\$ 1	\$ 1,055
39099813900	\$ 532,730,116	1571	\$ -	\$ 760	\$ 243	\$ -	\$ 1,003
39099802702	\$ 370,099,686	2818	\$ 468	\$ 528	\$ 435	\$ 0	\$ 964
39099813800	\$ 338,625,705	3024	\$ 165,108	\$ 463	\$ 448	\$ 47	\$ 959
39099804000	\$ 448,672,200	2080	\$ -	\$ 632	\$ 321	\$ -	\$ 952
39099802400	\$ 386,591,129	2531	\$ -	\$ 552	\$ 391	\$ -	\$ 943
39099801600	\$ 410,614,070	2336	\$ -	\$ 578	\$ 354	\$ -	\$ 932
39099804200	\$ 335,679,127	1934	\$ -	\$ 479	\$ 299	\$ -	\$ 778
39099802900	\$ 298,621,097	2233	\$ -	\$ 426	\$ 345	\$ -	\$ 771
39099810800	\$ 323,601,600	2046	\$ 18,575	\$ 443	\$ 303	\$ 5	\$ 751
39099801100	\$ 293,764,858	2335	\$ -	\$ 402	\$ 346	\$ -	\$ 748
39099811800	\$ 285,215,746	1629	\$ -	\$ 440	\$ 273	\$ -	\$ 713
39099814200	\$ 288,463,682	1722	\$ 123,987	\$ 395	\$ 255	\$ 36	\$ 685
39099801300	\$ 263,454,268	2141	\$ 14,645	\$ 360	\$ 317	\$ 4	\$ 682
39099801700	\$ 369,538,032	928	\$ -	\$ 524	\$ 142	\$ -	\$ 667
39099801400	\$ 244,903,897	2104	\$ -	\$ 335	\$ 312	\$ -	\$ 647
39099801500	\$ 259,258,487	1818	\$ -	\$ 363	\$ 276	\$ -	\$ 640
39099804100	\$ 280,767,732	1300	\$ -	\$ 401	\$ 201	\$ -	\$ 601
39099800501	\$ 200,649,900	2116	\$ 17,050	\$ 274	\$ 313	\$ 5	\$ 593
39099803000	\$ 187,937,523	1875	\$ -	\$ 268	\$ 290	\$ -	\$ 558
39099810300	\$ 223,174,786	1665	\$ -	\$ 305	\$ 247	\$ -	\$ 552
39099800600	\$ 265,980,246	1194	\$ 6,073	\$ 364	\$ 177	\$ 2	\$ 543
39099802600	\$ 205,016,927	1604	\$ -	\$ 292	\$ 248	\$ -	\$ 540
39099800502	\$ 267,614,386	959	\$ 4,457	\$ 366	\$ 142	\$ 1	\$ 509
39099802500	\$ 204,306,658	1312	\$ 468	\$ 291	\$ 203	\$ 0	\$ 494
39099811100	\$ 247,323,965	996	\$ 7,295	\$ 338	\$ 148	\$ 2	\$ 488
39099804300	\$ 234,377,583	900	\$ 572	\$ 328	\$ 139	\$ 0	\$ 467
39099801200	\$ 167,738,201	1477	\$ -	\$ 229	\$ 219	\$ -	\$ 448
39099802100	\$ 186,179,016	892	\$ -	\$ 266	\$ 138	\$ -	\$ 403
39099802300	\$ 137,739,609	787	\$ -	\$ 197	\$ 122	\$ -	\$ 318
Grand Total	\$48,322,567,878	228579	\$78,699,686	\$ 70,607	\$ 36,005	\$ 25,366	\$131,978

There are no Mahoning County census tracts (CTs) facing a high risk for Hail building, agricultural, or population harm based on this NRI data.

MAHONING COUNTY NRI LIGHTNING EXPOSURE AND EXPECTED ANNUAL LOSS

Census Tract	Exposure (Buildings)	Exposure (Population)	Expected Annual Loss (Buildings)	Expected Annual Loss (Pop Equiv)	Expected Annual Loss (Total)
39099811002	\$ 1,488,462,348	7506	\$ 98	\$ 33,165	\$ 33,263
39099812200	\$ 1,477,856,673	6570	\$ 106	\$ 31,507	\$ 31,614
39099812302	\$ 761,039,925	6482	\$ 53	\$ 29,984	\$ 30,037
39099812001	\$ 1,598,232,043	5622	\$ 124	\$ 29,187	\$ 29,311
39099812101	\$ 1,414,799,349	6143	\$ 96	\$ 27,743	\$ 27,839
39099813601	\$ 1,090,328,952	5839	\$ 75	\$ 26,660	\$ 26,735
39099811500	\$ 747,828,672	5824	\$ 51	\$ 26,571	\$ 26,622
39099812602	\$ 569,453,727	5212	\$ 40	\$ 24,161	\$ 24,201
39099812604	\$ 792,565,362	4884	\$ 58	\$ 23,947	\$ 24,005
39099812500	\$ 1,504,735,737	4952	\$ 108	\$ 23,855	\$ 23,963
39099812601	\$ 684,583,548	4745	\$ 50	\$ 23,300	\$ 23,351
39099810700	\$ 667,920,009	5233	\$ 44	\$ 23,000	\$ 23,044
39099813200	\$ 750,024,956	4171	\$ 57	\$ 21,215	\$ 21,272
39099811301	\$ 433,696,834	4199	\$ 33	\$ 21,095	\$ 21,127
39099813000	\$ 1,246,856,314	4117	\$ 94	\$ 20,689	\$ 20,783
39099811901	\$ 1,000,875,300	4289	\$ 69	\$ 19,839	\$ 19,908
39099812102	\$ 1,190,460,182	4231	\$ 84	\$ 19,700	\$ 19,784
39099812900	\$ 1,198,191,752	4101	\$ 84	\$ 19,373	\$ 19,457
39099810100	\$ 524,443,884	4213	\$ 36	\$ 19,386	\$ 19,422
39099812002	\$ 668,173,203	3882	\$ 50	\$ 19,368	\$ 19,418
39099813502	\$ 1,090,574,664	4058	\$ 77	\$ 18,999	\$ 19,076
39099812301	\$ 466,039,372	3888	\$ 33	\$ 18,407	\$ 18,440
39099811600	\$ 606,285,014	3479	\$ 47	\$ 18,062	\$ 18,109
39099813501	\$ 1,053,906,557	3537	\$ 80	\$ 17,896	\$ 17,976
39099811001	\$ 574,122,895	4002	\$ 38	\$ 17,537	\$ 17,575
39099813400	\$ 1,061,243,740	3420	\$ 79	\$ 17,105	\$ 17,184
39099811400	\$ 407,781,283	3218	\$ 32	\$ 16,695	\$ 16,727
39099812800	\$ 965,124,425	3560	\$ 66	\$ 16,155	\$ 16,221
39099813700	\$ 957,127,710	3506	\$ 66	\$ 16,061	\$ 16,126
39099811902	\$ 1,303,296,697	3292	\$ 93	\$ 15,675	\$ 15,768
39099813300	\$ 1,049,911,713	3101	\$ 78	\$ 15,427	\$ 15,505
39099802701	\$ 471,455,533	3232	\$ 32	\$ 14,752	\$ 14,784
39099812605	\$ 532,541,726	3134	\$ 37	\$ 14,695	\$ 14,732
39099813800	\$ 338,625,705	3024	\$ 24	\$ 14,024	\$ 14,048

Mahoning County Hazard Mitigation Plan 2024-2028

39099811700	\$ 395,152,616	2622	\$ 31	\$ 13,609	\$ 13,640
39099814000	\$ 2,006,283,704	2908	\$ 138	\$ 13,365	\$ 13,503
39099812400	\$ 950,774,743	2742	\$ 68	\$ 13,210	\$ 13,278
39099802702	\$ 370,099,686	2818	\$ 26	\$ 13,186	\$ 13,211
39099802800	\$ 450,052,033	2665	\$ 32	\$ 12,482	\$ 12,514
39099810600	\$ 494,813,030	2784	\$ 33	\$ 12,465	\$ 12,498
39099802400	\$ 386,591,129	2531	\$ 28	\$ 12,197	\$ 12,225
39099813602	\$ 670,841,406	2468	\$ 46	\$ 11,273	\$ 11,319
39099801600	\$ 410,614,070	2336	\$ 29	\$ 10,987	\$ 11,016
39099814100	\$ 766,588,892	2303	\$ 54	\$ 10,927	\$ 10,981
39099801100	\$ 293,764,858	2335	\$ 20	\$ 10,757	\$ 10,777
39099811200	\$ 567,925,899	2393	\$ 38	\$ 10,705	\$ 10,743
39099802900	\$ 298,621,097	2233	\$ 21	\$ 10,526	\$ 10,547
39099800501	\$ 200,649,900	2116	\$ 14	\$ 10,015	\$ 10,029
39099812700	\$ 1,030,072,005	2124	\$ 71	\$ 9,659	\$ 9,730
39099811302	\$ 668,444,129	2139	\$ 46	\$ 9,591	\$ 9,638
39099801300	\$ 263,454,268	2141	\$ 18	\$ 9,601	\$ 9,619
39099804000	\$ 448,672,200	2080	\$ 31	\$ 9,515	\$ 9,545
39099801500	\$ 259,258,487	1818	\$ 20	\$ 9,432	\$ 9,452
39099810900	\$ 525,611,318	2021	\$ 36	\$ 9,374	\$ 9,410
39099801400	\$ 244,903,897	2104	\$ 16	\$ 9,327	\$ 9,343
39099810800	\$ 323,601,600	2046	\$ 22	\$ 9,023	\$ 9,045
39099803000	\$ 187,937,523	1875	\$ 13	\$ 8,899	\$ 8,913
39099810200	\$ 556,338,737	1974	\$ 37	\$ 8,852	\$ 8,889
39099804200	\$ 335,679,127	1934	\$ 23	\$ 8,847	\$ 8,870
39099811800	\$ 285,215,746	1629	\$ 22	\$ 8,452	\$ 8,475
39099814200	\$ 288,463,682	1722	\$ 21	\$ 8,219	\$ 8,240
39099810300	\$ 223,174,786	1665	\$ 15	\$ 7,641	\$ 7,656
39099802600	\$ 205,016,927	1604	\$ 14	\$ 7,506	\$ 7,520
39099813900	\$ 532,730,116	1571	\$ 37	\$ 7,281	\$ 7,318
39099801000	\$ 631,089,035	1467	\$ 43	\$ 6,765	\$ 6,809
39099801200	\$ 167,738,201	1477	\$ 11	\$ 6,623	\$ 6,635
39099802500	\$ 204,306,658	1312	\$ 14	\$ 6,088	\$ 6,102
39099804100	\$ 280,767,732	1300	\$ 19	\$ 5,947	\$ 5,966
39099800600	\$ 265,980,246	1194	\$ 19	\$ 5,672	\$ 5,691
39099811100	\$ 247,323,965	996	\$ 16	\$ 4,417	\$ 4,433
39099800502	\$ 267,614,386	959	\$ 18	\$ 4,381	\$ 4,399
39099801700	\$ 369,538,032	928	\$ 26	\$ 4,303	\$ 4,329
39099802100	\$ 186,179,016	892	\$ 13	\$ 4,136	\$ 4,149
39099804300	\$ 234,377,583	900	\$ 16	\$ 4,117	\$ 4,133
39099802300	\$ 137,739,609	787	\$ 10	\$ 3,649	\$ 3,659
Grand Total	\$48,322,567,878	228579	\$ 3,414	\$ 1,078,258	\$ 1,081,672

There are no Mahoning County census tracts (CTs) facing a high risk for Lightning caused building, agricultural, or population harm based on this NRI data.

2.11 Tornadoes

2.11.1 Extent

A tornado is a violent rotating column of air, in contact with the ground, either pendant from a cumuliform cloud or underneath a cumuliform cloud, and often (but not always) visible as a funnel cloud. Tornadoes are produced from the energy released during a thunderstorm, but account for only a tiny fraction of the overall energy generated. What makes them particularly dangerous is that the energy is concentrated in a small area, perhaps only 100 yards across. Not all tornadoes are the same and science does not yet completely understand how a portion of a thunderstorm's energy becomes focused into something as small as a tornado.

Tornadoes occur mostly in the central plains of North America, east of the Rocky Mountains and west of the Appalachian Mountains. They occur primarily during the spring and summer – the tornado season comes early in the south and later in the north according to the seasonal changes in relation to latitude – usually during the late afternoon and early evening. They have been known to occur in every state in the United States and every continent on the earth, any day of the year, and at any hour.

The damaging strong winds generated from tornadoes can reach 300 mph in the most violent tornadoes, causing automobiles to become airborne, ripping ordinary homes to shreds, and turning broken glass and other debris into lethal missiles. The biggest threat to living creatures, including humans, during tornadoes is flying debris and being tossed about in the wind. Contrary to previous belief, it is not true that the pressure in a tornado contributes to damage by making buildings "explode". According to the NWS, the development of Doppler radar has made it possible, under certain circumstances, to detect tornado winds with radar. However, spotters remain an important part of the system to detect tornadoes, because not all tornadoes occur in situations where the radar can "see" them. Citizen volunteers comprise what is called the SKYWARN (www.skywarn.org) network of storm spotters, who work with their local communities to watch out for approaching tornadoes to ensure that appropriate action is taken during tornado events. Spotter information is relayed to the NWS, who operates the Doppler radars and issues warnings, usually relayed to the public by radio and TV, for communities ahead of the storms. The NWS utilizes all the information they can obtain from weather maps, modern weather radars, storm spotters, monitoring power line breaks, as well as additional sources for issuing tornado warnings.

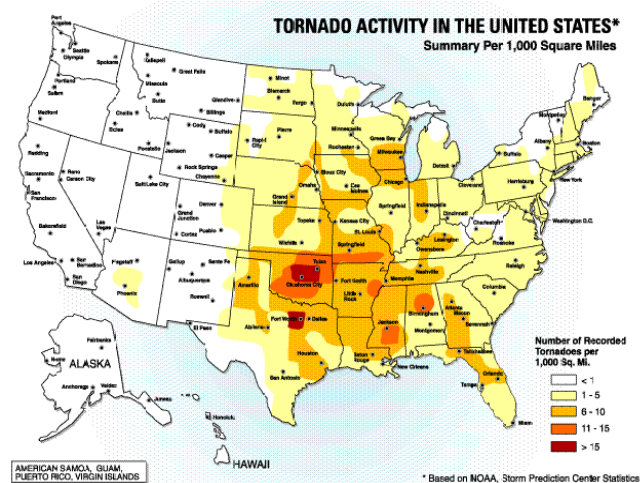


Figure 1.1 The number of tornadoes recorded per 1,000 square miles

Based on NOAA (National Oceanic Atmospheric Association) Storm Prediction Center Statistics

Although the process by which tornadoes form is not completely understood, scientific research has revealed that tornadoes usually form under certain types of atmospheric conditions. Those conditions can be predicted, but it is not yet possible to predict in advance exactly when and where they will develop, how strong they will be, or precisely what path they will follow. According to the NWS, there are some "surprises" every year, when tornadoes form in situations that do not look like the right conditions in advance, but these are becoming less frequent. Once a tornado is formed and has been

detected, warnings can be issued based on the path of the storm producing the tornado, but even these cannot be perfectly precise regarding who will, or will not, be struck.

Climate Change Impact:

Based on the US Climate Resilience Toolkit, Mahoning County is expected to see an increase in the number of hot weather days and fewer days of rain, but with greater annual precipitation. The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Annual Days > 90°F	6	23	26
Annual Days > 95°F	1	5	7
Annual Days > 100°F	0	1	1
Avg. annual total precipitation	37"	38"	39"
Days with precipitation	211	207	207

The impact of this will be additional energy in the atmosphere which may result in slightly more frequent and intense tornadoes. Although the number of tornadoes in Ohio does not rank high compared to other states in the United States, the State does average around 14 tornadoes a year. Ohio's peak tornado season runs from April through July, with most tornadoes occurring between 2 p.m. and 10 p.m. Even though June has been the month with the most tornado occurrences, many of the State's major tornado outbreaks have taken place in April and May. However, history has shown that tornadoes can occur during any month of the year and at any time of the day or night.

Tornadoes are considered the most violent atmospheric phenomenon on the face of the earth with their strength being measured by the Enhanced Fujita (EF) Scale, shown below. This scale is the mechanism used to determine the potential type of tornado that may have affected a particular community. It is based on velocity of wind and the type of damage the tornado caused. Many EF0 and EF1 tornadoes have touched down in Ohio, but Ohio has also been struck by some of the most destructive (EF5) tornadoes ever, including the April 3, 1974 tornado which devastated Xenia, killing over 30 people and destroying 2,000 buildings.

Enhance Fujita (EF) Scale for Tornadoes

Scale	Wind Speed	Typical Damage
EF-0 Light	65-85 mph	Light Damage: Some chimneys damaged, twigs and branches broken off trees, shallow-rooted trees pushed over, signboards damages, some windows broken.
EF-1 Moderate	86-110 mph	Moderate Damage: Surface of roofs peeled off, mobile homes pushed off foundations or overturned, outbuildings demolished, moving autos pushed off the roads, trees snapped or broken; beginning of hurricane speed winds.
EF-2 Strong	111-135 mph	Considerable Damage: Roofs torn off frame houses, mobile homes demolished, frame houses with weak foundations lifted and moved, large trees snapped or uprooted, light-object missiles generated.
EF-3 Severe	136-165 mph	Severe Damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forecast

		uprooted, heavy cars lifted off the ground and thrown, weak pavement blown off the roads.
EF-4 Violent	166-200 mph	Devastating Damage: Well-constructed houses leveled, structures with weak foundations blown off the distance, cars thrown and disintegrated, trees in forest uprooted and carried some distance away.
EF-5 Violent	+200 mph	Incredible Damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate, automobile-sized missiles fly through the air in excess of 300 feet, trees debarked, incredible phenomena will occur.

15 tornadoes were recorded in Mahoning County from 1972 to 2022, according to the NCEI. 13 of the 15 events caused property damage. These tornadoes caused \$5.432 million worth of property damage with 3 reported deaths and 15 injuries. This data is included in *Appendix F*.

2.11.2 Historic Occurrence

On average, tornadoes occur in the County every five (5) years (15 events over 50 years). More significant events include:

- 3/1/1955 with a magnitude of F3 resulting in \$250,000 worth of property damage, with 1 death and 6 injuries.
- 3/22/1955 with a magnitude of F1 resulting in \$0 worth of property damage with 3 injuries.
- 8/5/1956 with a magnitude of F3 resulting in \$250,000 worth of property damage with 2 deaths.
- 4/16/1963 with a magnitude of F2 resulting in \$250,000 worth of property damage.
- 2/16/1976 with a magnitude of F2 resulting in \$250,000 worth of property damage.
- 6/22/1981 with a magnitude of F1 resulting in \$2.5M worth of property damage and 6 injuries.
- 06/27/1987 with a magnitude of F2 resulting in \$250,000 worth of property damage.
- 7/9/1999 with a magnitude of F1 resulting in \$150,000 worth of property damage (N. Jackson).
- 4/9/2021 with a magnitude of F2 resulting in \$200,000 worth of property damage (Lowellville).
- 7/21/2003 with a magnitude of F1 resulting in \$1M worth of property damage (Youngstown).
- 7/8/2014 with a magnitude of EF1 resulting in \$250,000 worth of property damage (Ellsworth).

2.11.3 Frequency/Probability of Future Occurrence

The probability of future occurrences is moderate, and the likelihood of severe damage based on past events is moderate. One reason that the County would not expect to suffer severe damage is because most of the County is sparsely populated. The County is more affected by straight-line winds, which are not categorized as a tornadic event, but can do just as much damage. The likelihood of a future tornado is 30% (15 events / 50 years) in any one year, or about one (1) event every three (3) years.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Tornado	Relatively Moderate/ 89.1	1950-2021	0.20	Relatively Moderate/89.1	\$2.87M/\$1,399	0.25

There is a good annual frequency risk correlation between NCEI data (.33) and the NRI data (.20).

2.11.4 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Tornado	0.20	\$5,757,877	\$2,865,534	\$1,399	\$2,890,944	0.25

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Agriculture Value
Tornado	\$1/\$16.86k	1/917.18k	\$1/\$56.26k

MAHONING COUNTY NRI TORNADO EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	Expected Annual Loss (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099814000	\$2,006,283,704	2908	\$ 23,308	\$ 135,640	\$ 44,626	\$ 0	\$ 180,266
39099812500	\$1,504,735,737	4952	\$ 223,202	\$ 102,000	\$ 76,302	\$ 4	\$ 178,306
39099812302	\$ 761,039,925	6482	\$ -	\$ 51,586	\$ 99,876	\$ -	\$ 151,462
39099811002	\$1,488,462,348	7506	\$ 2,025,183	\$ 76,657	\$ 72,428	\$ 38	\$ 149,122
39099812101	\$1,414,799,349	6143	\$ 393,762	\$ 77,857	\$ 67,128	\$ 7	\$ 144,992
39099812200	\$1,477,856,673	6570	\$ 116,928	\$ 76,692	\$ 63,562	\$ 2	\$ 140,256
39099812001	\$1,598,232,043	5622	\$ 4,438	\$ 82,627	\$ 54,350	\$ 0	\$ 136,978
39099812604	\$ 792,565,362	4884	\$ 44,319	\$ 53,728	\$ 75,255	\$ 1	\$ 128,984
39099812601	\$ 684,583,548	4745	\$ 468	\$ 46,403	\$ 73,112	\$ 0	\$ 119,515
39099812602	\$ 569,453,727	5212	\$ -	\$ 38,600	\$ 80,307	\$ -	\$ 118,907
39099811500	\$ 747,828,672	5824	\$ 6,541	\$ 44,081	\$ 73,568	\$ 0	\$ 117,650
39099812800	\$ 965,124,425	3560	\$ 3,807,092	\$ 61,859	\$ 51,406	\$ 67	\$ 113,332
39099813700	\$ 957,127,710	3506	\$ 23,859	\$ 61,803	\$ 50,927	\$ 0	\$ 112,731
39099813601	\$1,090,328,952	5839	\$ 4,117,638	\$ 56,190	\$ 56,352	\$ 74	\$ 112,616
39099810700	\$ 667,920,009	5233	\$ 3,001	\$ 40,814	\$ 69,736	\$ 0	\$ 110,551

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39099812400	\$ 950,774,743	2742	\$ 12,069	\$ 64,449	\$ 42,249	\$ 0	\$ 106,698
39099813000	\$1,246,856,314	4117	\$ 8,416,109	\$ 64,754	\$ 39,836	\$ 151	\$ 104,741
39099812102	\$1,190,460,182	4231	\$ 3,021,010	\$ 62,339	\$ 41,820	\$ 54	\$ 104,213
39099812900	\$1,198,191,752	4101	\$11,961,404	\$ 62,243	\$ 39,685	\$ 216	\$ 102,144
39099812700	\$1,030,072,005	2124	\$ 5,037,105	\$ 68,931	\$ 31,282	\$ 87	\$ 100,299
39099811902	\$ 1,303,296,697	3292	\$ 37,840	\$ 67,115	\$ 31,767	\$ 1	\$ 98,882
39099813502	\$1,090,574,664	4058	\$ 7,338,374	\$ 56,476	\$ 39,226	\$ 129	\$ 95,831
39099811901	\$1,000,875,300	4289	\$ -	\$ 51,538	\$ 41,384	\$ -	\$ 92,922
39099812301	\$ 466,039,372	3888	\$ -	\$ 31,590	\$ 59,907	\$ -	\$ 91,497
39099810100	\$ 524,443,884	4213	\$ 10,278	\$ 32,230	\$ 56,584	\$ 0	\$ 88,815
39099813501	\$1,053,906,557	3537	\$ 1,593,992	\$ 54,418	\$ 34,163	\$ 28	\$ 88,609
39099813400	\$1,061,243,740	3420	\$ 9,542,842	\$ 55,132	\$ 33,096	\$ 172	\$ 88,399
39099814100	\$ 766,588,892	2303	\$ 69,976	\$ 51,963	\$ 35,485	\$ 1	\$ 87,449
39099813300	\$1,049,911,713	3101	\$10,878,953	\$ 54,523	\$ 30,008	\$ 194	\$ 84,725
39099812605	\$ 532,541,726	3134	\$ 556,094	\$ 36,100	\$ 48,290	\$ 9	\$ 84,399
39099802701	\$ 471,455,533	3232	\$ -	\$ 31,957	\$ 49,799	\$ -	\$ 81,756
39099813200	\$ 750,024,956	4171	\$ 137,217	\$ 8,919	\$ 40,352	\$ 2	\$ 79,273
39099811301	\$ 433,696,834	4199	\$ -	\$ 25,589	\$ 51,896	\$ -	\$ 77,485
39099811400	\$ 407,781,283	3218	\$ 702	\$ 27,633	\$ 49,559	\$ 0	\$ 77,192
39099811001	\$ 574,122,895	4002	\$ 375,161	\$ 30,850	\$ 42,288	\$ 7	\$ 73,144
39099812002	\$ 668,173,203	3882	\$ 485,554	\$ 34,675	\$ 37,558	\$ 9	\$ 72,241
39099802800	\$ 450,052,033	2665	\$ 2,570	\$ 30,506	\$ 41,063	\$ 0	\$ 71,569
39099811302	\$ 668,444,129	2139	\$ -	\$ 40,851	\$ 28,210	\$ -	\$ 69,060
39099802702	\$ 370,099,686	2818	\$ 468	\$ 25,087	\$ 43,420	\$ 0	\$ 68,507
39099810600	\$ 494,813,030	2784	\$ 27,532	\$ 30,409	\$ 37,391	\$ 0	\$ 67,801
39099811600	\$ 606,285,014	3479	\$ -	\$ 31,508	\$ 33,825	\$ -	\$ 65,333
39099802400	\$ 386,591,129	2531	\$ -	\$ 26,205	\$ 38,998	\$ -	\$ 65,203
39099813800	\$ 338,625,705	3024	\$ 165,108	\$ 20,811	\$ 40,615	\$ 3	\$ 61,429
39099804000	\$ 448,672,200	2080	\$ -	\$ 29,515	\$ 31,791	\$ -	\$ 61,307
39099801600	\$ 410,614,070	2336	\$ -	\$ 27,012	\$ 33,889	\$ -	\$ 60,902
39099810200	\$ 556,338,737	1974	\$ 47,300	\$ 34,191	\$ 26,512	\$ 1	\$ 60,704
39099813900	\$ 532,730,116	1571	\$ -	\$ 36,110	\$ 24,206	\$ -	\$ 60,317
39099810900	\$ 525,611,318	2021	\$ 2,545,599	\$ 32,347	\$ 27,147	\$ 43	\$ 59,537
39099801000	\$ 631,089,035	1467	\$ -	\$ 38,801	\$ 19,706	\$ -	\$ 58,507
39099813602	\$ 670,841,406	2468	\$ 5,452,866	\$ 34,574	\$ 23,820	\$ 95	\$ 58,489
39099802900	\$ 298,621,097	2233	\$ -	\$ 20,242	\$ 34,406	\$ -	\$ 54,648
39099804200	\$ 335,679,127	1934	\$ -	\$ 22,754	\$ 29,799	\$ -	\$ 52,553
39099811200	\$ 567,925,899	2393	\$ 702	\$ 29,241	\$ 23,089	\$ 0	\$ 52,331
39099801100	\$ 293,764,858	2335	\$ -	\$ 18,054	\$ 31,361	\$ -	\$ 49,415
39099810800	\$ 323,601,600	2046	\$ 18,575	\$ 19,870	\$ 27,422	\$ 0	\$ 47,293
39099811700	\$ 395,152,616	2622	\$ -	\$ 20,644	\$ 25,539	\$ -	\$ 46,183
39099801300	\$ 263,454,268	2141	\$ 14,645	\$ 16,191	\$ 28,755	\$ 0	\$ 44,947
39099801500	\$ 259,258,487	1818	\$ -	\$ 16,885	\$ 26,503	\$ -	\$ 43,388
39099801400	\$ 244,903,897	2104	\$ -	\$ 15,051	\$ 28,258	\$ -	\$ 43,309

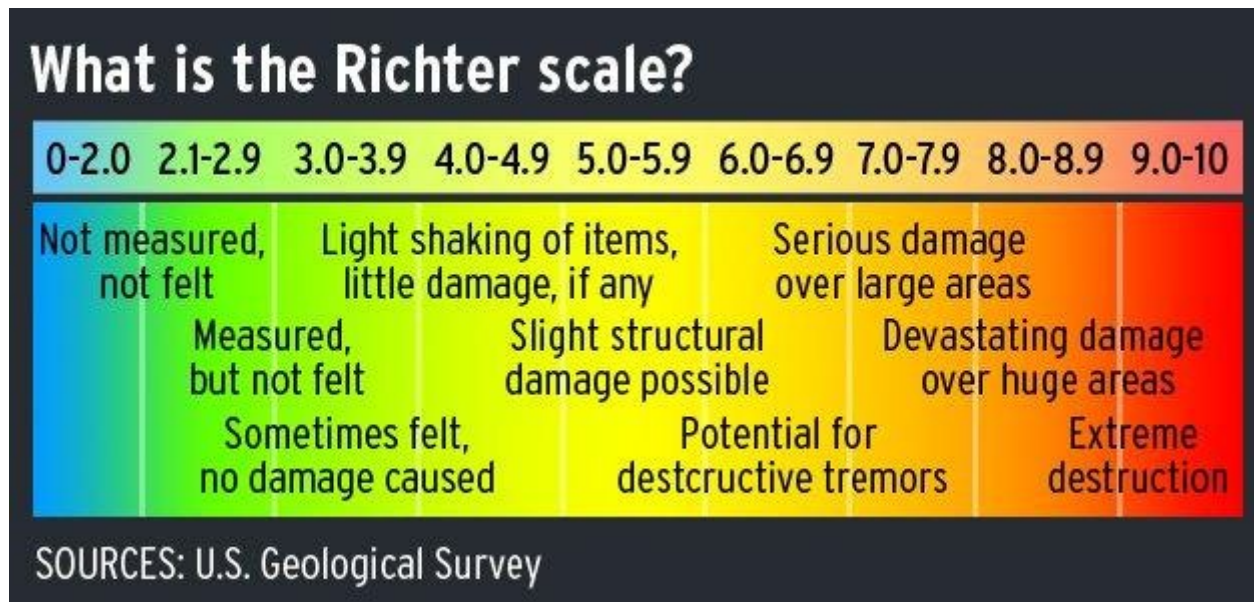
39099803000	\$ 187,937,523	1875	\$ -	\$ 12,739	\$ 28,890	\$ -	\$ 41,629
39099814200	\$ 288,463,682	1722	\$ 123,987	\$ 17,728	\$ 23,128	\$ 2	\$ 40,858
39099800501	\$ 200,649,900	2116	\$ 17,050	\$ 12,331	\$ 28,420	\$ 0	\$ 40,751
39099804100	\$ 280,767,732	1300	\$ -	\$ 19,031	\$ 20,031	\$ -	\$ 39,062
39099801700	\$ 369,538,032	928	\$ -	\$ 24,751	\$ 13,938	\$ -	\$ 38,689
39099802600	\$ 205,016,927	1604	\$ -	\$ 13,897	\$ 24,715	\$ -	\$ 38,611
39099810300	\$ 223,174,786	1665	\$ -	\$ 13,716	\$ 22,362	\$ -	\$ 36,078
39099802500	\$ 204,306,658	1312	\$ 468	\$ 13,849	\$ 20,215	\$ 0	\$ 34,064
39099800600	\$ 265,980,246	1194	\$ 6,073	\$ 16,346	\$ 16,036	\$ 0	\$ 32,383
39099811800	\$ 285,215,746	1629	\$ -	\$ 15,173	\$ 16,544	\$ -	\$ 31,717
39099801200	\$ 167,738,201	1477	\$ -	\$ 10,309	\$ 19,837	\$ -	\$ 30,146
39099800502	\$ 267,614,386	959	\$ 4,457	\$ 16,447	\$ 12,880	\$ 0	\$ 29,327
39099804300	\$ 234,377,583	900	\$ 572	\$ 15,243	\$ 13,808	\$ 0	\$ 29,051
39099811100	\$ 247,323,965	996	\$ 7,295	\$ 15,199	\$ 13,370	\$ 0	\$ 28,569
39099802100	\$ 186,179,016	892	\$ -	\$ 12,620	\$ 13,744	\$ -	\$ 26,364
39099802300	\$ 137,739,609	787	\$ -	\$ 9,336	\$ 12,126	\$ -	\$ 21,463
Grand Total	\$48,322,567,878	228579	\$78,699,686	2,865,534	\$2,890,944	\$ 1,399	\$5,757,877

The risk for Tornado caused building damage are highest in CT 8125 (Canfield) and CT8140 (Youngstown). Most CTs rate building loss risk at \$20k- \$75k/year. Population risk ranges from \$30K- \$ 99K in almost every CT.

2.12 Earthquakes

2.12.1 Extent

An earthquake is a violent and abrupt shaking of the ground, caused by movement between tectonic plates along a fault line in the earth's crust. The Richter scale is the recognized method for measuring the impact of earthquakes. The following chart shows Richter scale ratings from 0 to 10.



Climate Change Impact:

There is no available data, based on the US Geological Survey, suggesting that climate change will impact earthquakes anywhere in Ohio.

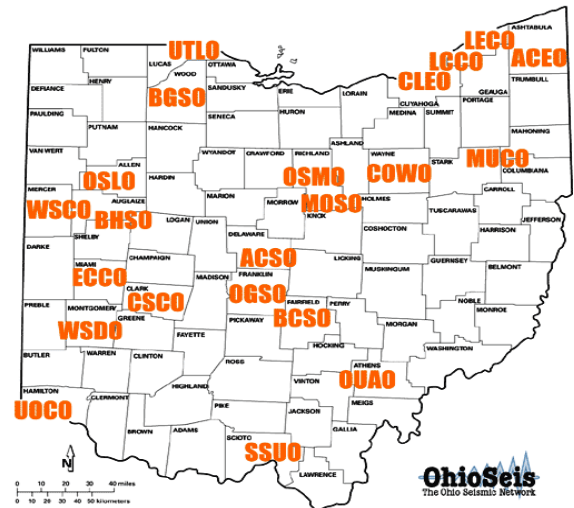
2.12.2 Monitoring of Earthquakes

The ODNR Division of Geological Survey has established a 23-station cooperative network of seismograph stations throughout the State to continuously record earthquake activity. The network, which went online in January 1999, ended a five-year gap during which there was only one operating station in Ohio. The State was dependent on seismographs in Kentucky and Michigan to record Ohio earthquakes.

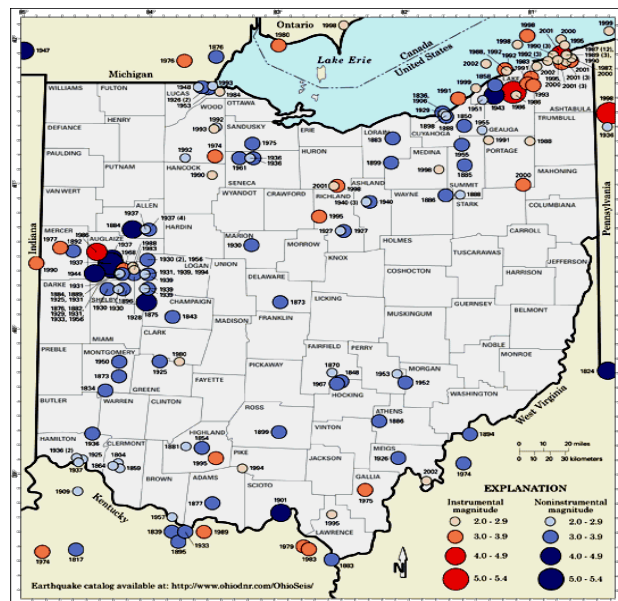
The 23 stations of the new seismograph network, which is called OhioSeis, are distributed across the State, but are concentrated in the most seismically active areas or in areas that provide optimal conditions for detecting and locating very small earthquakes that are below the threshold of human notice. These small micro earthquakes are important because they occur more frequently and help to identify the location of faults that may periodically produce larger, potentially damaging earthquakes.

The OhioSeis seismograph stations are located at colleges, universities, and other institutions, employing new technology that not only makes them very accurate, but also relatively inexpensive and easy to operate and maintain. In contrast to the old technology, in which a pen made a squiggly line on a paper drum, the new system is entirely digital and uses a desktop computer to continuously record and display data. Two other innovations have made the system unique. An inexpensive Global Positioning System (GPS) receiver is used to keep very precise time on the continuously recorded seismogram, and each station's computer is connected to the Internet for rapid data transfer.

Each OhioSeis station is a cooperative effort. Seismometers, the instrument that detects Earth motions, and other seismic components were purchased by the Division of Geological Survey with funds provided by FEMA through the OEMA, as part of the National Earthquake Hazards Reduction Program. The computers and Internet connection were purchased and provided by the cooperating institutions.



The Division of Geological Survey coordinates the seismic network and has established the Ohio Earthquake Information Center at the Horace R. Collins Laboratory at Alum Creek State Park, north of Columbus. This facility functions as a repository and laboratory for rock core and well cuttings but has a specially constructed room for earthquake recording. The seismograph system allows for very rapid location of the epicenter and calculation of the magnitude of any earthquake in the State. The earthquake records, or seismograms, from at least three seismograph stations are needed to determine earthquake locations (epicenters). These records can be downloaded from the internet at any network station, location, and magnitude can be determined. Small earthquakes were in many cases not even detected by distant, out-of-date seismograph stations. The OhioSeis network provides a whole new dimension of understanding about the pulse of the Earth beneath Ohio. Although the new seismograph network will not predict earthquakes or provide an alert prior to an event, it will provide insight into earthquake risk in the State so that intelligent decisions about building and facility design and construction, insurance coverage and other planning decisions can be made by individuals, business and industry, and governmental agencies.



Epicenters of past earthquakes in Ohio.

2.12.3 Historic Occurrence

Earthquakes in Ohio

The problem with earthquakes is that major earthquakes are a low probability, high consequence event. It is because of the potential high consequences that geologists, emergency planners and other government officials have taken a greater interest in understanding the potential for earthquakes in some of the areas of the eastern United States and educating the population as to the risk in their areas. Although there have been great strides in increased earthquake awareness in the eastern United States, the low probability of such events makes it difficult to convince most people that they should be prepared.

It is surprising to many Ohioans that the State has experienced more than 120 earthquakes since 1776, and that 14 of these events have caused minor to moderate damage. The largest historic earthquake in Ohio was centered in Shelby County in 1937. This event, estimated to have had a magnitude of 5.5 on the Richter scale, caused considerable damage in Anna and several other western Ohio communities, where at least 40 earthquakes have been felt since 1875. Northeastern Ohio, east of Cleveland, is the second most active area of the state. At least 20 earthquakes have been recorded in the area since 1836, including a 5.0 magnitude event in 1986 that caused moderate damage. A broad area of southern Ohio has experienced more than 30 earthquakes.

Although the New Madrid Line is in close proximity to the State of Ohio, there has not been an earthquake of any significance since 1875 caused by this fault line. An earthquake on June 18, 1975 caused damage in western Ohio, and affected a total area estimated at over 40,000 square miles. Walls were cracked and chimneys thrown down in Sidney and Urbana. The shock was felt sharply at Jeffersonville, Indiana. The affected area included parts of Illinois, Indiana, Kentucky and Missouri.

Mahoning County Earthquake Events

NRI data has no earthquake events on record for the county, but data from OhioSeis indicated the following events.

EARTHQUAKES IN AND AROUND MAHONING COUNTY 2010-2018					
<i>Date</i>	<i>Source</i>	<i>Depth (km)</i>	<i>Magnitude</i>	<i>Place</i>	<i>Description</i>
3/11/2014	OhioSeis	5	2.1	Lowellville, Mahoning County	A small earthquake in the Lowellville area of Mahoning County was felt at 3:01 EDT.
3/10/2014	OhioSeis	5	2.2 to 3.0	Lowellville, Mahoning County	Four small earthquakes above 2.0 magnitude were recorded about 2.8 kilometers (1.75 miles) south of Lowellville, Poland Township, Mahoning County, at 2:26 a.m. EDT (3.0 magnitude), 2:42 a.m. EDT (2.4 magnitude), 11:03 a.m. EDT (2.2 magnitude), and 11:44 a.m. EDT (2.6 magnitude). Felt reports were received for the 2:26, 11:03, and 11:44 events. There were no damages from these minor earthquakes.
3/5/2014	OhioSeis	5	2.3	Lowellville, Mahoning	A small earthquake occurred at 10:05 p.m. EST (March 4) south of Lowellville, Poland Township, Mahoning County. No felt reports

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EARTHQUAKES IN AND AROUND MAHONING COUNTY 2010-2023					
Date	Source	Depth (km)	Magnitude	Place	Description
				County	were received.
11/12/2013	OhioSeis	3	2.1	Youngstown, Mahoning County	A minor earthquake occurred in the Youngstown area on November 12, 2013, 3:12 p.m. EST. There were no felt reports.
7/1/2013	USGS	5	3.2	6km NW of Fairport Harbor, Ohio	N/A
3/8/2013	USGS	5	2.7	Lake Erie, Ohio	N/A
1/13/2012	OhioSeis	5	2.1	Youngstown, Mahoning County	A very small earthquake was instrumentally recorded on January 13, 2012 at 5:22 p.m. Eastern Standard Time in the Youngstown area. No felt reports were received, which is not unusual considering the small magnitude of this event.
12/31/2011	USGS & OhioSeis	5	4.0	Youngstown-Akron urban area, Ohio	A 4.0 magnitude earthquake centered at Youngstown rocked northeastern Ohio just before 3:05 p.m. EST on New Year's Eve. This was the 11th earthquake in a sequence that began on March 17, 2011 at Youngstown. The December 31 earthquake was felt throughout northeastern Ohio, adjacent areas in western Pennsylvania, and in Ontario, Canada. Media reports indicate that damage was minor from this event with a few reports of cracked plaster and glassware falling from shelves. Earthquakes in the low 4 magnitude range would not be expected to cause major damage. More than 4,700 felt reports have been submitted by individuals to the U.S. Geological Survey's Did You Feel It Web site.
12/24/2011	OhioSeis	3.55	2.7	Youngstown, Mahoning County	A small earthquake rattled portions of Youngstown early (1:24 a.m. EST) on the morning of December 24. No damage was reported. More than 90 people submitted reports to the USGS Did You Feel It Web site.
11/25/2011	OhioSeis	5	2.2	Youngstown, Mahoning County	A small earthquake occurred at Youngstown at 1:47 a.m. EST. This event is in the same area as previous small earthquakes in the Youngstown area. No felt reports were received.
10/20/2011	OhioSeis	5	2.3	Youngstown, Mahoning County	A small earthquake was felt in Youngstown at 6:41 p.m. EDT. There were no reports of damage. This earthquake is in the vicinity of several other small earthquakes in 2011.
9/30/2011	OhioSeis	5	2.7	Youngstown, Mahoning County	A small earthquake on September 29, 2011, at 8:52 p.m. EDT, was widely felt in Youngstown and surrounding communities including Campbell, Canfield, Girard, Hubbard, McDonald, and Mineral Ridge, throughout an area of about 1,000 square kilometers. More than 300 felt reports were submitted. Many residents reported a loud boom followed by brief shaking and some thought a vehicle had hit the house or a tree had fallen. No damage was reported. Several small earthquakes have occurred in this area in 2011.
9/26/2011	OhioSeis	5	2.6	Youngstown, Mahoning County	A small earthquake was felt by a few people on the west side of Youngstown at 9:06 p.m. Eastern Daylight Time. This event is in the general area of several small earthquakes in recent months.
9/2/2011	OhioSeis	5	2.2	Youngstown, Mahoning County	A small earthquake occurred at 5:03 p.m. EDT on September 2 on the west side of Youngstown. This is in the general vicinity of earthquakes on March 17, August 22, and August 25. A few people in Youngstown reported feeling the event.

8/22/2011	OhioSeis	5	2.2	Youngstown, Mahoning County	A very small earthquake occurred at 4:00 a.m. EDT on the west side of Youngstown. No felt reports were received.
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2.12.4 Frequency/Probability of Future Occurrence

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follows:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Earthquake	Relatively Low/62	2021 dataset	0.019% chance per year	Relatively Low/62	\$222,944/ N/A	N/A

NRI data has no earthquake events on record for the county.

2.12.5 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Earthquake	0.019	\$278,466	\$222,944	N/A	\$55,522	0

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Agriculture Value
Earthquake	\$1/\$216.75k	1/47.76m	N/A

MAHONING COUNTY NRI EARTHQUAKE EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Buildings)	Exposure (Population)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Total)
39099814000	\$ 2,006,270,000	2910	\$ 13,343	\$ 2,641	\$ 15,984
39099813000	\$ 1,246,844,000	4117	\$ 8,896	\$ 2,186	\$ 11,082
39099812001	\$ 1,598,220,000	5622	\$ 8,331	\$ 1,758	\$ 10,088
39099812800	\$ 965,117,000	3565	\$ 7,130	\$ 1,724	\$ 8,853
39099812900	\$ 1,198,178,000	4101	\$ 6,767	\$ 1,768	\$ 8,535
39099811002	\$ 1,488,453,000	7506	\$ 6,319	\$ 1,978	\$ 8,297

Mahoning County Hazard Mitigation Plan 2024-2028

39099812500	\$ 1,504,721,000	4952	\$ 7,012	\$ 1,196	\$ 8,207
39099812700	\$ 1,030,060,000	2124	\$ 7,108	\$ 958	\$ 8,066
39099811902	\$ 1,303,286,000	3292	\$ 7,067	\$ 973	\$ 8,040
39099812200	\$ 1,477,844,000	6570	\$ 6,203	\$ 1,698	\$ 7,900
39099812101	\$ 1,414,789,000	6143	\$ 5,408	\$ 1,051	\$ 6,460
39099812400	\$ 950,762,000	2742	\$ 5,679	\$ 772	\$ 6,451
39099813300	\$ 1,049,902,000	3101	\$ 5,314	\$ 934	\$ 6,248
39099813200	\$ 750,013,000	4171	\$ 4,851	\$ 1,332	\$ 6,182
39099812601	\$ 684,574,000	4745	\$ 4,302	\$ 1,804	\$ 6,106
39099813501	\$ 1,053,895,000	3537	\$ 5,034	\$ 842	\$ 5,876
39099814100	\$ 766,578,000	2303	\$ 4,880	\$ 895	\$ 5,775
39099811901	\$ 1,000,867,000	4289	\$ 4,776	\$ 950	\$ 5,726
39099813502	\$ 1,090,563,000	4058	\$ 4,515	\$ 1,202	\$ 5,717
39099813700	\$ 957,112,000	3506	\$ 4,843	\$ 864	\$ 5,707
39099812102	\$ 1,190,449,000	4231	\$ 4,753	\$ 784	\$ 5,537
39099813601	\$ 1,090,318,000	5839	\$ 3,897	\$ 1,203	\$ 5,100
39099813400	\$ 1,061,235,000	3420	\$ 4,199	\$ 783	\$ 4,982
39099812302	\$ 761,030,000	6482	\$ 3,262	\$ 1,188	\$ 4,450
39099802800	\$ 450,043,000	2665	\$ 3,023	\$ 1,041	\$ 4,064
39099812604	\$ 792,559,000	4884	\$ 3,029	\$ 766	\$ 3,795
39099812602	\$ 569,444,000	5222	\$ 2,316	\$ 1,466	\$ 3,782
39099801000	\$ 631,081,000	1467	\$ 3,203	\$ 446	\$ 3,648
39099811302	\$ 668,435,000	2139	\$ 3,046	\$ 529	\$ 3,574
39099812301	\$ 466,030,000	3888	\$ 2,568	\$ 987	\$ 3,556
39099813900	\$ 532,720,000	1571	\$ 2,789	\$ 524	\$ 3,313
39099811500	\$ 747,820,000	5824	\$ 2,264	\$ 840	\$ 3,104
39099802701	\$ 471,450,000	3232	\$ 2,309	\$ 789	\$ 3,098
39099813602	\$ 670,830,000	2468	\$ 2,433	\$ 508	\$ 2,940
39099811200	\$ 567,916,000	2393	\$ 2,208	\$ 731	\$ 2,939
39099811600	\$ 606,277,000	3479	\$ 2,282	\$ 639	\$ 2,922
39099801600	\$ 410,604,000	2336	\$ 2,294	\$ 625	\$ 2,919
39099804000	\$ 448,665,000	2080	\$ 2,252	\$ 493	\$ 2,745
39099801700	\$ 369,532,000	928	\$ 2,095	\$ 594	\$ 2,689
39099812002	\$ 668,165,000	3882	\$ 1,978	\$ 561	\$ 2,539
39099802400	\$ 386,583,000	2531	\$ 1,942	\$ 530	\$ 2,471
39099802900	\$ 298,612,000	2233	\$ 1,862	\$ 582	\$ 2,444
39099810900	\$ 525,602,000	2021	\$ 1,939	\$ 493	\$ 2,432
39099811700	\$ 395,145,000	2622	\$ 1,872	\$ 477	\$ 2,349
39099811400	\$ 407,772,000	3218	\$ 1,739	\$ 585	\$ 2,324
39099811301	\$ 433,691,000	4199	\$ 1,528	\$ 699	\$ 2,227
39099811800	\$ 285,207,000	1647	\$ 1,773	\$ 442	\$ 2,215
39099801100	\$ 293,755,000	2335	\$ 1,494	\$ 589	\$ 2,084
39099802702	\$ 370,094,000	2818	\$ 1,402	\$ 615	\$ 2,016
39099800502	\$ 267,609,000	959	\$ 1,501	\$ 340	\$ 1,840

39099812605	\$ 532,537,000	3134	\$ 1,330	\$ 511	\$ 1,840
39099810100	\$ 524,436,000	4213	\$ 1,196	\$ 504	\$ 1,700
39099804100	\$ 280,761,000	1300	\$ 1,381	\$ 271	\$ 1,652
39099810200	\$ 556,331,000	1974	\$ 1,350	\$ 214	\$ 1,563
39099804200	\$ 335,670,000	1934	\$ 1,052	\$ 458	\$ 1,510
39099801500	\$ 259,251,000	1818	\$ 1,073	\$ 407	\$ 1,480
39099803000	\$ 187,931,000	1875	\$ 981	\$ 461	\$ 1,442
39099802600	\$ 205,009,000	1604	\$ 1,015	\$ 400	\$ 1,414
39099810700	\$ 667,909,000	5233	\$ 1,050	\$ 364	\$ 1,414
39099813800	\$ 338,616,000	3024	\$ 990	\$ 411	\$ 1,401
39099800600	\$ 265,975,000	1194	\$ 1,052	\$ 335	\$ 1,387
39099810600	\$ 494,803,000	2784	\$ 1,126	\$ 221	\$ 1,346
39099802500	\$ 204,301,000	1312	\$ 999	\$ 315	\$ 1,313
39099802100	\$ 186,172,000	892	\$ 947	\$ 266	\$ 1,213
39099801200	\$ 167,733,000	1477	\$ 766	\$ 271	\$ 1,037
39099811001	\$ 574,114,000	4002	\$ 783	\$ 223	\$ 1,006
39099804300	\$ 234,373,000	900	\$ 869	\$ 134	\$ 1,003
39099814200	\$ 288,455,000	1722	\$ 634	\$ 282	\$ 916
39099800501	\$ 200,641,000	2116	\$ 568	\$ 259	\$ 827
39099802300	\$ 137,735,000	787	\$ 632	\$ 189	\$ 821
39099801400	\$ 244,899,000	2104	\$ 452	\$ 171	\$ 623
39099810800	\$ 323,596,000	2046	\$ 484	\$ 124	\$ 608
39099801300	\$ 263,447,000	2141	\$ 454	\$ 150	\$ 604
39099810300	\$ 223,166,000	1665	\$ 403	\$ 130	\$ 533
39099811100	\$ 247,315,000	996	\$ 332	\$ 81	\$ 413
Grand Total	\$ 48,321,897,000	228614	\$ 222,944	\$ 55,522	\$278,466

There are no Mahoning County census tracts (CTs) facing a high risk for earthquake building, agricultural, or population harm based on this NRI data.

2.13 Landslide/ Land and Mine Subsidence

2.13.1 Extent

Landslides are the sliding down of a mass of earth, rock, or debris down a slope. The County Engineer has indicated that more landslides are occurring along county roads because of increased rain and flash flooding. Infrastructure will be impacted.

Climate Change Impact:

Based on the US Climate Resilience Toolkit, Mahoning County is expected to see a decrease in the number of days of rain, but with greater annual precipitation. The following charts show the projected trends.

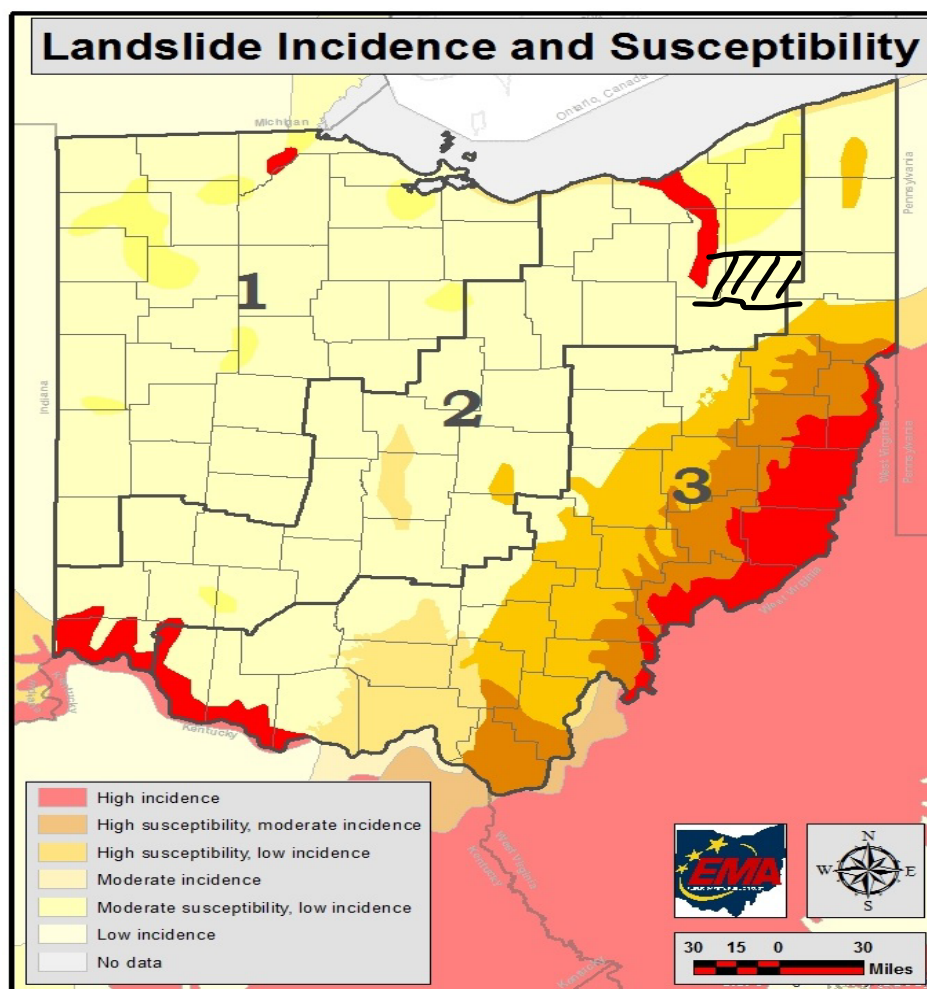
Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Avg. annual total precipitation	37"	38"	38"
Days with precipitation	211	207	207

The impact of this will be slightly more intense summer storms with more potential rain and flooding during some events. The increase in heat may also intensify storm conditions. All of this could create flash flooding putting more stress on creating the conditions for landslides.

2.13.2 Historical Occurrence

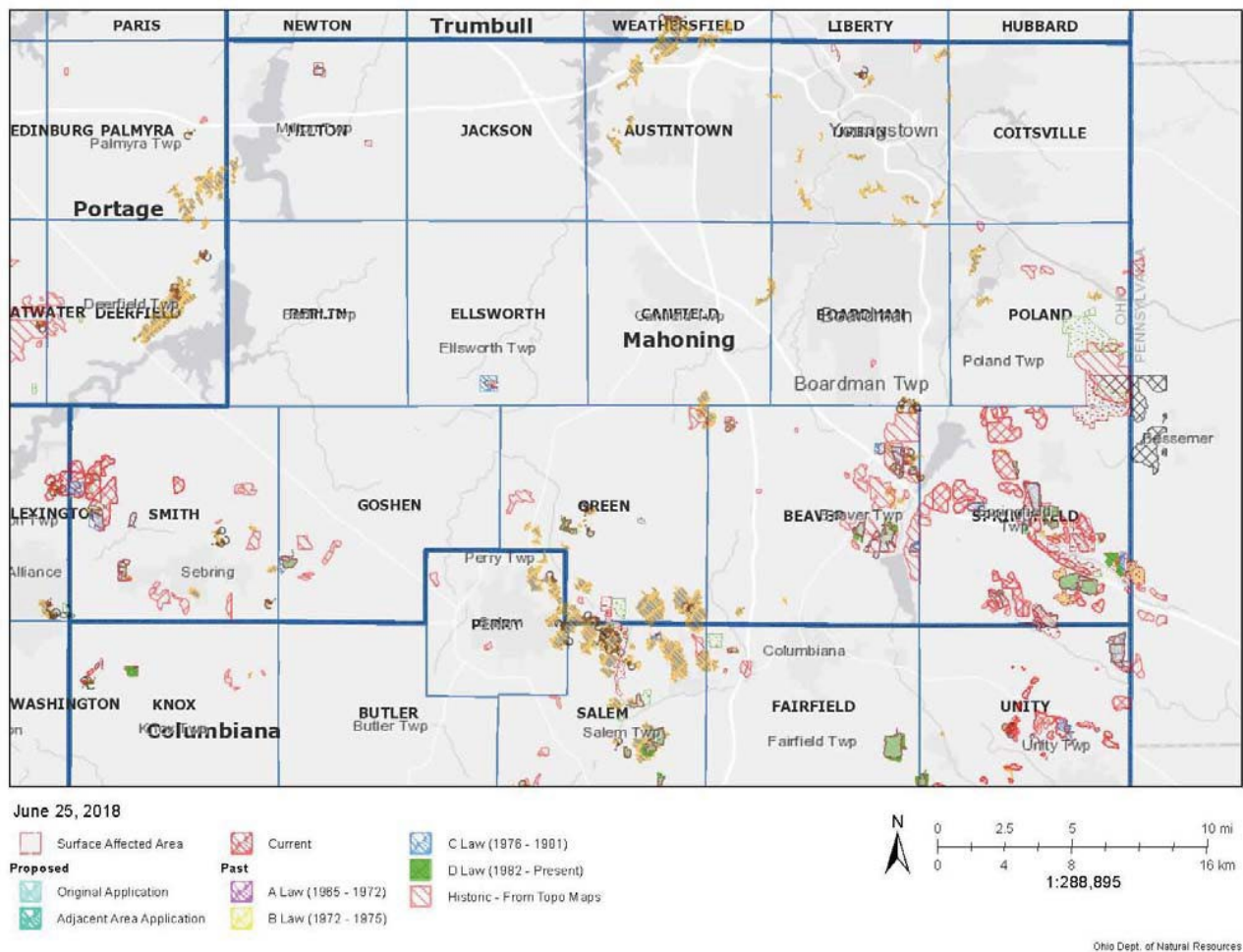
The following Ohio EMA chart shows the history of landslides on state roads across Ohio.

The following *Landslide Incidence and Susceptibility Map* shows High Incidence of landslides in red, having more than 15% of the area involved in landslides. Moderate Incidence landslides are noted in tan, having between 1.5% and 15% of the area involved with landslides. Low Incident landslide areas are noted in yellow, with less than 1% landslide activity.



Based on this map, Mahoning County (scored) is entirely in the low Incidence (light tan) category. This is further supported by the NRI annual frequency record of "0" events per year.

Mine subsidence, like an earthquake, is a geologic hazard that can strike with little or no warning and can result in catastrophic and costly damages. Unlike an earthquake, mine subsidence normally only affects few people. However, if a mine collapses under an interstate highway, several lives and industries are subjected to potential damage. Mine subsidence can also cause foundation damage to buildings, disrupt underground utilities, and be a potential risk to human life.



LOSS AND DAMAGES

The Ohio Enhanced Hazard Mitigation Plan estimates the potential losses due to a landslide in each county; in Mahoning County, it estimates that there would be \$89,779 in losses. It also indicates that the average structure value is \$89,779, making the total structural losses, one.

According to Mahoning County GIS, there are 176,602 buildings in the county; of those, 10,756 are located within the land and mine subsidence risk areas. This number includes all types of buildings.

One of the most common types of repairs to buildings from subsidence includes repairing the foundation. Based on data from Home Advisor (n.d.) the average cost of repair for a residential foundation in Ohio is \$3,989. If, for the purpose of estimation, all the buildings were residential, the cumulative loss of all the buildings in a known hazard area would be around \$42.9 million.

2.13.3 Frequency/Probability of Future Occurrence

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Landslide	Relatively Moderate/ 94.8	2010-2021	0	Relatively Moderate/94.8	\$206,266/NA	0

Based on additional input from the County Engineer and other Planning Team members, it is estimated that there will be a landslide impacting property and/or infrastructure every five (5) years.

2.13.4 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Landslides	0/year	\$240,183	\$206,266	N/A	\$33,917	1/78.18m

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Ag. Value
Landslides	\$1/\$234.27k	1/78.18m	N/A

MAHONING COUNTY NRI LANDSLIDE EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Sq. Mi)	Exposure (Buildings)	Exposure (Population)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Total)
39099813700	0.58	\$ 665,104,010	1831	\$ 90,062	\$ 10,575	\$100,637
39099802600	0.31	\$ 184,719,431	1418	\$ 25,013	\$ 8,194	\$ 33,207
39099812101	0.65	\$ 458,249,585	2008	\$ 7,446	\$ 1,392	\$ 8,838
39099814000	0.27	\$ 388,003,945	638	\$ 6,305	\$ 442	\$ 6,747
39099813400	0.57	\$ 299,238,722	945	\$ 4,862	\$ 655	\$ 5,517
39099813900	0.35	\$ 287,769,765	1072	\$ 4,676	\$ 743	\$ 5,419
39099811002	0.39	\$ 258,141,026	1198	\$ 4,195	\$ 831	\$ 5,025
39099814100	0.31	\$ 254,216,664	868	\$ 4,131	\$ 602	\$ 4,733
39099812800	0.37	\$ 248,982,598	673	\$ 4,046	\$ 467	\$ 4,513
39099812900	0.47	\$ 198,118,372	615	\$ 3,219	\$ 426	\$ 3,645
39099813502	0.38	\$ 181,922,165	666	\$ 2,956	\$ 462	\$ 3,418
39099810200	0.08	\$ 205,583,064	0	\$ 3,341	\$ -	\$ 3,341

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39099812102	0.26	\$ 180,754,427	329	\$ 2,937	\$ 228	\$ 3,165
39099813000	0.27	\$ 173,949,587	455	\$ 2,827	\$ 315	\$ 3,142
39099810800	0.25	\$ 135,675,376	1055	\$ 2,205	\$ 731	\$ 2,936
39099802400	0.17	\$ 134,847,219	1037	\$ 2,191	\$ 719	\$ 2,910
39099800600	0.22	\$ 147,618,559	718	\$ 2,399	\$ 498	\$ 2,896
39099813601	0.26	\$ 143,754,568	674	\$ 2,336	\$ 467	\$ 2,803
39099811901	0.11	\$ 138,436,521	267	\$ 2,249	\$ 185	\$ 2,435
39099802500	0.19	\$ 118,791,025	651	\$ 1,930	\$ 451	\$ 2,381
39099813300	0.28	\$ 121,082,757	375	\$ 1,967	\$ 260	\$ 2,227
39099811001	0.21	\$ 110,581,698	615	\$ 1,797	\$ 426	\$ 2,223
39099813501	0.23	\$ 108,110,288	403	\$ 1,757	\$ 279	\$ 2,036
39099811902	0.07	\$ 116,991,820	37	\$ 1,901	\$ 26	\$ 1,927
39099813800	0.17	\$ 81,447,503	859	\$ 1,323	\$ 595	\$ 1,919
39099813602	0.27	\$ 95,372,178	374	\$ 1,550	\$ 259	\$ 1,809
39099812200	0.12	\$ 98,193,275	259	\$ 1,596	\$ 179	\$ 1,775
39099802702	0.16	\$ 80,259,291	629	\$ 1,304	\$ 436	\$ 1,740
39099810900	0.22	\$ 75,088,894	421	\$ 1,220	\$ 292	\$ 1,512
39099801000	0.05	\$ 79,859,039	9	\$ 1,298	\$ 6	\$ 1,304
39099802300	0.11	\$ 59,353,129	368	\$ 964	\$ 255	\$ 1,220
39099812605	0.13	\$ 55,918,703	299	\$ 909	\$ 207	\$ 1,116
39099810700	0.09	\$ 47,777,024	474	\$ 776	\$ 328	\$ 1,105
39099811400	0.06	\$ 51,124,337	344	\$ 831	\$ 239	\$ 1,069
39099812500	0.11	\$ 49,807,958	323	\$ 809	\$ 224	\$ 1,033
39099810600	0.03	\$ 56,379,098	54	\$ 916	\$ 37	\$ 954
39099812604	0.08	\$ 42,307,626	244	\$ 687	\$ 169	\$ 857
39099813200	0.08	\$ 33,995,324	407	\$ 552	\$ 282	\$ 835
39099802701	0.07	\$ 39,130,633	279	\$ 636	\$ 193	\$ 829
39099802900	0.04	\$ 31,377,738	225	\$ 510	\$ 156	\$ 666
39099803000	0.05	\$ 30,358,009	214	\$ 493	\$ 148	\$ 642
39099810300	0.04	\$ 25,544,293	105	\$ 415	\$ 73	\$ 488
39099812400	0.07	\$ 23,617,342	121	\$ 384	\$ 84	\$ 467
39099801600	0.02	\$ 24,345,839	81	\$ 396	\$ 56	\$ 452
39099811200	0.03	\$ 22,828,837	101	\$ 371	\$ 70	\$ 441
39099811100	0.02	\$ 20,577,414	66	\$ 334	\$ 46	\$ 380
39099814200	0.04	\$ 17,513,978	86	\$ 285	\$ 60	\$ 344
39099812700	0.04	\$ 18,123,836	68	\$ 294	\$ 47	\$ 342
39099804000	0.01	\$ 12,404,755	0	\$ 202	\$ 0	\$ 202
39099801500	0.01	\$ 8,182,561	40	\$ 133	\$ 28	\$ 160
39099812002	0.02	\$ 6,472,824	50	\$ 105	\$ 34	\$ 140
39099802800	0.01	\$ 5,349,358	44	\$ 87	\$ 30	\$ 117
39099800502	0.00	\$ 4,643,167	0	\$ 75	\$ 0	\$ 75
39099800501	0.00	\$ 2,786,375	11	\$ 45	\$ 7	\$ 53
39099801300	0.01	\$ 1,078,179	2	\$ 18	\$ 1	\$ 19
Grand Total	9.41	\$ 6,461,861,706	25101	\$ 206,266	\$ 33,917	\$240,183

Only Census Tract 8137 (Youngstown) shows any risk of property damage based on this NRI data.

2.14 Drought/Heatwave

2.14.1 Extent-Drought

A drought is a period of abnormally dry weather that persists long enough to produce a serious hydrologic imbalance (i.e., crop damage, water supply shortage, etc.) The severity of the drought depends upon the degree of moisture deficiency, the duration and the size of the affected area

There are several types of droughts:

Meteorological Drought: Differences from the normal precipitation amounts. Because not every area receives the same amount of rainfall, a drought in one place might not be considered a drought in another.

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

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

Socioeconomic Drought: A lack of water that begins to affect people's daily lives.

The Palmer Drought Severity Index (PDSI) is a widely used measure of drought to track moisture conditions. The PDSI is defined as "an interval of time, generally in months or years in duration, during which the actual moisture supply at a given place consistently falls short of the climatically expected or climatically appropriate moisture supply". The range of PDSI is from -4.0 (extremely dry) to +4.0 (excessively wet), with the central half (-0.5 to +0.5) representing the normal or near normal conditions. In the United States, the USDA, National Drought Mitigation Center at University of Nebraska-Lincoln, U.S. Department of Commerce, and NOAA developed another measurement of droughts named the U.S. Drought Monitor (USDM).

A heatwave is a prolonged period of abnormally hot weather. The World Meteorological Organization (WMO) defines a heat wave as “A period during which the daily maximum temperature exceeds more than five consecutive days the maximum normal temperature by 9 degrees Fahrenheit (5 degrees Celsius).”

USDM AND PDSI COMPARISON			
U.S. Drought Monitor Index		Palmer Drought Severity	
N/A		> 4.0	Extreme moist spell
		3.0 to 3.99	Very moist spell
		2.0 to 2.99	Unusual moist spell
		1.0 to 1.99	Moist spell
		0.50 to 0.99	Incipient moist spell
		-0.49 to 0.49	Near normal
		-0.5 to -0.99	Incipient dry spell
D0	Abnormally dry	-1.0 to -1.99	Mild drought
D1	Moderate drought	-2.0 to -2.99	Moderate drought
D2	Severe drought	-3.0 to -3.99	Severe drought
D3	Extreme drought	< -4.0	Extreme drought
D4	Exceptional drought		N/A

Climate Impact:

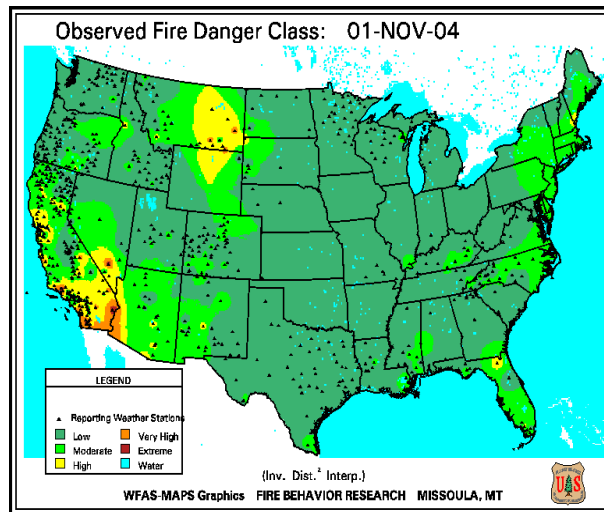
Based on the US Climate Resilience Toolkit, Mahoning County is expected to see an increase in the number of hot weather days and fewer days of rain, but with greater annual precipitation. The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Annual Days > 90°F	6	23	26
Annual Days > 95°F	1	5	7
Annual Days > 100°F	0	1	1
Avg. annual total precipitation	37"	38"	39"
Days with precipitation	211	207	207
Days with no precipitation (dry days)	154	158	158
Max number of consecutive dry days	10	11	11

The data suggests that the risk of an increase in hotter days is real, the risk for a drought is relatively low.

2.14.2 Historical Occurrence

Dry conditions that began in the spring and early summer continued into July and August. Excessive heat contributed to substantial crop loss across much of the state. Rainfall was widely scattered and did little to help farmers. Most areas received well below normal rainfall for the month of August. In some areas, around 50% of crops were considered total losses. Most counties in southwest Ohio were declared Federal Disaster Areas by the United States Department of Agriculture (USDA). The total dollar loss amount is unknown.



The worst drought in 50 years affected 35 states during the long, hot summer of 1988, when some areas had been suffering from lack of rainfall since 1984. Rainfall totals in 1988 throughout the mid-west, Northern Plains and the Rockies were 50% to 85% below normal. Crops and livestock died, and some areas became desert. Forest fires began over the Northwest that left 4,100,000 acres destroyed by autumn.

2.14.3 Droughts-Precursor to Other Disasters

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

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

Fire fighters talk of the fire triangle in terms of the heat of combustion, fuel and oxygen all being necessary for fire to occur. Wild land fire fighters are concerned with the wild land fire triangle of fuel (grass, brush, forests, crops, etc.), terrain (open flat lands, steep slopes and everything conducive to wild land fire spread) and weather (hot, dry, windy conditions are typical wild land fire weather).

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

2.14.4 Frequency/Probability of Future Drought Occurrence

According to the NCEI, Mahoning County has had 1 drought since 1972 (9/1/1999), which resulted in \$1M crop damage. The odds of future occurrences based on this information are less than 1% (.01). However, Mahoning County is largely agricultural and suffers varying amounts of crop damage during severe heat and dry conditions that may not be categorized as a drought. The Planning Team concluded that this damage is not always recorded but still has a detrimental effect on the County. The Planning Team also realized that, unlike other hazards such as flooding or tornadoes, there is little

mitigation that can be preplanned to reduce the amount of agricultural damage caused by a drought.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Drought	No expected loss/0	2000-2021	0	Relatively Moderate/15.94	0	N/A
Heatwave	Relatively Moderate/82.9	2005-2021	0.2	Very Low/2.67	\$1,619/\$1,076	.05

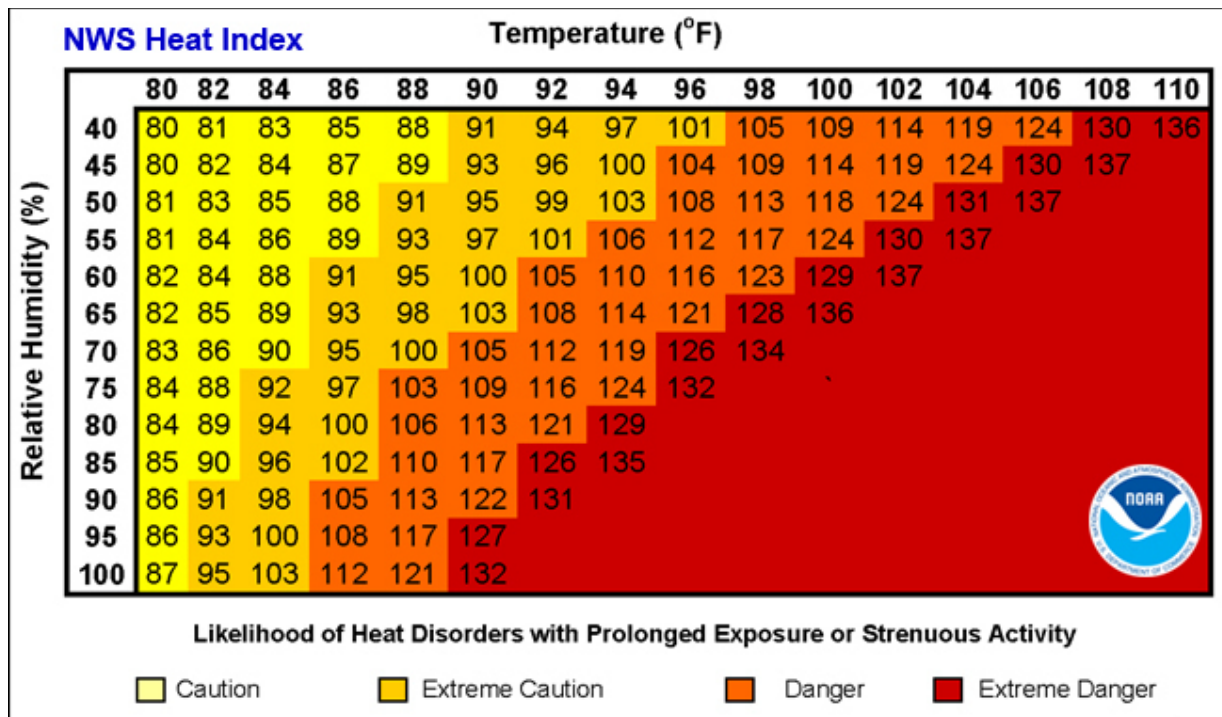
Based on this data, there is a low probability of any impactful droughts or heatwaves in Mahoning County.

2.14.5 Extent-Heatwave

A heat wave or excessive heat event is defined as a prolonged period of excessive heat and humidity. Medical conditions that a population could suffer from during a heat wave are heat exhaustion and heat stroke.

Heat-related deaths are preventable, people need to be aware of who is at greatest risk and what actions can be taken to prevent a heat-related illness or death. The elderly, the very young, and people with mental illness and chronic diseases are at highest risk.

However, even young and healthy individuals can succumb to heat if they participate in strenuous physical activities during hot weather. Air-conditioning is the number one protective factor against heat-related illness and death. If a home is not air-conditioned, people can reduce their risk for heat-related illness by spending time in public facilities that are air-conditioned. The following National Weather Service (NWS) Heat Index chart shows the scale of magnitude and extent of heat and humidity including "Caution", "Extreme Caution", "Danger" and "Extreme Danger."



The Heat Index is a measure of how hot it really feels when [relative humidity](#) is factored in with the actual air temperature. To find the Heat Index temperature, look at the Heat Index Chart above or check our [Heat Index Calculator](#). As an example, if the air temperature is 96°F and the relative humidity is 65%, the heat index--how hot it feels--is 121°F. The red area without numbers indicates extreme danger. The National Weather Service will initiate alert procedures when the Heat Index is expected to exceed 105°-110°F (depending on local climate) for at least 2 consecutive days. NWS also offers a [Heat Index chart](#) for area with high heat but low relative humidity. Since heat index values were devised for shady, light wind conditions, **exposure to full sunshine can increase heat index values by up to 15°F**. Also, strong winds, particularly with very hot, dry air, can be extremely hazardous.

2.14.6 Historical Occurrence

There have been three (3) heat events and one (1) excessive heat event in Highland Co since 1999, with no property or crop damage, injuries, or deaths as per the NOAA-NCEI database and local assessments. The heat events occurred on 7/20/99, 6/28/12 and 7/1/12. The excessive heat event occurred on 8/7/07. The data is included in *Appendix G*.

2.14.7 Frequency/Probability of Future Heatwave Occurrence

There have been no documented heat/excessive heat events in the NOAA-NCEI database, over the past 50 years plus.

Still, the Planning Team believes that climate change's impact on weather patterns could alter these historic trends in short order. This plan identifies specific actions to prepare our community for future heat emergencies. The Planning Committee assumes one (1) heat emergency event per year. This is more consistent with the National Risk Index data above.

2.14.8 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Drought	0	NA	N/A	\$0	N/A	NA
Heat Wave	0.2/yr.	\$532,650	\$1,619	\$1,076	\$529,955	0.05

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Agriculture Value
Drought	N/A	N/A	NA
Heat Wave	\$1/\$29.85m	1/5.0m	\$1/\$73.12k

MAHONING COUNTY NRI HEATWAVE EXPOSURE AND EXPECTED ANNUAL LOSS

Census Tract	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099811002	\$1,488,462,348	7506	\$ 2,025,183	\$ 50	\$17,402	\$ 28	\$ 17,480
39099812200	\$1,477,856,673	6570	\$ 116,928	\$ 50	\$15,232	\$ 2	\$ 15,283
39099812302	\$ 761,039,925	6482	\$ -	\$ 25	\$15,028	\$ -	\$ 15,054
39099812101	\$1,414,799,349	6143	\$ 393,762	\$ 47	\$14,242	\$ 5	\$ 14,295
39099813601	\$1,090,328,952	5839	\$ 4,117,638	\$ 37	\$13,538	\$ 56	\$ 13,630
39099811500	\$ 747,828,672	5824	\$ 6,541	\$ 25	\$13,503	\$ 0	\$ 13,528
39099812001	\$1,598,232,043	5622	\$ 4,438	\$ 54	\$13,034	\$ 0	\$ 13,088
39099810700	\$ 667,920,009	5233	\$ 3,001	\$ 22	\$12,133	\$ 0	\$ 12,155
39099812602	\$ 569,453,727	5212	\$ -	\$ 19	\$12,084	\$ -	\$ 12,103
39099812500	\$1,504,735,737	4952	\$ 223,202	\$ 50	\$11,481	\$ 3	\$ 11,535
39099812604	\$ 792,565,362	4884	\$ 44,319	\$ 27		\$ 1	\$ 11,351

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					\$11,323		
39099812601	\$ 684,583,548	4745	\$ 468	\$ 23	\$11,001	\$ 0	\$ 11,024
39099811901	\$1,000,875,300	4289	\$ -	\$ 34	\$ 9,944	\$ -	\$ 9,977
39099812102	\$1,190,460,182	4231	\$ 3,021,010	\$ 40	\$ 9,809	\$ 41	\$ 9,891
39099810100	\$ 524,443,884	4213	\$ 10,278	\$ 18	\$ 9,768	\$ 0	\$ 9,785
39099811301	\$ 433,696,834	4199	\$ -	\$ 15	\$ 9,735	\$ -	\$ 9,750
39099812900	\$1,198,191,752	4101	\$11,961,404	\$ 40	\$ 9,508	\$ 164	\$ 9,712
39099813000	\$1,246,856,314	4117	\$ 8,416,109	\$ 42	\$ 9,545	\$ 115	\$ 9,702
39099813200	\$ 750,024,956	4171	\$ 137,217	\$ 25	\$ 9,670	\$ 2	\$ 9,697
39099813502	\$1,090,574,664	4058	\$ 7,338,374	\$ 37	\$ 9,408	\$ 100	\$ 9,545
39099811001	\$ 574,122,895	4002	\$ 375,161	\$ 19	\$ 9,279	\$ 5	\$ 9,303
39099812301	\$ 466,039,372	3888	\$ -	\$ 16	\$ 9,014	\$ -	\$ 9,030
39099812002	\$ 668,173,203	3882	\$ 485,554	\$ 22	\$ 9,000	\$ 7	\$ 9,029
39099812800	\$ 965,124,425	3560	\$ 3,807,092	\$ 32	\$ 8,254	\$ 52	\$ 8,338
39099813501	\$1,053,906,557	3537	\$ 1,593,992	\$ 35	\$ 8,200	\$ 22	\$ 8,258
39099813700	\$ 957,127,710	3506	\$ 23,859	\$ 32	\$ 8,129	\$ 0	\$ 8,161
39099813400	\$1,061,243,740	3420	\$ 9,542,842	\$ 36	\$ 7,929	\$ 131	\$ 8,095
39099811600	\$ 606,285,014	3479	\$ -	\$ 20	\$ 8,066	\$ -	\$ 8,086
39099811902	\$1,303,296,697	3292	\$ 37,840	\$ 44	\$ 7,632	\$ 1	\$ 7,677
39099802701	\$ 471,455,533	3232	\$ -	\$ 16	\$ 7,493	\$ -	\$ 7,509
39099811400	\$ 407,781,283	3218	\$ 702	\$ 14	\$ 7,461	\$ 0	\$ 7,475
39099813300	\$1,049,911,713	3101	\$10,878,953	\$ 35	\$ 7,190	\$ 149	\$ 7,374
39099812605	\$ 532,541,726	3134	\$ 556,094	\$ 18	\$ 7,266	\$ 8	\$ 7,292
39099813800	\$ 338,625,705	3024	\$ 165,108	\$ 11	\$ 7,011	\$ 2	\$ 7,025
39099814000	\$2,006,283,704	2908	\$ 23,308	\$ 67	\$ 6,742	\$ 0	\$ 6,810
39099802702	\$ 370,099,686	2818	\$ 468	\$ 12	\$ 6,533	\$ 0	\$ 6,546
39099810600	\$ 494,813,030	2784	\$ 27,532	\$ 17	\$ 6,455	\$ 0	\$ 6,472
39099812400	\$ 950,774,743	2742	\$ 12,069	\$ 32	\$ 6,357	\$ 0	\$ 6,389
39099802800	\$ 450,052,033	2665	\$ 2,570	\$ 15	\$ 6,179	\$ 0	\$ 6,194
39099811700	\$ 395,152,616	2622	\$ -	\$ 13	\$ 6,079	\$ -	\$ 6,092
39099802400	\$ 386,591,129	2531	\$ -	\$ 13	\$ 5,868	\$ -	\$ 5,881
39099813602	\$ 670,841,406	2468	\$ 5,452,866	\$ 22	\$ 5,722	\$ 75	\$ 5,819
39099811200	\$ 567,925,899	2393	\$ 702	\$ 19	\$ 5,548	\$ 0	\$ 5,567
39099801600	\$ 410,614,070	2336	\$ -	\$ 14	\$ 5,416	\$ -	\$ 5,430
39099801100	\$ 293,764,858	2335	\$ -	\$ 10	\$ 5,414	\$ -	\$ 5,423

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39099814100	\$ 766,588,892	2303	\$ 69,976	\$ 26	\$ 5,339	\$ 1	\$ 5,366
39099802900	\$ 298,621,097	2233	\$ -	\$ 10	\$ 5,177	\$ -	\$ 5,187
39099812700	\$1,030,072,005	2124	\$ 5,037,105	\$ 35	\$ 4,924	\$ 69	\$ 5,028
39099811302	\$ 668,444,129	2139	\$ -	\$ 22	\$4,959	\$ -	\$ 4,982
39099801300	\$ 263,454,268	2141	\$ 14,645	\$ 9	\$ 4,964	\$ 0	\$ 4,973
39099800501	\$ 200,649,900	2116	\$ 17,050	\$ 7	\$ 4,906	\$ 0	\$ 4,913
39099801400	\$ 244,903,897	2104	\$ -	\$ 8	\$ 4,878	\$ -	\$ 4,886
39099804000	\$ 448,672,200	2080	\$ -	\$ 15	\$ 4,822	\$ -	\$ 4,837
39099810800	\$ 323,601,600	2046	\$ 18,575	\$ 11	\$ 4,744	\$ 0	\$ 4,755
39099810900	\$ 525,611,318	2021	\$ 2,545,599	\$ 18	\$ 4,686	\$ 35	\$ 4,738
39099810200	\$ 556,338,737	1974	\$ 47,300	\$ 19	\$ 4,577	\$ 1	\$ 4,596
39099804200	\$ 335,679,127	1934	\$ -	\$ 11	\$ 4,484	\$ -	\$ 4,495
39099803000	\$ 187,937,523	1875	\$ -	\$ 6	\$ 4,347	\$ -	\$ 4,353
39099801500	\$ 259,258,487	1818	\$ -	\$ 9	\$ 4,215	\$ -	\$ 4,224
39099814200	\$ 288,463,682	1722	\$ 123,987	\$ 10	\$ 3,992	\$ 2	\$ 4,004
39099810300	\$ 223,174,786	1665	\$ -	\$ 7	\$ 3,860	\$ -	\$ 3,868
39099811800	\$ 285,215,746	1629	\$ -	\$ 10	\$ 3,777	\$ -	\$ 3,786
39099802600	\$ 205,016,927	1604	\$ -	\$ 7	\$ 3,719	\$ -	\$ 3,726
39099813900	\$ 532,730,116	1571	\$ -	\$ 18	\$ 3,642	\$ -	\$ 3,660
39099801200	\$ 167,738,201	1477	\$ -	\$ 6	\$ 3,424	\$ -	\$ 3,430
39099801000	\$ 631,089,035	1467	\$ -	\$ 21	\$ 3,401	\$ -	\$ 3,422
39099802500	\$ 204,306,658	1312	\$ 468	\$ 7	\$ 3,042	\$ 0	\$ 3,049
39099804100	\$ 280,767,732	1300	\$ -	\$ 9	\$ 3,014	\$ -	\$ 3,023
39099800600	\$ 265,980,246	1194	\$ 6,073	\$ 9	\$ 2,768	\$ 0	\$ 2,777
39099811100	\$ 247,323,965	996	\$ 7,295	\$ 8	\$ 2,309	\$ 0	\$ 2,318
39099800502	\$ 267,614,386	959	\$ 4,457	\$ 9	\$ 2,223	\$ 0	\$ 2,232
39099801700	\$ 369,538,032	928	\$ -	\$ 12	\$ 2,152	\$ -	\$ 2,164
39099804300	\$ 234,377,583	900	\$ 572	\$ 8	\$ 2,087	\$ 0	\$ 2,094
39099802100	\$ 186,179,016	892	\$ -	\$ 6	\$ 2,068	\$ -	\$ 2,074
39099802300	\$ 137,739,609	787	\$ -	\$ 5	\$ 1,825	\$ -	\$ 1,829
Grand Total	\$ 48,322,567,878	228579	\$78,699,686	\$ 1,619	529,955	\$ 1,076	\$532,650

There are no Mahoning County census tracts (CTs) facing a high risk for Heat Wave building, agricultural, or population harm based on this NRI data.

While there is no NRI data regarding drought impact, exposure and potential risk can be identified by the impact on agriculture. The 2022 Census of Agriculture, Mahoning Co. Profile, shows the following crop acreage and market sales changes from 2017 to 2022.

Factor	2022 Data	Change in % since 2017
Acreage	71,023 acres	-5%
Number of Farms	661	-15%
Market value of products sold	\$86,551,000	+26%
Net cash farm income	\$29,418	+175%

Additional agricultural data, from USDA.gov Quickstats, shows the following growth of corn and soybean planting in Mahoning Co from 2017 to 2023.

Crop	2017 Acres Planted	2023 Acres Planted	% Change
Corn	15,000	16,400	+9.3%
Soybeans	16,100	16,300	+0.1 %

It is clear from this data that crop agriculture is an expanding economic engine in Mahoning Co, with fewer farmers being more productive than ever.

A drought would have a devastating impact on crop production, thus farmer's livelihood.

2.15 Wildfire

2.15.1 Extent

A wildfire is a large, destructive fire that spreads quickly over woodland or brush.

Climate Change Impact:

Based on the US Climate Resilience Toolkit, Mahoning County is expected to see an increase in the number of hot weather days and fewer days of rain, but with greater annual precipitation. The following charts show the projected trends.

Indicator	Modeled History (1976-2005)	Low Estimate (2015 -2044)	High Estimate (2015-2044)
Annual Days > 90°F	6	23	26
Annual Days > 95°F	1	5	7
Annual Days > 100°F	0	1	1
Avg. annual total precipitation	37"	38"	39"
Days with precipitation	211	207	207
Days with no precipitation (dry days)	154	158	158
Max number of consecutive dry days	10	11	11

The data suggests that the risk of an increase in hotter days is real, the risk for a drought is relatively low. Further, while the model projects four (4) fewer days of rain, the days it does rain are likely to be

more intense. As a result, climate change is not likely to increase or reduce the risk of wildfires in Mahoning County.

2.15.2 Droughts-Precursor to Other Disasters

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

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

Fire fighters talk of the fire triangle in terms of the heat of combustion, fuel and oxygen all being necessary for fire to occur. Wild land fire fighters are concerned with the wild land fire triangle of fuel (grass, brush, forests, crops, etc.), terrain (open flat lands, steep slopes and everything conducive to wild land fire spread) and weather (hot, dry, windy conditions are typical wild land fire weather).

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

2.15.3 Urban/Rural Fire Interface

The wildland-urban interface can be defined as the zone where structures and other human developments meet or intermingle with undeveloped lands.

Topography plays a major role in how fast wildfire spreads. Steep slopes are the greatest topographical influence on fire behavior. As the steepness of a slope increases, fires spread more quickly. A fire will spread twice as fast on a 30% slope than it will on level ground. This fast speed is the result of a fire starting at the bottom of a slope that has a longer upslope run with more available fuel in its path. Unlike most hazards, the threat of a drought tends to be dismissed because of the relatively long time a drought takes to have damaging effects.

According to the NCEI, there have been no recorded wild or forest fires in Mahoning County's history from 1972 to 2022. The data is included in *Appendix F*.

2.15.4 Frequency/Probability of Future Occurrence

According to the NCEI, Mahoning County has had no droughts since 1972, with no property or crop damage. The odds of future occurrences based on this information are less than 1% (.01). However, Mahoning County is largely agricultural and suffers varying amounts of crop damage during severe heat and dry conditions that may not be categorized as a drought. The Planning Team concluded that this damage is not always recorded but still has a detrimental effect on the County. The Planning Team also realized that, unlike other hazards such as flooding or tornadoes, there is little mitigation that can be preplanned to reduce the amount of agricultural damage caused by a drought or wildfire.

The Mahoning County National Risk Index (12/3/23) indicates frequency and probability of future events as follow:

Hazard	Risk Index Rating/ Risk Index Score (0-100)	Record Period	Annualized Event Frequency	Expected Annual Loss Rating Score (0-100)	Expected Annual Property/Ag Loss \$	Expected Deaths/Injuries
Wildfire	Very Low/56.5	2021 dataset	0.001% chance per year	Very Low/56.5	\$52,893/\$5	0

Both NCEI and NRI data indicate a low risk of wildfire and minimal damage when events occur.

2.15.5 Vulnerability

National Risk Index Data

Hazard	Annualized Event Frequency	Expected Annual Loss Values Total	Building Annual Loss Value	Ag Annual Loss Value	Population Equivalency Annual Loss Value	Expected Annual Deaths/Injuries
Wildfires	0.001/yr.	\$ 57,145	\$52,893	\$5	\$4,247	

Further, NRI analysis suggests the following losses based on building value, population injury/death, and agriculture value.

Hazard	Building Value	Population	Agriculture Value
Wildfires	\$1/\$913.58k	1/624.33m	\$1/\$15.93m

MAHONING COUNTY NRI WILDFIRE EXPOSURE AND EXPECTED ANNUAL LOSS (EAL)

Census Tract	Exposure (Sq. Mi)	Exposure (Buildings)	Exposure (Population)	Exposure (Agriculture)	EAL (Buildings)	EAL (Pop Equiv)	EAL (Agriculture)	EAL (Total)
39099813400	9.65	\$ 696,582,305	2369	\$ 4,918,575	\$ 2,786	\$ 166	\$ 1	\$2,953
39099813000	8.62	\$ 668,911,631	2440	\$ 4,248,458	\$ 2,676	\$ 171	\$ 1	\$2,847
39099812101	1.33	\$ 642,794,150	2879	\$ 212,832	\$ 2,571	\$ 202	\$ 0	\$2,773
39099812900	10.97	\$ 639,933,521	2369	\$ 5,539,006	\$ 2,560	\$ 166	\$ 1	\$2,727
39099813300	9.93	\$ 640,967,267	1990	\$ 4,937,097	\$ 2,564	\$ 139	\$ 1	\$2,704
39099811002	2.32	\$ 566,528,228	2859	\$ 827,466	\$ 2,266	\$ 200	\$ 0	\$2,467
39099813502	6.30	\$ 538,182,575	2079	\$ 3,088,863	\$ 2,227	\$ 153	\$ 0	\$2,381
39099812500	0.93	\$ 520,784,728	1593	\$ 143,354	\$ 2,083	\$ 112	\$ 0	\$2,195
39099813501	2.31	\$ 512,437,390	1735	\$ 888,708	\$ 2,050	\$ 122	\$ 0	\$2,171
39099812200	0.74	\$ 496,877,187	2296	\$ 56,504	\$ 1,988	\$ 161	\$ 0	\$2,148
39099813601	3.58	\$ 416,221,181	2238	\$ 1,604,971	\$ 1,674	\$ 158	\$ 0	\$1,832

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39099812700	4.30	\$ 427,363,140	1015	\$ 2,136,942	\$ 1,709	\$ 71	\$ 0	\$1,781
39099812102	2.34	\$ 398,304,433	1594	\$ 992,940	\$ 1,596	\$ 112	\$ 0	\$1,708
39099812800	4.43	\$ 392,866,807	1408	\$ 2,214,491	\$ 1,571	\$ 99	\$ 0	\$1,670
39099811902	0.48	\$ 369,138,371	1265	\$ 13,044	\$ 1,477	\$ 89	\$ 0	\$1,565
39099812001	0.41	\$ 357,389,543	1288	\$ 3,270	\$ 1,430	\$ 90	\$ 0	\$1,520
39099813602	4.32	\$ 325,920,175	1144	\$ 2,082,282	\$ 1,304	\$ 80	\$ 0	\$1,384
39099811500	0.49	\$ 281,856,554	2126	\$ 2,530	\$ 1,127	\$ 149	\$ 0	\$1,276
39099813200	0.51	\$236,944,574	1221	\$ 91,526	\$ 948	\$ 86	\$ 0	\$1,033
39099812302	0.41	\$ 217,376,349	1818	\$ -	\$ 870	\$ 127	\$ -	\$ 997
39099812604	0.39	\$ 220,262,677	1228	\$ 40,306	\$ 881	\$ 86	\$ 0	\$ 967
39099812605	0.94	\$ 214,119,465	1174	\$ 356,888	\$ 856	\$ 82	\$ 0	\$ 939
39099810900	2.45	\$ 209,050,004	842	\$ 1,187,366	\$ 840	\$ 59	\$ 0	\$ 899
39099812400	0.25	\$ 207,995,293	431	\$ 10,838	\$ 832	\$ 30	\$ 0	\$ 862
39099812002	0.78	\$ 192,735,841	1233	\$ 289,061	\$ 771	\$ 86	\$ 0	\$ 857
39099812601	0.19	\$ 172,421,987	1237	\$ 465	\$ 690	\$ 87	\$ 0	\$ 776
39099811200	0.24	\$ 177,553,458	787	\$ 234	\$ 710	\$ 55	\$ 0	\$ 765
39099810700	0.24	\$ 162,494,300	1213	\$ 3,001	\$ 650	\$ 85	\$ 0	\$ 735
39099811001	0.74	\$ 161,108,567	987	\$ 226,593	\$ 644	\$ 69	\$ 0	\$ 714
39099814100	0.18	\$ 156,418,517	697	\$ 15,441	\$ 626	\$ 49	\$ 0	\$ 675
39099811600	0.20	\$ 131,064,267	725	\$ -	\$ 524	\$ 51	\$ -	\$ 575
39099814200	0.42	\$ 127,166,154	870	\$ 40,584	\$ 509	\$ 61	\$ 0	\$ 570
39099810100	0.23	\$ 120,183,817	888	\$ 8,392	\$ 481	\$ 62	\$ 0	\$ 543
39099802702	0.17	\$ 98,337,698	704	\$ 241	\$ 393	\$ 49	\$ 0	\$ 443
39099812602	0.16	\$ 95,702,471	827	\$ -	\$ 383	\$ 58	\$ -	\$ 441
39099802701	0.13	\$ 83,066,285	595	\$ -	\$ 332	\$ 42	\$ -	\$ 374
39099811901	0.08	\$ 85,908,682	291	\$ -	\$ 344	\$ 20	\$ -	\$ 364
39099810200	0.15	\$ 81,959,805	488	\$ 5,126	\$ 328	\$ 34	\$ 0	\$ 362
39099812301	0.13	\$ 74,275,436	612	\$ -	\$ 297	\$ 43	\$ -	\$ 340
39099811301	0.12	\$ 70,206,922	663	\$ -	\$ 281	\$ 47	\$ -	\$ 327
39099811302	0.12	\$ 71,225,753	463	\$ -	\$ 285	\$ 32	\$ -	\$ 317
39099813800	0.29	\$ 65,570,280	642	\$ 95,721	\$ 262	\$ 45	\$ 0	\$ 307
39099810800	0.14	\$ 67,943,829	457	\$ 10,024	\$ 272	\$ 32	\$ 0	\$ 304
39099811400	0.08	\$ 60,423,269	406	\$ 702	\$ 242	\$ 28	\$ 0	\$ 270
39099813900	0.07	\$ 57,835,512	241	\$ -	\$ 231	\$ 17	\$ -	\$ 248
39099800501	0.12	\$ 51,728,741	549	\$ 3,967	\$ 207	\$ 38	\$ 0	\$ 245
39099814000	0.07	\$ 53,066,097	179	\$ 674	\$ 212	\$ 13	\$ 0	\$ 225
39099802800	0.07	\$ 46,939,766	217	\$ 1,643	\$ 188	\$ 15	\$ 0	\$ 203
39099811100	0.07	\$ 44,701,838	282	\$ 1,405	\$ 179	\$ 20	\$ 0	\$ 199
39099813700	0.07	\$ 45,079,223	173	\$ 476	\$ 180	\$ 12	\$ 0	\$ 192
39099801000	0.03	\$ 43,684,802	79	\$ -	\$ 175	\$ 6	\$ -	\$ 180
39099810600	0.06	\$ 37,033,209	238	\$ 3,017	\$ 148	\$ 17	\$ 0	\$ 165
39099803000	0.06	\$ 34,523,263	318	\$ -	\$ 138	\$ 22	\$ -	\$ 160
39099802600	0.07	\$ 33,047,319	275	\$ -	\$ 132	\$ 19	\$ -	\$ 151
39099802500	0.04	\$ 33,670,512	117	\$ 13	\$ 135	\$ 8	\$ 0	\$ 143

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39099801200	0.05	\$ 29,027,885	213	\$ -	\$ 116	\$ 15	\$ -	\$ 131
39099804000	0.03	\$ 27,109,721	54	\$ -	\$ 108	\$ 4	\$ -	\$ 112
39099801700	0.03	\$ 23,104,626	143	\$ -	\$ 92	\$ 10	\$ -	\$ 102
39099802400	0.04	\$ 22,379,030	181	\$ -	\$ 90	\$ 13	\$ -	\$ 102
39099810300	0.03	\$ 21,555,491	125	\$ -	\$ 86	\$ 9	\$ -	\$ 95
39099801300	0.04	\$ 20,353,414	185	\$ 1,549	\$ 81	\$ 13	\$ 0	\$ 94
39099811700	0.02	\$ 21,136,283	123	\$ -	\$ 85	\$ 9	\$ -	\$ 93
39099804300	0.01	\$ 21,837,416	17	\$ 228	\$ 87	\$ 1	\$ 0	\$ 89
39099801600	0.02	\$ 15,624,941	139	\$ -	\$ 62	\$ 10	\$ -	\$ 72
39099801500	0.02	\$ 15,817,306	103	\$ -	\$ 63	\$ 7	\$ -	\$ 70
39099801400	0.03	\$ 12,412,409	116	\$ -	\$ 50	\$ 8	\$ -	\$ 58
39099804200	0.01	\$ 10,833,155	52	\$ -	\$ 43	\$ 4	\$ -	\$ 47
39099801100	0.02	\$ 8,699,933	103	\$ -	\$ 35	\$ 7	\$ -	\$ 42
39099800600	0.01	\$ 8,068,480	37	\$ -	\$ 32	\$ 3	\$ -	\$ 35
39099804100	0.00	\$ 5,411,768	13	\$ -	\$ 22	\$ 1	\$ -	\$ 23
39099800502	0.00	\$ 1,156,602	0	\$ 466	\$ 5	\$ 0	\$ 0	\$ 5
39099811800	0.00	\$ 376,509	2	\$ -	\$ 2	\$ 0	\$ -	\$ 2
39099802900	0.00	\$ -	0	\$ -	\$ -	\$ -	\$ -	\$ -
39099802300	0.00	\$ -	0	\$ -	\$ -	\$ -	\$ -	\$ -
39099802100	0.00	\$ -	0	\$ -	\$ -	\$ -	\$ -	\$ -
Grand Total	84.31	\$ 13,200,790,141	60460	\$ 36,307,276	\$ 52,893	\$ 4,247	\$ 5	\$57,145

There are no Mahoning County census tracts (CTs) facing a high risk for Wildfire building, agricultural, or population harm based on this NRI data.

3.0 Mitigation Strategy

Mahoning County Hazard Mitigation Plan 2024-2028

3.0 MITIGATION STRATEGIES

As the hazard mitigation planning team in Mahoning County developed mitigation goals and strategies, the intent was to address the identified risks and vulnerabilities for the county and addresses concerns in each jurisdiction.

3.1 GOALS AND ACTION ITEMS

Mahoning County, OH Mitigation Action Plan Matrix

The following chart shows 11 Goals and 39 Action Items which are intended to address and mitigate the loss of property and life because of All Natural Hazards in Mahoning County over the next five (5) years (2024-2028).

Priority Projects were determined by the Planning Team and all Action Items are ranked based on critical need to implement:

1 Highest Priority: 1-2 years; 2 Important Priority 1-3 years; 3 Priority 2-3 years; 4 Medium Priority 3-4 years; and
5 Low Priority 4-5 years

“ALL” under Target Jurisdiction and Comments includes ALL the following local jurisdictions and unincorporated areas in Mahoning County: **Cities of Campbell, Canfield, Struthers, and Youngstown; Villages of Beloit, Craig Beach, Lowellville, New Middletown, Poland, and Sebring** (The number at the end of each Action Item corresponds to the 2018 Plan).

The Planning Team also rated the **Financial Feasibility** of the Action Item on a scale of (1) good cost/benefit, (2) fair cost/benefit, and (3) poor cost/benefit. The primary leader for each Action Item is in **bold**.

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
ALL Hazards 1.1 Reduce health, safety, and property risks during future natural disasters	1	1.1.1 Install 3 200kw portable generators for Youngstown water pump stations at: Evans Field Pump Station; West Side Pump Station; Oak St. Pump Station; Stewart Ave. Pump Station (New)	2 years	Youngstown Engineer	\$525,100 quote (3/19/24) City Water Fund OEPA FEMA (2)	Youngstown	New
	3	1.1.2 Communities develop emergency storm cleanup plans (New) <i>Utility companies do PM tree work, but will not cleanup after disasters</i>	3 years	MCEMA Director	OEMA FEMA Local Resource (1)	All Cities and Villages	New
	2	1.1.3 Fixed Generators to assist during emergency situations (New)	3 years	MCEMA Director	OEMA FEMA-PDM \$25K/unit (2)	New Middletown (2 churches) Mill Creek Parks Austin Twps. Senior Center	New
	3	1.1.4 Additional ambulances for public safety needs during emergencies (New)	3 years	Community Fire Chiefs	+/- \$150,000 per unit (2)	New Middletown Austintown Township Boardman Youngstown	New
	2	1.1.5 Additional residential and community storm shelters for use during emergencies and disasters (25)	3 years	Mayors and Administrators of each participating jurisdiction	FEMA (2)	Cities and Villages	Continued

	2	1.1.6 Mahoning Co EMA will assist limited/ medium capacity jurisdictions improve/expand their capabilities regarding plans, functions, funding, and regulations as listed in Sections 1.3 and 4.2, where applicable. This will be achieved by conducting Strength/Weakness/Gap Assessments and by providing technical support to securing funding and to implement their Action Items. This will include a focus on plan integration efforts to reflect stronger jurisdiction commitment to integrate local planning mechanisms into future HMPs, as well as HMPs and HM into future policies, and regulations. (NEW)	3 years	MCEMA Director Mayors and Administrators of each participating jurisdiction	Existing community resources (1)	Cities of Cambell, Canfield, and Struthers Beloit, Craig Beach, Lowellville, New Middletown, Poland, Sebring	New
Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
Strong Winds 2.1 Reduce health, safety, and property risks during strong wind events.	5	2.1.1 Identify and demolish old vacant homes that have been condemned to reduce the risk from severe winds, or if feasible retrofit to current building codes. (6)	5 years	City Council	Est \$45k /unit CDBG FEMA-BRIC (1)	Campbell	Continued

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
	3	2.1.2 Develop community-based tree trimming programs beyond utility company efforts, to reduce damage during wind events (New)	3 years	MCEMA Director	Existing community resources (1)	All jurisdictions	New
	2	2.1.3 Coordinate utility company tree maintenance work with community-based tree trimming efforts (New)	3 years	MCEMA Director	No new resources required. (1)	All jurisdictions	New
	3	2.1.4 Public education PSAs to help residents and businesses prepare for wind events (New)	3 years	MCEMA Director	Existing resources (1)	All jurisdictions	New
Flood 3.1 Reduce health, safety, and property risks during flood disasters	1	3.1.1 Improve stormwater management via box culverts, greenspace, and bioswales to reroute water from Glenwood Ave and Rockdale area into Mill Creek. The project includes property acquisition, demolition, and relocations (New)	2 years	Boardman Township Administrator	\$47,247,600 Federal: FEMA Local match: \$11,791,900 (1)	Boardman	Waiting for approvals
	4	3.1.2 Replace problem-area sections of the stormwater system on Wilson Ave. (5)	4 years	Campbell Administrator	OPWC CDBG C/B Not known	Cambell	Continued

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
	1	3.1.3 Conduct drainage study of Briarcliff and Bradford area to address persistent flooding (7)	2 years	City Council	Planning Grant Water Resource Restoration C/B not known	Canfield	Underway
	2	3.1.4 Employ techniques of erosion control within the watershed area (proper bank stabilization, planting of vegetation on slopes, creation of terraces on hillsides, use of riprap and geotextile fabric etc.) (12)	3 years	Floodplain Coordinator	\$65,000-\$150,000 OEMA FEMA (2)	Lowellville	Ongoing
	2	3.1.5 Educate local officials on sources of information that can be used to monitor flooding, storm, and other weather information (IFLOWS, U.S.G.S. gage data etc.) (14)	3 years	Soil and Water Conservation Coordinator	No additional funding needed (1)	ABC Stormwater District; MVDSD: Boardman continue efforts. Poland Stuthers	Ongoing
	3	3.1.6 Participate in Community Rating System (CRS) on a county-wide basis to reduce flood insurance rates (21)	3 years	MCEMA Director	No additional funding needed, but may need staff support (1)	County-wide	Continued
	2	3.1.7 Develop/implement community specific plans for repetitive loss structures to flood proof, relocate, or buyout to eliminate future risks. (29)	3 years	Co Floodplain Administrator Mahoning Co Commissioners, Mayors of Youngstown and Canfield	FEMA-BRIC (1) FMA	County-wide	Continued

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
	4	3.1.8 Preventative maintenance plan for storm sewers to better handle heavy rain events. (New)	4 years	MC Engineer Political Subdivision Engineers	No additional funding (1)	Sebring Youngstown Austintown	New
	5	3.1.9 Address flow and capacity in Canterbury Creek (fed from Raybuck Lake) to reduce flooding in Poland Township (New)	5 years	Township Administrator	C/B not known	Poland Township	New
	4	3.1.10 Develop and implement floodplain/land use management with new building regulations, to reduce the impact of flooding (New)	4 years	City Manager	Existing resources (1)	Sebring	New
	2	3.1.11 Consider rejoining NFIP	3 years	Village Administrator	Existing resources	Beloit	Continued
Winter Weather 4.1 Reduce health, safety, and property risks during winter weather disasters	2	4.1.1 Purchase adequate snow removal equipment Campbell: 3 plow trucks Lowellville: 2 plow trucks Austintown Township: 1 truck (11) Investigate brine storage and spreading equipment	3 years	Village Councils Public Safety Coord.	New units (truck, plow, and accessories) around \$90,000/unit ODOT CDBG (1)	Campbell Lowellville Austintown Township	Continued and expanded

	4	4.1.2 Develop warming centers to serve vulnerable populations	4 years	MCEMA Director Red Cross	CDBG OEMA C/B not known	County-wide	New
Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
	3	4.1.3 Develop public information program to increase awareness of winter weather risks and available resources to help (New)	3 years	MCEMA Director	Existing resources (1)	All jurisdictions	New
Dam/Levee Failure 5.1 Reduce health, safety, and property risks during dam/levee disasters	2	5.1.1 Regulate future development in the hydrological shadow of Berlin Lake Dam and Lake Milton Dam. (10)	3 years	MC Zoning Administrator Village Mayor	ODNR with existing resources (1) FEMA-HHPD if assessment is conducted	Craig Beach Milton Township Berlin Township	Continued
	5	5.1.2 Coordinate with the ODNR, Division of Dam Safety Section, in accordance with ORC Section 1512.062, to periodically inspect and update /reclassify any dam within Mahoning County as a result of a change in circumstances to ensure adequate safety according to the potential for downstream damage. (17)	5 years	MCEMA Director ODNR	ODNR with existing resources (1) FEMA-HHPD if assessment is conducted	County-wide	Continued

	4	5.1.3 Work with Class I dam owners to obtain or develop Emergency Action Plans, to include a detailed assessment of the vulnerability of structures and critical facilities near the hydrological shadow of the dams as well as inundation studies. (28)	4 years	MCEMA Director	ODNR Up to \$45,000 needed county-wide (1) FEMA-HHPD if assessment is conducted	County-wide	Continued
Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
	3	5.1.4 Complete repair work on Lake Milton Dam (New)	By 10/1/24	ODNR Div of Water Resources Dir.	ODNR (1)	Lake Milton Dam Milton Township	Waiting for as-built plans
	1	5.1.5 Develop alternative drinking water plans if Meander or Evans dams are compromised or fail (New)	2 years	MVSD Engineer Aqua Engineer Youngtown Water Dept. Engineer	ODNR OWDA C/B not known HHPD if assessment is conducted	Youngstown County-wide	New Over 300k people get water from these dams
Summer Storms 6.1 Reduce health, safety, and property risks during summer storm events		Summer Storm related mitigations are captured in Action Items 1.1.2, 1.1.3, 1.1.5, 2.1.1, 2.1.2, 2.1.4, 3.1.5, 3.1.8, 3.1.9, and 3.1.10					

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
Tornadoes 7.1 Reduce health, safety, and property risks during tornadoes.	1	7.1.1 Implement a redundant siren control backup system and replace a broken siren in Boardman and add a new siren in Canfield. (20)	2 years	MCEMA Director	USDA FEMA-BRIC OEMA \$25,000 per siren (1)	Boardman Canfield	Continued (with more detail)
	4	7.1.2 Coordinate with the County Building Inspector to annually assess County building codes to determine possible enhancements for reducing tornado risks that supplement Ohio building code requirements for commercial and apartments with four or more dwellings. (30)	4 years	County Building Inspector	Local funding up to \$5,000 (1)	County-wide	Continued
	2	7.1.3 Purchase mobile 35kw generators or (gen-sets) that can be transported to shelters throughout Mahoning Co (31)	3 years	MCEMA Director	FEMA-BRIC Local Funding \$10K-\$15K/generator (2)	Continue: Purchase 2 additional mobile units for EMA	Continued

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
Earthquakes 8.1 Reduce health, safety, and property risks during earthquake disasters	4	8.1.1 Perform an annual reassessment of the vulnerability of county facilities to natural disasters based on past year experience to determine mitigation needs. (13)	4 years	MC Engineer	Local funding FEMA-BRIC (1)	County-wide	Continued
	2	8.1.2 Install sensory systems that immediately shut off the flow of gas throughout the county as soon as earth movements are felt. (33)	3 years	MC EMA Director	FEMA-BRIC FEMA-HMGP Up to \$3k per sensor (1)	County-wide	Continued
Landslides/ 9.1 Reduce health, safety, and property risks during landslides or subsidence events	3	9.1.1 Coordinate with the Ohio Department of Natural Resources, Division of Mineral Resources Management, Office of Abandon Mine Lands and Reclamation to undertake reclamation projects if subsidence occurs at a specific location. (23)	3 years	Beaver Township Trustees	Coordination should require no significant additional funding; however, a project would require significant funding, primarily from ODNR through the AML&R program up to \$2M. (1)	Beaver Township at Beaver Springfield Road and SR 165	Underway

Goal	Priority	Action Item Mahoning County	Timeline to Complete	Responsible Party	Resources Cost Benefit 1 good/2 fair/3 poor	Target Jurisdiction	Status
Drought/ Heat Wave 10.1 Reduce health, safety, and property risks during drought conditions or heat waves	5	10.1.1 Consider developing ordinances to prioritize or control water use and encourage residents to take water-saving measures such as installing low flow shower heads and toilets during new construction. (2)	5 years	County Commissioners Water Utility Companies	Existing resources (1)	All Jurisdictions County-Wide	Continued
	2	10.1.2 To encourage greater use of shelters by vulnerable populations (elderly) during emergencies, develop pet friendly shelter policies (New)	3 years	MCEMA Director Red Cross	No new resources required (1)	Shelter locations	New
Wildfire 11.1 Reduce health, safety, and property risks during wildfire disasters	4	11.1.1 To reduce the risk of wildfires, organize community cleanup efforts for leaves, branches etc. (New)	4 years	Mayors Managers	Community resources (1)	All jurisdictions	New
	4	11.1.2 Implement public awareness effort to educate residents about how to prevent wildfires (New)	4 years	ODNR	Existing resources (1)	All jurisdictions	New

4.0 PLAN MAINTENANCE

The plan maintenance section of the hazard mitigation plan includes methods of how the committee and the jurisdictions will monitor, evaluate, and update the plan, how they will integrate existing plans with hazard mitigation, and how they will continue to involve the public in the five-year cycle of this plan.

4.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

The committee understands that “the mitigation plan is a living document that guides action over time. As conditions change, new information becomes available, or actions progress over the life of the plan, plan adjustments may be necessary to maintain its relevance” (FEMA, 2013). To that end, the committee discussed the strategy to maintain the plan in the next five years after the official adoption and before the next update. They determined the following:

- The steering committee will meet every year, in person or on the phone, to evaluate the effectiveness of the HMP and mitigation actions.
- A representative from the steering committee will attend one local emergency planning committee (LEPC) meeting, one township meeting, and one general policy board meeting; they will attempt to get on the agenda for one of those meetings at least once a year and reach every meeting within the five-year timeframe.
- In order to streamline the update process for the next cycle, the committee will keep records of:
 - events and incidents that occur in the county or surrounding counties that impact the Mahoning County,
 - emergency disaster declarations,
 - changes in the county (e.g., population, economy, development, transportation, infrastructure, etc.),
 - progress on mitigation projects outlined in this plan, and
 - any other relevant information.
- Mahoning County EMA Director, as the entity in charge of this plan, will ensure this plan is updated in five years according to the most recent standards and will include any updates from the previous five years.

4.2 PLAN INTEGRATION

There are a variety of plans that the county and individual jurisdictions have that can organically integrate hazard mitigation projects in them; some already have. All plans identify certain problems and propose solutions within a community. If these plans reference each other and work together to make a community safer, more attractive to residents, commerce, and industries, and healthier overall, then they will work together to create a more resilient community. This is where hazard mitigation actions can aid in making communities safer by lessening the impacts of a variety of hazards.

The different plans are described below in more detail. In general, each section describes who

each plan relates to hazard mitigation; when appropriate, the sections identify specific mitigation actions within the existing plans.

Comprehensive Plans

As mentioned in Section 1.3 Capabilities, comprehensive plans guide the location, type, and extent of future development. In them, they describe a variety of projects that can relate to mitigation. The following table outlines the general elements that comprehensive plans incorporate and how they relate directly to hazard mitigation.

COMPREHENSIVE PLAN CONCEPT INTEGRATION	
<i>Plan Element</i>	<i>Relevance to Hazard Mitigation</i>
Goals & Objectives	Definition*: <i>This section establishes goals and objectives that serve as a guide for the development and economic and social well-being of the local jurisdictions. The goals and objectives tell the world how the community wants to function and look in the future.</i> This section provides an opportunity for local officials to acknowledge the reciprocal benefits of hazard mitigation to community-level comprehensive planning. This section also serves as a statement of the community's stance on resilience as it moves forward.
Land Use	Definition: <i>The land use element outlines the most appropriate and desirable patterns of growth and development.</i> This section can include risk areas as key points of information for consideration as to these appropriate and desirable patterns. Incorporating mitigation in this section does not automatically imply banning development from all high hazard areas; rather, it can identify those areas where certain types of resilient construction techniques would be beneficial.

Source: Maryland Department of Planning

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COMPREHENSIVE PLAN CONCEPT INTEGRATION Plan Element Relevance to Hazard Mitigation	
Transportation	Definition: <i>The transportation element describes and presents transportation patterns and includes the entire spectrum of transportation facilities (transit, roads, bicycle and pedestrian amenities, and transit-oriented development) applicable to the jurisdiction.</i> This section can recognize the importance of the transportation infrastructure to overall emergency and disaster preparedness. Within such a discussion, maintaining critical arterial routes can be prioritized as a mitigative measure.
Community Facilities	Definition: <i>The community facilities element identifies the location, character and extent of public and semi-public buildings, lands, and facilities.</i> This section provides another perspective from which to consider high-risk areas.
Development Regulations	Definition: <i>The development regulations section identifies development tools that are the best available mechanisms to implement the plan, including streamlined review for development in designated growth areas.</i> This section can discuss how local ordinances and regulations can be amended to account for hazard risks. As with the land use element, these regulations may recommend or require certain types of resilient construction.
Sensitive Areas	Definition: <i>The sensitive areas element sets goals, objectives, principles, policies, and standards to protect sensitive areas from the adverse effects of development. The Land Use Article requires jurisdictions to protect streams and their buffers; the 100-year floodplain; habitats of threatened and endangered species; and steep slopes, wetlands, and agricultural and forest lands intended for resource protection or conservation.</i> This section gives communities the option of designating high risk areas as sensitive areas.
Implementation	Definition: <i>Recognizing the importance of designing land development regulations that implement the plan, this section is supposed to address recommendations for land development regulations.</i> This section can include a series of actions that may be duplicated in the hazard mitigation plan (and vice versa). It allows communities to acknowledge those initiatives that overlap both community development and hazard mitigation goals.
Development Capacity Analysis	Definition: <i>This section is an estimate of the total amount of development that may be built in an area under a certain set of assumptions, including land use laws and policies (e.g., zoning), environmental constraints, etc.</i> This section can include high risk areas as a type of environmental constraint.
Municipal Growth	Definition: <i>This element requires municipalities to identify areas for future growth consistent with their long-range visions.</i> This section supports the multi-jurisdictional approach of this hazard mitigation plan by integrating discussions of high risk areas and their relation to areas targeted for future growth. It also provides space to consider such measures as resilient construction in municipal areas.
Water Resources	Definition: <i>This element identifies drinking water supplies needed by projected populations.</i> This section supports the continued operation of critical infrastructure, particularly water systems. By identifying drinking water supply needs and potential upgrades necessary to meet those needs, this section gives local officials the opportunities to discuss upgrades and other means of ensuring reliability of water during emergencies.

Currently, the City of Youngstown is the only jurisdiction within Mahoning County that has a current comprehensive plan; the city has considered updating it. According to the steering committee, Lowellville has already hired a contractor to develop their comprehensive plan and Canfield has considered developing their plan as well. Comprehensive plans should strongly consider actions that will reduce the loss of life and property from hazards and increase the overall resiliency of the jurisdiction.

HAZARD MITIGATION AND COMPREHENSIVE PLAN INTEGRATION	
<i>Concept</i>	<i>Example Projects</i>
Cleaner	• Convert surplus school building sites to green space. • Seek Clean Ohio funding for Brownfields remediation. • Study/Implement code enforcement
Greener	• Create and maintain high quality city parks. • Adopt citywide/regional greenway network. • Support the Mahoning River restoration project. • Encourage preservation of open space
Better Planned and Organized	• Establish industrial green districts. • Support planned development with City Commission approval. • Adopt new zoning code with new development design standards

Source: Youngstown 2010 Citywide Plan

Land Use Plan

Land use plans ensure adherence to the jurisdictions' floodplain, zoning, building, subdivision, and other relevant ordinances and consider the implementation of storm water management projects. Land use plans can also incorporate or consider the implementation of green infrastructure/low-impact development into site-specific projects (e.g., use of porous pavement, tree planting initiatives, planter boxes, bio swales, etc.).

In 2016 Mahoning County Land Use Plan, almost every township in the county has goals and objectives that relate to land use and future development.

HAZARD MITIGATION AND LAND USE PLAN INTEGRATION	
<i>Township</i>	<i>Objectives</i>
Austintown Township	• Preserving floodplains, wetlands and riparian areas • Effectively manage storm water retention/detention
Beaver Township	• Manage the uses and development of land in the township to protect surface water resources from pollution, sedimentation, and increased storm water runoff
Berlin Township	• N/A
Boardman Township	• Advocate adoption of local measure that prevent increases in storm water runoff. • Recognize the importance and encourage the preservation of green space, parklands, sensitive lands, and farmlands
Canfield Township	• Advocate adoption of local measures that prevent increases in storm water runoff

HAZARD MITIGATION AND LAND USE PLAN INTEGRATION	
Township	Objectives
	• Recognize the importance and encourage the preservation of green space, parklands, sensitive lands, and farmlands. • Preserve the natural resources, scenic quality and recreational opportunities of the township through the strict enforcement of regulations to reduce pollution of land and water
Coitsville Township	• Preserve the natural resources, scenic quality and recreational opportunities of the township through the strict enforcement of regulations to reduce pollution of land and water
Ellsworth Township	• Stress environmental protection/riparian corridors/recreational areas
Goshen Township	• N/A
Green Township	• Preserve the natural resources, scenic quality and recreational opportunities of the township through the strict enforcement of regulations to reduce pollution of land and water. • Advocate adoption of local measures that prevent increases in storm water runoff
Jackson Township	• Advocate adoption of local measures that prevent increases in storm water runoff
Milton Township	• Preserve the natural resources, scenic quality and recreational opportunities of the township through the strict enforcement of regulations to reduce pollution of land and water. • Advocate adoption of local measures that prevent increases in storm water runoff. • Recognize the importance and encourage the preservation of green space, parklands, sensitive lands, and farmlands
Poland Township	• Preserve the natural resources, scenic quality and recreational opportunities of the township through the strict enforcement of regulations to reduce pollution of land and water. • Advocate adoption of local measures that prevent increases in storm water runoff
Smith Township	• Advocate adoption of local measures that prevent increases in storm water runoff
Springfield Township	• N/A

Emergency Operations Plan

HAZARD MITIGATION AND EMERGENCY OPERATIONS PLAN INTEGRATION	
Section	Hazard Mitigation Integration
	• Develops a radiological training program. • Develops a radiological reporting network
Annex O: Hazardous Materials (2015)	• Identifies potential hazards. • Establishes warning procedures. • Educates the public and trains emergency personnel. • Develops and exercises emergency response operations
Annex T: Critical Care Facilities (2007)	• Determines hazard vulnerabilities that affect the critical care facility

Emergency operations plans (EOPs) ensure consistency between updated hazard analyses and the risk assessment portion of the plan. They also consider mitigation projects as part of the overall cycle of emergency management. EOPs establish and maintain effective response programs, support continuity of critical infrastructure and key resources, and identify specific risk areas for certain hazards.

The Mahoning County Emergency Management Agency maintains the county's EOP; in it, specific annexes relate to hazard mitigation. The following table describes the annexes and how they can integrate hazard mitigation.

HAZARD MITIGATION AND EMERGENCY OPERATIONS PLAN INTEGRATION	
Section	Hazard Mitigation Integration
Annex J: Evacuation (2007)	• Identifies areas that may require evacuations. • Discourages development, particularly residential, in flood plains and other hazardous areas. • Develops emergency public information messages for areas where the risk population and the evacuation routes can be predetermined. • Includes guides for evacuation assistance in mutual-aid agreements.
Annex M: WMD (2012)	• Establishes a radiological program. • Designates a radiological officer

Source: Mahoning County EOP, 2010

Transportation Planning

Transportation plans can ensure hazards are acknowledged in long-range transportation planning and consider response elements to the hazards identified in the mitigation plan, as appropriate, with respect to transportation (e.g., evacuation). These plans also ensure that planned transportation projects do not add to vulnerabilities (e.g., ensure projects utilize proper drainage, are properly elevated, etc.) and can consider the incorporation of green infrastructure/low-impact development as transportation projects are undertaken (e.g., permeable pavements, green streets and alleys, etc.).

In Mahoning County, the Eastgate Regional Council of Governments has developed the 2040 Metropolitan Transportation Plan which includes Mahoning and Trumbull Counties. Refer to Section 1.4.3 Transportation for information on specific actions this plan outlines.

Floodplain Ordinances

The entire purpose of floodplain ordinances is to mitigate the effect of floods in an area where flooding is prone to occur and therefore relate closely to hazard mitigation activities. Floodplain ordinances support resiliency by ensuring new development and redevelopment stays clear of known hazard areas or is built in such a way as to withstand the effects of known hazards. Ordinances protect green spaces in special flood hazard areas (SFHAs). For specific information on floodplain ordinances and National Flood Insurance Program (NFIP) participation refer to section 2.6 Flooding.

Watershed Plans

Watershed plans identify site-specific flooding concerns and other water quality issues and provide a means for consideration of low-impact development options for flood mitigation.

In Mahoning County, the Eastgate Regional Council of Governments has developed the Yellow Creek Watershed Action Plan (2015) in which they include a variety of information about the watershed. The plan:

- provides information on previous and current water quality efforts,
- contains physical attributes that support water quality such as floodplains, riparian buffers, dams, channelization, and eroding banks, among others,
- identifies causes and sources of water pollution including permitted discharges, spills, surface mines, animal feeding operations, etc., and
- identifies actions to be completed, the timeframe, and estimated cost including reduction of nitrogen, phosphorus, sediment, and bacteria loading, protecting surface drinking water sources, determining the impact of acid mine drainage on the watershed, and educating stakeholders and watershed residents.

4.3 Continued Public Involvement

The public will be involved on a continuous basis. The Planning Team, led by the Mahoning Co EMA Director, will hold annual public open meetings to review plan progress, celebrate accomplishments, and make any needed changes/upgrades. There will also be a formalized press release developed for this annual review process, as well as notices on the County and EMA web sites. Mahoning Co has assembled a sizable number of agency and organization community partners who were very active in this plan update. They will continue to actively reach out to this group to gain their input as well.

5.0 PLAN ADOPTION

As the final step in updating the mitigation plan, Mahoning County followed the formal process for state review, federal approval, and local adoption. This section describes that process and includes all dates relevant to plan approval, adoption, and expiration.

5.1 State Review and Federal Plan Approval

After extensive review by stakeholders and the community, the Mahoning County Hazard

Mitigation Plan was submitted to the Ohio Emergency Management Agency. Following state review, the Contractor and EMA incorporated Ohio EMA's recommended revisions and prepared the plan for submission to the Federal Emergency Management Agency. Upon receipt of conditional approval from OEMA, Mahoning County EMA began to pursue adoption by the jurisdictions.

5.2 Local Adoption

The local plan adoption process began upon receipt of conditional plan approval from FEMA. Mahoning County was the first jurisdiction to formally adopt the plan on behalf of the county as a jurisdiction and on behalf of the townships. All incorporated jurisdictions were also asked to formally adopt the plan through legislation.

Sample legislation was provided to each jurisdiction to assist in this process. A complete list of plan adoptions by jurisdiction is provided in table 5-1. Adoption resolutions from each jurisdiction are also attached to this section.

Table 5.2: Jurisdiction Adoption

Following formal adoption by all jurisdictions, FEMA issued final plan approval. The complete plan was uploaded into the Ohio EMA's MIP (formally SHARRP) portal.

Jurisdiction	Date of Adoption
Mahoning County	
Beloit	
Campbell	
Canfield City	
Craig Beach	
Lowellville	
New Middleton	
Poland Village	
Sebring	
Struthers	
Youngstown	

5.3 Plan Expiration

This updated Mahoning County Hazard Mitigation Plan will expire on **12/31/2028**. The process to maintain the plan will be ongoing throughout the five-year period, as explained in section 1.0 The Planning Process. A detailed plan of action on the process Mahoning County will utilize to update the plan prior to the expiration date should be in place by Spring 2027.

End of Plan