GOSHEN COMMON COUNCIL

Minutes of the OCTOBER 6, 2025 Regular Meeting

Convened in the Council Chambers, Police & Court Building, 111 East Jefferson Street, Goshen, Indiana

Assisted by Mayor Gina Leichty, Andrew, Nate and Lily Deranek called the meeting to order at 6:00 p.m. and led the Pledge of Allegiance. Andrew, Nate and Lily are students at Goshen Community Schools.

Mayor Leichty asked Clerk-Treasurer Aguirre to conduct the roll call. The results:

Present:	**Linda Gerber** (At-Large)	**Phil Lederach** (District 5)	**Doug Nisley** (District 2)
	Megan Peel (District 4)	**Donald Riegsecker** (District 1)	**Matt Schrock** (District 3)
	Council President Brett Weddell (At-Large)	**Youth Adviser Abril Reyes** (Non-voting)	
Absent:	None		

Approval of Minutes:

Mayor Leichty asked the Council's wishes regarding the **minutes of the Sept. 12, 2025 Education/Work Session. Councilor Nisley moved to approve the minutes as presented. Councilor Schrock seconded the motion. The motion passed 7-0 on a voice vote.**

Approval of Meeting Agenda:

Mayor Leichty presented the agenda as submitted by **Clerk-Treasurer Aguirre with the addition of #9 Resolution 2025-17, *A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025*. Councilor Lederach moved to approve the agenda as amended. Councilor Peel seconded the motion. The motion passed 7-0 on a voice vote.**

1) State Rep. Joanna King presentation of the Circle of Corydon Award from Gov. Mike Braun to Goshen Special Police Officer James Ballard, the City's Behavioral Health Response Coordinator

Before the presentation, **State Rep. Joanna King** said that over the past few months she has had discussions with **Mayor Leichty** and others about **Senate Bill 1** and "we do have work to do yet on that bill. And as I've said to the Mayor, we're making some changes for next session, so I appreciate the work that you've put into it and the effort that you've put in to communicate to me the things that need to still change."

Rep. King then said she would honor a community member who has "done an exceptional job of really helping me and others understand the challenges around homelessness and around mental health issues and helping to understand the importance of compassionate care, but also responsibility that takes place in that field. So, tonight, it's my honor, along with the Governor of Indiana … to present this award."

Rep. King then presented **Goshen Police Officer James Ballard** with the **Circle of Corydon Award**, which honors Hoosiers who demonstrate exceptional service to Indiana and its people. The award recognizes individuals who make significant contributions to their communities through leadership, innovation and dedication to public service. It is the only state honor jointly issued and signed by members of both the executive and legislative branches.

Officer Ballard is the behavioral health response coordinator for the City of Goshen. He works for the City's Mobile Integrated Health (MIH) program, which connects people in crisis with shelter, treatment and long-term support.

The program improves coordination among law enforcement, health care providers and community organizations.
Rep. King said **Officer Ballard** has demonstrated in life and in service to the people of the Indiana the qualities exemplified by the state's greatest citizens and was worthy of being declared a member of the Circle of Corydon.
In describing the work of **Officer Ballard**, **Rep. King** added, "He's taken the time to really help other stakeholders in other communities understand the intricacies of this very challenging issue. It's something that I'm committed to continue working on in my role, and Jim has helped me to understand what we can do to help with that."
In response to the award, **Officer Ballard** said, "I couldn't do this without the City of Goshen. It was very difficult for me to come over here when I retired from Elkhart. You know, I was going from a much larger city to a smaller city, so I didn't know what to expect, but the whole entire City, including the Police Department, the Fire Department, they accepted me with open arms."
Officer Ballard added, "Without the stakeholders from this community, our corporate stakeholders, the individuals that work in social services, that provide shelter, such as First Light Mission, Lacasa, we couldn't do this. It's a team effort, and I'm really grateful and humbled by accepting this award."
The audience responded with applause.
Mayor Leichty thanked **Rep. King** and **Officer Ballard** and said, "The work that's being done for mental health advocacy and care for the least of these in our community through our Mobile Integrated Health program cannot be overstated in its importance. Jim touched on something really important, and that is the value of those community partnerships, and he's helped to lead that charge in making sure we're working hand-in-hand with others in our community to expand the reach of what we're doing through public safety and public service to our community."

2) Resolution 2025-16, *Acquisition of Real Estate at 1711 Eisenhower Drive North*
Mayor Leichty called for the introduction of Resolution 2025-16, *Acquisition of Real Estate at 1711 Eisenhower Drive North*. Council President Weddell asked the Clerk-Treasurer to read Resolution 2025-16 by title only, which was done.
Weddell/Nisley made a motion to approve Resolution 2025-16.

BACKGROUND:
Before the Common Council for consideration and approval was Resolution 2025-16, Acquisition of Real Estate at 1711 Eisenhower Drive North.
According to Resolution 2025-16, the City of Goshen is interested in and needs to acquire certain real estate, more commonly known as 1711 Eisenhower Drive North, Goshen, for the expansion of the Kercher Wellfield.
Besides authorizing the purchase, if Resolution 2025-16 was approved, it would be resolved that the purchase price for the real estate "shall not be greater than the average of two appraisals of the fair market value of the real estate, and the acquisition shall be subject to the terms and conditions of a written agreement between the seller of the real estate and City as approved by the Goshen Board of Public Works and Safety."

OCT. 6, 2025 DISCUSSION AND APPROVAL OF RESOLUTION 2025-16:
City Director of Public Works & Utilities Dustin Sailor said that if the property was purchased by the City, it would be used to expand the new Kercher Wellfield.
As previously discussed, **Sailor** said the City we went through a study of its well fields and out of that study it was determined and decided to expand the well field south, by the airport.

Along with that, **Sailor** said it was identified that the City would need additional capacity at the Kercher Wellfield. He said purchasing this parcel would allow for up to three wells to be placed on that property. They would supplement the three wells in the Kercher Wellfield.

Mayor Leichty invited questions from Councilors.

Council President Weddell asked about the price of the parcel. **Sailor** said it hasn't been determined. Although the owner offered a price, it will be the average of two appraisals.

At 6:11 p.m., Mayor Leichty asked if there were any questions or comments about Resolution 2025-16 from the audience. There were not.

Council President Weddell asked how the final price would be determined. For example, he asked what would happen if the average of the two appraisals was lower than what the seller wanted. **Sailor** indicated that in case, the City could not make a higher offer.

On a voice vote, Councilors then unanimously passed Resolution 2025-16, *Acquisition of Real Estate at 1711 Eisenhower Drive North,* by a 7-0 margin, with all Councilors voting "yes," at 6:12 p.m.

3) Public Hearing for Ordinance 5234, An Ordinance for Appropriations and Tax Rates (Second Reading for the proposed 2026 City of Goshen budget)

Mayor Leichty called for the introduction on Second Reading of Ordinance 5234, *An Ordinance for Appropriations and Tax Rates (the proposed 2026 City of Goshen budget).* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5234 by title only, which was done.

Weddell/Peel moved to approve Ordinance 5234 on Second and Final Reading.

BACKGROUND:

Before the Council was the City of Goshen's proposed budget for 2026 as set forth in Ordinance 5234.

If Ordinance 5234 was approved by the Common Council, it would be ordained/resolved "that the expenses of Goshen Civil City for the year ending Dec. 31, 2026, the sums herein specified are hereby appropriated and ordered set apart out of the several funds herein named and for the purposes herein specified, subject to the laws governing the same. Such sums herein appropriated shall be held to include all expenditures authorized to be made during the year, unless otherwise expressly stipulated and provided for by law. In addition, for the purposes of raising revenue to meet the necessary expenses of GOSHEN CIVIL CITY, the property tax levies and property tax rates as herein specified are included herein. Budget Form 4-B for all funds must be completed and submitted in the manner prescribed by the Department of Local Government Finance."

Ordinance 5234 would be in full force and effect after Common Council passage/approval in these amounts:

Fund Code	Fund Name	Adopted budget	Adopted Tax Levy	AdoptedTaxRate
0061	RAINY DAY	$0	$0	0.0000
0101	GENERAL	$31,986,350	$23,545,800	1.6539
0180	DEBT SERVICE	$371,350	$555,800	0.0390
0201	BOND PROCEEDS	$2,977,606	$0	0.0000
0341	FIRE PENSION	$567,200	$0	0.0000
0342	POLICE PENSION	$422,400	$0	0.0000

0706	LOCAL ROAD/STREET	$700,000	$0	0.0000
0708	MOTOR VEH HWAY	$4,834,420	$3,090,500	0.2171
1191	CUM FIRE SPECIAL	$210,000	$732,100	0.0514
1301	PARK & RECREATION	$2,971,988	$4,273,900	0.0136
2102	AVIATION/AIRPORT	$572,000	$193,700	0.0136
2379	CUM CAP IMP (CIG TAX)	$85,000	$0	0.0000
2391	CUM CAP DEV	$1,022,000	$1,023,281	0.0719
2411	ECONDEV INC.TAX CED	$3,628,000	$0	0.0000
6290	CUM SEWER	$1,700,000	$732,100	0.0514
TOTALS		**$52,452,971**	**$34,182,100**	**2.4009**

Home-Ruled Funds (not reviewed by State Department of Local Government Finance):

Fund Code	Fund Name	Adopted Budget
9500	PROBATION DEPARTMENT	$123,130
9501	ECONOMIC IMPROVEMENT DISTRICT	$89,350
9502	LAW ENFORCEMENT CONTINUTING EDUCATION (LECE 1)	$0
9503	COURT FEES	$56,000
9504	ARP Fiscal Recovery Fund	$2,750,648
9505	RESIDENTIAL LEASE FEES	$73,206
9506	LAW ENFORCEMENT CONTINUING EDUCATION (LECE 2)	$36,000
9507	TIF BOND AND INTEREST	$946,440
9508	Public Safety LOIT	$3,549,790
9509	Township Fire Support	$607,570
9510	REDEVELOPMENT NON-REVERTING	$311,630
9511	STORM WATER MANAGEMENT	$1,053,176
9512	TIF Lippert/Dierdorff	$250,000
9513	SOUTHEAST GOSHEN TIF	$20,065,890
9514	CEMETERY CAPITAL IMPROVEMENT	$0
9517	Unsafe Buildings	$0
9518	Opioid Settlement Unrestricted	$71,832
9518	Opioid Settlement Restricted	$0
9519	Redhawk Fire/EMS Training Academy	$25,000
9520	2015 GO BOND PROCEEDS	$849,472
9521	CONS RR/US 33 TIF	$1,724,000
9522	Municipal Wheel Tax	$ $750,000
9523	Aviation Federal Grant	$4,042,500
9525	U.S. Forestry Grant	$701,675
9526	Donation	$30,000
9526	East College TIF	$900,000
TOTAL		**$26,028,509**

After it is approved by the Common Council, the City's Ordinance for Appropriations and Tax Rates will be submitted to the Indiana Department of Local Government Finance for review.

The 2026 Spending Plan for the City of Goshen included schedules for the following funds: Board of Public Works and Safety, Building Department, Building and Grounds Department, Cemetery Department, Central Garage City Council, Clerk-Treasurer's Office, Community Engagement, City Court, Engineering, Environmental Resilience, Fire Department, Legal Department, Mayor's Office, Planning and Zoning, Police Department, Technology Department, Street Department, Parks and Recreation, the Airport and the Redevelopment Department.
The spending plan also included schedules for other funds, including: Debt Service, Fire Pension, Police Pension, Local Road and Streets, Motor Vehicle Highway, Motor Vehicle Highway Restricted, Cumulative Capital Improvement Fire, Township Fire Support, Park and Recreation, Cumulative Capital Improvement, Cumulative Capital Development, Cumulative Capital Improvement/Storm Sewer, and Economic Development,

The Common County's meeting packet for Oct. 6, 2025 contained the following: Notice to Taxpayers (State Budget Form 3); draft Ordinance 52234, An Ordinance for Appropriations and Tax Rates (State Budget Form 4); Mayor Leichty's six-page "2026 Budget Overview – Short-Term Adjustments and Long-Term Preparedness," a Sept. 16, 2025 memorandum to the Common Council and City Department Leaders; and the City of Goshen 2026 Budgeted Appropriations, a 35-page document with summaries of proposed spending for all City departments along with 2023 and 2024 actual expenditures, and 2025 and 2026 budget figures.

Ordinance 5234, *An Ordinance for Appropriations and Tax Rates* (the proposed 2026 City of Goshen budget), was considered on First Reading by the Common Council, on Sept. 22, 2025.
Councilors heard extensive presentations about the proposed budget from **Amber Nielsen, a Manager at Baker Tilly Municipal Advisors (the City of Goshen's financial advisors), and Mayor Leichty.**
The **Mayor** also delivered an in-depth report on the expected impact of Senate Enrolled Act 1 (the new property tax reduction law) and the possible consequences on the City of Goshen's finances. **Mayor Leichty** then led Council members through an overview of the 2026 budget. She provided summaries of proposed spending for all City departments along with 2023 and 2024 actual expenditures, and 2025 and 2026 budget figures.
Mayor Leichty then invited **public comments** and there were extensive remarks from 18 people. **Councilors** then engaged in discussion about the public comments, the budget and the budget preparation process.

On a roll call vote, Councilors then passed Ordinance 5234, *An Ordinance for Appropriations and Tax Rates,* on First Reading by a 6-0-1 margin, with Councilors Gerber, Lederach, Peel, Riegsecker, Schrock and Weddell voting "yes" and Councilor Nisley voting "pass" at 8:33 p.m.

Ordinance 5234 was scheduled for Second Reading on Oct. 6, 2025.

OCT. 6, 2025 COUNCIL DISCUSSION AND SECOND READING/FINAL APPROVAL OF ORDINANCE 5234:
At 6:13 p.m. Mayor Leichty opened a public hearing on Ordinance 5234, An Ordinance for Appropriations and Tax Rates. The Mayor said notice of the hearing was properly published in accordance with Indiana Code and state Department of Local Government Finance requirements.

Mayor Leichty said this hearing was providing the public with this opportunity to speak on anything related to the budget, including the appropriations, tax rates or the levies, before the Council moved forward with adoption. However, she said people would have additional time to comment later in the meeting after the budget was again presented.
No one asked to speak at this point, so Mayor Leichty closed the public hearing.

Mayor Leichty then announced that the Council would move forward with consideration of the budget.
The **Mayor** said, "There's been a substantial amount of input in the budget process this year. We actually started in January of this year. Typically, we start closer to May but given the changes that we were facing with Senate Bill 1, and then Senate Enrolled Act 1, we got a running start to make sure that we were well prepared and that we had multiple scenarios to consider in developing an appropriate budget that would protect the City resources and help us plan for the future.
"And I just want to extend my thanks, again, to all of the Department heads who worked very diligently to make sure that we were appropriately prepared, but also making some difficult decisions on trimming expenses to make sure that we're as tight as we can be in preparing for the future. And also, thanks to the Clerk Treasurer's Office for their help in preparing this as well."
Mayor Leichty pointed out that at the Sept. 22 Council meeting there was a detailed presentation of the budget, fund by fund, and that wasn't necessary to repeat. So, instead, the Mayor said she would ask **Councilors** if they had anything they wanted to discuss and that could now be done in detail before a more general discussion.
Councilor Gerber asked if there had been any changes made in the budget since it was last reviewed by Councilors.
Mayor Leichty said there had not.
Councilor Lederach said he also didn't have anything to add. He thanked Department heads, the Mayor and the Clerk-Treasurer's Office "for all this good work … I think, given the circumstances, this is about as good as we can do."

Councilor Nisley made a motion to shift the $3,500 in the Council budget for a retreat to a fund to provide stipends for technology and phone usage. Councilor Schrock seconded the motion.
Council President Weddell clarified that passage of this motion would shift $3,500 from budget line 1101-5-02-4210501 (Council/Retreat) to 1101-5-4110159 (Council/Technology Stipend).

At 6:18 p.m., Mayor Leichty invited public questions on the Nisley/Schrock motion. There were none.

The Mayor invited questions or comments from Councilors on the motion.
Council President Weddell said if this motion was approved, Councilors would be responsible for submitting to the Clerk-Treasurer requests for reimbursement of up to $500 each.
Councilor Lederach said "I'm not in favor of making that move, in a time when we're tightening budgets, adding a stipend to City Council. It seems counter to what we're trying to do with the rest of the budget. He added, he would favor moving the Council's $3,500 in travel expenses to the General Fund if that would help but would not add the technology stipend.
Councilor Nisley responded that Councilors don't have to use the stipend. He said, "It's not something that you're mandatory to spend, to use for your reimbursement of City business on your telephones."
Councilor Gerber said she also opposed the motion, but said she would support moving the travel funds into the General Fund if that motion was made.

Councilor Gerber added, "These devices that we received in the last year, can do everything, I think, except a voice call, unless there's some technology I'm not aware of that allows that to happen. So, I don't think we need to be reimbursed an additional $500 a year to cover our personal cell phone expenses."
Councilor Schrock asked if unused technology funds would be returned to the General Fund. **Mayor Leichty** said the funds would be returned.
Council President Weddell said the City-provided iPad works for him but requires internet access to be used and that isn't provided by the City. **Mayor Leichty** said it should have been provided through the City's data plan and she would make sure that was done.
Council President Weddell asked if activating data plans for Council member iPads would increase the City's costs. The **Mayor** said it would and for about $50 a month. **Council President Weddell** said if that was the case, each Councilor would have about $600 in mobile internet service being provided a year, which would add functionality and would be more than **Councilor Nisley**'s proposed $500 technology stipend. He said that was something to ponder.
Councilor Peel said she would rather have access on the iPad.
Councilor Nisley said, "Most of my stuff comes through my telephone. The Mayor sent us stuff on our phone today, My constituents call me on my cell phone. Our phone number is on the (City) website. That's what they're using."
Council President Weddell said, "My vote has now changed based upon the data I just received."
Councilor Lederach said, "My vote still would be 'no,' and I don't plan on activating the data. I just think we have to make cuts. We're making cuts all across the City. We need to make cuts as well here as a Council."

Noting that the Council did not have unanimous consent, Mayor Leichty asked the Clerk-Treasurer for a roll call vote. Clerk-Treasurer Aguirre asked for a clarification of the motion, which was provided by the **Mayor.**
Council President Weddell said he downloaded an update of his iPad software over the weekend and just discovered that he can make phone calls on the device.

On a roll call vote, Councilors rejected the motion by Councilors Nisley and Schrock to shift $3,500 from budget line 1101-5-02-4210501 (Council/Retreat) to 1101-5-4110159 (Council/Technology Stipend) by a 5-2 margin with Councilors Gerber, Lederach, Peel, Riegsecker and Weddell voting "no" and Councilors Nisley and Schrock voting "yes" at 6:26 p.m. Youth Adviser Reyes chose to not vote.

Councilor Nisley indicated he didn't have any other proposed changes in the budget.
Councilor Peel said she didn't have any proposed budget changes, but said, "I'd just like to thank you and the Department heads for doing the really hard work of making the cuts for us. And I appreciate all the time and effort that's been put into this."
Youth Adviser Reyes said she didn't have any proposed budget changes.
Councilor Riegsecker also didn't have any budget changes, but said, "I did want to thank everybody as well. And the recaps and everything that we get to read before we get in here helps a lot, so appreciate all of that."
Councilor Schrock said he had nothing to add.
Council President Weddell thanked the Mayor for sending an email to **Councilors** today about cell phone usage. He also thanked Councilors for their work on the budget as well as their phone calls, emails and text messages over the past week. He added, "I appreciate everyone's openness to discuss different things, so thank you."

Councilor Nisley said, "I would like to add that the problem I have was just more of the wheel tax being in this is something that I'm not pleased with." The **Mayor** acknowledged the Councilor's position on this issue.

At 6: 28 p.m., Mayor Leichty invited public comment on the Ordinance 5234 (proposed 2026 City budget).
Before taking comments, **Mayor Leichty** said, "I did receive some comments and feedback from some of the audience members last time who expressed some concern about the limitation on time, and I hear you, and I think that's a totally appropriate concern to express, and I will continue to honor that. I think in the desire to facilitate an expedient meeting, I moved things quick – more quickly than I should, and so we will allow the full three minutes for anybody who wishes to speak today."
Marilyn Torres of Goshen thanked Councilors for their "bipartisan approach" to the budget. She said, "Decisions being made at both the state and federal levels lately lack common sense and even civility, but you have stayed focused on what is good for the residents of Goshen. Thank you for working together to make Goshen a thriving community."
The **Mayor** and **Councilors** thanked **Torres** for her comments.
There were no further remarks, so Mayor Leichty closed the public comment period at 6:29 p.m.

Council President Weddell noted that several Councilors mentioned the possibility of transferring funds from the Council budget to the General Fund. He asked if Councilors wanted to make a motion to do so today.
Councilor Lederach said, "I was only suggesting that as a compromise, as a way to move forward, but I'm happy with the way it is; happy is not quite the right word." **Council President Weddell** responded, "Understood."
Mayor Leichty then requested a roll call vote on Ordinance 5234.

On a roll call vote, Councilors on Second (and final) Reading, unanimously approved Ordinance 5234, *An Ordinance for Appropriations and Tax Rates* (the proposed 2026 City of Goshen budget) by a 7-0 vote with all Councilors present voting "yes" at 6:30 p.m. Youth Adviser Reyes also voted "yes."

Clerk-Treasurer Aguirre reminded **Councilors** and the **Mayor** to stay after the meeting to sign Ordinance 5234, the City's Ordinance for Appropriations and Tax Rates. He said it must be signed by them and the Clerk-Treasurer after passage and submitted to the Indiana Department of Local Government Finance for review.

4) Ordinance 5235, 2026 Compensation for Elected Officials
Mayor Leichty called for the introduction of Ordinance 5235, *Compensation for Elected Officials.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5235 by title only, which was done.
Weddell/Nisley made a motion to approve Ordinance 5235 on First Reading.

BACKGROUND:
Before the Council for was Ordinance 5235, the City of Goshen's proposed 2026 Compensation for Elected Officials, including wages and benefits.
Under Ordinance 5235, Goshen elected officials would receive the following bi-weekly salaries in 2025:
Mayor – $4,3,331 bi-weekly. The salary shall be paid 60% from the general fund of the Civil City and 40% from the funds of Water and Sewer Utilities.

Clerk-Treasurer –$3,301 bi-weekly. The salary shall be paid 60% from the general fund of the Civil City and 40% from the funds of Water and Sewer Utilities.
Judge – $2,372 bi-weekly. The salary shall be paid 100% from the general fund of the Civil City.
Common Council Members – $690 bi-weekly. The salary shall be paid 60% from the general fund of the Civil City and 40% from the funds of the Water and Sewer Utilities.
Ordinance 5235 also: would establish **additional compensation** for a Common Council member serving on a collective bargaining unit negotiation team ($500 stipend) and describes the **Public Employee's Retirement Fund benefits** for the Mayor, Clerk-Treasurer and Judge.
Ordinance 5235 also: describes the **health insurance benefits for the Mayor and Clerk-Treasurer** and sets the **cell phone stipends for the Mayor, Clerk-Treasurer and Judge** ($50 maximum per month).

OCT. 6, 2025 COUNCIL DISCUSSION AND PASSAGE OF ORDINANCE 5235:
Mayor Leichty said these year' **salaries were based on a 3% cost-of-living adjustment.**

The Mayor invited questions or comments from the Council. There were none.

At 6:31 p.m., Mayor Leichty invited comments from the public. There were none.

Council President Weddell said, "Normally I would be advocating for an increase of the mayor's salary. I still think that the mayor's position is more than deserving for that. However, I'm not sure that – no offense, Mayor, sitting up there – that the timing is right for that with the unknowns. But I will just advocate for the fact that I think that that position is undercompensated."
Councilor Peel said, "I would agree with that. I appreciate the fact that it was removed, just in lieu of everything going on. I think is appropriate, but normally I would not agree with removing that (pay increase)."
Mayor Leichty said, "I appreciate your support, but I wouldn't agree to that this year either."

Mayor Leichty asked Councilors if they were ready to vote. They indicated that they were.

On a voice vote, Councilors unanimously passed Ordinance 5235, *Compensation for Elected Officials*, on First Reading by a 7-0 margin at 6:33 p.m. Youth Adviser Reyes also voted "yes."

Councilors gave unanimous consent to proceed with a Second Reading of Ordinance 5235.

Mayor Leichty then called for the introduction of Ordinance 5235, *Compensation for Elected Officials*. Council President Weddell asked the Clerk-Treasurer to read Ordinance 5235 by title only, which was done.
Weddell/Nisley made a motion to approve Ordinance 5235 on Second Reading.

Mayor Leichty invited questions or comments from Councilors or the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5235, *Compensation for Elected Officials*, on Second (and final) Reading by a 7-0 margin at 6:34 p.m. Youth Adviser Reyes also voted "yes."

5) Ordinance 5236, 2026 Compensation for Civil City and Utilities Employees

Mayor Leichty called for the introduction on First Reading of Ordinance 5236, *2026 Compensation for Civil City and Utilities Employees.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5236 by title only, which was done.

Weddell/Riegsecker made a motion to approve Ordinance 5236 on First Reading.

BACKGROUND:

Before the Council for approval was Ordinance 5236, the City of Goshen's proposed 2026 Compensation for Civil City and Utilities Employees, including wages and benefits, as fixed by the Mayor, except for Police and Fire Department employees.

Ordinance 5236 was a 16-page document, with 12 pages of attachments, which set forth the employees covered by the ordinance, lists positions, classifications, grades and wages, describes how and when wages are paid, pension and health insurance benefits, vacation leave, sick leave, holidays (13), floating holidays, increment pay, longevity bonuses, funeral leave, court duty pay, paid leave, clothing and fitness allowances, CPA license pay, state certification bonuses, cell phone stipends, collective bargaining agreement provisions, overtimes compensation and other provisions. Attached to Ordinance 5236 were four exhibits (documents) which listed: all City positions, by Department, classifications and grades; the 2026 wages for all grades; the 2026 hourly wages for Teamster employees; and the 2026 wages for ungraded positions.

OCT. 6, 2025 COUNCIL DISCUSSION AND PASSAGE OF ORDINANCE 5236:

Mayor Leichty said during the budgeting process with City Department heads it was decided to grant a 3% cost-of-living adjustment, and then up to a .5% merit-based adjustment as well. The Mayor said, "In communication with the City Attorney, there's a lot of complexity with that in figuring out to do that with all of our collective bargaining agreements and MOUs, so we are still looking to find a mechanism to do some type of utilization of that other half of percent that we had discussed and budgeted for this year.

"So, I will be coming back to Council at some point with a proposal on how we would implement some kind of modification to provide an extra amount of pay for, the City staff. But given its complexity, there's lots of details to work through with that, so, we'll be continuing to look at that."

Mayor Leichty asked if there were any questions of comments from Councilors.

Council President Weddell asked if there were any changes to the employee pay grades.

Mayor Leichty said there was a modified position of Financial Assistant in the Clerk-Treasurer's Office and it's pay grade has been increased from 10 to 12. In the Central Garage, the **Mayor** said there was a change in the Fleet Maintenance Director position from grade 20 to 22. And in the Engineering Department, an Administrative Assistant position has been upgraded to Executive Assistant and another position was changed to Project Coordinator. She added that some positions also moved to different departments.

Council President Weddell thanked the Mayor for the information.

At 6:40 p.m., the Mayor invited questions about Ordinance 5236 from the public. There were none.

Mayor Leichty asked if Councilors were ready to vote. They indicated that they were.

On a voice vote, Councilors unanimously passed Ordinance 5236, *2026 Compensation for Civil City and Utilities Employees,* on First Reading by a 7-0 margin at 6:40 p.m. Youth Adviser Reyes also voted "yes."

Councilors gave unanimous consent to proceed with a Second Reading of Ordinance 5236.

Mayor Leichty called for the introduction of Ordinance 5236, *2026 Compensation for Civil City and Utilities Employees.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5236 by title only, which was done.
Weddell/Schrock made a motion to approve Ordinance 5236 on Second Reading.

Mayor Leichty invited questions or comments from Councilors or the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5236, *2026 Compensation for Civil City and Utilities Employees,* on Second Reading by a 7-0 margin at 6:41 p.m. Youth Adviser Reyes also voted "yes."

6) Ordinance 5237, 2026 Compensation for Fire Department Employees

Mayor Leichty called for the introduction on First Reading of Ordinance 5237, *2026 Compensation for Fire Department Employees.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5237 by title only, which was done.
Weddell/Nisley made a motion to approve Ordinance 5237 on First Reading.

BACKGROUND:
Before the Council for approval was Ordinance 5237, the City of Goshen's proposed 2026 Compensation for Fire Department Employees, including wages and benefits.
Ordinance 5237 was a 13-page document that set forth a wide range of compensation provisions for Fire Department employees, including employees covered, wages, benefits, vacation and sick leave, holiday compensation, longevity increases in pay, uniform allowances, certification pay, classification pay, additional benefits and more.
2026 proposed Base Wages:

Fire Chief	$4,074.96 Bi-weekly
Assistant Fire Chief	$3,813.67 Bi-weekly
Division Chief	$40.84 per hour
EMS Supervisor	$37.86 per hour
Inspector I	$34.87 per hour
Inspector II	$32.91 per hour
Inspector II	$31.95 per hour

	Annual Base Salary	*Base Wage per Hour*
Battalion Chief	$89,972.49.	$32.65 per hour
Captain	$76,576.50	$27.79 per hour
Ambulance Captain	$74,576.50	$27.79 per hour
Lieutenant	$72,709.95	$26.38 per hour

Ambulance Lieutenant	$72,709.95	$26.38 per hour
Sergeant	$68,650.43	$24.41 per hour
Private	$66,926.62	$24.28 per Hour
Probationary Private	$66,926.62	$24.28 per hour

OCT. 6, 2025 COUNCIL DISCUSSION AND PASSAGE OF ORDINANCE 5237:
Mayor Leichty asked if Councilors had questions or comments on Ordinance 5237. They did not.

At 6:41 p.m., the Mayor invited questions or comments from the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5237, *2026 Compensation for Fire Department Employees,* on First Reading by a 7-0 margin at 7:42 p.m. Youth Adviser Reyes also voted "yes."

Councilors gave unanimous consent to proceed with a Second Reading of Ordinance 5237.

Mayor Leichty called for the introduction on Second Reading of Ordinance 5237, *2026 Compensation for Fire Department Employees.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5237 by title only, which was done.
Weddell/Peel made a motion to approve Ordinance 5237 on Second Reading.

Mayor Leichty invited questions or comments from Councilors or the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5237, *2026 Compensation for Fire Department Employees,* on Second (and final) Reading by a 7-0 margin at 6:42 p.m. Youth Adviser Reyes also voted "yes."

7) Ordinance 5238, 2026 Compensation for Police Department Employees
Mayor Leichty called for the introduction on First Reading of Ordinance 5238, *2026 Compensation for Police Department Employees.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5238 by title only, which was done.
Weddell/Schrock made a motion to approve Ordinance 5238 on First Reading.

BACKGROUND:
Before the Council, for first reading, was Ordinance 5238, the City of Goshen's proposed 2026 Compensation for Police Department Employees.
Ordinance 5238 was a 12-page document that set forth a wide range of compensation provisions for Police Department employees, including who is covered, wages, benefits, vacation, sick and personal leave, holiday compensation, longevity increases in pay, clothing allowances, technical skills pay, specialty pay, shift differentials, court time pay, a residency bonus, a hiring bonus, and more. The following were the proposed wages for 2026.

2026 Base Wages:
POLICE OFFICERS

	Bi-Weekly Salary
Police Chief	$3,983.92.
Assistant Police Chief	$3,772.51
Division Chief	$3,599.86

	Annual Base Salary Base	*Wage per hour*
Captain	$82,679.65	$39.26
Lieutenant	$77,308.89	$36.71
School Resource Officer	$77,308.89	$36.71
Detective	$77,308.89	$36.71
Sergeant	$75,125.61	$35.67
Patrol Officer	$72,539.38	$34.44
Probationary Patrol Officer	$64,374.50	$30.57

CIVILIAN EMPLOYEES

	Base Wage per Hour
Special Police Officer	$29.17
Special Police Officer – Investigations & Community Relations	$29.76
Special Police Officer – Mobile Integrated Health Officer	$30.95
Administrative Assistant	$26.07

OCT. 6, 2025 COUNCIL DISCUSSION AND PASSAGE OF ORDINANCE 5238:
Mayor Leichty asked if Councilors had questions or comments on Ordinance 5238. They did not.

At 6:43 p.m., the Mayor invited questions or comments from the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5238, *2026 Compensation for Police Department Employees*, on First Reading by a 7-0 margin at 6:43 p.m. Youth Adviser Reyes also voted "yes."

Councilors gave unanimous consent to proceed with a Second Reading of Ordinance 5238.

Mayor Leichty called for the introduction of Ordinance 5238, *2026 Compensation for Police Department Employees*. Council President Weddell asked the Clerk-Treasurer to read Ordinance 5238 by title only, which was done.
Weddell/Nisley made a motion to approve Ordinance 5238 on Second Reading.

Mayor Leichty invited questions or comments from Councilors or the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5238, *2026 Compensation for Police Department Employees*, on Second (and final) Reading by a 7-0 margin at 6:44 p.m. Youth Adviser Reyes also voted "yes."

8) Ordinance 5239, Authorization to Appoint Police Reserve Officers and Payment of Compensation in 2026

Mayor Leichty called for the introduction of Ordinance 5239, *Authorization to Appoint Police Reserve Officers and Payment of Compensation in 2026.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5239 by title only, which was done.

Weddell/Nisley made a motion to approve Ordinance 5239 on First Reading.

BACKGROUND:

Before the Council, for First Reading, was Ordinance 5239, the City of Goshen's proposed Authorization to Appoint Police Reserve Officers and Payment of Compensation in 2026.

Ordinance 5239 would authorize the City Board of Public Works and Safety to appoint up to 10 Police Reserve Officers to be utilized by the Goshen Police Department. It also would establish the compensation for Police Reserve Officers, which would include a uniform allowance ($500), court appearance compensation (which is the current overtime rate per hour for a Probationary Patrol Officer) and coverage and pay for a duty-related illness or injury.

OCT. 6, 2025 COUNCIL DISCUSSION AND PASSAGE OF ORDINANCE 5239:

Mayor Leichty asked if Councilors had questions or comments on Ordinance 5239. They did not.

At 6:44 p.m., the Mayor invited questions or comments from the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5238, *2026 Compensation for Police Department Employees,* on First Reading by a 7-0 margin at 6:44 p.m. Youth Adviser Reyes also voted "yes."

Councilors gave unanimous consent to proceed with a Second Reading of Ordinance 5239.

Mayor Leichty called for the introduction of Ordinance 5239, *Authorization to Appoint Police Reserve Officers and Payment of Compensation in 2026.* Council President Weddell asked the Clerk-Treasurer to read Ordinance 5239 by title only, which was done.

Weddell/Peel made a motion to approve Ordinance 5239 on Second Reading.

Mayor Leichty invited questions or comments from Councilors or the audience. There were none.

On a voice vote, Councilors unanimously passed Ordinance 5239, *Authorization to Appoint Police Reserve Officers and Payment of Compensation in 2026,* on Second (and final) Reading by a 7-0 margin at 6:45 p.m. Youth Adviser Reyes also voted "yes."

8) Resolution 2025-17, *A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025*

Mayor Leichty called for the introduction of Resolution 2025-17, *A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025.* Council President Weddell asked the Clerk-Treasurer to read Resolution 2025-17 by title only, which was done.

Weddell/Lederach made a motion to approve Resolution 2025-17.

BACKGROUND:

Before the Common Council for approval was Resolution 2025-17, *A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025*. This resolution would establish that:

- The City of Goshen recognizes the threat that natural hazards pose to people and property within The City of Goshen; and
- The City of Goshen has contributed to the preparation of a multi-hazard mitigation plan, hereby known as Elkhart County Multi-Hazard Mitigation Plan 2025, in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and
- Elkhart County Multi-Hazard Mitigation Plan 2025 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Goshen from the impacts of future hazards and disasters; and
- Adoption by the City of Goshen demonstrates its commitment to hazard mitigation and achieving the goals outlined in the Elkhart County Multi-Hazard Mitigation Plan 2025.

If Resolution 2025-17 was passed by the Common Council, it would be resolved that: The City of Goshen adopts the Elkhart County Multi-Hazard Mitigation Plan 2025, a copy of which is attached hereto. While content related to the City of Goshen may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the City of Goshen to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

Accompanying Resolution 2025-17 was the "Elkhart County Multi-Hazard Mitigation Plan, January 2025," which was prepared for the Elkhart County Emergency Management Agency by Christopher B. Burke Engineering, LLC of Indianapolis.

This comprehensive plan was a 106-page document that included detailed information: about the community, population and demographics, employment, transportation and commuting, infrastructure, waterways and watersheds, topography, climate, underserved, disadvantaged and socially vulnerable populations, community capacity, risk assessment, hazard information, mitigation goals and practices, stormwater, hazardous materials, emergency preparedness, emergency response and recovery, building protection, safe rooms and shelters, public education and outreach, floodplain management, public involvement and more.

NOTE: This agenda item, #9, Resolution 2025-17, *A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025*, was added to the agenda at the start of the meeting. **Before the meeting, Councilors were provided with copies of the two-page Resolution 2025-17 (EXHIBIT #1) and the 106-page Elkhart County Multi-Hazard Mitigation Plan (EXHIBIT #2)**

OCT. 6, 2025 DISCUSSION AND APPROVAL OF RESOLUTION 2025-17:

Mayor Leichty invited an overview of the matter from City Fire Chief Anthony Powell.

Chief Powell said that if the Council approved Resolution 2025-17 and the City of Goshen later experiences a natural disaster, such as a tornado or a flood, officials can request reimbursement through Elkhart County, which will forward the request to the federal government. He added, "So, it's kind of a formality, just so that we can potentially have extra funding if something would happen."

The Mayor asked if Councilors had questions or comments for Chief Powell.

Councilor Gerber said, "I did not read every word, but I tried to give it a good effort, and there's a lot of really interesting information in there, so I'd encourage members of the public to check it out as well."

Councilor Gerber said that especially valuable was the plan's demographic data as well as information about the vulnerable areas in our community and how the City will respond to disasters.
Councilor Lederach asked if the City could receive reimbursement from the Federal Emergency Management Agency (FEMA). **Chief Powell** said, Potentially, yes."
There were no further Council questions or comments.

At 6:47 p.m., invited questions or comments from the audience. There were none.

Councilors indicated they were ready to vote on the resolution.

On a voice vote, Councilors unanimously passed Resolution 2025-17, *A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025,* by a 7-0 margin at 6:47 p.m. Youth Adviser Reyes also voted "yes."

Privilege of the Floor:
At 6:47 p.m., Mayor Leichty invited public comments regarding matters not on the agenda.
Before accepting comments, the **Mayor** said, "I just want to say how heartening it is to see so many people attending our City Council meetings and participating and engaging. We appreciate having you here. We appreciate your advocacy for the City, particularly in regard to Senate Enrolled Act 1.
"I know that you are all not only showing up and speaking here, but sharing that word throughout your circles, and that is a tremendous bit of advocacy, not only for the folks sitting here in this room who are working hard on your behalf, but for the City you love and call home. So, thank you for making those efforts."

Daniel Emery of Goshen informed Councilors that he is helping organize the second annual "Side-by-Side Ride," which will take place Oct. 18, 2026. He said it will be a non-guided tour ride involving four Goshen businesses.
Emery said it was a successful event last year and had about 200 participants and about 88 machines. He said participating business supported repeating the event. He thanked Councilors for their support.

Marcia Yost of Goshen said she wanted to talk about accountability. She said, "I so appreciate the accountability that's present here in looking at budgets, at looking at resolutions, in denying a raise. That kind of accountability is what we all need. In a time when things are unsettled, it is a wonderful feeling to know that things feel settled here.
"However, we do need to find ways to hold others accountable and so I am hoping that we have opportunity to talk to our representatives. And I would encourage us all to continue to talk to folks. Sometimes it's hard for them to see what they need to be accountable for. And so, once again, my praise and my thanks, but the job is not yet done."

Geof Landis of Goshen said, "Like everyone here, I just appreciate all the work that everyone has done, but I wonder what the general public knows. And I would be willing to bet the general public doesn't have a clue what's going on ... So, I don't know what we can do to get the word out, but I think what we could do would be helpful."

At 6:52 p.m., Mayor Leichty closed the public comment period.

Elected Official Reports:

Mayor Leichty asked if there were any reports from Councilors.

Councilor Peel said that in the morning she would attend a meeting of the City Economic Improvement District.

Youth Adviser Reyes said at the beginning of the school year students participated in Senior Sunrise, an early morning gathering of Goshen High School students on the football field. She said doughnuts were provided and everyone had fun.

Youth Adviser Reyes said last month students conducted a clothing drive for winter clothing. Later this month, students will collect funds for children who need Halloween costumes. Students also want to give away candy.

Mayor Leichty thanked Youth Adviser Reyes and the other youth advisers for their work.

Clerk-Treasurer Aguirre thanked and congratulated the Mayor for her leadership through the very difficult City budget process. He said, "I don't think we've ever, at least in my four or five years, experienced a Mayor who had as clear an idea and communicated it as clearly about the consequences facing the City in terms of revenue. And I think that's been a guidepost for us throughout this process, and I just wanted to thank you for that."

Mayor Leichty thanked the Clerk Treasurer for his comments.

There were no further comments by the Mayor or by Councilors.

Adjournment:

Councilor Nisley made a motion to adjourn the meeting, which was seconded by Councilor Riegsecker

Councilors unanimously approved the motion to adjourn the meeting.

Mayor Leichty adjourned the meeting at 6:55 p.m.

EXHIBIT #1: *The two-page Resolution 2025-17, A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025. Consideration of this resolution was added to the agenda at the start of the meeting. Councilors were provided with copies of Resolution 2025-17 before the meeting.*

EXHIBIT #2: *The 106-page Elkhart County Multi-Hazard Mitigation Plan, which was prepared for the Elkhart County Emergency Management Agency by Christopher B. Burke Engineering, LLC of Indianapolis. The plan was provided to Councilors before the meeting for consideration of added agenda item #9, Resolution 2025-17, A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025.*

APPROVED:

Gina Leichty, Mayor of Goshen

ATTEST:

Richard R. Aguirre, City Clerk-Treasurer

GOSHEN COMMON COUNCIL

RESOLUTION 2025-17

A Resolution of the City of Goshen Adopting the Elkhart County Multi-Hazard Mitigation Plan 2025

WHEREAS the City of Goshen recognizes the threat that natural hazards pose to people and property within The City of Goshen; and

WHEREAS the City of Goshen has contributed to the preparation of a multi-hazard mitigation plan, hereby known as Elkhart County Multi-Hazard Mitigation Plan 2025 in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS Elkhart County Multi-Hazard Mitigation Plan 2025 identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Goshen from the impacts of future hazards and disasters; and

WHEREAS adoption by the City of Goshen demonstrates its commitment to hazard mitigation and achieving the goals outlined in the Elkhart County Multi-Hazard Mitigation Plan 2025.

NOW THEREFORE, BE IT RESOLVED by the Common Council of the City of Goshen, Indiana, that:

The City of Goshen adopts the Elkhart County Multi-Hazard Mitigation Plan 2025, a copy of which is attached hereto. While content related to the City of Goshen may require revisions to meet the plan approval requirements, changes occurring after adoption will not require the City of Goshen to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.

ADOPTED by the Goshen Common Council on the 6th day of October, 2025.

Gina M. Leichty, Presiding Officer

ATTEST:

Richard R. Aguirre, Clerk-Treasurer

PRESENTED to the Mayor of the City of Goshen on October 6, 2025, at the hour of 7:00 p.m.

Richard R. Aguirre, Clerk-Treasurer

APPROVED and ADOPTED on October 6, 2025.

Gina M. Leichty, Mayor

Elkhart County Multi-Hazard Mitigation Plan

January 2025

Prepared for:

Elkhart County Emergency Management Agency
26861 County Road 26
Elkhart, IN 46517

Prepared by:

Christopher B. Burke Engineering, LLC
115 W. Washington St., Ste. 1368 S.
Indianapolis, IN 46204

Burke Project No. 19R.220390

BURKE

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EXECUTIVE SUMMARY

The Federal Emergency Management Agency (FEMA) defines the disaster life cycle as the process through which emergency managers respond to disasters when they occur; help people and institutions recover from them; reduce the risk of future losses; and prepare for emergencies and disasters. In **Figure i** each phase in the Emergency Management Lifecycle; Mitigate, Prepare, Respond, and Recover has a description of the phase as well as a time frame within the disaster cycle. Although each of the phases is visually tied to a specific time period within the life cycle of the disaster, mitigation can take place throughout much of the disaster life cycle. The Elkhart County Multi-Hazard Mitigation Plan (MHMP) update focuses on the mitigation activities that may be implemented throughout the disaster life cycle.

Figure i Phases of the Emergency Management Lifecycle

According to FEMA, mitigation is most effective when it's based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. The MHMP planning process identifies hazards, the extent that they affect the municipality, and formulates mitigation practices to ultimately reduce the social, physical, and economic impact of the hazards.

The overall goals of the Elkhart County MHMP, which align closely with the State of Indiana MHMP, are:

1) Lessen the impacts of disasters and enhance community resilience.
2) Minimize the loss of life and injuries caused by disasters.
3) Promote mitigation activities both prior to and following a disaster.

To achieve the stated goals the community strategy includes the following:

1) Lessen the impacts of disasters and enhance community resilience by:
   a. Supporting resilience opportunities within the community
   b. Incorporating the MHMP into local ordinances, local planning efforts and the community comprehensive plans
   c. Evaluating and strengthening collaboration among organizations
   d. Making sure essential facilities can withstand disasters
   e. Supporting the NFIP
   f. Identifying opportunities to reduce repetitive loss incidents

2) Minimize the loss of life and injures caused by disasters by:
   a. Improving warning systems for the residents
   b. Developing public awareness and outreach programs
   c. Improving shelter availability
   d. Developing a program of affordable housing that is resilient to flooding
   e. Improving education and training for emergency personnel and officials
   f. Developing ways to provide education, awareness, and warning of disasters to the underserved populations.

3) Promote mitigation activities prior to and following a disaster by:
   a. Ensuring better communication between federal, state and local officials
   b. Seizing opportunities to buy out properties, floodproof buildings, or improve building codes

c. Conducting new studies and/or research opportunities to reduce impacts from disasters and prepare for future events anticipating the impacts of our changing climate.
d. Conducting outreach efforts to educate community members of the risks and hazards in their area as well as encouraging the implementation of a variety of mitigation actions.

For National Flood Insurance Program (NFIP) communities to be eligible for future mitigation funds, they must adopt either their own MHMP or participate in the development of a multi-jurisdictional MHMP. Further, it is required that local jurisdictions review, revise, and resubmit the MHMP every five years. As representatives from Elkhart County, the Cities of Elkhart, Goshen, and Nappanee, and the Towns of Bristol, Middlebury, Millersburg, and Wakarusa have provided information, attended meetings, and participated in the planning process, the planning process used to update the Elkhart County MHMP satisfies the requirements of a multi-jurisdictional plan.

During Planning Committee meetings, those in attendance revisited existing the 2017 MHMP and identified new critical facilities and local hazards; reviewed the State's mitigation goals and updated the local mitigation goals; reviewed the most recent local hazard data, vulnerability assessment, and maps; evaluated the effectiveness of existing mitigation measures and identified new mitigation projects; and reviewed materials for public participation. Keeping in mind the ever-changing climate, the team also examined the needs of underserved populations that may be more vulnerable to the impacts of the listed hazards. Meetings were conducted with key groups such as city planners, health department specialists, representatives of organizations serving the underserved populations and various emergency responders. Their information has been incorporated into this MHMP update. This plan update will examine each of the hazards with data from the past 5 years, where possible.

The review of hazards and risks is based on the methodology described in the Local Mitigation Planning Policy Guide FP 206-21-0002, Effective April 19, 2023. The plan identifies the hazards assessed, the nature of each hazard including historic occurrences, vulnerabilities, and the relationship to other hazards. Using a ranking tool known as the Calculated Risk Priority Index (CPRI), the planning team scored each of the hazards. **Table i** lists the hazards in the plan and compares the scores to the previous plan. The CPRI scores reflect the hazards of most concern by the planning team members and change from one plan to another based on recent experiences, changes in community demographics, and challenges.

Table i: Comparison of CPRI Scores for All Hazards

Hazard	2024 Rank	CPRI Score	2017 Rank	Hazard
Fires and Wildfire	1	3.55		Not covered in 2017 plan
Hazard Materials Incident	2	3.50	2	Hazardous Materials Incident
Landslide/Subsidence	3	3.15		Not covered in 2017 plan
Extreme Temperature	4	3.13		Not cover in 2017 plan
Tornado	5	3.10	3	Tornado
Hailstorms/Thunderstorms/Windstorms	6	3.06	4	Hailstorms/Thunderstorms/Windstorms
Winter Storm and Ice	7	3.00	1	Winter Storm and Ice
Flood	8	2.93	5	Flood
Drought	9	2.61		Not covered in 2017 plan
Earthquake	10	2.29	7	Earthquake
Dam and Levee Failure	11	1.94	6	Dam Failures

Lastly, the plan concludes with a discussion about mitigation actions. The MHMP lists a variety of mitigation actions the planning team members would like to accomplish within the next 5 years to enhance the resilience of Elkhart County. In addition, it celebrates the mitigation successes from the previous MHMP Plans and community actions which contribute to mitigating the various risks and hazards identified.

This MHMP is a living document which has a 5-year life span. During the next 5 years, Elkhart County and the incorporated communities that adopt this plan will work to complete the mitigation actions as well as regularly noting items for the 2029 MHMP update. The County EMA and planning team members will also use tools contained in the Appendices, or similar documents, to track progress, and note changes that may impact community resilience.

1.0 INTRODUCTION

1.1 DISASTER LIFE CYCLE

The Federal Emergency Management Agency (FEMA) defines the disaster life cycle as the process through which emergency managers respond to disasters when they occur; help people and institutions recover from them; reduce the risk of future losses; and prepare for emergencies and disasters. The disaster life cycle, shown in **Figure 1** includes four phases:

Figure 1 Disaster Life Cycle

Mitigation – to prevent or to reduce the effects of disasters (building codes and zoning, vulnerability analyses, public education)
Preparedness – planning, organizing, training, equipping, exercising, evaluation and improvement activities to ensure effective coordination and the enhancement of capabilities (preparedness plans, emergency exercises/training, warning systems)
Response – the mobilization of the necessary emergency services and first responders to the disaster area (search and rescue; emergency relief)
Recovery – to restore the affected area to its previous state (rebuilding destroyed property, re-employment, and the repair of other essential infrastructure)

The Elkhart County Multi-Hazard Mitigation Plan (MHMP) focuses on the mitigation phase of the disaster life cycle. According to FEMA, mitigation is most effective when it's based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs. Recent reviews of grant programs have determined for every $1 spent on mitigation efforts, between $6 and $10 are saved within the community on efforts following disasters. The MHMP planning process identifies hazards, the extent that they affect the municipality, and formulates mitigation practices to ultimately reduce the social, physical, and economic impact of the hazards.

1.2 PROJECT SCOPE & PURPOSE

REQUIREMENT §201.6(d)(3):

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.

The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources. (44 CFR §201.1(b))

A FEMA-approved MHMP is required to apply for and/or receive project grants under the Building Resilient Infrastructure and Communities (BRIC), Hazard Mitigation Grant Program (HMGP), and Flood Mitigation Assistance (FMA). Additional detailed studies may need to be completed prior to applying for these grants even though this plan meets the requirements of DMA 2000 and eligibility requirements of the above listed grant programs.

The National Flood Insurance Program (NFIP) requires participating communities adopt either their own MHMP or participate in the development of a multi-jurisdictional MHMP to be eligible for future mitigation funds. The Indiana Department of Homeland Security (IDHS) and the United States Department of Homeland Security (US DHS)/FEMA Region V offices administer the MHMP program in Indiana. Local jurisdictions are required to review, revise, and resubmit the MHMP every five years. The MHMP updates must demonstrate that progress has been made in the last five years to fulfill the commitments outlined in the previously approved MHMP. The update may validate the information in the previously approved MHMP or may be a major rewrite depending on community needs and planning guidance. The updated MHMP is not intended to be an annex to the previously approved Plan; it stands on its own as a complete and current MHMP.

The Elkhart County MHMP Update is a multi-jurisdictional planning effort led by the Elkhart County EMA. This Plan was prepared in partnership with Elkhart County, the Cities of Elkhart, Goshen, and Nappanee, and the Towns of Bristol, Middlebury, Millersburg, and Wakarusa. Representatives from these communities attended the Committee meetings, provided valuable information about their community, reviewed, and commented on the draft MHMP, and assisted with local adoption of the approved Plan. As each of the jurisdictions had an equal opportunity for participation and representation in the planning process, the process used to update the Elkhart County MHMP satisfies the requirements of DMA 2000 in which multi-jurisdictional plans may be accepted.

The Community Rating Service (CRS) program is a voluntary incentive program that recognizes and encourages community floodplain activities that exceed the minimum NFIP requirements. As a result, flood insurance premiums are discounted to reflect the reduced flood risk resulting from community actions that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote education and awareness of flood insurance. Savings in flood insurance premiums are proportional to the points assigned to various activities. A minimum of 500 points is necessary to enter the CRS program and receive a 5% flood insurance premium discount. This MHMP could contribute as many as 374 points toward participation in the CRS. At the time of this planning effort, the Cities of Elkhart, Nappanee, and Goshen and the Towns of Bristol, Middlebury, and Wakarusa as well as Elkhart County participate in the NFIP, however, none currently participate in the CRS program. Throughout this Plan, activities that could count toward CRS points are identified with the NFIP/CRS logo. (**Figure 2**) Acronyms referenced throughout this plan are contained in **Appendix 1.**

Figure 2 NFIP/CRS Logo

Funding to update the MHMP was made available through a FEMA/DHS grant awarded to the Elkhart County EMA and is administered by IDHS. Elkhart County provided the local 25% match required by the grant. Christopher B. Burke Engineering, LLC (Burke) was hired to facilitate the planning process and prepare the Elkhart County MHMP.

1.3 ANALYSIS PROCESS

REQUIREMENT §201.6(c)(1):

The plan shall document the planning process used to prepare the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Preparation for the Elkhart County MHMP Update began in 2022, when the grant request was approved by FEMA and grant funds were awarded. The plan update process began immediately upon the hiring of Chrispher B. Burke Engineering, LLC. The planning process to update the 2017 MHMP took 18 months. This included a review period by IDHS and FEMA for the draft MHMP Update, and time for Elkhart County and communities to adopt the final MHMP Update.

1.3.1 Planning Committee and Involvement of Other Interested Parties

In May of 2023, the EMA began to compile a list of Planning Committee members to guide the MHMP update planning process. These individuals were specifically invited to serve on the Committee because they were knowledgeable of local hazards; have been involved in hazard mitigation activities; have the tools necessary to reduce the impact of future hazard events; and/or served as a representative on the prior Planning Committee in 2017. Cass and St. Joseph Counties in Michigan and LaGrange, Noble, Kosciusko, Marshall, and St. Joseph Counties in Indiana were invited to attend the team meetings and were given an opportunity to provide input and feedback to the plan throughout the planning process and during draft review. No comments or corrections were received from the neighboring EMA offices. **Table 1** lists the individuals that actively participated on the Committee and the entity they represent.

Table 1: Elkhart County MHMP Planning Team

Name	Title	Organization	Representing
Jill Swartz	Asst. Town Manager	Town of Bristol	Bristol
Adam Bujalski	County Council	Elkhart County	County
Suzanne Weirick	Commissioner	Elkhart County	County
Leah Bender	EMA Volunteer - New Paris Firefighter	Elkhart County EMA	County
Therese Sailor	Deputy Director of Administration	Elkhart County EMA	County
Josh Shook	Deputy Director of Operations	Elkhart County EMA	County
Jenn Tobey	Executive Director	Elkhart County EMA	County
Andrew Bylsma	Community Service Manager	Elkhart County Health Department	County
Mark Philson	Planning Coordinator	Elkhart County EMA	County
Melanie Sizemore	Administrator	Elkhart County Health Department	County
Lydia Spencer	Emergency Preparedness Coordinator	Elkhart County Health Department	County
Donny Aleo	Deputy Director	Elkhart County Parks	County
Bernard Cunningham	Deputy Director of Park Operations	Elkhart County Parks	County
Ronda DeCaire	Parks Director	Elkhart County Parks	County
Ryan Smith	Planner	Elkhart County Planning	County
Casey Lehman	Lieutenant	Elkhart County Sheriff Department	County
Steve Schweisberger	Deputy Director	Elkhart County Surveyor's Office	County
Chaz Taylor	LEPC	LEPC	County
Roger Mertz	RACES Officer	RACES	County
Sandy Schwartzendruber		RACES	County
Bob Barnes	Commissioner	Elkhart County	County
Eric Trotter	Assistant Director	City of Elkhart Planning	Elkhart
Mark Travis	Chief	Cleaveland Twp. Fire Dept	Elkhart
Shawn Miller	Assistant Chief	Concord Fire Department	Elkhart
Danny Sink	Chief	Goshen Fire Department	Goshen
Anthony Powell	Asst. Chief	Goshen Fire Department	Goshen
Steffen Schrock	Asst. Chief	Goshen Fire Department	Goshen
Ed Rock	Director	Kosciusko County EMA	Kosciusko County
Kip Shuter	Deputy Director	Kosciusko County EMA	Kosciusko County
Don Lehman	Chief	Nappanee Fire Department	Nappanee

Name	Title	Organization	Representing
Brenda Horein	Red Cross	Red Cross	Red Cross
Kristin Marlow	Executive Director	Red Cross	Red Cross
Brent Smart	DPM	Red Cross	Red Cross
Deborah Griffis	Office Manager	Salvation Army	Salvation Army
Holly Landis	Town Manager	Wakarusa	Wakarusa
Mary Cripe	Town Manager	Town of Middlebury	Middlebury
Raymundo Rodriguez	Marshal	Town of Millersburg	Millersburg

Members of the Committee participated in the MHMP Update through various team meetings as well as outside group meetings where mitigation opportunities are supported or addressed. During the MHMP team meetings, the Committee:

- Reviewed the State's mitigation goals and updated the local mitigation goals.
- Reviewed the most recent local hazard data, vulnerability assessment, and maps.
- Comparatively evaluated and ranked the hazards based on probability of occurrence, impact, warning time and duration of the hazard event.
- Revisited existing (in the 2017 MHMP) critical and essential infrastructure and identified new critical infrastructure and local hazards.
- Evaluated the effectiveness of existing mitigation measures and identified new mitigation projects.
- Reviewed materials for public participation.

A sign-in sheet recorded those present at each meeting to document participation. The following members also represented the underserved populations: Lydia Spencer, Andrew Bylsma, Mark Philson, and Melanie Sizemore represented the Elkhart County Health Department that works frequently with the underserved population. Members of the Red Cross and Salvation Army often assist the underserved population as well. Twelve census tracts with 55,847 residents in Elkhart County are identified as disadvantaged population areas. The City of Elkhart team members were able to speak about the needs of the disadvantaged and programs currently underway to assist community members. Meeting agendas and summaries are included in **Appendix 2**. Members of the Committee also reviewed a draft MHMP, provided comments and suggestions, and assisted with adoption of the Elkhart County MHMP Update.

1.3.2 Public Involvement

The Elkhart County EMA Director has reported on the planning effort at public commissioner's meetings, LEPC meetings, and other events and gatherings of first responders and community officials. A draft of the Elkhart County MHMP Update was posted to the Elkhart County website (Home - Elkhart County) for public review and comment. A media release indicating the posting of the draft MHMP and the ability to comment was submitted for release. Of the 125 views, no comments or corrections were received from the public or the Committee. The media release, web page posting, and any comments received are included in **Appendix 3**.

Neighboring Emergency Managers were invited to attend both planning meetings as well as being provided with an opportunity to review the draft plan. The EMA Directors, current and incoming, from Kosciusko County attended the planning meetings. No comments or corrections were received from the neighboring Emergency Management Agencies in Cass and St. Joseph Counties in Michigan or LaGrange, Noble, Marshall or St. Joseph Counties in Indiana.

1.4 PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

REQUIREMENT §201.6(c)(1):

The plan shall include a review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

During the development of the Elkhart County MHMP Update, several relevant sources of information were reviewed either as a document or through discussions with local personnel. This exercise was completed to gather updated information since the development of the previous Elkhart County MHMP, and to assist the Committee in developing potential mitigation measures to reduce the social, physical, and economic losses associated with hazards affecting Elkhart County.

Just as the 2017 Elkhart County MHMP informed the plan writers of key concerns for the communities in 2016, including housing, land development and flood risks, this planning effort includes the review of community specific plans and studies for incorporation in this plan update. For the purposes of this planning effort, the following materials (among others) were discussed and utilized:

- MHMP Elkhart County 2017
- Elkhart County Comprehensive Plan (2006)
- City of Elkhart Comprehensive Plan Update (1996)
- Town of Bristol Town Ordinances (2019)
- City of Goshen Code (2016)
- Elkhart County Code of Ordinances (2021)
- City of Nappanee Code of Ordinances (1998)
- Elkhart County GIS data

The Elkhart 2006 Comprehensive Plan in coordination with multiple plans looks at development, ensuring community and rural character, environmental stewardship, and transportation. Safety of the residents is a key component of the plan. The MHMP was used to inform decision makers during recent ordinance updates. Elkhart County, The Cities of Elkhart, Goshen, and Nappanee, and the Towns of Bristol, Middlebury, Millersburg, and Wakarusa strive to enhance the overall quality of life and keeping people informed and out of harm's way.

This MHMP planning effort sought to use existing plans to inform the planning team about mitigation actions that would support the community development, as outlined in the comprehensive plans, and to support and/or enhance existing ordinances.

The Elkhart County Building and Planning Department has jurisdiction over the unincorporated rural areas of Elkhart County as well as the Towns of Bristol, Middlebury, Millersburg, and Wakarusa. The Cities of Elkhart, Goshen, and Nappanee have their own Building Departments.

In addition to local agencies and offices such as those listed above, several regional and state agencies were contacted and subsequently provided data for this planning effort. Those contacts, and the information they provided, include:

- Indiana Department of Natural Resources, Division of Water – *Flood insurance policies, claims, and payment information; NFIP Participation; DNR listed Dams and associated records; Dam Breach Inundation App; and IN Floodplain Information Portal.*
- Indiana Department of Natural Resources, Other Divisions – *Mining Records*

- Indiana Geologic Survey and Water – *Earthquakes in Indiana; Liquefaction Potential Map: Karst Regions and Maps of Karst locations*
- Indiana Geographic Information Office - *IndianaMap*
- Indiana Department of Homeland Security – *Current Fire and Building Code Information*
- FEMA, Region V – Repetitive loss structure counts and insurance payments
- Midwest Regional Climate Center – Climate Trends; County specific climate reports
- National Weather Service – Indianapolis Weather Forecast Office – Confirmation of WSSI tool; local storm reports; weather event photos.

The CRS program credits NFIP communities with a maximum of 170 points. Up to 15 points for organizing a planning committee composed of staff from various departments; up to 120 points for involving the public in the planning process; and up to 35 points for coordinating among other agencies and departments to resolve common problems relating to flooding and other known natural hazards.

2.0 COMMUNITY INFORMATION

Figure 3 Elkhart County Location

Elkhart County was established in 1830. It is believed the county was named after the Shawnee Indian Chief Elkhart, cousin of the famous Chief Tecumseh, and father of princess Mishawaka. Elkhart was inhabited by the Potawatomi tribe in the early days of settlement. Elkhart was officially established with the county seat in Dunlap after reorganizing the county borders, was moved to Goshen. Elkhart County was founded by immigrants from New England, known as the "Yankee" immigrants. The completion of the Erie Canal in 1821 caused a surge of people to northern Indiana. Some of the settlers were from upstate New York and members of the Congregational Church many converted to Methodism and Baptists. During the end of the nineteenth century many Irish and German migrants came to Elkhart County. The name Elkhart is idealizing of "Elks-heart," which refers to Eastern elk. Since 1749, the name Elkhart has been attached to the Elkhart River and surrounding area.

The location of the county within the State of Indiana is identified in **Figure 3.** Elkhart County encompasses 463.17 square miles and 98.97% is land and only 1.03% is water. The city of Elkhart, located 15 miles east of South Bend, takes center stage as the county's most populous city. Despite this, Goshen holds the position of the county seat, forming the core of the Elkhart-Goshen Metropolitan Statistical Area and contributing to the broader South Bend-Elkhart-Mishawaka Combined Statistical Area, affectionately known as Michiana. Elkhart County is characterized by flat to gently rolling terrain. It is part of the Northern Lakes Natural Region of Indiana, which means it has a landscape with lakes, wetlands, and glacial features. Elkhart County is referred to as the recreation vehicle (RV) capital of the world and known for its Amish and Old Order Mennonite population.

2.1 POPULATION AND DEMOGRAPHICS

The US Census Bureau shows the 2023 population for Elkhart County was 206,409 which ranks 6 of 92 in the State. Since 2020, Elkhart County population has decreased by -0.3%. The County's population reached its highest point of 207,066 in 2021. However, since 2020, the county population has fluctuated to its present level of 206,890. The City of Elkhart is the county's largest incorporated area, accounting for 26.0% of the county's population (53,801 people). Elkhart County is a predominantly white community, making up 89.3% of the county's racial demographics. The county is 81.9% non-Hispanic and 18.1% Hispanic.

In 2022, the median age of the population in the county was 35.8. That is 2.4 years younger than the statewide median age of 38.2. The largest demographic age group in the county is Younger Adults (25 to 44) making up 24.7% of the county's population. The second largest is the Older Adult group (25 to recovered to its 44) making up

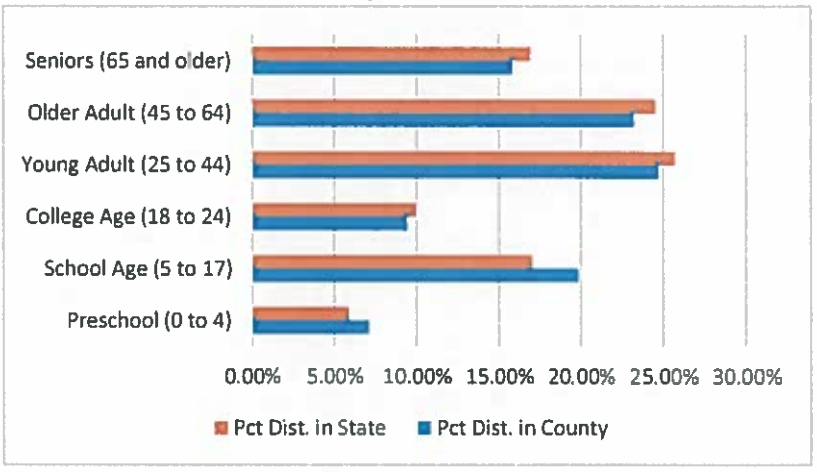

Figure 4: Age Distribution Compared to State Population

23.2% of the county and the third largest age group is the school age group (5 to 17) at 19.8%. The Seniors age group (65 and older) follows, making up 15.8% of the population; then the College age group (18 to 24) at 9.4% and finally the Preschool age group (0 to 4) at 7.1%. **Figure 4** shows the age distribution totals compared to the state.

The approximate median household income in 2022 was reported to be $63,777 while the poverty rate in the same year was reported at 16.3% county-wide. In total, 13,822 (19.3%) of households are married with children, and 22,651 (31.6%) of households are married without children. There are 6,947 single parents in Elkhart County with the remaining 19,696 (27.5%) of the population living alone.

Within the county, 82.2% of adults older than 25, have reportedly completed a High School education. Further, 20% of those same adults have also completed a Bachelor of Arts or higher degree.

In the past 14 years, Elkhart County population has been shrinking with an overall net change of -0.3%. The US Census population projections anticipate the county will increase in population by 3%.

2.2 EMPLOYMENT

US Census data indicates that of the Elkhart County workforce, the private sector is the largest employment sector within the county at 94%, followed by Government at 5.1% and then by Farming at 0.9%. "Manufacturing" category represents the largest group within the Private Sector Employment category at 44.5%. "Other Private – not listed above" is the second largest. "Other Private" is a catchall category which addresses any employment category not normally reported on the census questionnaires. The total resident labor force according to estimates in 2023 is 110,513 (with 4,413 unemployed) and as of June 2024, unemployment rate of 4%. The top 10 employers within Elkhart County according to Hoosiers by the Numbers are:

- Norfolk Southern (Elkhart)
- Keystone RV Co (Goshen)
- Always In Stone Monument Co (Goshen)
- Elkhart General Hospital (Elkhart)
- Jayco (Middlebury)
- Henkels & Mccoy (Elkhart)
- Supreme Industries Inc (Goshen)
- Conn-Selmer Inc. (Goshen)
- Morryde International (Elkhart)
- Kik Custom Products (Elkhart)

The Elkhart County Economic Development website shares the strong, yet diversified industries which includes mobility and automotive manufacturing, advanced manufacturing, farming and agriculture, corporate headquarters, musical instruments, biomedical and life sciences, manufacturing housing, and electronic components. Elkhart County ranks number 1 in the nation for robots per 1,000 workers. In addition, Elkhart County is ranked 13 in the nation for % of manufacturing jobs. The County Economic Development team is working to grow the local economy and is working with community leaders with innovative plans for the next five years.

2.3 TRANSPORTATION AND COMMUTING PATTERNS

Several major transportation routes pass through Elkhart County and the municipalities within. US Routes 6, 20, 33, 131, and State Roads 4, 13, 15, 19, 119, and 120 serve as main routes. There are five railways (The Elkhart & Western Railroad, Grand Elk Railroad, and Norfolk Southern Railroad, Chicago, Southshore, & S. Bend Railroad, and CSX Railroad) in the county. **Figure 5** shows the location of each of the transportation routes.

Figure 5 Elkhart County Transportation Routes

Although Elkhart County attracts a number of workers to the community from neighboring counties, a significant number of the Elkhart County workforce travel to neighboring counties for employment. According to STATSIndiana, 31,112 people commute into Elkhart County daily. Approximately 39.8% travel from St. Joseph County. Furthermore, approximately 7,276 Elkhart County residents commute to other counties, with St. Joseph County receiving the greatest percentage of commuters from Elkhart County at 60.9%.

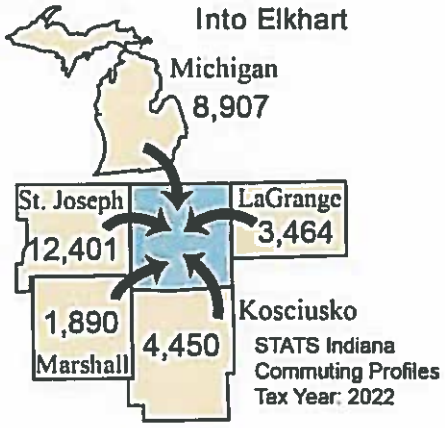

Figure 6 Commuting Pattern into Elkhart County

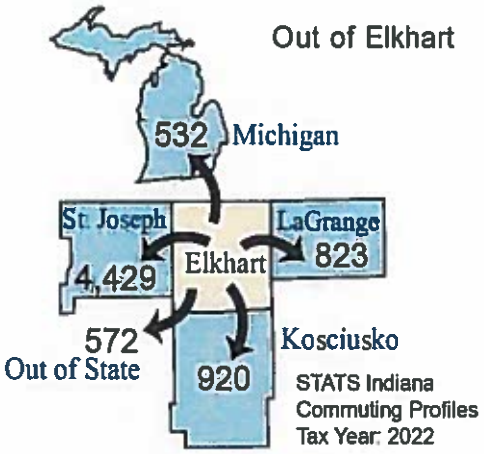

Figure 7 Commuting Pattern Out of Elkhart County

Figure 6 indicates the number of Elkhart County residents 16 and older do not live within Elkhart County but commute into the County for employment purposes. **Figure 7** indicates the number of workers 16 and older who live in Elkhart County and commute out of the county for employment.

2.4 CRITICAL AND ESSENTIAL INFRASTRUCTURE

REQUIREMENT §201.6(c)(2)(ii)(A):

The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas....

Figure 8 Elkhart County Courthouse

Critical facilities, critical infrastructure, and essential facilities are the assets, systems, and networks, whether physical or virtual, so vital to local governments and the United States that their incapacitation or destruction would have a debilitating effect on security, economic security, public health or safety, or any combination thereof.

These structures are vital to the community's ability to provide essential services and protect life and property; are critical to the community's response and recovery activities; and/or are the facilities, the loss of which, would have a

severe economic or catastrophic impact. The operation of these facilities becomes especially important following a hazard event.

The Elkhart County EMA and GIS Department Offices provided the listing and locations of the following 1,459 critical and essential facilities for the MHMP update. **Figure 8** shows the Elkhart County Courthouse as one of the critical facilities. The following list identifies the number of each of the critical and essential facilities identified.

- 7 Airports/Helipads/Landing Strip
- 19 Assisted Living Facilities
- 199 Places of Worship
- 30 Child Care Centers
- 4 Government
- 15 Land Mobile Commercial Transmission
- 1 Intermodal Freight Facility/Pipeline
- 1 Mental Health Facility
- 552 Microwave Service Towers
- 2 Landfills
- 13 Non-gasoline Alternative Fueling Stations
- 1 Biomass Facility
- 12 Police Stations
- 103 Schools
- 229 Tier 2 Hazardous Materials Sites
- 3 Urgent Care Facilities
- 2 College
- 2 Delivery Locations
- 1 EOC
- 4 EMS
- 1 C & D
- 1 Convention Center
- 30 Cell Towers
- 7 Clinics
- 31 Fire Department Stations
- 3 Dialysis Centers
- 1 Hydroelectric Power Facility
- 2 Hospitals
- 6 LM Broadcast Towers
- 33 Mobile Home Parks
- 7 Multi-use Complexes
- 58 Shelters
- 24 Nursing Homes
- 1 POL Pumping Station
- 1 Solar Farm
- 37 Substations
- 2 Wastewater Treatment Plants
- 1 Construction and Demolition Waste Site
- 4 TAP
- 1 TV Analog Transmitter
- 1 Intermodal Freight Facilities Pipelines

Information provided by the EMA, Elkhart County GIS, and the MHMP Planning Committee members was utilized to identify the types and locations of critical structures throughout Elkhart County. Draft maps were provided to the Planning Department and EMA, along with the Planning Committee for their review and all comments were incorporated into the maps and associated databases.

Exhibit 1, located after the narrative chapters of this document, illustrates the critical infrastructure identified throughout the unincorporated Elkhart County and the individual municipalities. **Appendix 4** lists the critical structures in Elkhart County by community. Non-critical structures include residential, industrial, commercial, and other structures not meeting the definition of a critical facility and are not required for a community to function. The development of this MHMP focused only on critical and essential structures; non-critical structures are neither mapped nor listed.

2.5 MAJOR WATERWAYS AND WATERSHEDS

According to the United States Geological Survey (USGS), there are 78 rivers and streams in Elkhart County, which are listed in **Appendix 5**. The county's main waterways are the Elkhart River, St. Joseph River, Buago Creek, Yellow Creek, Rock Run Creek, Turkey Creek, and Little Elkhart River. The county lies within three 8-digit Hydrologic Unit Code (HUC): Kankakee, Little Calumet-Galen and St. Joseph Watersheds. The major waterways, and others, are identified on **Exhibit 2**. There are 2 USGS gauges located in Elkhart County. The gauges are located at Goshen on the Elkhart River and at Elkhart on the St. Joseph River.

Elkhart County is in the northeast part of the state. As a rural, agriculture-based community it is home to two major reservoirs, Goshen Dam Pond and Goshen Pond. There are several regulated drains in Elkhart County. Some of the other larger waterways in the county include Christiana Creek, Puterbaugh Creek, Yellow Creek, Cobus Creek, Indian Creek, Rock Run Creek, Pine Creek, Trout Creek, North Fork Pine Creek, Sheep Creek, Juday Ditch, South Fork Pine Creek, Little Yellow Creek, and Owl Creek. (**Figure 9**)

There are 13 lakes in Elkhart County including Hunter Lake, Heaton Lake, Simonton Lake, Wolf Lake, Yellow Creek Lake, Fish Lake, Frog Pond, Butts Lake, Round Lake, Boot Lake, Norton Lake, Goose Pond, and Dock Lake. There have been five Watershed Management Plans involving Elkhart County. They are Elkhart River, Baugo Wisler, Puterbaugh Creek, St. Joseph River, and Upper Elkhart River.

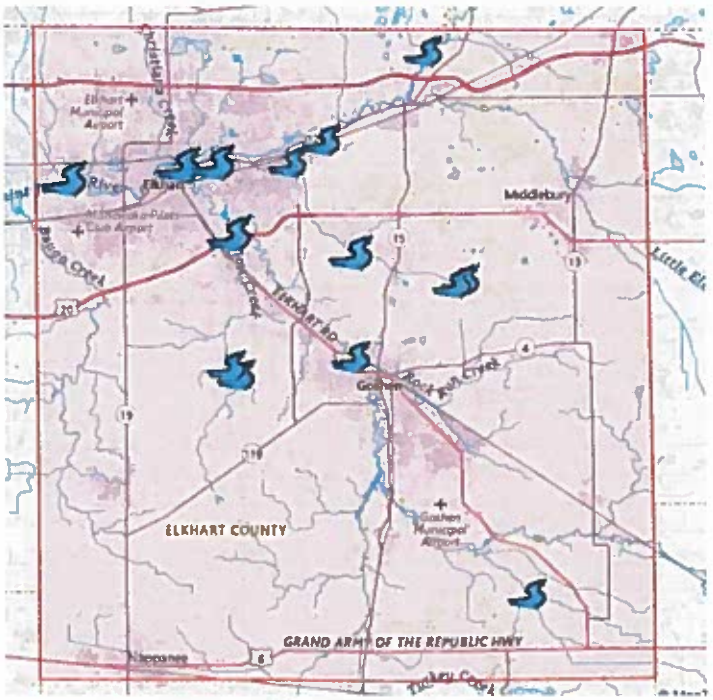

Figure 9 Major Waterways in Elkhart County

2.6 NFIP PARTICIPATION

The National Flood Insurance Program (NFIP) is a FEMA program that enables property owners in participating communities to purchase insurance protection against losses from flooding. According to FEMA, participation in the National Flood Insurance Program (NFIP) is voluntary. Elkhart County, the Cities of Elkhart and Goshen, and the Towns of Bristol, Middleburg, and Wakarusa participate in the NFIP. At the time of this planning effort, according to the Indiana Department of Natural Resources, the Elkhart County Planning Director is responsible for the administration of the floodplain program in the unincorporated areas of the County as well as all the incorporated towns of Bristol, Middlebury, and Wakarusa. The City of Elkhart, Goshen and Nappanee have their own community floodplain administrator. Substantial damage determinations are carried out by the floodplain administrators and their designated personnel to remain in compliance with the community flood ordinances. **Table 2** lists the NFIP number, effective map date, and the date each community joined the NFIP program.

Table 2 NFIP Participation

NFIP Community	NFIP Number	Effective Map Date	Join Date
Elkhart County	180056#	08/02/2011	11/01/1979
City of Elkhart	180057#	08/02/2011	08/01/1979
City of Goshen	180058#	08/02/2011	08/01/1979
City of Nappanee	180059#	NSFHA	08/15/1983
Town of Bristol	180060#	08/02/2011	04/16/1979
Town of Middlebury	180460#	08/02/2011	08/17/1983
Town of Millersburg	180363#		
Town of Wakarusa	180364#	08/02/2011	04/10/2012

2.7 TOPOGRAPHY

Elkhart County, is in the northeast area of Indiana, unfolds with a varied topography shaped by geological forces and human influence. Spanning an average elevation of 254 meters, the county showcases a terrain ranging from a minimum elevation of 214 meters. As of the 2020 census, the county spans 463.20 square miles, with nearly 99% comprising land and 1.03% water. The landscape is predominantly rural, adorned with rolling hills, particularly notable in the northeast, sculpted by ancient glaciers and identified as part of the St. Lawrence Seaway Continental Divide. The St. Joseph River, originating in Michigan, serves as the main watercourse, while the Elkhart River weaves through the county, merging with the St. Joseph River at Island Park. Additionally, the Little Elkhart River contributes scenic views in Bonneyville Mills County Park before joining the St. Joseph River near Bristol. Dotted with numerous creeks and lakes, including Simonton Lake, the county's topography is a captivating blend of geological history and natural beauty, reflecting the harmonious interaction between the environment and human settlement.

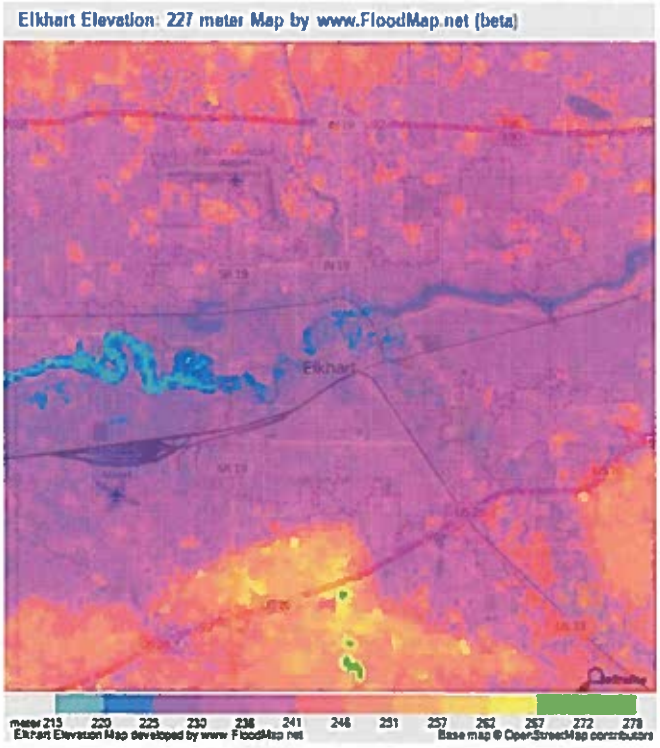

Figure 10 Topographic Map of Elkhart County

Figure 10 shows the topographic map of Elkhart County. There are several small lakes around the County in addition to the rivers which provide opportunities for outdoor activities such as fishing, camping, and wildlife observation.

2.8 CLIMATE

In Elkhart County, the annual average maximum temperature was 58.4 degrees Fahrenheit with an average annual low (minimum) temperature of 37.9 degrees Fahrenheit. **Figure 11** and **Figure 12** chart

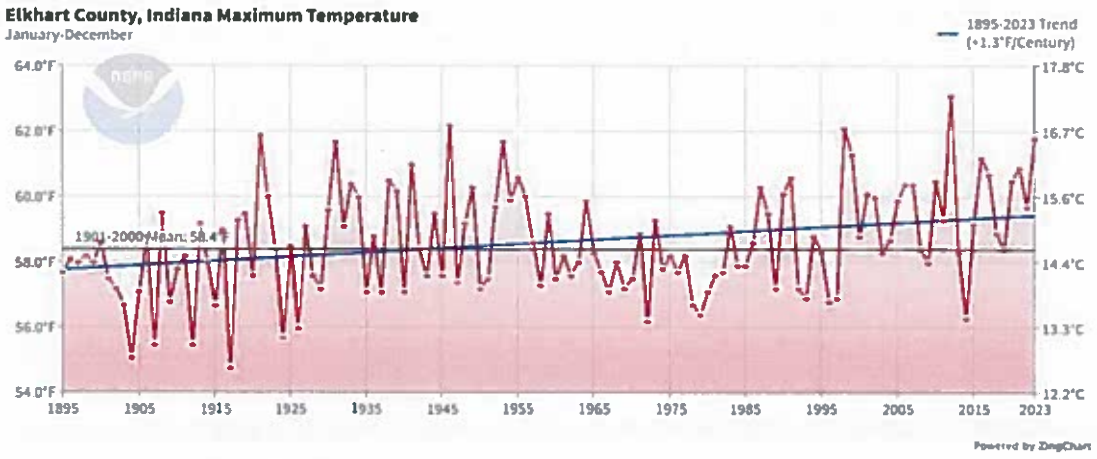

Figure 11 Elkhart County Maximum Temperature Trends 1895-2023

the annual maximum and minimum temperatures and show trends utilizing data from the National Centers for Environmental Information (NCEI).

The coldest month based on this data is January at a mean temperature of 25.5 degrees and the warmest is July with a mean temperature of 73.7 degrees. According to the Midwest Regional Climate Center (MRCC) between January 2018 and March 2024 at the Elkhart, IN (the long-term weather data site), the maximum temperature was 97 degrees (6/15/22), and the lowest minimum temperature was -22 degrees (1/31/19). The average daily high was 61 degrees, which is 1 degree cooler than the median within that time frame. Additionally, the average daily minimum temperature for the same five-year period was recorded at 39.5 degrees. That is 1.5 degrees warmer than the median temperature identified at 38-degrees Fahrenheit.

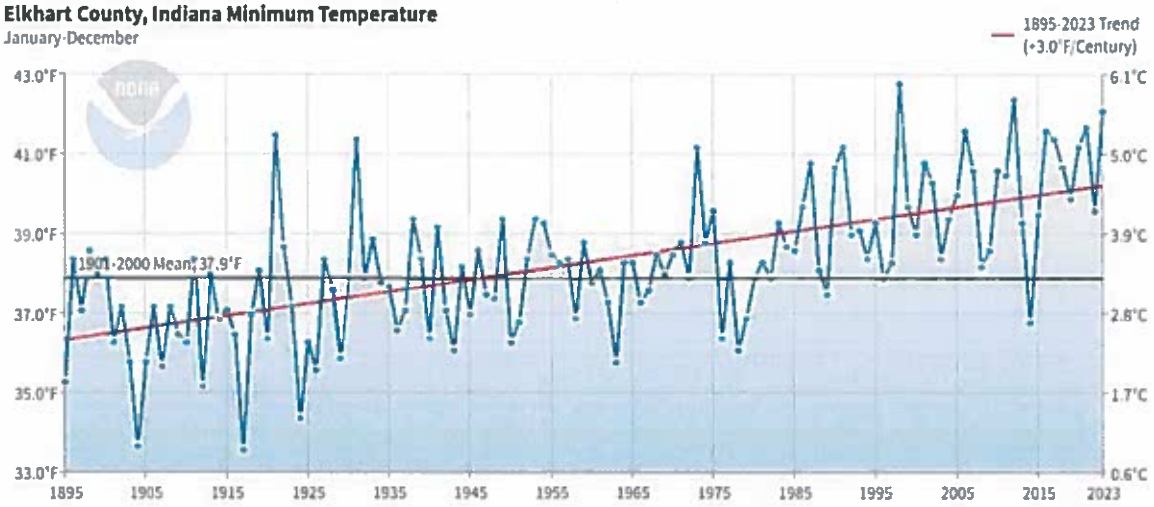

Figure 12 Elkhart County Minimum Temperature Trends 1895 - 2023

May is typically the wettest month of the year, with February being the driest. The average annual precipitation for Elkhart County is 38.34 inches. In the past 5 years Elkhart County had a low of 35.04 inches in 2023 and the highest annual precipitation of 45.58 inches. The highest monthly precipitation rate between January 2018 and April 2024 occurred in July 2022 where 7.51 inches fell. That is 2.25 times the normal average monthly rainfall amount. On the opposite end of the spectrum the driest

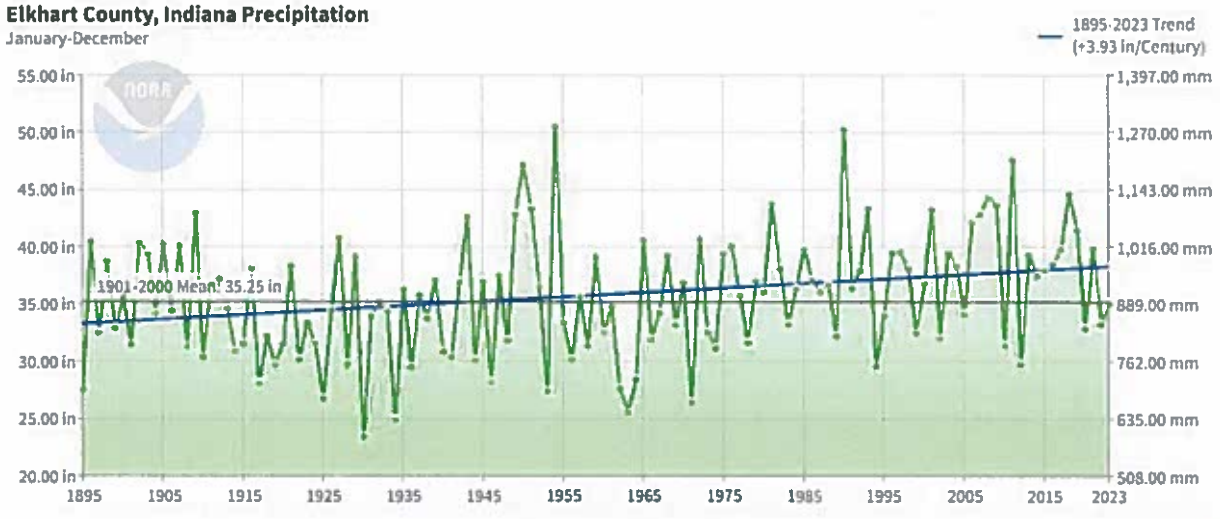

Figure 13 Elkhart County Precipitation Trends 1895 - 2023

month was January 2022 with 0.72 inches of precipitation. **Figure 13** illustrates the annual precipitation in Elkhart County.

Purdue University Indiana Climate Change Impacts Assessment Report analyzed the increased frequency of short duration high volume rain events, also known as extreme precipitation events, in Indiana. According to the report, an extreme rain event occurs when more than 0.86 inches of rain falls in a day. Since 1900, the number of days per year with extreme rain has been increasing by 0.2 days per decade on average. However, most of that increase has occurred since 1990. The northwestern part of the state has seen the largest increase — a rate of about 0.4 days per decade. In **Figure 14** the trend line shows an increase in the number of days where the rainfall exceeds 99th percentile. This ever-increasing trend is resulting in more frequent flash flood and overland flood events.

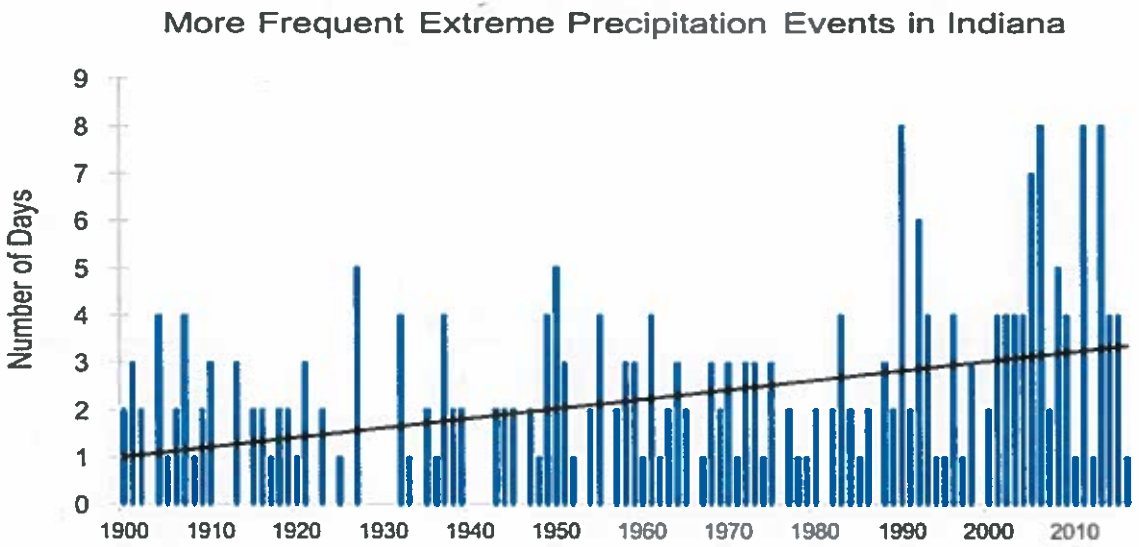

Figure 14 Extreme Precipitation Events in Indiana

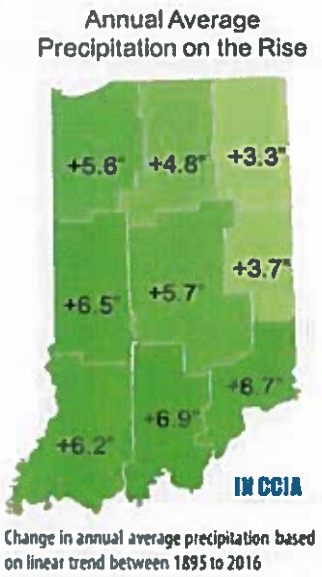

Figure 15 Annual Average Precipitation Change, Purdue

According to NOAA National Centers for Environmental Information the State Climate Summary for Indiana the following observations have been observed based upon climate change:

- The temperatures have risen almost 1.5 degrees Fahrenheit since the beginning of the 20th Century. Temperatures in the 2000's have been higher than in any other historical period except during the early 1930's Dust Bowl era.
- Indiana has experienced an increase in the number of rain intensity is increasing and rain duration is decreasing.
- Extreme events are increasing, especially flooding.

This is also verified in the Indiana Climate Change Assessment report from Purdue University.(**Figure 15**) In the report, the authors wrote, "This assessment documents that significant changes in Indiana's climate have been underway for over a century, with the largest changes occurring in the past few decades. These projections suggest that the trends that are already occurring will continue, and the rates of these changes

will accelerate. They indicate that Indiana's climate will warm dramatically in the coming decades, particularly in summer. Both the number of hot days and the hottest temperatures of the year are projected to increase markedly. Indiana's winters and springs are projected to become considerably wetter, and the frequency and intensity of extreme precipitation events are expected to increase, although more research is needed in this area to better determine the details."

2.9 UNDERSERVED, DISADVANTAGED AND SOCIALLY VULNERABLE POPULATIONS

For this planning effort, under the new FEMA guidance mitigation plan updates are required to include the perspective of socially vulnerable community members and the underserved communities in the county. The Agency for Toxic Substances and Disease Registry (ATSDR) and the Centers Disease Control (CDC) with higher education facilities to develop the Social Vulnerability Index (SVI). According to ATSDR/CDC, Social Vulnerability refers to the community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters, such as tornadoes or disease outbreaks, to human caused threats, such as toxic chemical threats. Sixteen census-derived factors are grouped into 4 general themes which summarize the extent of social vulnerability. **Figure 16** shows the 16 factors and how they are grouped into the four themes. The more factors impacting community members to more vulnerable those members are to the hazardous events.

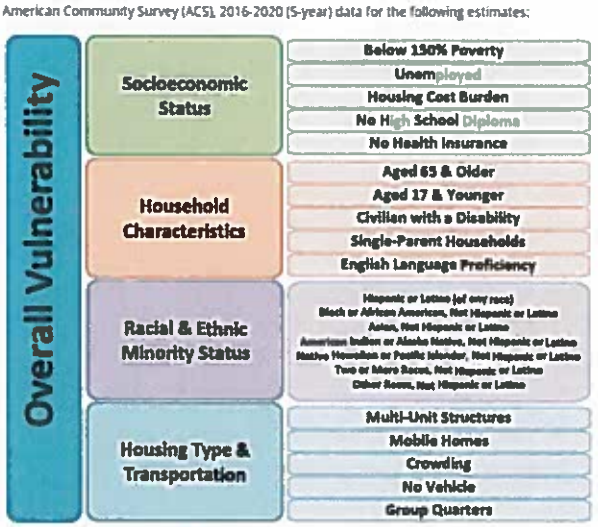

Figure 16 Social Vulnerability Factors

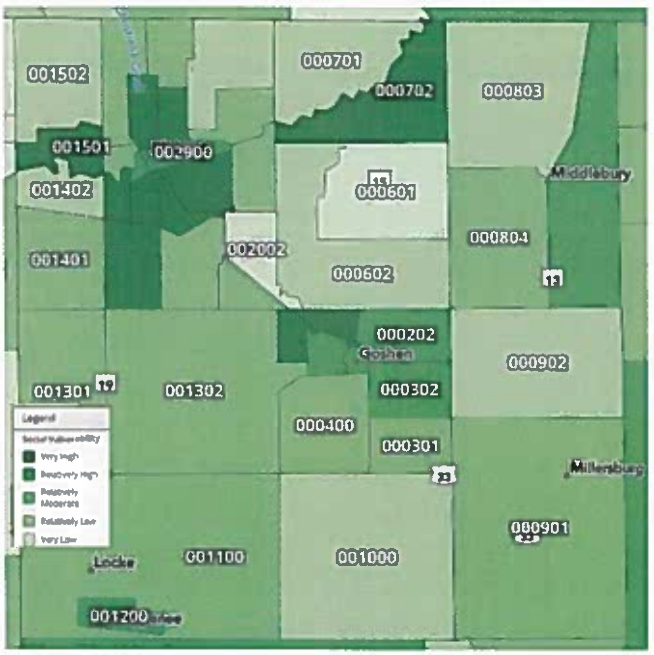

Figure 17 Elkhart County Social Vulnerability by Census Tract

Figure 17 Is a map of the social vulnerabilty of each of the census tracts in Elkhart County. Further details, including the 4 thematic maps may be found in **Appendix 11**. The Social Vulnerability Index is used in FEMA's National Risk Index, where the data is paired with expected annual losses, and community resilience to calculate a risk index for each of the hazards. This data is available both on the county level and the census tract level. Overall as a county the social vulnerability is relatively to very low, however, some census tracts in the northern ½ of the county have vulnerability scores meeting the relatively high to very high categories. When struck by the same intensity event, the areas in dark green on **Figure 17** may

require, more support in responding to and recovering from the hazardous event.

One last resource reviewed was the Climate and Economic Justice (CEJ) tool. Although the tool shows some similarities to the social vulnerabiltiy index, there are some differences.

The CEJ Tool highlights disadvantaged census tracts across all 50 states, the District of Columbia, and the U.S. territories. If the community is located in a census tracts that meet the thresholds for at least one of the tool's categories of burden, or if the community is on land within the boundaries of Federally Recognized Tribes then the people living within the census tract are considered disadvantaged.

Twelve census tracts within Elkhart County are considered disadvantaged. (***Figure 18***) Each area is considered disavantaged beause the households from this area are above the 65th percentile for low income. Low income is defined as an income less than or equal to twice the federal poverty level, not including students enrolled in higher education. Additionally each area meets or exceeds one of the other criteria which includes climate change impacts, health, housing, transportation, and water and wastewater. A more detailed analysis of each area may be found in **Appendix 11**.

Figure 18 Elkhart County Disadvantaged Populations

The team discussed the impacts of social vulnerability on the overall commuity and where possible has identified mitigation efforts to help address the hazards and make these areas of the community more resilient.

2.10 COMMUNITY CAPACITY

In Indiana the Fire Prevention and Building Safety Commission is tasked with the establishment and maintenance of fire and building safety codes. The commission also reviews variance requests, code modification proposals and orders enforcing the fire and building safety law. Only the commission is permitted to adopt codes for the state. Local communities may not adopt editions other than those adopted by the state. All jurisdictions of the state are required to follow the state adopted fire safety and building laws.

Local Building Officials serve as the local authority for building construction matters within their jurisdiction. In Elkhart County, the county Local Building Official serves all the incorporated communities except the City of Elkhart, Goshen and Nappanee. The Cities have their own Planning and Building Department. **Appendix 9** lists the local building official as well as a number of other key positions in each jurisdiction.

Elkhart County and the City of Elkhart have digitally published their ordinances for easy access. The City of Goshen, and the Towns of Bristol, Millersburg, and Wakarusa have some of their ordinances on their webpage. Elkhart County, and the Cities of Elkhart, Goshen, and Nappanee and the Towns of Bristol, Millersburg, and Wakarusa have zoning and subdivision ordinances. The County and the Cities of Elkhart and Goshen and the Town of Bristol have stormwater ordinance as well. The City of Elkhart and Goshen and the Town of Bristol have a burning ordinance. The City of Elkhart has a floodplain ordinance. None currently have a water conservation ordinance. County and community leaders take advantage of grant funding to help address non-budgeted activities. The Health Department along with the hospital and county EMS service work together to assure health and safety needs are met. The planning team identified a few community-wide needs such as overnight sheltering capabilities for unhoused individuals but has already begun finding whole community solutions to address the challenges. As needs for capacity building are identified, the communities and their leadership work together to ensure the challenges are addressed.

The State of Indiana is presently working with subject matter experts to update the current fire and building safety codes to more recent International Code Council versions. Due to the hearing and adoptions processes this is a multi-year effort. It is hoped that within the next five years updated fire safety and building codes will be adopted to assist the community in becoming more resilient. In all cases, local floodplain ordinances are anticipated to be updated within the next five-year cycle using the state model ordinance to guide their process.

3.0 RISK ASSESSMENT

REQUIREMENT §201.6(c)(2):

[The risk assessment shall provide the] factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessment must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

A risk assessment measures the potential loss from a hazard incident by assessing the vulnerability of buildings, infrastructure, and people in a community. It identifies the characteristics and potential consequences of hazards, how much of the community may be affected by a hazard, and the impact on community assets. The risk assessment conducted for Elkhart County and the communities within is based on the methodology described in the Local Mitigation Planning Handbook published by FEMA in 2023 and is incorporated into the following sections:

Section 3.1: Hazard Identification lists the natural, technological, and political hazards selected by the Planning Committee as having the greatest direct and indirect impact to the county as well as the system used to rank and prioritize the hazards.

Section 3.2: Hazard Profile for each hazard, discusses 1) historic data relevant to the county where applicable; 2) vulnerability in terms of number and types of structures, repetitive loss properties (flood only), estimation of potential losses, and impact based on an analysis of development trends; and 3) the relationship to other hazards identified by the Planning Committee.

Section 3.3: Hazard Summary provides an overview of the risk assessment process; a table summarizing the relationship of the hazards; and a composite map to illustrate areas impacted by the hazards.

3.1 HAZARD IDENTIFICATION

3.1.1 Hazard Selection

The MHMP Planning Committee reviewed the list of natural and technological hazards in the 2017 Elkhart County MHMP, discussed recent events, and the potential for future hazard events. The Committee identified those hazards which affected Elkhart County and each community selecting the hazards to study in detail as part of this planning effort. As shown in **Table 3,** these hazards include dam failure; earthquake; flood; hailstorms, thunderstorms, and windstorms; hazardous materials incident; snowstorms and ice storms; and tornado. All hazards studied within the 2017 Elkhart County MHMP are included in the update. Since the COVID pandemic, the Health Department continues to develop plans and policies to better respond to and reduce the spread if both routine human disease-causing organisms as well as zoonotic diseases and changes in that field. Drought, Extreme Temperatures, Fires and Wildfires, and Land Subsidence, Landslide, and Fluvial Erosion were added to the update since they are key hazards in the most recent Indiana State Multi-Hazard Mitigation Plan. The team will continue to assess the hazard inclusion for future MHMP updates.

Table 3: Hazards Selected

Type of Hazard	List of Hazards	MHMP	
		2017	2024
Natural	Drought	No	Yes
	Earthquake	Yes	Yes
	Extreme Temperature	No	Yes
	Fires and Wildfire	No	Yes
	Flood	Yes	Yes
	Hail/Thunder/Wind	Yes	Yes
	Land Subsidence/Landslide	No	Yes
	Snow / Ice Storm	Yes	Yes
	Tornado	Yes	Yes
Technological	Dam Failure	Yes	Yes
	Hazardous Material Incident	Yes	Yes

3.1.2 Hazard Ranking

The Planning Committee ranked the selected hazards in terms of importance and potential for disruption to the community using a modified version of the Calculated Priority Risk Index (CPRI). The CPRI is a tool by which individual hazards are evaluated and ranked according to an indexing system. The CPRI value (as modified by Burke) can be obtained by assigning varying degrees of risk probability, magnitude/severity, warning time, and the duration of the incident for each event, and then calculating as index value based on a weighted scheme. For ease of communications, simple graphical scales are used.

Probability:

Probability is defined as the likelihood of the hazard occurring over a given period. The probability can be specified in one of the following categories:

- Unlikely – incident is possible, but not probable, within the next 10 years.
- Possible – incident is probable within the next five years.
- Likely - incident is probable within the next three years.
- Highly Likely – incident is probable within the next calendar year.

Magnitude / Severity:

Magnitude/severity is defined by the extent of the injuries, shutdown of critical infrastructure, the extent of property damage sustained, and the duration of the incident response. The magnitude can be specified in one of the following categories:

- Negligible – few injuries OR critical infrastructure shutdown for 24 hours or less OR less than 10% property damaged OR average response duration of less than six hours.
- Limited – few injuries OR critical infrastructure shut down for more than one week OR more than 10% property damaged OR average response duration of less than one day.
- Significant – multiple injuries OR critical infrastructure shut down of at least two weeks OR more than 25% property damaged OR average response duration of less than one week.
- Critical – multiple deaths OR critical infrastructure shut down of one month or more OR more than 50% property damaged OR average response duration of less than one month.

Warning Time:

Warning time is defined as the length of time before the event occurs and can be specified in one of the following categories:

- More than 24 hours
- 12-24 hours
- 6-12 hours
- Less than six hours

Duration:

Duration is defined as the length of time that the actual event occurs. This does not include response or recovery efforts. The duration of the event can be specified in one of the following categories:

- Less than six hours
- Less than one day
- Less than one week
- Greater than one week

Calculating the CPRI:

The following calculation illustrates how the index values are weighted and how the CPRI value is calculated. CPRI = (Probability x 0.45) + (Magnitude/Severity x 0.30) + (Warning Time x 0.15) + (Duration x 0.10). For the purposes of this planning effort, the calculated risk is defined as:

- **Low** if the CPRI value is between 1 and 2.
- **Elevated** if the CPRI value is between 2 and 3.
- **Severe** if the CPRI value is between 3 and 4.

The CPRI value provides a means to assess the impact of one hazard relative to other hazards within the community. A CPRI value for each hazard was determined for each incorporated community, and then a weighted CPRI value was computed based on the community population.

Table 4 presents each community, population, and the weight applied to individual CPRI values to arrive at a combined value for the entire county. Weight was calculated based on the average percentage of each community's population in relation to the total population of the county. Thus, the results reflect the relative population influence of each community on the overall priority rank.

Table 4: Determination of Weighted Value for Communities

Community	Population (2021)	% of Total Population	Weighted Value
Elkhart County (w/o incorporated communities)	103,432	50.0%	0.500
City of Elkhart	53,949	26.1%	0.261
City of Goshen	34,756	16.8%	0.168
City of Nappanee	6,562	3.2%	0.032
Town of Bristol	1,781	0.9%	0.009
Town of Middlebury	3,449	1.7%	0.017
Town of Millersburg	953	0.5%	0.005
Town of Wakarusa	2,039	1.0%	0.010
Total	**206,921**	**100.0%**	**1**

3.2 HAZARD PROFILES

The hazards studied for this report are not equally threatening to all communities throughout Elkhart County. While it would be difficult to predict the probability of an earthquake or tornado affecting a specific community, it is much easier to predict where the most damage would occur in a known hazard area such as a floodplain or near a facility utilizing an Extremely Hazardous Substance (EHS). The magnitude and severity of the same hazard may cause varying levels of damage in different communities.

In the past eight years Indiana has had 3 FEMA disaster declarations and 1 FEMA Emergency Declaration.

- DR 4363, declared May 5, 2018, for Severe Storms and Flooding
- DR 4704, declared April 15, 2023, for Severe Storms, Straight-line Winds and Tornadoes
- DR 4515, declared April 3, 2020, for COVID 19 Pandemic
- EM 3456, declared March 13, 2020,

In addition, the US SBA disasters for 10 Indiana events. Of all these events, Elkhart County was only included in the two COVID declarations (DR-4515 and EM-3456) as well as DR 4363 for Severe Storms and Flooding and one USSBA declaration IN-200004 July 15, 2024 for Severe Storms and Tornadoes.

This section describes each of the hazards that were identified by the Planning Committee for detailed study as a part of this MHMP Update. The discussion is divided into the following subsections:

- **Hazard Overview** provides a general overview of the causes, effects, and characteristics that the hazard represents.
- **Historic Data** presents the research gathered from local and national courses on the hazard extent and lists historic occurrences and probability of future incident occurrence.
- **Assessing Vulnerability** describes, in general terms, the current exposure, or risk, to the community regarding potential losses to critical infrastructure and the implications to future land use decisions and anticipated development trends. Impacts on specific populations of communities are also addressed within this section.
- **Relationship to Other Hazards** explores the influence one hazard may have upon another hazard.

3.2.1 Drought

Overview

Drought, in general, means a moisture deficit extensive enough to have social, environmental, or economic effects. Drought is not a rare and random climate incident; rather, it is a normal, naturally recurring feature of climate. Drought may occur in all climactic zones, but its characteristics vary significantly from one region to another. Drought is a temporary aberration and is different from aridity, which is restricted to low rainfall regions.

Figure 19: Drought of 2023 affects farmers pocketbooks in Elkhart County

There are four academic approaches to examining droughts; these are meteorological, hydrological, agricultural, and socio-economic. Meteorological drought is based on the degree, or measure, of dryness compared to a normal, or average amount of dryness, and the duration of the dry period. Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply. Agricultural drought is related to agricultural impacts; and focuses on precipitation shortages, differences between actual and potential evapo-transpiration, soil water deficits, reduced ground water or reservoir levels, and crop yields. Socioeconomic drought relates the lack of moisture to community functions in the full range of societal functions, including power generation, the local economy, and food source Figure 19 shows a farm affected by drought conditions.

Recent Occurrences

Data gathered from the U.S. Drought Monitor indicated that between January 1, 2016 – August 2024, there were 144 weeks where some portions of Elkhart County was identified as being "Abnormally Dry" or at Drought Monitor Level D0. According to the Drought Monitor, there were 50 weeks within that period where any portion of Elkhart County was in a drought state higher

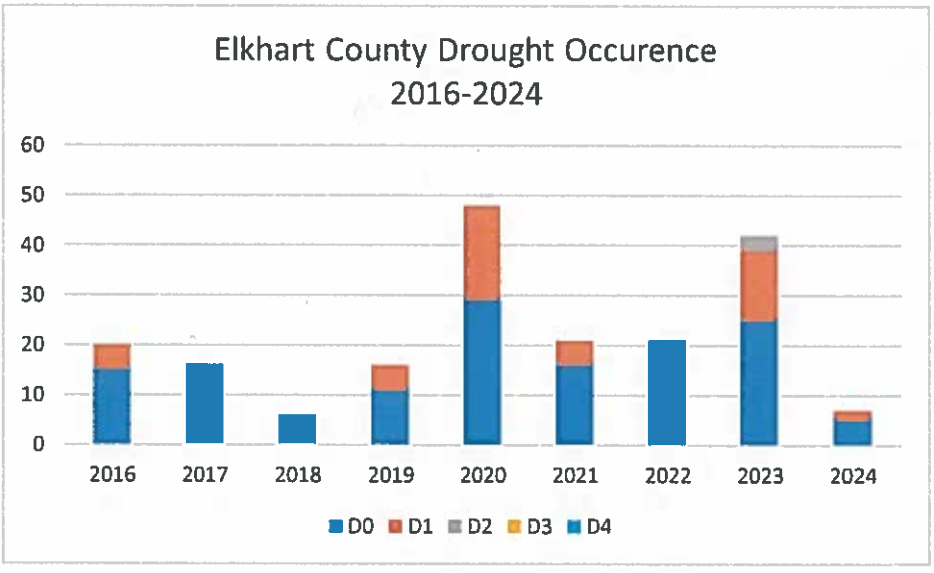

Figure 20 Drought Occurrences 2016 – August 2024

than D0. **Figure 20** shows the distribution of weeks in drought over the 8-year time frame.

As rain patterns change there are periodic times when the county is deemed "Abnormally Dry" or D0. Most of these instances are resolved quickly as sufficient rain arrives and the soil rehydrates. On occasion, the rain is insufficient to address the dryness and weather conditions cause the soil to further dry out stressing crops and reducing lake levels. Examples of continued dryness can be found in 2019, 2020, 2021, and 2023. During each of these years, Elkhart County was found to be in "Moderate Drought" or D1. On July 14, 2020, USDA/NASS records showed crop conditions as of July 12 rated poor or very poor have reached or surpassed 10% for corn in Indiana and Ohio, and soy in Illinois, Indiana, and Ohio. The highest level of drought experienced in Elkhart County in the past five years is D1 or "Moderate Drought". Many people will recall the summer of 2012 throughout Indiana because drought conditions had intensified and reached D2 for 3 weeks in Elkhart County. Burn bans were common and the fire threat was so great that all July 4 fireworks events were postponed or cancelled. Most recently, September 12 through October 10, 2023, Elkhart County once again was at D1 for 5 weeks. Although not as severe as 2012, due to high winds and low humidity many communities contemplated potential burn bans. **Figure 21**, from the U.S. Drought Monitor, describes the rationale to classify the severity of droughts.

Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: • short-term dryness slowing planting, growth of crops or pastures Coming out of drought: • some lingering water deficits • pastures or crops not fully recovered
D1	Moderate Drought	• Some damage to crops, pastures • Streams, reservoirs, or wells low, some water shortages developing or imminent • Voluntary water-use restrictions requested
D2	Severe Drought	• Crop or pasture losses likely • Water shortages common • Water restrictions imposed
D3	Extreme Drought	• Major crop/pasture losses • Widespread water shortages or restrictions
D4	Exceptional Drought	• Exceptional and widespread crop/pasture losses • Shortages of water in reservoirs, streams, and wells creating water emergencies

Figure 21 US Drought Monitor Drought Classification Descriptions

Table 5: Drought Trends in Elkhart County since 2016

	Percent of the Year in Each Drought Category					
Year	None	D0	D1	D2	D3	D4
2016	70%	20%	10%	0%	0%	0%
2017	69%	31%	0%	0%	0%	0%
2018	88%	12%	0%	0%	0%	0%
2019	78%	12%	10%	0%	0%	0%
2020	55%	19%	36%	0%	0%	0%
2021	69%	21%	10%	0%	0%	0%
2022	60%	40%	0%	0%	0%	0%
2023	46%	27%	21%	6%	0%	0%
2024	85%	9%	6%	0%	0%	0%

The National Climate Data Center (NCDC) does not report any events nor property or crop losses within Elkhart County during this planning period in relation to drought. During discussions with the Planning Committee, effects from the drought were highlighted. Committee members recalled the dry conditions and discussed the large field/wildland fires which frequently occur during harvest season. Although NCDC does not show any reports of damage, fires during harvest result in damage to farming equipment even if crops are preserved. **Table 5** depicts the number of weeks per year at each of the drought levels indicated above. Elkhart County has not exceeded D1- Moderate Drought during the past 8 years.

The Planning Committee, utilizing the CPRI, determined the overall risk of drought throughout Elkhart County and the City of Elkhart and Goshen and the Towns of Bristol and Middlebury is "Elevated." The City of Nappanee and the Towns of Millersburg and Wakarusa determined the overall risk is "Low". The impact of drought was determined to be "Highly Likely" (to occur within the next year) for Elkhart County and Cities of Elkhart and Goshen and the Towns of Bristol and Middlebury and "Possible" for the City of Nappanee and Towns of Millersburg and Wakarusa. The magnitude of drought is anticipated to be "Negligible." Further it is anticipated that with the enhanced weather forecasting abilities, the warning time for a drought is greater than 24 hours and the duration will be greater than one week. A summary is shown in **Table 6.**

Table 6: CPRI for Drought

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Negligible	> 24 hours	> 1 week	Elevated
City of Elkhart	Highly Likely	Negligible	> 24 hours	> 1 week	Elevated
City of Goshen	Highly Likely	Negligible	> 24 hours	> 1 week	Elevated
City of Nappanee	Possible	Negligible	> 24 hours	> 1 week	Low
Town of Bristol	Highly Likely	Negligible	> 24 hours	> 1 week	Elevated
Town of Middlebury	Highly Likely	Negligible	> 24 hours	> 1 week	Elevated
Town of Millersburg	Possible	Negligible	> 24 hours	> 1 week	Low
Town of Wakarusa	Possible	Negligible	> 24 hours	> 1 week	Low

According to the National Drought Mitigation Center, scientists have difficulty predicting droughts more than one month in advance due to numerous variables such as the precipitation, temperature, soil moisture, topography, and air-sea interactions. Further anomalies may also enter the equation and create more dramatic droughts or lessen the severity of droughts. The damage anticipated throughout the county is predicted to be "Negligible" as the municipalities rely on groundwater and surface water supplies for fire response efforts and face a higher risk during times of prolonged drought. Businesses and industry that rely upon water for their processes and products would be impacted by water limitations within the cities and towns. Throughout the unincorporated areas of the county, increased crop and livestock damage would also be expected during a significant drought. In addition, the long-term stress on the forested land could result in additional tree deaths and debris during subsequent high wind events.

Assessing Vulnerability

This type of hazard will generally affect entire counties and even multi-county regions at one time. Within Elkhart County, direct and indirect effects from a lengthy period of drought may include:

Direct Effects:

- Urban, developed areas, and local wildlife areas may experience revenue losses from decreased tourism; landscaping companies, golf courses revenue losses due to lack of growth and plant death; restrictions on industry cooling and processing demands; reduced incomes for businesses dependent on crop yields, and increased potential for fires.
- Rural areas within the county may experience revenue losses from reductions in decreased livestock and crop yields as well as increased incidence of field fires.
- Loss of tree canopy due to increased susceptibility to pests and diseases.

- Citizens served by drinking water wells or surface water supplies may be impacted during low water periods and may require drilling of deeper wells or loss of water service for a period.
- According to Purdue's Indiana Climate Change Impacts Assessment climate change will as temperatures rise, and rainfall patterns shift, managing multiple water needs will become increasingly difficult. This could result in more drought conditions.

Indirect Effects:

- Loss of income of employees from businesses and industry affected; loss of revenue to support services (food service, suppliers, etc.)
- Loss of revenue from recreational or tourism sectors associated with reservoirs, streams, and other open water venues.
- Lower yields from domestic gardens increasing the demand on purchasing produce and increased domestic water usage for landscaping.
- Increased demand for emergency responders and firefighting resources due to grass fires and increased medical calls for people having respiratory issues because of increased dust amounts.
- Drought conditions could make it more difficult for the underserved population as many of them do not have air conditioning which makes breathing more difficult and air quality conditions can become compromised.

Estimating Potential Losses

It is difficult to estimate the potential losses associated with a drought for Elkhart County because of the nature and complexity of this hazard and the limited data on past occurrences. However, for the purpose of this MHMP update, a scenario was used to estimate the potential crop loss and associated revenue lost due to a drought similar to that experienced during the drought of record from 1988. In 2023, Elkhart County produced approximately 7.25M bushels of corn and 2.00M bushels of soybeans, as reported by the United States Department of Agriculture (USDA) National Agricultural Statistics Service. Using national averages of $4.70 per bushel of corn and $12.80 per bushel of soybeans, the estimated crop receipts for 2023 would be $59.7M. Using the range of crop yield decreases reported in 1988 and 1989, just after the 1988 drought period (50%-86%) and assuming a typical year, economic losses could range between $29.8M-$51.3M; depending on the crop produced and the market demand. Effects of drought on corn crops can be seen in **Figure 22.**

Figure 22 Drought Effects on Corn Crop

Purdue Agriculture News reports that as of March 2013, Indiana producers received more than $1.49B in crop insurance payments for 2012 corn, soybean, and wheat losses. This amount is nearly double that of the previous record, $522M following 2008 losses, also due to drought. These losses are still considered to be record-setting in terms of drought effects, damages, and costs for Indiana. In comparison, in 2022 Indiana received $51,104,285 in crop insurance from the drought and weather-related events.

According to a July 5, 2012, article in The Times (Noblesville, IN), "The effects of drought also could touch agricultural businesses, such as handlers and processors, equipment dealers, and see, fertilizer and pesticide providers." Additional losses associated with a prolonged drought are more difficult to quantify. Drought has lasting impacts on trees: death to all or portions of a tree, reduction in the tree's ability to withstand insects and diseases, and interruption of normal growth patterns. Such effects on trees, especially urban trees can lead to additional impacts, both environmentally and monetarily in terms of the spread of Emerald Ash Borer insect and the weakening of tree limbs and trunks which may lead to increased damage during other hazard events such as wind and ice storms. Loss of trees also alters wildlife habitats causing wildlife to find new areas to live, often causing increased wildlife deaths as they navigate through more urbanized areas to reach new habitats.

Future Considerations

Advancements in plant hybrids and development have eased the impacts from short-lived droughts. Seeds and plants may be more tolerant of drier seasons and therefore fewer crop losses may be experienced.

As the municipal areas of the county continue to grow and expand, protocols may need to be updated to foster consistency throughout the communities and the unincorporated portions of the county for burn bans and water usage advisories.

According to the Indiana Climate Change Impacts Assessment, Indiana has experienced a rise in the average annual precipitation between 1895 and 2016; an increase of 3.3 inches for the area of Elkhart County. This increase in precipitation may lessen the likelihood or overall impact of a long-term drought in Elkhart County. However, the assessment also notes seasonal shifts in precipitation may lead to seasonal short-term droughts. In either scenario, changes in precipitation are not anticipated to relieve the area of a probability of a drought occurring.

Prior to municipalities expanding, provisions and considerations should be given regarding the potential additional demand for both water usage and fire response efforts. Following such expansion or development plans, alternative water sources should be explored. Since the previous MHMP was prepared, large scale and significant development has not occurred throughout the county. The majority of Elkhart County remains largely unincorporated and rural in nature.

Relationship to Other Hazards

Discussions with the Planning Committee were held regarding the similar effects of prolonged periods of extreme heat and the similar impacts that may be experienced during these times. Planning and mitigation efforts for one hazard may benefit the other. It is anticipated that rural areas of the county may be more susceptible to brush and rangeland or woodland fires during a drought, while urban areas may experience these impacts in areas where several abandoned buildings or overgrown lots exist, and this may lead to increased losses associated with a fire.

3.2.2 Earthquake

Overview

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free, causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of the plates.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can move off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage.

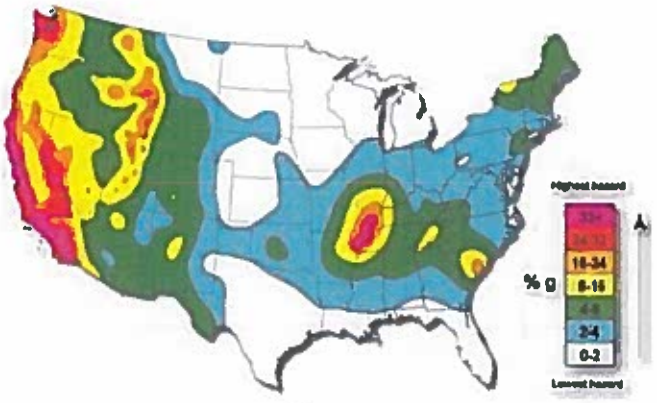

Figure 23 Earthquake Risk Areas in the US

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70-75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the United States approach $200B.

One method of measuring the magnitude or energy of an earthquake is the Richter Scale. This scale uses whole numbers and decimal fractions whereby each increase of a whole number represents a release of 31 times more energy than the amount associated with the previous whole number on the scale. Scientists are currently studying the New Madrid fault area and have predicted that the chances of an earthquake in the M8.0 range occurring within the next 50 years are approximately 7%-10%. However, the chances of an earthquake at a M6.0 or greater, are at 90% within the next 50 years.

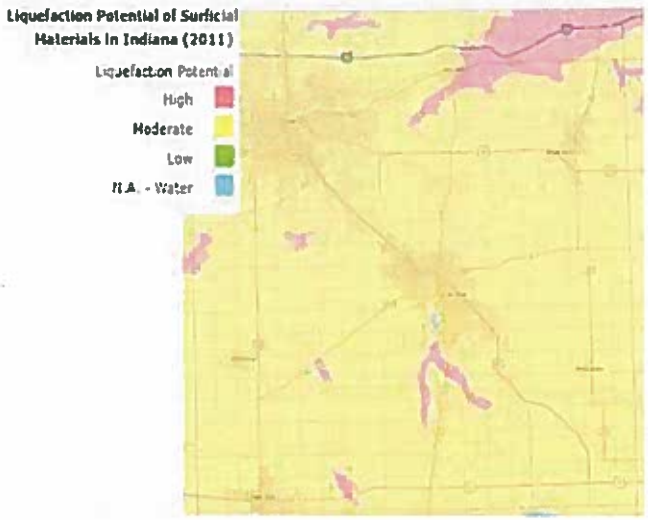

Figure 24: Elkhart County Liquefaction Potential

There are 45 states and territories in the United States at moderate to very high risk from an earthquake, and they are located in every region of the county **(Figure 23)**. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes – most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long

series of quakes from 1811 to 1812 occurred over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking. Several smaller historic faults are located throughout the state of Indiana. Additionally, some soil in Indiana is highly susceptible to liquefaction during earthquake conditions. The older riverbeds within Elkhart County show signs of a potential for liquefaction, especially near the northeast corner of the county where the potential is rated as high. (**Figure *24***)

Recent Occurrences

Indiana, as well as several other Midwestern states, lies in the most seismically active region east of the Rocky Mountains. **Figure 25** shows the 2014 Seismic Hazard for Indiana. The nearest known areas of concern for Elkhart County are the Anna Fault, Wabash Seismic Zone, and the New Madrid Fault Zone.

On June 17, 2021, an earthquake centered near Bloomingdale, Indiana in Parke County was felt as far north as Chicago, Illinois and as far east as Cincinnati, Ohio. With a magnitude of 3.8 several localized reports included descriptions of shaking buildings and feelings of tremors. No injuries or severe damage was reported due to this incident. As reported by the NBC 5 Chicago, "Once the earthquake was confirmed, officials said the 9-1-1 phone line "started ringing immediately."" Before this event, the last earthquake to be felt in Indiana was a magnitude 5.1 centered in Sparta, North Carolina, and the last event to occur within the state (near this event) was a magnitude 2.3 earthquake centered in Haubstadt, IN on May 28, 2015. No injuries or damage were reported with either of these events.

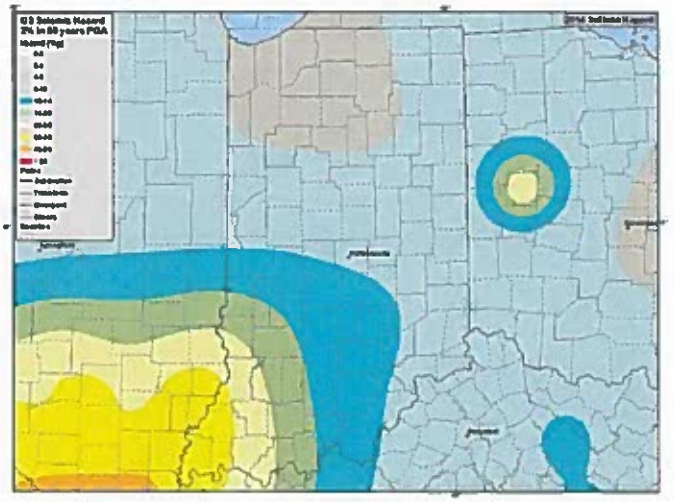

Figure 25 Indiana Seismic Zone Map

On December 30, 2010, central Indiana experienced an earthquake with a magnitude of 3.8; rare for this area in Indiana as it is only the 3rd earthquake of notable size to occur north of Indianapolis. Even rarer is the fact that scientists believe that the quake was centered in Greentown, Indiana approximately 13 miles southeast of Kokomo, Indiana. According to The Kokomo Tribune, "113 people called 911 in a 15-minute period after the quake, which was the first tremblor centered in Indiana since 2004". Further, a geophysicist from the USGS in Colorado stated, "It was considered a minor earthquake," and "Maybe some things would be knocked off shelves, but as far as some significant damage, you probably wouldn't expect it from a 3.8."

A M5.8 centered in Mineral, Virginia affected much of the East Coast on August 23, 2011. According to USA Today, 10 nuclear power plants were shut down for precautionary inspections following the quake, over 400 flights were delayed, and the Washington Monument was closed indefinitely pending detailed inspections by engineers.

Based on historical earthquake data, local knowledge of previous earthquakes, results of HAZUS-MH scenarios, and that Elkhart County has not been directly impacted by an earthquake, the Committee determined that the probability of an earthquake occurring in Elkhart County, the Cities of Elkhart, Goshen, and Nappanee, and the Town of Wakarusa is "Possible". The Towns of Bristol, Middlebury, and Millersburg felt it was "Unlikely". Should an earthquake occur, the impacts associated with this hazard are anticipated to be "Negligible" in Cities of Elkhart and Nappanee, and

the Towns of Bristol and Wakarusa. The Towns of Middlebury and Millersburg felt the impacts would be "Limited"; however, the Elkhart County and City of Goshen felt the impact would be "Significant". As with all earthquakes, it was determined that the residents of Elkhart County would have little to no warning time (less than six hours) and that the duration of the event would be expected to be less than 6 hours. A summary is shown in **Table 7.**

Table 7: CPRI for Earthquake

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Possible	Significant	< 6 hours	< 6 hours	Elevated
City of Elkhart	Possible	Negligible	< 6 hours	< 6 hours	Low
City of Goshen	Possible	Significant	< 6 hours	< 6 hours	Elevated
City of Nappanee	Possible	Negligible	< 6 hours	< 6 hours	Low
Town of Bristol	Unlikely	Negligible	< 6 hours	< 6 hours	Low
Town of Middlebury	Unlikely	Limited	< 6 hours	< 6 hours	Low
Town of Millersburg	Unlikely	Limited	< 6 hours	< 6 hours	Low
Town of Wakarusa	Possible	Negligible	< 6 hours	< 6 hours	Low

Per the Ohio Department of Natural Resources Division of Geological Survey, "...it is difficult to predict the maximum-size earthquake that could occur in the state and certainly impossible to predict when such an event would occur. In part, the size of an earthquake is a function of the area of a fault available for rupture. However, because all known earthquake-generating faults in Ohio are concealed beneath several thousand feet of Paleozoic sedimentary rock, it is difficult to directly determine the size of these faults." Further according to the Indiana Geological Survey, "...no one can say with any certainty when or if an earthquake strong enough to cause significant property damage, injury, or loss of life in Indiana will occur...we do indeed face the possibility of experiencing the potentially devastating effects of a major earthquake at some point in the future." The Committee felt that an earthquake occurring within or near Elkhart County is "Unlikely" to "Possible" occur within the next five years.

Figure 26: Minor Earthquake Damage

Assessing Vulnerability

Earthquakes generally affect broad areas and potentially many counties at one time. Within Elkhart County, direct and indirect effects from an earthquake may include:

Direct Effects:

- Urban areas may experience more damage due to the number of structures, the multi-story nature of the structures, and critical infrastructure (fire houses, cell phone towers, health care facilities, etc.) located in these areas.

- Rural areas may experience losses associated with agricultural structures such as barns and silos.
- Bridges buried utilities (gas lines, waterlines, pipelines), and other infrastructure may be affected throughout the county and municipalities.
- The homeless or underserved population will need to be checked on, especially if they seek shelter under bridges or structures that are not stable.

Figure 27: Structural Earthquake Damage

Indirect Effects:

- Elkhart County may be called upon to provide emergency response personnel to assist in the areas with more damage.
- Provide shelter for residents of areas with more damage.
- Delays in delivery of goods or services originating from areas more affected by the earthquake or originating at locations beyond the damaged areas, but that would have to be re-routed to avoid damaged areas.

The types of loss caused by an earthquake could be physical, economic, or social in nature. Due to the unpredictability and broad impact regions associated with an earthquake, all critical and non-critical infrastructure are at risk of experiencing earthquake related damage. Damage to structures, infrastructure, and even business interruptions can be expected following an earthquake. Examples of varying degrees of damage are shown in **Figure *26*** and **Figure *27*.**

Estimating Potential Losses

To determine the losses associated with an earthquake, the HAZUS-MH software was utilized in the Elkhart County MHMP update. HAZUS-MH is a nationally standardized risk modeling methodology which identifies areas with high risk for natural hazards and estimates physical, economic, and social impacts of earthquakes, hurricanes, floods, and tsunamis. For this plan an arbitrary earthquake scenario placed a magnitude 5.0 within Elkhart County.

Per the HAZUS-MH scenario noted above, there are over 79 thousand buildings in the region and the total economic losses are anticipated to be near $0.67M. Of that amount 27% of the estimated losses were related to business interruption. The largest loss was sustained by the residential occupancies which made up over 31% of the total loss. There 0 buildings are anticipated to be damaged beyond repair. Further, there are 151 critical facilities (3 hospital, 102 schools, 2 EOC, 10 Police Stations, and 34 Fire Stations) with reduced functionality on day 1. On the transportation segments there would be 278 bridges, and 101 highway segments would be expected to be impacted, and, on the railways, there would be 27 bridges, 4 facilities, and 677 segments impacted. On the Utility System Lifeline there would be 1 potable water facility, 8 wastewater facilities, 10 natural gas, 3 electrical power facilities, and 6 communication facilities impacted. No fires due to the earthquake were anticipated.

The HAZUS-MH model computes anticipated economic losses for the hypothetical earthquake due to direct building losses and business interruption losses. Direct building losses are the costs to repair or to replace the damage caused to the building and contents, while the interruption losses are associated with the inability to operate a business due to the damage sustained. Business interruption losses also include the temporary living expenses for those people displaced from their homes.

The HAZUS-MH Earthquake Model allows local building data to be imported into the analysis. However, these local data are imported as "general building stock," meaning that the points are assigned to a census tract rather than a specific XY coordinate. HAZUS performs the damage analysis as a county wide analysis and reports losses by census tract. While the results of the hypothetical scenario appear to be plausible, care should be taken when interpreting these results.

Future Considerations

While the occurrence of an earthquake in or near to Elkhart County may not be the highest priority hazard studied for the development of the plan, it is possible that residents, business owners, and visitors may be affected should an earthquake occur anywhere within the state. For that reason, Elkhart County should continue to provide education and outreach regarding earthquakes and earthquake insurance along with education and outreach for other hazards. As Elkhart County and the communities within the county grow and develop, the proper considerations for the potential of an earthquake to occur may help to mitigate social, physical, or economic losses in the future.

It can be anticipated that while all structures in Elkhart County will remain at-risk of earthquake damage and effects, new construction or redevelopment may reduce the overall risks. As redevelopment or growth occurs, the new construction may be significantly sturdier. Further, as blighted or abandoned areas are addressed, those communities and the county are less susceptible to economic and physical damage associated with earthquakes. Since the last planning effort, no significant development has occurred within the county.

Relationship to Other Hazards

Hazardous materials incidents may occur because of damage to material storage containers or transportation vehicles involved in road crashes or train derailments. Further, dam failures, levee breaks, or landslides may occur following an earthquake or associated aftershocks due to the shifting of the soils in these hazard areas. These types of related hazards may have greater impacts on Elkhart County communities than the earthquake itself. It is not expected that earthquakes will be caused by other hazards studied within this plan.

3.2.3 Extreme Temperature

Overview

Extreme Heat

Extreme heat is defined as a temporary elevation of average daily temperatures that hover 10 degrees or more above the average high temperature for the region for the duration of several weeks. Humid or muggy conditions, which add to the discomfort of elevated temperatures, occur when a dome of high atmospheric pressure traps water-laden air near the ground. In a normal year, approximately 175 Americans die from extreme heat.

According to the NWS, "The Heat Index or the "Apparent Temperature" is an accurate measure of how hot it really feels when the Relative Humidity is added to the actual air temperature." To find the Heat Index Temperature, refer to the Heat Index Chart in **Figure 28**. 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 National Weather Service has 3 levels of Excessive Heat Notifications.

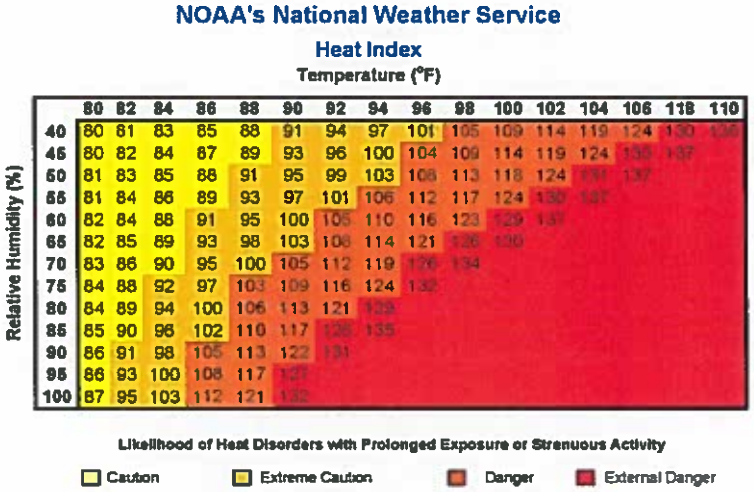

Figure 28 NWS heat Index Chart

1) A Heat Advisory - means that temperatures of at least 100°F* or Heat Index values of at least 105°F* are expected.

2) An Excessive Heat Watch means that Heat Index values are expected to reach or exceed 110°F* and not fall below 75°F* for at least a 48-hour period.

3) An Excessive Heat Warning means that Heat Index values are expected to reach or exceed 110°F* and not fall below 75°F* for at least a 48-hour period, beginning in the next 24 hours. A warning may also be issued for extended periods with afternoon heat index values of 105°F-110°F.

Classification	Heat Index	Effect on the body
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity
Extreme Caution	90°F - 103°F	Heat stroke, heat cramps, or heat exhaustion possible with prolonged exposure and/or physical activity
Danger	103°F - 124°F	Heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity
Extreme Danger	125°F or higher	Heat stroke highly likely

Figure 29 Extreme Heat Effects by Heat Index

It is important to also note that these heat index values were devised for shady, light wind conditions. Exposure to full sunshine may increase heat index values by up to 15°F. Further, high winds, particularly with very hot, dry air, can also be extremely hazardous.

As **Figure 29** indicates, there are four cautionary categories associated with varying heat index temperatures. Each category provides a heat index range along with effects on the human body.

People with underlying health issues, the very old or very young may be impacted at lower temperatures since their systems are less likely to be able to compensate for the heat and humidity.

Extreme Cold

Extreme cold is defined as a temporary, yet sustained, period of extremely low temperatures. Extremely low temperatures can occur in winter months when continental surface temperatures are at their lowest point and the North American Jet Stream pulls arctic air down into the continental United States. The jet stream is a current of fast-moving air found in the upper levels of the atmosphere. This rapid current is typically thousands of kilometers long, a few hundred kilometers wide, and only a few kilometers thick. Jet streams are usually found somewhere between 10-15 km (6-9 miles) above the Earth's surface. The position of this upper-level jet stream denotes the location of the strongest surface temperature contrast over the continent. The jet stream winds are strongest during the winter months when continental temperature extremes are greatest. When the jet stream pulls arctic cold air masses over portions of the United States, temperatures can drop below 0° F for one week or more. Sustained extreme cold poses a physical danger to all individuals in a community and can affect infrastructure function as well. (**Figure 30**)

Figure 30 Working in Extreme Cold

In addition to strictly cold temperatures, the wind chill temperature must also be considered when planning for extreme temperatures. The wind chill temperature, according to the NWS, is how cold people and animals feel when outside and it is based on the rate of heat loss from exposed skin. **Figure 31** identifies the Wind Chill Chart and how the same ambient temperature may feel vastly different in varying wind speeds.

Wind chill is a guide to winter danger

New wind chill chart

Frostbite occurs in 15 minutes or less

Temperature (°F)

Wind (MPH)	30	25	20	15	10	5	0	-5	-10	-15	-10	-25
5	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40
10	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47
15	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51
20	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55
25	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58
30	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60
35	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62
40	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64
45	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65
50	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67
55	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68
60	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69

Figure 31 Wind Chill Guide

Recent Occurrences

The effects of extreme temperatures extend across large regions, typically affecting several counties, or states, during a single event. According to the NCDC, there has been no extreme heat event and three extreme cold events between January 1, 2016 and August 1, 2024. Local reports did not provide any additional information regarding the period of excessive heat during this time

period. However, the National Weather Service reported wind chills ranging from -25 to-50 degrees Fahrenheit in Elkhart County on January 29 - 31, 2019. Three years later December 23 and 24, 2022, an extremely cold event ushered in wind chills ranging from -25 to -40 degrees Fahrenheit. The most recent extreme cold event was January 14, 2024, wind chills of -25 to -35. A wind chill of -32 was reported by the ASOS station in Goshen at 8:53 am. Although the committee members recall several hot days with heat indexes greater than 100 in the past 5 years, neither NCDC nor the local National Weather Service Office website have any reports. No damage or losses associated with the prolonged cold temperatures or heat events were reported.

It is difficult to predict the probability that an extreme temperature event will affect Elkhart County residents within any given year. However, based on historic knowledge and information provided by the community representatives, an extreme temperature event is "Highly Likely" (likely within the year to next 3 years) to occur within the county and if an event did occur, it would result in "Limited" to "Significant" magnitude. **Table 8** identifies the CPRI for extreme temperatures-both heat and cold events for all communities in Elkhart County.

Table 8: CPRI for Extreme Temperatures

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Elkhart	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Goshen	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Nappanee	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
Town of Bristol	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
Town of Middlebury	Highly Likely	Significant	> 24 hours	< 1 week	Severe
Town of Millersburg	Highly Likely	Significant	> 24 hours	< 1 week	Severe
Town of Wakarusa	Highly Likely	Limited	> 24 hours	< 1 week	Elevated

Assessing Vulnerability

As noted above, this type of hazard will generally affect entire counties and even multi-county regions at one time; however, certain portions of the population may be more vulnerable to extreme temperatures. For example, outdoor laborers, very young and very old populations, low-income populations, and those in poor physical condition are at an increased risk to be impacted during these conditions.

By assessing the demographics of Elkhart County, a better understanding of the relative risk that extreme temperatures may pose to certain populations can be gained. In total, just over 18.8% of the county's population is over 65 years of age, 5.5% of the population is below the age of 5, and approximately 15.3% of the population is considered to be welfare (TANF) monthly average families in 2022. People within these demographic categories are more susceptible to social or health related impacts associated with extreme heat. Families below the poverty line are less likely to have functioning air conditioning in their homes. Because of high energy costs those who do have air conditioning may be less likely to use the units in a way to benefit their health and well-being. The same factors are key when looking at heating sources in cold temperatures. Elderly and those living below the poverty line are more likely to rely on alternative heating sources because of the cost of energy. These alternative heating sources are frequently the cause of carbon monoxide poisoning and/or house fires.

In January 2024, subzero windchills impacted the entire State of Indiana with Indianapolis reporting 84 hours of sub-zero windchills between January 13 and 17. Elkhart County EMA along with

neighboring Counties sought to address the warming needs for unsheltered homeless people who reside in the community. Although there are numerous daytime facilities open to warm those who are cold, nighttime accommodations are very limited at best.

Extreme heat can affect the proper function of organ and brain systems by elevating core body temperatures above normal levels. Elevated core body temperatures, usually more than 104°F are often exhibited as heat stroke. For weaker individuals, an overheated core body temperature places additional stress on the body, and without proper hydration, the normal mechanisms for dealing with heat, such as sweating to cool down, are ineffective. Examples of danger levels associated with prolonged heat exposure are identified in **Figure 32.** Extreme cold may result in similar situations as normal functions are impacted as the temperature of the body is reduced. Prolonged exposure to cold may result in hypothermia, frostbite, and even death if the body is not warmed.

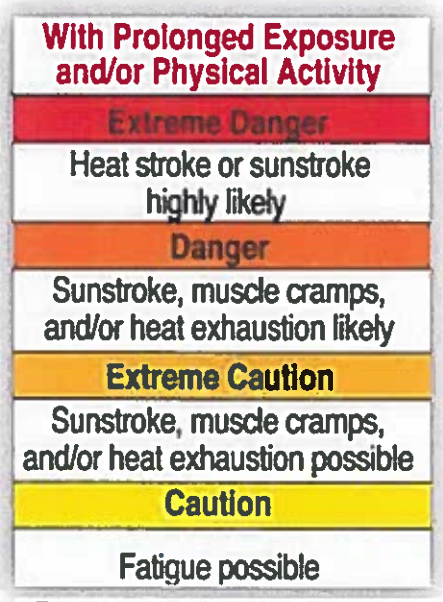

Figure 32 Heat Danger Classification

Within Elkhart County, direct and indirect effects from a prolonged period of extreme temperature may include:

Direct Effects:

- Direct effects are primarily associated with health risks to the elderly, infants, people with chronic medical disorders, lower income families, outdoor workers, and athletes. Health risks can range from heat exhaustion or mild hypothermia to death due to heat stroke, amputations due to frost bite or death due to severe hypothermia.

Indirect Effects:

- Increased need for cooling or warming shelters
- Increased medical emergency response efforts.
- Increased energy demands for heating or cooling.

Estimating Potential Losses

It is difficult to estimate the potential losses due to extreme temperatures as damage is not typically associated with buildings but instead with populations and people.

This hazard is not typically as damaging to structures or critical infrastructure as it is to populations so monetary damages associated with the direct effects of the extreme temperature are not possible to estimate accurately.

Indirect effects:

- Increased expenses for facilities such as healthcare or emergency services due to the increased number of calls and people seeking assistance.

- Manufacturing facilities where temperatures are normally elevated may need to alter work hours or experience loss of revenue if forced to limit production during the heat of the day.

- Energy suppliers may experience demand peaks during the hottest and/or coldest portions of the day.

- Extreme cold indirect effects include pipes freezing resulting in loss of access to water for industrial processes as well as personal hygiene, sanitation and hydration of livestock and people. These effects may disproportionately impact vulnerable populations (elderly and children) within Elkhart County.

Future Considerations

As more and more citizens are experiencing economic difficulties, local power suppliers along with charitable organizations have implemented programs to provide cooling and heating mechanisms to residents in need. Often, these programs are donation driven and the need for such assistance must be demonstrated. As susceptible populations increase, and/or as local economies are stressed, such programs may become more necessary to protect Elkhart County's at-risk populations. Additionally, the increase in the number of unsheltered homeless in the area calls for innovative approaches to addressing heating and cooling needs after traditional business hours when this population is particularly susceptible.

The Climate Change Assessment identifies several temperature related considerations of which communities should be aware of and begin planning to avoid further impacts. For example, rising temperatures will increase the number of extreme heat days, thereby increasing the potential for heat related illnesses, potential hospitalizations, and medication costs to vulnerable populations. In addition, added days of extreme heat will impact agriculture, manufacturing, and potentially, water sources. Increasing greenspaces within the cities and towns not only provide benefits of stormwater control, carbon sequestration and air pollution filtration, but also are great for reducing the energy from the sun reaching the ground surface, thus cooling the area. Future community planning should include the incorporation of heat tolerant green infrastructure to lessen the impacts of extreme heat upon the community as a whole.

New construction associated with development of residential areas often brings upgraded and more efficient utilities such as central heating and air units further reducing vulnerabilities to the aging populations in those municipalities mentioned above. Conversely, new development associated with industrial or large commercial structures in the inner-urban centers often result in increased heat over time, which may cause additional stress to labor-related populations. Since the last planning effort, there has not been significant residential and commercial development within the county.

Extreme Temperatures: Relationship to Other Hazards

While extreme temperatures may be extremely burdensome on the power supplies in Elkhart County, the Committee concluded that this type of hazard is not expected to cause any hazards studied. It is anticipated that due to prolonged extreme temperatures, primarily long periods of elevated temperatures, citizens may become increasingly agitated and irritable, and this may lead to a disturbance requiring emergency responder intervention.

3.2.4 Fires and Wildfire

Overview

A wildfire, also known as a forest fire, vegetation fire, or a bushfire, is an uncontrolled fire in wildland areas and is often caused by lightning; other common causes are human carelessness and arson. Small wildfires may be contained to areas less than one acre, whereas larger wildfires can extend to areas that cover several hundred or even thousand acres. Generally, ambient weather conditions determine the nature and severity of a wildfire event. Very low moisture and windy conditions can help to exacerbate combustion in forested or brush areas (**Figure 33**) and turn a small brush fire into a major regional fire event in a very short period. Wildfires can be very devastating for residents and property owners.

Figure 33 Forest Fire

A structural fire is an incident where a fire starts within a structure and is largely contained to that structure. Causes of structure fires can be related to electrical shorts, carelessness with ignition sources and/or alternative heating sources, poor storage of flammable materials, as well as arson. These types of fires can be deadly if no warning or prevention measures are present. The most dangerous aspect of structural fires is the production of toxic gases and fumes that can quickly accumulate in enclosed areas of structures and asphyxiate those who might be in the structure.

Problems associated with structural fires are compounded when high-rise buildings catch fire. High-rise fires hinder the ability of rescue workers to fight the fire, reach impacted building occupants, and evacuate impacted occupants. Rescue efforts also become more complicated when handicapped or disabled persons are involved. Complications associated with high-rise fires typically increase as the height and occupancy levels of the buildings increase. Structural collapse is another concern associated with high-rise fires. Structural collapse often results in people becoming trapped and severely injured. However, it is important to note that the concern associated with structural collapse, is not limited to high-rise buildings; the collapse of smaller residential buildings can also lead to severe injury and death.

Combating a wildfire or a structure fire is extremely dangerous. If weather conditions change suddenly, the fire may change course and/or increase in strength potentially overtaking neighboring structures and firefighters, causing severe injury or death. Fires can travel at speeds greater than 45 mph. Members of the homeless community, hunters and/or campers may also be in the area of the fires with no means to escape. Fire response capabilities are limited by the ever-dwindling number of volunteer firefighters able to respond, especially during "normal working hours". This further increases the risks for first responders and community members alike.

Recent Occurrences

Within the NCDC, there are no reports of wildfires occurring in Elkhart County between January 1, 2016 to August 1, 2024. Many 10 acre or larger field/grass and woods fires take place regularly. In 2006 in Pike County, Indiana two field fires burned over 350 acres (larger than most field fires in Indiana). On November 20, 2022, a 110-acre brush fire was brough under control by several volunteer fire departments and Indiana DNR staff at Brown County State Park. Grass fires in the median and along Interstate 65 recently closed the southbound lanes for a number of hours while fire departments attempted to extinguish the wind driven fires. On April 26, 2017, Elkhart County had a large landfill fire that closed schools, the smoke was very potent and strong winds made it difficult to extinguish. There were 800 gallons of water dropped by planes and more than 34 units from various fire departments spraying water and moving dirt see **Figure 34 .**

Figure 34 Landfill fire in Elkhart

The impacts of wildfires can be quite extensive and reach well beyond the borders of the jurisdiction fighting the fire. This is well demonstrated by the summerlong wildland fires in Canada in 2023. Over 16.5 million acres, an area the size of the entire state of Florida, burned between March and September. The fires resulted in smoke plumes which reached central Indiana at levels requiring people with asthma and other respiratory difficulties to remain indoors.

The NCDC does not report structure fires; therefore, local sources were utilized to provide information regarding residential and business fires. Residential fires are the most common fire hazard affecting Elkhart County in the last several years.(**Figure 35)** Due to the expansive acreage of agricultural land within Elkhart County, and the potential for urban areas to be at risk due to abandoned homes, blighted areas, or industrial activities, the Planning Committee determined the probability to be "Highly Likely" throughout the County. **Table 9** identifies the CPRI rankings for fire in Elkhart County.

Figure 35: Two homes destroyed in Elkhart County Fire

Table 9: CPRI for Fire

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Significant	< 6 hours	< 1 day	Severe
City of Elkhart	Highly Likely	Significant	< 6 hours	< 1 day	Severe
City of Goshen	Highly Likely	Critical	< 6 hours	< 1 day	Severe
City of Nappanee	Highly Likely	Critical	< 6 hours	< 1 day	Severe
Town of Bristol	Highly Likely	Limited	< 6 hours	< 1 day	Severe
Town of Middlebury	Highly Likely	Limited	< 6 hours	< 1 day	Severe
Town of Millersburg	Highly Likely	Limited	< 6 hours	< 1 day	Severe
Town of Wakarusa	Highly Likely	Significant	< 6 hours	< 1 day	Severe

Information provided in **Table 10** highlights the number of fire calls the Elkhart County fire departments responded to during the time period January 2018 through December 2022. Damage to structures, contents, crops, forests, and vehicles is significant for each municipality on an annual basis. Social losses, such as being unable to work following a residential structure fire or losses associated with a business fire should also be considered as an impact.

Table 10: Elkhart County Fire Calls 2018-2022

Department	2018	2019	2020	2021	2022
Baugo Fire Dept.	699	688	735	861	880
Benton Twp. Vol. Fire Dept.	152	122	127	151	136
Bristol Fire Dept.	856	889	798	1,035	898
Cleveland Twp. Vol. Fire Dept.	641	734	772	860	872
Concord Twp. Fire Dept.	1,194	1,250	1,224	1,312	1,359
Elkhart Fire Dept.	2,567	3,575	2,506	2,896	2,854
Elkhart Twp. Vol. Fire Dept.	12	6	11	41	67
Foraker Community Vol. Fire Dept.	31	46	31	31	47
Goshen Fire Dept.	3,620	3,783	3,585	3,988	4,470
Harrison Twp. Fire Dept.	84	77	63	82	93
Jefferson Twp. Vol. Fire Dept.	406	351	361	401	409
Middlebury Vol. Fire Dept.	824	761	821	978	953
Millersburg-Clinton Fire Territory	92	126	103	114	136
Nappanee Vol. Fire Dept.	95	85	98	91	871
New Paris Fire Dept.	75	73	65	81	113
Osolo Twp. Vol. Fire Dept.	530	462	489	225	247
Wakarusa Vol. Fire Dept.	201	76	61	71	65
TOTAL	**12,079**	**13,104**	**11,850**	**13,218**	**14,470**

Assessing Vulnerability

Physical, economic, and/or social losses impact not only the property owner whose property was damaged by the fire, but also the community. Typically, a structural fire is limited to one or two structures, as the fire response focuses on extinguishment as well as containment thus preventing the fire from spreading to neighboring structures. This type of action works to reduce the magnitude and severity. Nonetheless, the loss of or damage to historic structures, town squares, etc. takes a toll on the community spirit as well as the financial and physical loss.

Much of the county is rural, which is also susceptible to brush and/or crop fires, especially in times of drought. Since agriculture is a big source of income for the community, field fires, especially during harvest season, or barn fires after crops have been stored have an immense impact.

Direct and indirect effects of fires and wildfires within Elkhart County may include:

Direct Effects:

- Loss of structures (residential as well as agricultural)
- Loss of vital equipment (industrial and agricultural)
- Loss of forests
- Loss of natural resources and wildlife

Indirect Effects:

- Loss of revenue as businesses may be closed.
- Loss of revenue from reduced tourist activities in the county
- Increased emergency response times based on safety of roads.
- Loss of income if dependent on crop production or timber harvest

Estimating Potential Losses

Given the nature and complexity of a potentially large hazard such as a wildfire, it is difficult to quantify potential losses to property and infrastructure. As a result, all critical and non-critical structures and infrastructure may be at some degree of risk.

Monetary damages associated with the direct effects of the fires are difficult to estimate, other than utilizing historic information as provided. Indirect effects would cause increased efforts associated with emergency response services as wildfires are difficult to contain and may accelerate very quickly. Further, multi-level business or residential structures place increased risks to those who work or live within those structures or nearby structures.

Future Considerations

As populations increase and community growth increases, the need to respond to fire will remain an important municipal effort. As new construction or re-development occurs, especially new or existing critical infrastructure, it is important to ensure that these new structures are equipped to deal with the potential risks associated with this hazard. Those may include increased risk for wooden or flammable outer structures and potential lengthy power outages. With the adverse impacts of extreme temperatures and drought upon the heavily forested areas, consideration must be given to mitigating fire risks for structures that are built in the rural areas to limit losses should a wildland fire take place.

In addition, increased populations require increased housing. Many urban communities develop large multi-family residential structures, or apartment complexes, where structures are not only in close proximity to each other, but also house a large number of citizens. As communities age, some structures may become abandoned, significantly increasing the risk of fire due to potential vagrant populations and lack of maintenance. These areas should be considered at-risk and potentially demolished to avoid such risk and potential hazard.

In areas, such as Elkhart County, which are reliant on volunteer firefighters, firefighting responses can be slowed due to the limited numbers of volunteers available at various times of the day. Increasing numbers of people working outside of the community in which they reside limits volunteer presence to outside of normal working hours. Recruitment initiatives will need to be considered as the firefighting needs and staffing levels change.

Fires can also result in substantial indirect costs. Increased emergency response times, loss of work or the inability to get to work, as well as business interruption, are possible indirect effects of a fire and how it may affect those businesses related to cropland or natural resource areas.

Relationship to Other Hazards

Fires may certainly result in a hazardous materials incident if storage structures are within the path of the fire. Material storage containers farther away from the burn path may become damaged by high winds and embers resulting in a spill or release of materials. Fires may result from lightning either alone or associated with a thunderstorm. Typical wind speeds during a thunderstorm may also exacerbate the impacts from any ignitions from the lightning.

3.2.5 Flood

Overview

Floods are the most common and widespread of all the natural disasters. Most communities in the United States have experienced flooding because of spring rains, heavy rain and thunderstorms, or winter snow melts. A flood, as defined by the National Flood Insurance Program (NFIP), is a general and temporary condition of partial or complete inundation or two or more acres of normally dry land area or of two or more properties from overflow of inland or tidal waters, or unusual and rapid accumulation or runoff of surface waters from any sources, or a mudflow. Floods can be slow or fast rising but generally develop over a period of days.

Figure 36 Flooding in Goshen Indiana

Flash flooding is a term often used to describe flood events which are a result of heavy or excessive rainfall in a short period of time, generally less than 6 hours. Unlike traditional flooding which can be slower developing, these raging torrents rip through river beds, streets and roads, and overland taking anything in its way with the force of the water. Flash floods typically occur within minutes up to a few hours after an excessive rain event.

In Elkhart County, flooding and associated flood damage are most likely to occur during the spring because of heavy rains combined with melting snow. (**Figure 36**) However, provided the right saturated conditions, intense rainfall of short duration during rainstorms can produce damaging flash flood conditions, as well. There are no exceptions to when floods may occur. There are times they are less likely but given the right atmospheric conditions a flood or flash flood can take place virtually any time. Climate change has directly impacted flooding with the increase in precipitation and the duration of the events being shorter.

The traditional benchmark for riverine or coastal flooding is a 1% Annual Exceedance Probability (AEP), formerly known as the 100-year flood. This is a benchmark used by FEMA to establish a standard of flood protection in communities throughout the country. The 1% AEP is referred to as the "regulatory" or "base" flood. Another term commonly used, the "100-year flood", can be misleading. It does not mean that only one flood of that size will occur every 100 years, but rather there is a 1% chance of a flood of that intensity and elevation happening during any given event. In other words, the regulatory flood elevation has a 1% chance of being equaled, or exceeded, in any given event and it could occur more than once in a relatively short time period. The area impacted by the 1% AEP flood event is called the Special Flood Hazard Area (SFHA).

Recent Occurrences

The NCDC indicates that between January 1, 2016 to August 1, 2024, there was one flash flood, and ten floods reported in Elkhart County. On February 20, 2018, there was a slow release of snowpack occurred days leading up to the event which started the river rising and then several rounds of rain from the 19th to 21st with a band of 4 to 6 inches of rain fell northwest of Logansport to Kendallville. This led to extensive flooding, several residents had to be evacuated with

businesses and homes suffering varying degrees of flooding. Several roads were closed including US 6, State Roads 19 and 106. Damage estimates total 1.2 million dollars.

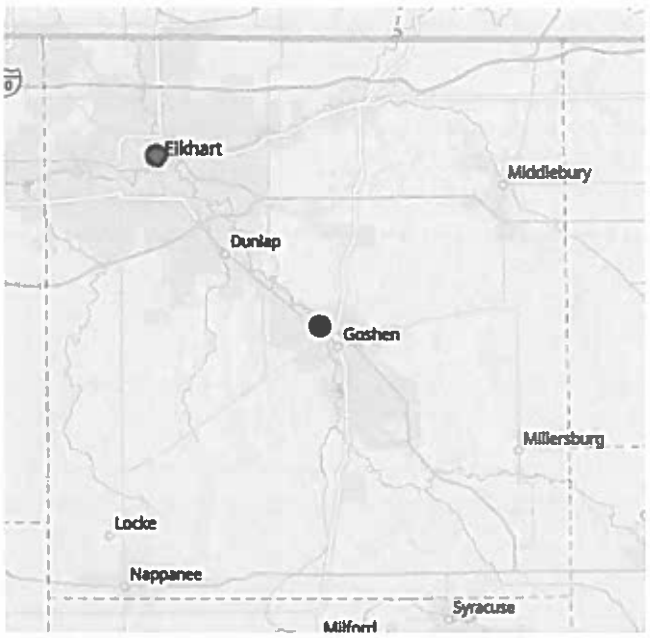

Figure 37 Elkhart County Stream Gauges

Stream gages are utilized to monitor surface water elevations and/or discharges at key locations and time periods. Some such gages are further equipped with NWS's National Water Prediction Service (NWPS) capabilities. These gages have the potential to provide valuable information regarding historical high and low water stages, hydrographs representing current and forecasted stages, and a map of the surrounding areas likely to be flooded. Within Elkhart County, there are 2 active stream gages, pictured in **Figure 37**. The 2 stream gauges are located on the St. Joseph River at Elkhart, IN, and the Elkhart River at Goshen, IN.

The gauge located on St. Joseph River near Elkhart reached its highest recorded river level in March 1908 at 30 feet. More recent crests, from March 7, 2023, at 23.03 feet. Of the 5 recent crests, 3 were at or above action level (23 ft.) and none have reached minor flooding at 24 feet. Moderate flooding is 25 feet and major flooding is 27 feet.

The Elkhart River at Goshen gauge saw 5 crests at or above Action level (6 ft) since January 1, 2016. The river has only once exceeded Major Flood Stage (11 ft) on February 21, 2018. Moderate flooding is 9 feet and minor flooding is 7 feet. At 11 feet, a major flood is in progress with several streets and US through Goshen flooded. Many evacuations of residential areas are necessary. At 12.5, a record flood is in progress, with many residences flooded and water as high as 4 feet can be expected in some commercial areas. At 13 feet, the Goshen wastewater plant operations are likely impacted.

Flood insurance is a key for flood recovery. Any property having received two insurance claim payments for flood damages totaling at least $1,000, paid by the NFIP within any 10-year period since 1978 is defined as a repetitive loss property. These properties are important to the NFIP because they account for approximately 1/3 of the country's flood insurance payments. According to FEMA Region V, there are a total of twenty-two repetitive loss structures in unincorporated Elkhart County. Additional repetitive loss structures were reported for the City of Elkhart, the City of Goshen and the Town of Bristol. **Table 11** identifies the number of repetitive losses and claims per community, as provided by FEMA.

Table 11: Repetitive Properties, Claims, and Payments

Community	# Repetitive Loss Properties	Occupancy Type	Total # of Losses
Elkhart County	22	All residences	76
City of Elkhart	3	2 – Residences 1 – Non-residential	6 – Residential 2 – Non-residential
City of Goshen	1	Residence	2
City of Nappanee	0		
Town of Bristol	1	Non-residential - Business	3
Town of Middlebury	0		
Town of Millersburg	0		
Town of Wakarusa	0		
TOTAL	27	25 Residential 2 Non-residential	89

Table 12 further indicates the current premiums and coverage totals for individual communities.

Table 12: Insurance Premiums and Coverage

Community	Policies in Force	Flood Insurance Premiums	Flood Insurance Coverage, Millions
Elkhart County	221	$172,466	$54.08
City of Elkhart	105	$112,800	$20.46
City of Goshen	61	$55,943	$17.48
City of Nappanee	14	$6,633	$2.32.
Town of Bristol	7	$7,327	$1.57
Town of Middlebury	12	$9,744	$3.25.
Town of Millersburg			
Town of Wakarusa	7	$3,699	$1.73.
TOTAL	427	$368,613	$93.59

As determined by the Committee, the probability of flooding occurring throughout Elkhart County is "Highly Likely." This is largely based on recent experiences with the rivers and streams near the communities. The City of Elkhart rated the magnitude and severity to be "Significant". The county, the cities of Goshen and Nappanee, and the towns rated the magnitude to "Limited". The Committee also determined that accurate warning time would be greater than 24 hours based on the terrain and flashy nature of the waterways in the county, forecasting methods, and local knowledge of stream activities. Finally, the duration of such an event is anticipated to last less than a week since the county is located closer to the headwaters for each of the streams. A summary of riverine flooding CPRI is shown in **Table 13.**

Table 13: CPRI for Flood

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
City of Elkhart	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Goshen	Highly Likely	Limited	> 24 hours	< 1 week	Elevated

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
City of Nappanee	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
Town of Bristol	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
Town of Middlebury	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
Town of Millersburg	Highly Likely	Limited	> 24 hours	< 1 week	Elevated
Town of Wakarusa	Highly Likely	Limited	> 24 hours	< 1 week	Elevated

Assessing Vulnerability

Flood events may affect substantial portions of Elkhart County at one time as river systems and areas with limited drainage cover much of the county and the incorporated communities. With an increase in high volume rain events, the low-lying roads within the county are vulnerable to frequent inundation isolating and/or restricting access to some parts of the county. Wooded areas and farm fields have provided ample supply of debris causing clogs and damage to culverts, and bridges, in the past.

Whenever significant flooding impacts the communities in Elkhart County, the concern about riverbank erosion also known as fluvial erosion is elevated. Fluvial Erosion Hazard (FEH) represents the risk associated with natural stream movements and losses associated with buildings and infrastructure. In some cases, this may be represented by a gradual movement of a stream across a farm field. In other, more extreme instances, homes or other infrastructure may be lost as riverbanks or bluffs sluff into the water below. This will be discussed in greater detail within the landslide/land subsidence discussion.

Figure 38 Ice Slabs Remaining After Ice Jam Flood, 2014

Log and ice jam flooding is a concern for the more populated areas. Although log jams can occur at any time of the year, ice jams are predominantly and early or late winter occurrence when air temperature rise after freezing temperatures which allow lake and river ice to form. Flooding occurs when pieces of ice either jam up against stationary sheets of ice or against structures in the river such as bridge pylons. The jammed ice can form a dam causing water levels behind it to rise causing localized flooding and pushing large pieces of ice out of the stream. The force of the moving ice pieces is enough to break off nearby trees and/or damage building foundations and small outbuildings. (**Figure 38**) The greatest challenge with ice jams is the lack of good science to predict when the jams will form and where jam formation is likely. With the variations in temperatures in late winter and early spring ice jams are becoming more common. Log jams, like ice jams, accumulate in low flow areas and near bridges and similar structures located in the stream, causing water levels to rise. Bridges and culverts are most frequently impacted since water flow is easily blocked at these locations forcing water outside of the riverbanks into neighborhoods and businesses.

Figure 39: Flood Inundation Map for St. Joseph River in Elkhart

Flood inundation maps were developed to identify areas impacted by a variety of flood stages on the St. Joseph and Elkhart Rivers in the City of Elkhart and Goshen. **Figure 39** is a sample view of the flood inundation map for the St. Joseph River in Elkhart County. Because the communities are vulnerable to flooding either from short duration heavy rain events, or the more familiar riverine flooding, all have chosen to participate in the National Flood Insurance Program (NFIP).

Table 14: NFIP Participation in Elkhart County

CID	Community	Init. FHBM	Identified FIRM	Current Effective Map Date	Reg-Emerg Date	CRS
180056	Elkhart County		11/1/1979	8/2/2011	11/1/1979	No
180057	City of Elkhart	6/28/1974	8/1/1979	8/2/2011	8/1/1979	No
180058	City of Goshen	11/23/1973	8/1/1979	8/2/2011	8/1/1979	No
180059A	City of Nappanee	5/24/1974	8/15/1983	(No SFHA)	8/15/1983	No
180060	Town of Bristol	11/19/1976	4/16/1979	8/2/2011	4/16/1979	No
180460	Town of Middlebury	9/7/1979	8/15/1983	8/2/2011	8/17/1983	No
	Town of Millersburg					
180364	Town of Wakarusa	2/21/1975	8/2/2011	8/2/2011	4/10/2012	No

The City of Nappanee has no Special Flood Hazard Areas designated within the corporate limits and the Town of Millersburg had no information provided. All the other communities in the county have areas of concern within their corporate limits, as shown in **Table 14.** Many of the flood risk areas are located within the boundaries of the disadvantaged and underserved population census blocks. With less financial capacity to mitigate flooding becomes an additional burden on the communities. Flash flooding, being less predictable, does not allow the advanced warning to be able to protect property and seek shelter out of harm's way, thus increasing vulnerability throughout the county, especially the underserved and disadvantaged community members. **(Figure 40)**

Figure 40 Special Flood Hazard Area in Elkhart County

Within Elkhart County, direct and indirect effects of a flood event may include:

Direct Effects:

- Structural and content damage and/or loss of revenue for properties affected by increased water.
- Increased costs associated with additional response personnel, evacuations, and sheltering needs.
- Increased potential impacts to infrastructure and buildings located within the SFHA.
- Increased cleanup costs for more frequent flash flood impacts.
- Loss of topsoil and deposition of sand due to flood inundation of farm fields.

Indirect Effects:

- Increased response times for emergency personnel when roads are impassable.
- Increased costs associated with personnel carrying out evacuations in needed areas.
- Increased risk of explosions and other hazards associated with floating propane tanks or other debris.
- Losses associated with missed work or school due to closures or recovery activities.
- Cancellations of special events in impacted areas or water related activities that become too dangerous due to high water.
- Debris removal costs to return local drainage to normal function.
- Getting notifications to the underserved populations that may not have access to radio, television, or social media of evacuations.

Estimating Potential Losses

Critical and non-critical structures located in regulated floodplains, poorly drained areas, or low-lying areas are most at risk for damages associated with flooding. For this planning effort, a GIS Desktop Analysis methodology was utilized to estimate flood damages.

For the GIS Desktop Analysis method, an analysis was completed utilizing the effective Digital FIRMs (DFIRMs) overlaid upon a Modified Building Inventory developed with information provided by Elkhart County. Structures located within each flood zone were tallied using GIS analysis techniques.

In the assessment, any structure listed as less than 400 ft^2 in area or classified in the Assessor's database as a non-habitable structure was assumed to be an outbuilding. It was assumed that a building was located on a parcel if the value listed in the "Assessed Value (Improvements)" showed a value greater than zero dollars. Parcels that intersected any portion of the FEMA flood zones were considered to be flood prone, and subsequently, further analyzed separately from parcels without structures. Structure values were calculated using:

Residential = Assessed Value x 0.5
Commercial = Assessed Value x 1.0
Industrial = Assessed Value x 1.5
Agricultural = Assessed Value x 1.0
Education = Assessed Value x 1.0
Government = Assessed Value x 1.0
Religious = Assessed Value x 1.0

To estimate anticipated damages associated with each flood zone in Elkhart County and communities, it was estimated that 25% of structures in the flood zones would be destroyed, 35% of structures would be 50% damaged, and 40% of structures would be 25% damaged. **Table 15** identifies the estimated losses associated with structures in the floodway, the 1% AEP (100-year floodplain), and the 0.2% AEP (500-year floodplain) areas by community within Elkhart County.

Table 15: Elkhart County Building Inventory Utilizing Best Available Data

	Floodway		1% AEP		0.2% AEP		Unnumbered	
	#	$, Million	#	$, Million	#	$. Million	#	$, Million
Elkhart County	2,157	$224.30	596	$52.24	92	$8.05	234	$29.80
City of Elkhart	457	$48.09	265	$23.58	110	$9.72	76	$14.54
City of Goshen	155	$20.69	126	$12.65	48	$5.32	1	$0.09
City of Nappanee	64	$6.85	22	$2.06	52	$4.26	0	$0.00
Bristol	59	$5.25	27	$2.23	19	$1.63	3	$0.27
Middlebury	35	$4.31	22	$2.37	1	$0.40	0	$0.00
Wakarusa	37	$4.67	20	$2.84	3	$0.25	0	$0.00
TOTAL	2,964	$314.16	1,078	$97.96	325	$29.62	314	$44.69

Utilizing the same GIS information and process, critical infrastructure within each of the flood hazard areas in Elkhart County was assessed and are included in **Table 16**. These buildings are included in the overall number of structures and damage estimate information provided in **Table 17**.

Table 16: Critical Infrastructure in the Flood Zones

Community	Floodway	1% AEP	0.2% AEP	DNR Zone A
Elkhart County	City Of Elkhart Microwave Tower Goshen Community Schools Mercury Wireless, Inc. SprintCom, Inc.	Pathfinder Communications Corporation		Commercial Broadband Solutions, Inc. New Cingular Wireless Pcs, LLC T-Mobile License LLC
City of Elkhart	City of Elkhart Microwave Tower Elkhart Alternative Education Frontier Communications Indiana Michigan Power Dunlap Station	Elkhart Hydroelectric Ministerio Evangelico Tabernaculo De Restauracion	Elkhart High School Success And Kingdom Advancement Life Center-S A K A L Inc	

Community	Floodway	1% AEP	0.2% AEP	DNR Zone A
	Indiana Michigan Power Elkhart Service Center (2) Indiana Michigan Power Greenleaf Station Mary Beck Elementary School and Child Care Stainless Plant			
City of Goshen	Goshen WWTP Mercury Wireless Indiana LLC Mercury Wireless, Inc. SprintCom, Inc. Unknown139035 - Substation	Goshen Water & Sewer Department	Broadmore Estates Mobile Home Park	
City of Nappanee			Nappanee WWTP	
Bristol		Bristol Mobile Village		Commercial Broadband Solutions, Inc. New Cingular Wireless Pcs, LLC T-Mobile License LLC
Middlebury	Middlebury Water Works	Middlebury Police Dept.		
Wakarusa				

Utilizing the information in **Table 15** regarding the number of structures within each of the flood hazard areas, it is also important to note the number of flood insurance policies within each area in Elkhart County. **Table 17** provides the comparison between the number of structures in the 1.0% AEP and the number of flood insurance policies. It is also important to note that flood insurance is voluntary unless the property owner carries a federally subsidized mortgage; insurance coverage may be discontinued when the mortgage is completed.

Table 17: Structures in the 1.0% AEP and Number of Flood Insurance Policies

Community	# Structures In 1.0% AEP	# Policies
Elkhart County	596	221
City of Elkhart	265	105
City of Goshen	126	61
City of Nappanee	22	14
Bristol	27	7
Middlebury	22	12
Wakarusa	20	7
Total	1,078	427

Future Considerations

As the municipalities within Elkhart County grow in population and redevelop, it can be anticipated that the number of critical and non-critical infrastructure will also increase accordingly. Elkhart County updated and adopted the County Floodplain Ordinance in 2011 similarly to the Cities of Elkhart and Goshen adopted their Floodplain Ordinance in 2011. The Towns of Bristol, Middlebury and Wakarusa also updated their flood ordinances in 2011. All the listed communities discourage critical facilities such as schools, medical facilities, community centers, municipal buildings, and other critical infrastructure from being located within the 1% AEP (100-year) floodplain. New structures must also be protected to that level along with flood-free access to reduce the risk of damage caused by flooding and to ensure that these critical infrastructures will be able to continue functioning during major flood events. Flooding due to poor drainage, low-lying land, or flash flooding is also an important consideration. It will be important for recognition of potential flood impacts to residents and businesses in these areas to be coupled with proper planning for future development and redevelopment of the flood zones. This would also include studying the inundation areas mapped through the development of the Indiana Floodplain Portal as well as studies of all the streams with 1 square mile or drainage area or greater. Since the previous planning effort, no development has occurred within the flood zones of Elkhart County or the incorporated communities within the county.

It is important to ensure that owners and occupants of residences and businesses within the known hazard areas, such as delineated or approximated flood zones and FEH, are well informed about the potential impacts from flooding incidents as well as proper methods to protect themselves and their property.

Increased precipitation, as predicted in the Indiana Climate Change Assessment, is anticipated to come in the form of heavier, shorter events which lead to the increased potential for flooding and stress on infrastructure such as sanitary and storm sewers. Heavy precipitation events are anticipated to occur more frequently as temperatures rise, replacing rain when previously there was snow.

Despite these efforts, the overall vulnerability and monetary value of damages is expected to increase in the area unless additional measures, such as those discussed later in Chapter 4 of this report, are implemented.

Indirect effects of flooding may include increased emergency response times due to flooded or redirected streets (**Figure 41**), the danger of dislodged and floating propane tanks causing

explosions, and the need for additional personnel to carry out the necessary evacuations. Additional effects may include sheltering needs for those evacuated, and the loss of income or revenue related to business interruptions. Several communities within Elkhart County host numerous special events near to or on the rivers and waterways. These special events may have to be cancelled or postponed due to flooding or high-water levels.

Figure 41 Flooded Roads and Street Closures

Relationship to Other Hazards

While flooding creates social, physical, and economic losses, it may also cause other hazards to occur. For example, flooding may increase the potential for a hazardous materials incident to occur. Above ground storage facilities may be toppled or become loosened and migrate from the original location. In less severe situations, the materials commonly stored in homes and garages such as oils, cleaners, and de-greasers, may be mobilized by flood waters. Should access roads to hazardous materials handlers become flooded, or if bridges are damaged by flood waters, response times to more significant incidents may be increased, potentially increasing the damage associated with the release.

Increased volumes of water during a flood event may also lead to a dam failure. As the water levels rise in areas protected by dams, at some point, these structures will over-top or will breach leading to even more water being released. These two hazards, flood, and dam failure, when combined, may certainly result in catastrophic damage.

In a similar fashion, a snowstorm or ice storm can also lead to flooding on either a localized or regional scale. When a large amount of snow or ice accumulates, the potential for a flood is increased. As the snow or ice melts, and the ground becomes saturated or remains frozen, downstream flooding may occur. Ice jams near bridges and culverts may also result in flooding of localized areas and potentially damage the bridge or culvert itself.

Repeated flooding may also create impacts associated with landslides along riverbanks and bluff areas. As floodwaters travel through the systems, saturating shorelines and increasing volumes and velocities of water, the natural process of fluvial erosion may be exacerbated. As these processes are increased, structures and infrastructure located on bluffs or in proximity to the river may be at risk.

Flooding in known hazard areas may also be caused by dams that experience structural damage or failures not related to increased volumes or velocities of water. These "sunny day failures," while not typical, may occur wherever these structures exist throughout the county.

3.2.6 Hailstorms, Thunderstorms, and Windstorms

Overview

Hail occurs when frozen water droplets form inside a thunderstorm cloud, and then grow into ice formations held aloft by powerful thunderstorm updrafts, and when the weight of the ice formations becomes too heavy, they fall to the ground as hail. Hail size ranges from smaller than a pea to as large as a softball, and can be very destructive to buildings, vehicles (**Figure 42**) and crops. Even small hail can cause considerable damage to young and tender plants. Residents should take cover immediately in a hailstorm, and protect pets and livestock, which are particularly vulnerable to hail, and should be under shelter as well.

Thunderstorms are defined as strong storm systems produced by a cumulonimbus cloud, usually accompanied by thunder, lightning, gusty winds, and heavy rains. All thunderstorms are considered dangerous as lightning is one of the by-products of the initial storm. In the United States, on average, 300 people are injured, and 80 people are killed each year by lightning. Although most lightning victims survive, people struck by lightning often report a variety of long-term, debilitating symptoms. Other associated dangers of thunderstorms included tornados, high winds, hail, and flash flooding.

Windstorms or high winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high- or low-pressure systems). High winds are speeds reaching 50 mph or greater, either sustained or gusting.

Recent Occurrences

In Elkhart County, the NCDC has recorded 40 reports of hail on 16 separate dates from January 1, 2016 to August 1, 2024 . Eight of the hail events took place on July 20, 2023, where hail was reported at 2.5 inches and $12,000 in property damages. The average diameter hail stone occurring throughout Elkhart County ranges from ¾ to 1 inch with the largest one for this period of interest being 2.5 inches. According to the Midwest Regional Climate Center (MRCC) hail is considered severe if a thunderstorm produces hail stones larger than one inch in diameter, or larger than the size of a quarter.

Figure 42 Damage to Vehicle and Structure Caused by Hail

Between January 1st, 2016, to August 1, 2024, 93 thunderstorms/windstorm events took place. Significant windstorms are characterized by the top wind speeds achieved during the incident. Such high wind events characteristically occur in conjunction with thunderstorms and have historically occurred year-round with the greatest frequency and damage occurring in May, June, and August. However, the event that had the most property damage was on March 31, 2023, with $130,000. Within Elkhart County, NCDC reports only 12 instances where top wind speeds were 60 mph or greater.

The NCDC recorded damages for hailstorms, thunderstorms, and windstorms throughout Elkhart County. From January 1, 2018, to August 1,2024, there were 40 instances of hailstorms, resulting in $20,000 property damage and no additional crop damage. Of the 71 instances of thunderstorms and high wind events, resulting in 25 reports indicated damages adding up to $232,000 in property damage and no additional crop damage. No injuries or deaths associated with these events. Many event reports included in the NCDC did not provide descriptive information on the social, physical, and economic losses resulting from individual storms specific to Elkhart County. In local storm reports at the National Weather Service, where damages were reported, narrative descriptions of the event rarely extended beyond reports of damage to broken tree limbs, downed power lines, or roof damage.

Appendix 6 provides the NCDC information regarding hailstorms, thunderstorms, and windstorms that have resulted in injuries, deaths, and monetary damage to property and/or crops.

According to the Institute for Business and Home Safety, central Indiana can expect to experience damaging hailstorms three to four times over 20 years; the average life of a residential roof. Further, thunderstorms and windstorms are considered a high frequency hazard and may occur numerous times per year. Climate change has impacted the frequency of hailstorms, thunderstorms, and windstorms.

The Committee determined the probability of a hailstorm, thunderstorm, or windstorm occurring anywhere throughout Elkhart County is "Highly Likely" and will typically affect broad portions of the county at one time resulting in potentially "Limited" damages except for City of Nappanee the potential is "Significant" As advancements in technologies such as weather radar systems and broadcast alerts are continually made, the warning time for such incidents may increase. Currently, the Committee feels that the warning time is anticipated to be between 6 and 12 hours and the duration is expected to last less than one day.

Indicative of a regional hazard, the probability, magnitude, warning time, and duration of a hailstorm, thunderstorm, or windstorm are expected to be similar throughout the county. These events are highly unpredictable, and the occurrences are distributed throughout the county, sometimes impacting one community more often or more severely than another. Therefore, the CPRI values reflect the distributed risk and associated priority for a hailstorm, thunderstorm, or windstorm. A summary is provided in **Table 18**.

Table 18: CPRI for Hailstorm, Thunderstorm, and Windstorm

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe
City of Elkhart	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe
City of Goshen	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe
City of Nappanee	Highly Likely	Significant	6 - 12 hours	< 1 day	Severe
Town of Bristol	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe
Town of Middlebury	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe
Town of Millersburg	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe
Town of Wakarusa	Highly Likely	Limited	6 - 12 hours	< 1 day	Severe

Specific locations and frequency of hailstorms, thunderstorms, and windstorms are difficult to predict as many of these individual events are without significant warning time and may have impacts to very limited areas or may affect broader areas. However, based on NCDC data and personal experiences of the Committee, it was determined that all areas within the County are anticipated to

experience a hailstorm, thunderstorm, or windstorm within the calendar year. More likely, these communities will be impacted by several of these hazard events each year.

Assessing Vulnerability

The effects of a hailstorm, thunderstorm, or windstorm may be minimal to extensive in nature and may affect small or broad ranges of land area. Within Elkhart County, direct and indirect effects from a hailstorm, thunderstorm, or windstorm may include:

Direct Effects:

- Damages to infrastructure (power lines)
- Damages to individual properties (homes, cars)
- Physical injuries may be experienced by those unable to find shelter during storm events, such as homeless people, hikers and outdoor workers.

Indirect Effects:

- Downed power lines due to falling tree limbs.
- Losses associated with power outages.
- Damages sustained from blowing debris.
- Cancellation or interruption of special events.

Estimating Potential Losses

Figure 43: Damage from a Windstorm

Due to the unpredictability of this hazard all critical infrastructure and non-critical structures in Elkhart County are at risk of damage including temporary or permanent loss of function. For hailstorms, thunderstorms, and windstorms, it is not possible to isolate specific critical infrastructure or non-critical structures that would be vulnerable to damages. However, areas where utility lines are above ground and areas where dead or dying trees have not been removed may be at a higher risk of property damage or power outages during hailstorms, thunderstorms, and windstorms. Additionally, mobile homes and accessory buildings such as pole barns and sheds may also be at a higher risk of damage from hailstorms, thunderstorms, and windstorms if not properly anchored to the ground. Damage from falling limbs or uprooted trees such as that shown in **Figure 43.** Homeless individuals and families who have alternative means of sheltering may experience greater losses since the stability of tents and alternative structures does not withstand the damaging forces of the storms. People working outdoors or travelling by bicycle or buggy may not be able to find shelter readily during pop up storm events.

Future Considerations

As the population of the communities in Elkhart County grows and the communities redevelop, it can be anticipated that the number of structures will also increase. To reduce the vulnerability for damage resulting from a hailstorm, thunderstorm, or windstorm, measures such as proper anchoring are vital. This includes not only roof anchors but also mobile home anchors. Proper tree

maintenance, and burial of power lines should be completed. Adoption and enforcement of the current International Building Codes is key to ensuring structures are able to withstand the power of wind and hailstorms. While measures can be taken to remove existing structures or prevent future structures from being built in known hazard areas such as floodplains and hazardous materials facility buffers, such measures are not applicable to hailstorms, thunderstorms, and windstorms due to the diffuse nature and regional impacts of this hazard.

Indirect effects resulting from a hailstorm, thunderstorm, or windstorm can include power outages caused by downed tree limbs or flying debris, damage resulting from prolonged power outages, and damage to structures or property as a result of debris. Damage to homeless encampments resulting in loss of personal property and potential injuries are also a concern during storms.

Relationship to Other Hazards

Hailstorms, thunderstorms, and windstorms may be the precursor for other hazards. For example, hazardous materials incidents can be the result of a hailstorm, thunderstorm, or a windstorm. Material storage containers can become damaged by high winds, debris, or even lightning, and can result in a spill or release of materials. With wind speeds greater than 58 mph, tankers and other transportation vehicles carrying hazardous materials are also at risk while on the road. High winds may also cause gaseous substances to travel farther distances at a much faster rate, increasing the evacuation area necessary to protect residents and visitors of Elkhart County.

Additionally, rainfall typically occurs with a thunderstorm and this additional precipitation may lead to localized flooding or riverine flooding depending on the amount of rain during the event. Debris from a windstorm may also lead to localized flooding if debris is deposited over drains or if obstructions are created by downed limbs, trees, or other storm related debris. A similar concern due to the potential precipitation would be dam failure. High winds may place debris near spillways, blocking the emergency drainage mechanism for the dams. High winds may also lead to structural damage to a dam or may cause damage to nearby trees or other structures, leading to indirect damage.

The risk of social losses also increases during a hailstorm, thunderstorm, or windstorm, as these hazards often result in downed power lines, utility poles, and trees. Debris such as this may impede traffic patterns and make it difficult for emergency vehicles (Fire, EMS, and Police) to pass through affected areas or people may be directly injured because of falling or flying debris.

3.2.7 Landslide/Subsidence

Overview

The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Although gravity acting on an over steepened slope is the primary reason for a landslide, there are other contributing factors. For example, erosion by rivers, glaciers, or ocean waves can cause rock to fall. Rock and soil slopes may be weakened through saturation by snowmelt or heavy rains, earthquakes can create stresses that make weak slopes fail, and excess weight from accumulation of rain or snow, stockpiling of rock or ore, from waste piles, or man-made structures that may stress weak slopes to the point of collapse.

Another important consideration is Fluvial Erosion Hazard (FEH). This represents the risk associated with natural stream movements and losses associated with buildings and infrastructure. In some cases, this may be represented by a gradual movement of a stream across a farm field. In other, more extreme instances, homes or other infrastructure may be lost as steep riverbanks or bluffs sluff into the water below.

Land subsidence, according to the USGS, is "a gradual settling or sudden sinking of the Earth's surface owing to subsurface movement of earth materials." Further, there are three processes that contribute to subsidence: compaction of aquifer systems, drainage and subsequent oxidation of organic soils, and dissolution and collapse of susceptible rocks.

Recent Occurrences

The potential for landslides or land subsidence within Elkhart County was discussed by the Planning Committee. IndianaMap shows that there are no Karst Sinkhole areas anywhere in the County. To the knowledge of the Planning Committee, there are no active underground mining operations within Elkhart County. Additionally, to date, there have not been any landslides or subsidence events reported in Elkhart. **Figure 44** shows the FEH corridor near Elkhart on Wabash River. The FEH zone appears to be relatively stable and located within the 1% flood event boundaries.

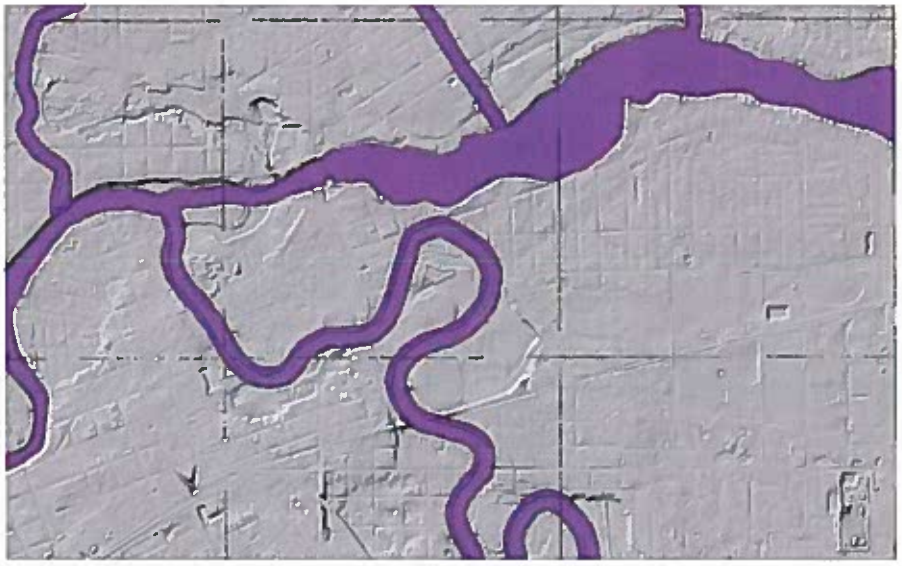

Figure 44: Fluvial Erosion Hazard along the St. Joseph and Elkhart Rivers near the City of Elkhart

The Committee determined the probability of a landslide or subsidence occurring in Elkhart County is "Highly Likely". Any event is expected to result in potentially "Significant"

damages. Currently, the Committee feels that the warning time is expected to be less than twenty-four hours and similarly, the duration is expected to last less than one week. These events are highly unpredictable and the risk, although very low according to the Committee, is distributed throughout the county. Therefore, the CPRI values reflect the distributed risk and associated priority for a landslide or subsidence event. A summary is provided in **Table 19**.

Table 19: CPRI for Land subsidence, Landslide and FEH

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Elkhart	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Goshen	Highly Likely	Significant	> 24 hours	< 1 week	Severe
City of Nappanee	Highly Likely	Significant	> 24 hours	< 1 week	Severe
Town of Bristol	Highly Likely	Significant	> 24 hours	< 1 week	Severe
Town of Middlebury	Highly Likely	Significant	> 24 hours	< 1 week	Severe
Town of Millersburg	Highly Likely	Significant	> 24 hours	< 1 week	Severe
Town of Wakarusa	Highly Likely	Significant	> 24 hours	< 1 week	Severe

Assessing Vulnerability

Although Elkhart County has no known presence of Karst geology and is at a low risk of land subsidence or sink holes, the portions of the county are considered at relatively high risk according to the National Risk Index for landslides. The risk index considers expected annual loss as well as vulnerabilities by census tract and community resilience. The Risk Index for Landslide in Elkhart County is shown in **Figure 45**. Ranging from very low to relatively moderate, much of the county has a relatively moderate risk. This rating is related to the social vulnerability of the community living in the area. The planning committee rated the Landslide, Land Subsidence and Fluvial Erosion Hazard as "Highly likely" according to the Planning Committee with "Significant" severity.

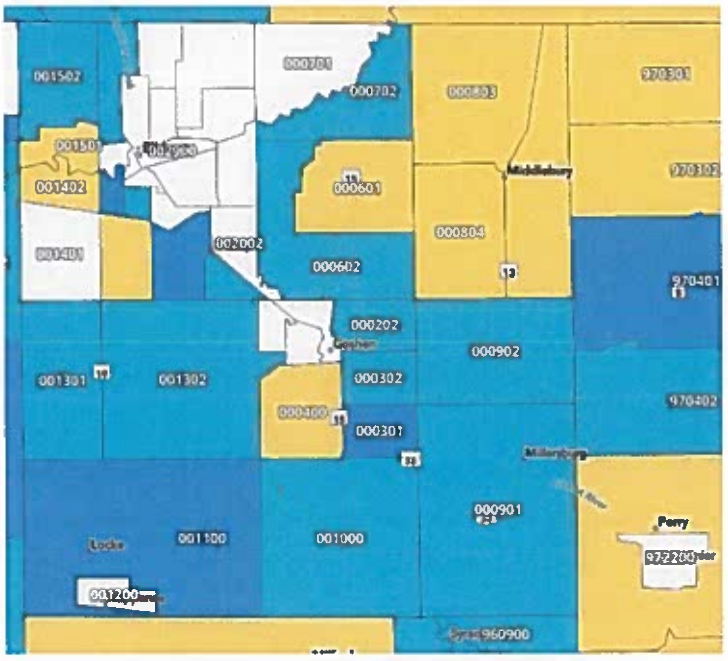

Figure 45 Risk Index for Landslide for Elkhart County

Within Elkhart County, direct and indirect effects may include:

Direct Effects:

- Damages to infrastructure (power lines, roads, bridges)
- Damages to individual properties (homes, cars)

- Loss of cropland immediately adjacent to the rivers

Indirect Effects:

- Increased response time for emergency vehicles
- Losses associated with affected land (crop loss)
- Potential contamination of groundwater resources
- Loss of business due to roadway access and power loss.

Estimating Potential Losses

According to the National Risk Index, expected annual losses have been calculated for the areas in Elkhart County which are at risk of damage including temporary or permanent loss of function. The greatest factor involving the higher risk rating is the potential for larger segments of the population to be exposed to the potential hazard.

In addition, areas where FEH meander belt widths (FEH Zones) have been identified, may be at a higher risk of property damage caused by such events. To prepare a community based basic "what-if" scenario, the Indiana FEH GIS layers were overlaid onto parcel data provided by the County. **Table 20** identifies the number of structures and potential damage within the FEH areas.

Table 20: Summary of Parcels and Essential Structures in the FEH Zone

Community	Potential Damages	
	# Parcels	# Essential Facilities
Elkhart County	575	2
City of Elkhart	276	3
City of Goshen	220	2
City of Nappanee	64	1
Town of Bristol	1	0
Town of Middlebury	35	2
Town of Millersburg	0	0
Town of Wakarusa	2	0

Future Considerations

As the populations of the communities in Elkhart County grow, it can be anticipated that the number of critical and non-critical structures will also increase. To reduce the vulnerability for damages resulting from a landslide or land subsidence, FEH area GIS layers along with the floodplain information should be integrated into the building permit or approval process. In recent years, no significant development has occurred within these areas of Elkhart County. However, depending on the location, any development may increase the vulnerability to this hazard.

Although Elkhart County rivers are considered relatively stable having little lateral movement annually, extreme precipitation events may cause erosion to take place in previously stable areas. Given this potential it is key the community continues to discourage construction of infrastructure and homes in the meander belt widths for each stream. Because of the changes in elevation on the southside of the City of Elkhart, landslide is a possibility, especially during extreme precipitation events. Caution must be exercised for existing structures. Elkhart County and the City should consider prevention efforts and opportunities to assure structures are not in potential slide areas.

As future growth takes place, the indirect effects resulting from a landslide or land subsidence event can cause challenges for the community if transportation routes are damaged, and businesses must close due to access issues and loss of power. Cascading impacts in smaller counties can have long lasting effects on the local economy, community growth, health and welfare.

Relationship to Other Hazards

A landslide, subsidence event or FEH event may be the precursor for other hazards. Depending on the location of the event, material storage containers can become damaged resulting in a spill or release of materials and potentially contaminating groundwater reserves. Dam failures may occur in much the same fashion if located in the potential hazard areas, or resulting from heavy saturation following a rainstorm, heavy snow, or rapid snow melt. FEH may result in flooding in areas previously not impacted by flood due to debris clogging drainage ways and loss of earthen berms near the waterways.

Similarly, these types of events may be caused by hail, thunder, or windstorms and their effects on the soils; an earthquake may release the ground enough to set a slide in motion; or a flood may add increased soil saturation or weight to at-risk areas increasing the potential for an event and resulting damages.

3.2.8 Tornado

Overview

Tornadoes are defined as violently rotating columns of air extending from thunderstorms to the ground. Funnel clouds are rotating columns of air not in contact with the ground. However, the funnel cloud may reach the ground very quickly – becoming a tornado. If there is debris lifted and blown around by the "funnel cloud," then it has reached the ground and is a tornado.

Figure 46 Funnel Cloud During Lightning Storm at Night

A tornado is generated when conditions in a strong cell are produced that exhibit a wall of cool air that overrides a layer of warm air. The underlying layer of warm air rapidly rises, while the layer of cool air drops – sparking the swirling action. The damage from a tornado is a result of the high wind velocity and wind-blown debris. Tornado season is generally from April through June in Indiana, although tornadoes can occur at any time of year. Tornadoes tend to occur in the afternoons and evenings; over 80 percent of all tornados strike between 3:00 pm and 9:00 pm but can occur at any time of day or night as shown in **Figure 46.** Tornadoes occur most frequently in the United States east of the Rocky Mountains. In Indiana, tornadoes generally come from the southwest to the northeast and/or from west to east. While most tornadoes (69%) have winds of less than 100 mph, they can be much stronger. Although violent tornadoes (winds greater than 205 mph) account for only 2% of all tornadoes, they cause 70% of all tornado deaths. In 1931, a tornado in Minnesota lifted an 83-ton rail car with 117 passengers and carried it more than 80 feet. In another instance, a tornado in Oklahoma carried a motel sign 30 miles and dropped it in Arkansas. In 1975, a Mississippi tornado carried a home freezer more than a mile. Tornado debris can be clearly seen in **Figure 47.**

Figure 47 Debris Flying as Tornado Destroys Apartments under Construction

According to an article in the New York Times, researchers say that in recent years tornadoes seem to be occurring in greater "clusters," and that the region known as tornado alley in the Great Plains, where most tornadoes occur, appears to be shifting eastward. This shift brings greater numbers and more intense tornadic storms to Indiana. The actual number of tornadoes nationwide appears to

remain constant near 1,200, but tornadoes are occurring more frequently in traditionally "quiet" cooler months.

Recent Occurrences

The classification of tornadoes utilizes the Enhanced Fujita Scale of tornado intensity and damage. Tornado intensity ranges from low intensity (EF0) tornadoes with effective wind speeds of 65-85 mph to high intensity (EF5+) tornadoes with effective wind speeds of 200+ mph. (**Table 21**) According to the NCDC, Elkhart County experienced 0 tornados between January 1, 2018, and December 31, 2023.

Table 21: Enhanced Fujita Scale for Tornados

EF-Scale	Windspeed, mph	Character of Damage	Relative Frequency	Typical Damages
EF0	65-85	Light damage	29%	Shallow rooted trees blown over; damage to roofs, gutters, siding
EF1	86-110	Moderate damage	40%	Mobile homes overturned, roofs stripped, windows broken
EF2	111-135	Considerable damage	24%	Large trees snapped, light-object missiles generated, cars lifted
EF3	136-165	Severe damage	6%	Severe damages to large buildings, trains overturned
EF4	166-200	Devastating damage	2%	Whole houses destroyed; cars thrown
EF5	200+	Incredible damage	<1%	High-rise buildings significantly damaged, strong framed homes blown away

The Committee estimated the probability of a tornado occurring in Elkhart County would be "Highly Likely" and the magnitude and severity of such an event to be "Limited". The overall risk index is "Severe" throughout the county. As with many hazardous events, the Committee anticipated a short warning time of typically less than six hours, and a short duration, also less than six. The summary is shown in **Table 22.**

Table 22: CPRI for Tornado

	Probability	Magnitude / Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
City of Elkhart	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
City of Goshen	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
City of Nappanee	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
Town of Bristol	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
Town of Middlebury	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
Town of Millersburg	Highly Likely	Limited	< 6 hours	< 6 hours	Severe
Town of Wakarusa	Highly Likely	Limited	< 6 hours	< 6 hours	Severe

The Indiana State Climate Office estimates that throughout Indiana, there is an average of 20 tornado touchdowns per year. Based on the number of tornado touchdowns previously reported through the NCDC and local weather agencies, the Committee determined the general probability of a future tornado occurring in Elkhart County is "Highly Likely" (within the next five years).

Assessing Vulnerability

As the path of a tornado is not pre-defined, it is difficult to isolate specific critical infrastructure and non-critical structures, or areas of Elkhart County that would be vulnerable to a tornado. Direct and indirect effects from a tornado may include:

Direct Effects:

- Increase damage to older construction including residential and business structures, mobile homes, and accessory structures (pole barns, silos, sheds, etc.)
- Damage to structures in the immediate pathway.(businesses, residences, warehouses, etc.)
- Loss of alternative housing stock nearby.
- Damages to above ground utility lines and structures

Indirect Effects:

- Loss of revenue for affected businesses.
- Expenses related to community clean-up and debris removal from public rights of way and public facilities.
- Inability for property owners to work while addressing damages from the tornado and debris removal from high winds.
- Affected business owners may experience loss of revenue if they are unable to continue operations following the event. Similarly, if a business is affected and unable to operate, employees may experience a loss of wages during the period of recovery.

Estimating Potential Losses

Due to the unpredictability of this hazard, all critical and non-critical structures within the county are at risk of future damage or loss of function. Estimates of potential physical losses were determined through a hypothetical exercise where an EF2 intensity tornado traveled through portions of the county and the communities. This is intended to present a "what-if" scenario of a tornado incident and associated damages. Damage estimates were derived by assuming that 25% of all structures in the path of the tornado would be completely destroyed, 35% of the structures would be 50% damaged, and 40% of the structures would sustain 25% damage. These estimations were also determined utilizing three wind speed zones based on distance from the tornado path. Zone 1 is nearest the center of the tornado path, while Zone 3 is the farthest from the path and with a theoretically lower wind speed. **Table 23** provides summary data for the hypothetical tornado, which is identified on **Exhibit 3**.

Table 23: Summary of Hypothetical Tornado Damages

	Zone 1		Zone 2		Zone 3		Total	
	#	$, Million	#	$, Million	#	$, Million	#	$, Million
Elkhart County	169	$29.58	104	$11.53	128	$15.60	401	$56.71
City of Elkhart	462	$63.91	323	$41.55	310	$35.17	1,095	$140.62
Town of Bristol	18	$4.10	5	$1.99	4	$1.59	27	$7.68
Totals	615	$69.97	409	$42.96	419	$43.19	1,523	$205.01

Utilizing the same GIS information and process, critical infrastructure within each of the hypothetical tornado zones are included in **Table 24.** These buildings are included in the above table showing the number of structures and damage estimate information.

Table 24: Critical Infrastructure within Hypothetical Tornado

Community	Zone 1	Zone 2	Zone 3
Elkhart County		Commercial Broadband Solutions, Inc. Tower	Commercial Broadband Solutions, Inc. Tower 2 - Indiana Michigan Power Company Towers
City of Elkhart	Adorn Lamination Plant 140 Atlas Chemical Milling Commercial Broadband Solutions, Inc. Tower Elkhart Headend, Warehouse & Service Center Elkhart Plating Corporation Flexform Technologies Franklin Bay, LLC Global Composites Incorporated Plant 6 Panel Division Mary Beck Elementary School and Daycare Mishawaka Pilots Club Airport Mobile Home Park Ozinga Bros., Inc. St Joseph Valley Community Church Inc	BD Industries Incorporated Commercial Broadband Solutions, Inc. Tower Elijahs Fire International Inc Gaska Tape Incorporated RR 120 Elkhart – Tier II Facility Unity Church Of God in Christ Inc	American Red Cross Shelter Novae Corp. Elkhart Operations
Town of Bristol	Bristol Mobile Village Chem Tech Thor Motor Coach Inc		Commercial Broadband Solutions

Future Considerations

The communities of Elkhart County host numerous events each year in addition to the regular tourist attractions and outdoor recreation opportunities which draw thousands of guests. Elkhart County also has a larger number of Amish in the county who shun using modern amenities such as electricity, and do not allow telephones in their homes. Due to these two factors, it is imperative that the EMA place continued importance on maintaining their outdoor warning siren coverage and/or support alternative notification methods for people who may not be tuned in to local media. Because of the dispersed population concentrations, coverage is limited to the more densely populated portions of the county. The existing siren locations are identified in **Figure *48*.**

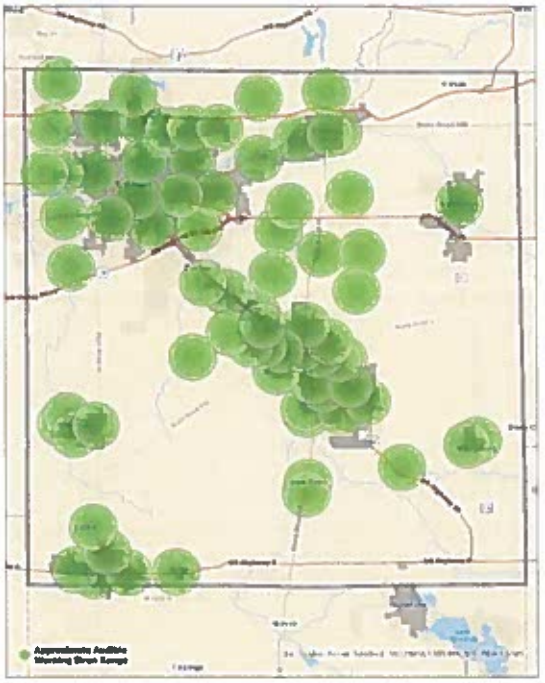

Figure 48 Siren locations in Elkhart County

While it can be anticipated that new construction associated with development may be stronger than older or existing construction, existing older structures, barns, pole buildings, silos and mobile homes remain threatened by tornados. The unincorporated portions of Elkhart County will remain vulnerable, especially where the outdoor warning siren coverage is not present. It is impossible to predict the path of a tornado and therefore all current and future development will continue to be at risk for damage. Risks to the citizens of Elkhart County may be lessened through participation in mass notification programs, use of weather radios, and turning on the emergency alert feature on cell phones. Having multiple means of warning citizens, businesses and visitors of incoming weather events is critical to continued economic growth and well-being of the communities and the county.

Relationship to Other Hazards

Tornadoes may result in a hazardous materials incident. Material storage containers can become damaged by high winds and debris can result in a spill or release of materials. As wind speeds increase, the potential for damage to above ground storage containers also increases. Tankers and other transportation vehicles carrying hazardous materials are also at an increased risk while on the road or rail.

Tornadoes may also result in a dam failure as the increased wind speeds, and debris caused by the tornado, may directly impact the dam, or cause indirect damage by clogging outlet structures and/or emergency spillways. In addition, tornadoes may lead to structural fires as the destruction path is sometimes long and broad, leading to an increased number of potentially damaged homes, exposed power lines, gas leaks and substantial amounts of debris.

3.2.9 Winter Storm and Ice

Overview

A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, ice storms, freezing rain or sleet, heavy snowfall with blinding wind-driven snow, and extremely cold temperatures that can last for several days. Some winter storms may be large enough to affect several states while others may affect only a single community. Winter storms are typically accompanied by cold temperatures and blowing snow, which can severely reduce visibility. A winter storm is defined as one that drops four or more inches of snow during a 12-hour period, or six or more inches during a 24-hour span. An ice storm occurs when freezing rain falls from clouds and freezes immediately on contact with a variety of surfaces. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can affect a community or region for days, weeks, and even months.

Figure 49 Ice Covered Powerlines

Storm effects such as extreme cold, flooding, and snow and ice accumulation can cause hazardous conditions and hidden problems for people in the affected area. **Figure 49** shows the added weight on trees and ice coated powerlines. People can become stranded on the road or trapped at home, without utilities or other services, including food, water, and fuel supplies. The conditions may overwhelm the capabilities of a local jurisdiction. Winter storms are considered deceptive killers as they may indirectly cause transportation accidents, and injury and death resulting from exhaustion/overexertion, hypothermia and frostbite from wind chill, and asphyxiation. House fires occur more frequently in the winter due to the use of alternative heat sources, such as space heaters, and lack of proper safety precautions.

Wind chill is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. On November 1, 2001, the NWS implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index, which was based on the 1945 Siple and Passel Index.

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are on the way. In the event of a blizzard, a winter storm warning will be issued and include the details of the blizzard - that large amount of falling or blowing snow and sustained winds of at least 35 mph are expected for several hours. Being in Northern Indiana, winter storms are somewhat common in Elkhart County and the surrounding region. Such conditions can

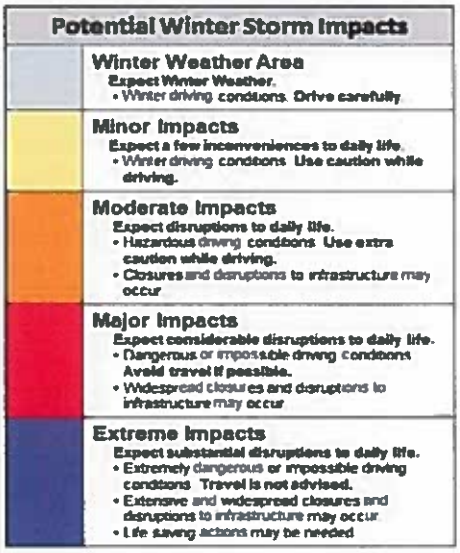

Figure 50 Winter Storm Impacts

result in substantial personal and property damage, even death. The National Weather Service recently (October 15, 2018) consolidated their watch and warning products. In doing so, blizzards and lake effect snows are no longer separate watches and warnings, but instead are detailed as a part of winter storm watches and warnings. A large number of winter storm products are available on the internet from the National Weather Service. One is The Winter Storm Severity Index (WSSI). When a storm is forecast, the NWS can help communities better understand the potential impacts of storm using WSSI. **Figure 50** shows the description of the WSSI impacts. More detailed information with regards to the timing of the storms, etc., is provided as the event gets closer to the forecast area.

Recent Occurrences

From January 1, 2016 to August 1, 2024 the NCDC has recorded 24 winter weather events, 1 ice storm, 4 heavy snow events, 1 lake-effect snow, and 9 winter storms. NCDC reports indicated no property damage, no additional crop damage and no injuries, or deaths associated with any of the events. Many narrative descriptions indicated poor travel conditions, lots of power outages and debris associated with the winter weather events.

The probability, magnitude, warning times, and duration of a snowstorm or ice storm causing disruption to residents and businesses in Elkhart County, as determined by the Planning Committee, is expected to be mostly consistent throughout the county and communities. It is "Highly Likely" that this type of hazard will occur in the area and will typically affect the entire county, and possibly several surrounding counties at one time, resulting in primarily "Limited" damage. The typical warning time for severe temperatures or several inches of snow associated with a winter storm is usually 12 to 24 hours while the duration of the incident is anticipated to be less than one week. A summary is shown in **Table 25.**

Table 25: CPRI Summary for Winter Storms and Ice

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
City of Elkhart	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
City of Goshen	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
City of Nappanee	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
Town of Bristol	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
Town of Middlebury	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
Town of Millersburg	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated
Town of Wakarusa	Highly Likely	Limited	12 - 24 hours	< 1 week	Elevated

The Planning Committee determined that the probability for a snowstorm or ice storm to occur in Elkhart County and the communities within is "Highly Likely" or may occur within the calendar year. Based on historical data and the experience of the Planning Committee, snowstorms have become less common in Elkhart County with the changing climate, however, ice storms bring more extensive challenges to the communities. Actions have been taken to mitigate many impacts from snow and ice storms. Lake effect snowstorms can be less predictable, depositing greater amounts of snow in a contiguous county and lesser amounts in Elkhart County or the opposite. The Committee considered only the larger, more detrimental events for this effort.

Assessing Vulnerability

A snowstorm typically affects a large regional area with potential for physical, economic, and/or social losses. Direct and indirect effects of a snowstorm or ice storm within Elkhart County may include:

Direct Effects:

- A higher number of businesses rely on the outside workforce and may experience loss of production as employees may not be able to get to work. The high number of residents traveling to other areas for work results in loss of income due to the inability to reach their normal worksites.
- Rural (County) roads may impassable
- Expenses related to snow removal or brine/sand applications.
- Weight of ice and wet snow impacts older structures roofs as well as powerlines.
- Large ice and snow events interrupt economic activity within the community.

Indirect Effects:

- Loss of revenue as businesses are closed.
- Increased emergency response times based on safety of roads.
- Loss of income if workers are unable to get to their place of employment.
- Delayed impacts due to supply chain disruptions – products not received or shipped on time cause lost wages and revenues.
- Cancellation of special events and reduced tourist activities impact the local economy.

Estimating Potential Losses

Figure 51 Travel Impacted During Snowstorm

Given the nature and complexity of a regional hazard such as a snowstorm, it is difficult to quantify potential losses to property and infrastructure. As a result, all critical and non-critical structures and infrastructure are at risk from snowstorm and ice storm incidents.

For planning purposes, information collected in snowstorms impacting other communities around the nation is also useful in assessing the potential social, physical, and economic impact that a winter storm could have on communities. For example, a March 2003 snowstorm in Denver, Colorado dropped approximately 31 inches of snow and caused an estimated $34M in total damage. In addition, a February 2003 winter storm dropped an estimated 15-20 inches of snow in parts of Ohio. The Federal and Ohio Emergency Management Agencies and U.S. Small Business Administration surveyed damaged areas and issued a preliminary assessment of $17M in disaster related costs. These costs included snow and debris removal, emergency loss prevention measures, and public utilities repair. The agencies found

over 300 homes and businesses either damaged or destroyed in six counties. Snowstorms and blizzards also make road travel difficult and dangerous, as seen in **Figure 51**.

Looking a bit closer to home, In December 2008, Allen County had a wintry combination of freezing rains, snow and ice. This storm was the largest disaster for Indiana Michigan Power with 110,000 Allen County customers without power. One thousand six hundred (1,600) additional crew members were brought in to restore electrical service to the county. According to the Journal Gazette $10 – $12 million was spent to clean up the debris, make repairs and labor costs for this event.

While the above examples indicate the wide-ranging and large-scale impact that winter storms can have on a community or region, winter storms generally tend to result in less direct economic impacts than many other natural hazards. According to the Workshop on the Social and Economic Impacts of Weather, which was sponsored by the U.S. Weather Research Program, the American Meteorological Society, the White House Subcommittee on Natural Disaster Relief, and others, winter storms resulted in an average of 47 deaths and more than $1B in economic losses per year between 1988 and 1995. However, these totals account for only 3% of the total weather-related economic loss and only 9% of fatalities associated with all weather-related hazards over the same period.

Future Considerations

As populations increase and communities continue to grow, the need to respond to snowstorms or ice storms will remain an important municipal effort. As new construction or re-development occurs, especially new or existing critical infrastructure, it is important to ensure that these new structures are equipped to deal with the potential risks associated with this hazard. Those may include lengthy power outages and potentially impassable transportation routes, making it difficult to obtain supplies or for passage of response vehicles. These hazard events will typically affect the entire county, perhaps multiple counties, and therefore all developments, current and future, will be at risk for damage associated with snow and ice storms. In addition, there will be a need for additional warming shelters for the underserved populations to take refuge and get warm and safe respite for stranded commuters on their way to or from work. This not only includes daytime available spaces but also overnight accommodation as the winter storms is often accompanied by very cold temperatures and wind chills.

Winter storms can also result in substantial indirect costs. Increased emergency response times, loss of work or the inability to get to work, as well as business interruption, are possible indirect effects of a winter storm. According to a report by the National Center for Environmental Predictions, the cold and snowy winter in late 1977 and early 1978, which impacted several heavily populated regions of the country, was partially responsible for reducing the nation's Gross Domestic Product (GDP) from an estimated growth rate of between 6% and 7% during the first three quarters of 1977 to approximately -1% in the last quarter of 1977 and 3% during the first quarter of 1978.

Relationship to Other Hazards

Winter storms and ice storms can lead to flooding as the precipitation melts and enters local receiving waters. This increased volume of water on already saturated, or still frozen ground can quickly result in flood-related damage to structures and properties (**Figure 52**) as well as within the stream or river channel. Elkhart County has an increased risk of flooding following heavy precipitation events. The increased flooding may then lead to a dam failure within the same area, further exacerbating the damage.

Hazardous materials incidents may be caused by poor road conditions during winter storms or ice storms. Many hazardous materials are transported by rail or by tanker over highways and

interstates. In the more rural areas of Elkhart County, or where open areas are more susceptible to snow drifts on roads, the possibility of a traffic related hazardous materials incident may increase due to road obstruction and lack of visibility.

Figure 52 Flooding caused by Snow Melt

Power outages and other infrastructure failures may also occur during a winter storm. Weight from snow and ice accumulations can directly or indirectly cause power lines to fail. During extreme cold temperatures, power outages may prove deadly for certain populations such as the homeless, the elderly or ill. Power outages in the winter are especially dangerous as families try to generate heat using alternative heat sources. Alternative heating sources may not be safely used or may be placed too close to combustible materials resulting in fires and burn injuries or death.

3.2.10 Dam and Levee Failure

Overview

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams typically are constructed of earth, rock, concrete, or mine tailings. A dam failure is a collapse, breach, or other failure resulting in downstream flooding.

A dam impounds water in the upstream area, referred to as the reservoir. The amount of water impounded is measured in acre-feet. An acre-foot is the volume of water that covers an acre of land to a depth of one foot. As a function of upstream topography, even a small dam may impound or detain many acre-feet of water. Two factors influence the potential severity of a full or partial dam failure: the amount of water impounded, and the density, type, and value of development and infrastructure located downstream.

Of the approximately 80,000 dams identified nationwide in the National Inventory of Dams, the majority are privately owned. Each regulated dam is assigned a downstream hazard classification based on the potential loss of life and damage to property should the dam fail. The three classifications are high, significant, and low. With changing demographics and land development in downstream areas, hazard classifications of regulated are updated continually. The following definitions of hazard classification currently apply to dams in Indiana:

- High Hazard Dam: a structure, the failure of which may cause the loss of life and severe damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads.
- Significant Hazard Dam: a structure, the failure of which, may damage isolated homes and highways or cause the temporary interruption of public utility services.
- Low Hazard Dam: a structure, the failure of which, may damage farm buildings, agricultural land, or local roads.

In Indiana, not all dams are regulated. To be regulated by the Indiana Department of Natural Resources (DNR), To be a jurisdictional structure, the dam must meet at least one of the following criteria:

- Have a drainage area above the dam of more than one square mile.
- The dam is 20 feet in height or greater.
- The dam impounds a volume of more than 100 acre-feet of water.

A dam's classification may be changed to a High-hazard classification through a successful petition by a downstream property owner. Federally owned and operated dams are not under Indiana DNR's jurisdiction. Examples of Federally regulated dams include Federal Energy Regulatory Commission (FERC) and US Army Corps of Engineers (USACE) structures. Although regulations are similar, there are additional requirements based on the regulating agency.

A levee is a flood control structure engineered and designed to hold water away from a building. Levees protect buildings from flooding as well as from the force of water, from scour at the foundation, and from impacts of floating debris. Flood protection levees principle causes of levee failure, like those associated with dam failure, include overtopping, surface erosion, internal erosion, and slides within the levee embankment or the foundation walls. Levees are designed to protect against a particular flood level and may be overtopped in a more severe event. When a levee system fails or is overtopped, the result can be catastrophic and often more damaging than if the levee were not there, due to increased elevation differences and water velocity. The water flowing through the breach continues to erode the levee and increases the size of the breach until it is repaired or water levels on the two sides of the levee have equalized. The FEMA and US Army Corps of Engineers (USACE) remind people living and working behind levees that there is always a residual risk when

living or working in a facility located behind a levee. Levees reduce the risk of a flood, but do not completely eliminate that risk.

Recent Occurrences

Within Elkhart County, there are 10 structures listed in the DNR dams list. Of the 10 in Elkhart County, two are classified as a high hazard dam, eight are classified as low hazard dams, one has been decommissioned. **Table 26** shows all the structures listed on the National Inventory of Dams (NID). According to local information and state dam safety records, there have not been any recent dam failures or incidents within Elkhart County.

Table 26: Dams in Elkhart County

Dam Name	Owner Type	State Regulated Dam	Hazard Potential Classification	IEAP Prepared	Notes
Elkhart River (In-Channel) Dam	Local Government	Yes	Low	No	Decommissioned
Goshen Pond Dam	Local Government	Yes	High	Yes	
Bainter Town Hydro Plant	Local Government	Yes	Low	No	
Elkhart Dam	Public Utility	No	High	Yes	
Bainter Town Dam	Local Government	Yes	Low	No	
Bonneyville Mill Dam	Local Government	Yes	Low	No	
Little Elkhart River Dam (In-Channel)	Private	Yes	Low	No	
Benton Dam	Local Government	Yes	Low	No	
Heaton Lake Control Structure	Private	N/A	Low	No	
Christiana Creek (In-Channel) Dam	Local Government	Yes	Low	No	

According to the National Levee Database (NLD) managed by the USACE, there are no certified levees systems within Elkhart County. The Indiana Silver Jackets Team completed a survey of levee like features also known as non-levee embankments. The non-levee embankments are not certified or engineered structures. They are earthen structures which act like levees, however, are not capable of protecting the features behind the structures adequately. In fact, non-levee embankments impose lateral constraints on flood flows, reducing the floodplain

Figure 53 Non-Levee Embankment in Elkhart County

storage capacity and increasing the flood velocity. These non-levee embankments can cause stream erosion and downstream flooding. Some farms along the rivers and streams rely on these embankments to keep flood waters out of their fields. **Figure 53** shows the location of some of the non-levee embankments in Elkhart County.

Based on the information provided to them and their local knowledge, experience, and expertise, the Committee determined the probability of a dam failure is "Unlikely." The magnitude of a dam failure can have "Critical" damages for the Cities of Elkhart and Goshen and the Town of Bristol. The County, City of Nappanee, and the Towns of Middlebury, Millersburg, and Wakarusa the magnitude was considered "Negligible". The warning time is under 6 hours. **Table 27** provides a summary of the Planning Committee's expectations during a dam failure.

Table 27: CPRI Summary for Dam and Levee Failure

	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI
Elkhart County	Unlikely	Negligible	< 6 hours	< 1 day	Low
City of Elkhart	Unlikely	Critical	< 6 hours	< 1 day	Elevated
City of Goshen	Unlikely	Critical	< 6 hours	< 1 day	Elevated
City of Nappanee	Unlikely	Negligible	< 6 hours	< 1 day	Low
Town of Bristol	Unlikely	Critical	< 6 hours	< 1 day	Elevated
Town of Middlebury	Unlikely	Negligible	< 6 hours	< 1 day	Low
Town of Millersburg	Unlikely	Negligible	< 6 hours	< 1 day	Low
Town of Wakarusa	Unlikely	Negligible	< 6 hours	< 1 day	Low

Assessing Vulnerability

The actual magnitude and extent of damage due to a dam failure depends on the nature of the breach, the volume of water that is released, and the width of the floodplain valley to accommodate the flood wave. Due to the conditions beyond the control of the dam owner or engineer, there may be unforeseen structural problems, natural forces, mistakes in operation, negligence, or vandalism that may cause a structure to fail. The high hazard dam, owned by USACE, has developed an Emergency Action Plans (EAP). **Figure *54*** shows the inundation areas during a worst-case scenario breach of the dam under full maximum pool conditions.

Figure 54 Goose Pond Dam Inundation Area

Incident and Emergency Action Plans (IEAPs) are now required for all high hazard dams by state law; however, these plans are not mandated for the low hazard structures. Dam owners are, however, encouraged to prepare an IEAP to help identify whom to notify and what actions may need to take place in the event of an incident or emergency event affecting the dam. For the state regulated high hazard dams,

the Indiana DNR dam safety webpage shows areas which areas would be inundated during a dam failure.

Within Elkhart County, direct and indirect effects from a dam failure may include:

Direct Effects:

- Potential loss of life and severe damage to downstream homes, industrial and commercial buildings, public utilities, major highways, or railroads
- Loss of use of reservoirs for flood control, recreation, and water supply

Indirect Effects:

- Loss of land in the immediate scour area
- Increased response times due to damaged or re-routed transportation routes and/or bridges
- Long lasting economic impacts on the community due to business closures, and relocation of impacted property owners.

Estimating Potential Losses

As of July 1, 2022, the State of Indiana is requiring High Hazard dams to have Incident and Emergency Action Plans (IEAPs) developed. These plans have detailed potential dam failure inundation areas identified along with at-risk structures identified. The actual magnitude and extent of damage depends on the type of dam break, the volume of water that is released, and the width of the floodplain valley to accommodate the dam break flood wave. All dam owners are encouraged to develop an IEAP.

The greatest impact for Elkhart County is a breach of the Goshen Pond Dam and Elkhart Dam. Both of these dams are high hazard dams. The USACE Breach Analysis reviews various scenarios at a variety of times to estimate impacts upon the inundated community. **Figure 55** shows a few of the scenarios and the impacts anticipated.

Consequence Estimates

Scenario	Type	Daytime People at Risk	Nighttime People at Risk	Buildings at Risk	Economic Cost
Maximum High Pool - BREACH	Maximum High Pool Breach	39,047	40,510	17,110	$4,540,685,706
Intermediate High Pool - BREACH	Intermediate High Pool Breach	26,701	28,457	12,703	$2,682,017,213
Normal High Pool - BREACH	Normal High Pool (10% EDP) Breach	230	182	103	$9,508,428

Figure 55 USACE Dam Breach Consequence Estimates

Utilizing GIS maps and orthoimagery, the infrastructure and other features below this dam can be identified. This imagery will show properties that would be isolated due to the inundation of the roadways leading in and out of the area as well as those properties which would be inundated.

Future Considerations

As areas near existing dams continue to grow in population, it can be anticipated that the number of critical and non-critical structures could also increase accordingly. Location of these new facilities should be carefully considered, and precautions should be taken to ensure that schools, medical facilities, municipal buildings, and other critical infrastructure are located outside of the delineated

or estimated dam failure inundation areas. Also, flood-free access should be provided for these facilities. Large areas of new development have not yet occurred downstream of the dams in Elkhart County. Until such development or re-development downstream of a dam is prohibited, those areas remain vulnerable to losses and damage associated with a failure of that structure.

It is also particularly important to all downstream communities and property owners that dam IEAPs are developed, kept up-to-date, and routinely exercised to ensure the greatest safety to those within the hazard area. Although not mandated, this is a best management practice for Significant and Low Hazard dams as well.

The high hazard dams, Goshen Pond, is operated and maintained by the Local Government and Elkhart Dam is operated and maintained by the public utility. As such it is and will continue to be maintained according to the dam safety program requirements. Although failure is always a possibility with a record-breaking extreme precipitation event, it is not anticipated to take place in the near future (next 5- 10 years). The communities downstream continue to work with the Army Corps of Engineers to reduce potential damage through outreach efforts and assuring property owners are informed on ways to mitigate their risks, such as building on higher ground, etc. These mitigation efforts are a part of the day-to-day operations of the building and zoning departments, for all dams, as they issue permits and discuss floodplain issues with nearby property owners.

Relationship to Other Hazards

With the potentially large volumes and velocities of water released during a breach, it can be expected that such a failure would lead to flooding and debris flow within the inundation areas downstream of the dam. Nearby bridges and roads are also in danger of being destroyed or damaged due to a dam failure. Bridges may become unstable, and portions of road surfaces may be washed away. Entire roads may be undermined by the forces of the water and debris. Other infrastructure such as utility poles and lines may be damaged as the water and debris flows along. Buried utility pipes may become exposed due to scouring; all of which may lead to utility failures within the area downstream of the dam failure.

Due to flood and debris flow damages, hazardous materials facilities and transportation routes may be damaged resulting in releases. If LP gas tanks are located nearby, they may be torn from their mountings and would become part of the flowing debris as well as leaking their contents from the ruptured service lines.

3.2.11 Hazardous Materials Incident

Overview

Hazardous materials are substances that pose a potential threat to life, health, property, and the environment if they are released. Examples of hazardous materials include corrosives, explosives, flammable materials, radioactive materials, poisons, oxidizers, and dangerous gases. Despite precautions taken to ensure careful handling during manufacture, transport, storage, use, and disposal, accidental releases are bound to occur. These releases create a serious hazard for workers, neighbors, and emergency response personnel. Emergency response to a release may require fire, safety/law enforcement, search and rescue, and hazardous materials response units.

Figure 56 Potentially Hazardous Waste

As materials are transported for treatment, disposal, or transport to another facility, all infrastructure, facilities, and residences near the transportation routes are at an elevated risk of being affected by a hazardous materials release. Often these releases can cause serious harm to Elkhart County and its residents if proper and immediate actions are not taken. Most releases are the result of human error or improper storage (**Figure *56***), and corrective actions to stabilize these incidents may not always be feasible or practical in nature.

Railways often transport materials that are classified as hazardous and preparations need to be made and exercised for situations such as derailments, train/vehicle crashes, and/or general leaks and spills from transport cars.

Recent Occurrences

During conversations with Committee members and through information provided by local news outlets, it was noted that numerous small and moderately sized incidents involving manufacturing facilities and transportation routes have occurred since the development of the original MHMP. However, the number of SARA Title III Tier II facilities utilizing, storing, and/or manufacturing chemicals has decreased over the years as facilities reduce the amount hazardous materials on site. Both Tier II and other chemical facilities as well as businesses and industries rely on just in time delivery which results in an increase in the number of delivery vehicles transporting hazardous mate/rials across the county. Vehicular traffic on Interstate 80/90 carries materials across the top part of the county from Ohio into Illinois. US 20, 12, 6, 33, 131 and SR 4, 13, 15, 19, 119, and 120 crosses Elkhart County are major transportation arteries through the county,

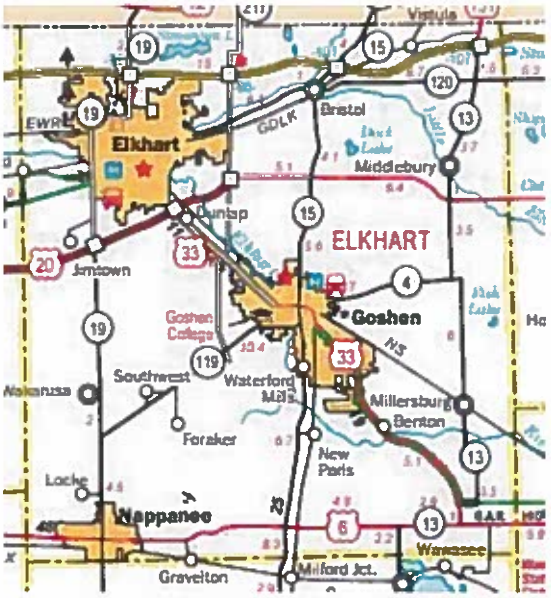

Figure 57 Transportation Map of Elkhart County

local roadways and state roads are often used to avoid traffic accidents, and slowdowns. The volume of traffic increases the potential for incident. (**Figure 57**) Elkhart County does have a hazardous materials response capacity and has mutual aid hazardous materials response capabilities in nearby counties. Elkhart County has worked with local industry to augment the response capabilities and training.

According to the Committee, the probability of a hazardous materials release or incident is "Highly Likely" in all areas due to the number of transportation routes within and through county. "Significant" damages are anticipated to result from an incident. The level of damage is dependent upon the location of the event. As with hazards of this nature, a short warning time of less than six hours and a short duration, less than a day_is anticipated in the event of a hazardous materials incident. A summary is shown in **Table 28.**

Table 28: CPRI Summary for Hazardous Materials

	Probability	Magnitude / Severity	Warning Time	Duration	CPRI
Elkhart County	Highly Likely	Significant	< 6 hours	< 1 day	Severe
City of Elkhart	Highly Likely	Significant	< 6 hours	< 1 day	Severe
City of Goshen	Highly Likely	Significant	< 6 hours	< 1 day	Severe
City of Nappanee	Highly Likely	Significant	< 6 hours	< 1 day	Severe
Town of Bristol	Highly Likely	Significant	< 6 hours	< 1 day	Severe
Town of Middlebury	Highly Likely	Significant	< 6 hours	< 1 day	Severe
Town of Millersburg	Highly Likely	Significant	< 6 hours	< 1 day	Severe
Town of Wakarusa	Highly Likely	Significant	< 6 hours	< 1 day	Severe

Relatively small hazardous materials incidents have occurred throughout Elkhart County in the past and may, according to the Committee, occur again. As the number of hazardous materials producers, users, and transporters increase within or surrounding Elkhart County, it can be anticipated that the likelihood of a future incident will also increase. Additionally, as the I-80/90 traffic increases, the international shipments will continue to increase, enhancing the potential for accidents.

Assessing Vulnerability

Within Elkhart County, direct and indirect effects from a hazardous materials incident may include:

Direct Effects:

- Acute or chronic health issues due to chemical exposure.
- Closure of impacted railroad crossings.
- Possible crop or livestock damage from chemical exposure.
- Damage to infrastructure from leaks, accidents, or recovery operations.
- Expense of decontamination and reconstruction of affected structures.

Indirect Effects:

- Loss of revenue or production while testing, recovery and/or reconstruction occurs.
- Anxiety or stress related to the event.
- Potential evacuation of neighboring structures or facilities.
- Evacuation and/or relocation of homeless persons living in the impacted area.
- Added expenses detouring traffic around incident location.

- Expenses incurred due to response, testing, and cleaning of the affected areas.

Figure 58 Hazardous Material Incident

While the possibility of an incident occurring may be possible, the vulnerability of Elkhart County has been lowered due to the enactment of Superfund Amendments and Reauthorization Act (SARA) Title III national, state, and local requirements. SARA Title III, also known as the Emergency Planning and Community Right to Know Act (EPCRA), establishes requirements for planning and training at all levels of government and industry. EPCRA also establishes provisions for citizens to have access to information related to the type and quantity of hazardous materials being utilized, stored, transported, or released within their communities.

One local result of SARA Title III is the formation of the Local Emergency Planning Committee (LEPC). This committee has the responsibility for preparing and implementing emergency response plans, cataloging Safety Data Sheets (SDS) formerly known as Material Safety Data Sheets (MSDS), creating chemical inventories of local industries and businesses, and reporting materials necessary for compliance.

In Elkhart County, facilities are subject to SARA Title III provisions due to the presence of listed hazardous materials in quantities at or above the minimum threshold established by the Act. These facilities are also required to create and distribute emergency plans and facility maps to local emergency responders such as the LEPC, fire departments, and police departments. With this knowledge on hand, emergency responders and other local government officials can be better prepared to plan for an emergency and the response it would require, and to better prevent serious effects to the community involved.

Estimating Potential Losses

In addition, the very nature of these events makes predicting the extent of their damage very difficult. A small-scale spill or release might have a minor impact and would require only minimal response efforts. Another slightly larger incident might result in the disruption of business or traffic patterns, and in this situation, might require active control response measures to contain a spill or release. However, even small, or moderate events could potentially grow large enough that mass evacuations or shelter in place techniques are needed, multiple levels of response are utilized, and additional hazards such as structural fires and/or additional hazardous materials releases (or explosions) may occur. Given the unpredictable nature of hazardous materials incident, an estimate of potential losses was not generated.

Future Considerations

Additional facilities, both critical and non-critical in nature may be affected if a hazardous materials release were to occur along a transportation route. All of the state roads are traveled by carriers of hazardous materials. As businesses and industries increase in the area, the increased use of these routes will increase the number of transportation related incidents.

By restricting development within the known hazardous materials facility buffer zones, future losses associated with a hazardous materials release can be reduced. Critical infrastructure should be especially discouraged from being located within these areas. Further, by restricting construction in these zones, the number of potentially impacted residents may also be reduced, lowering the risk for social losses, injuries, and potential deaths. Future construction of hazardous materials facilities should be located away from critical infrastructure such as schools, medical facilities, municipal buildings, and daycares. Such construction would likely reduce the risk to highly populated buildings and populations with physical or social, emotional, or behavioral challenges or considerations such as children, elderly, and medically fragile individuals.

Many facilities constructed within close proximity to a hazardous materials facility are similar due to local zoning ordinances. This reduces the risk and vulnerability of some populations. However, there are several facilities and numerous transportation routes located throughout each of the communities making current and future development at risk for losses associated with a hazardous materials release.

Relationship to Other Hazards

Dependent on the nature of the release, conditions may exist where a fire or spark ignites a flammable or explosive substance. As the fire spreads throughout the facility or the area, structural and/or property damage will increase. If the hazardous substances are in enclosed containers such as railroad tank cards, cylinders or other containers, near heat generating events such as a fire, explosion becomes a risk as well. Response times to a hazardous materials incident may be prolonged until all necessary information is collected detailing the type and amount of chemicals potentially involved in the incident. Depending on the nature of the incident, further delays may take place until qualified Hazardous Materials Responders with the appropriate response and monitoring equipment can be transported to the incident location. While this may increase structural losses, it may decrease social losses such as injuries or even deaths.

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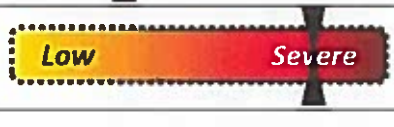
3.3 HAZARD SUMMARY

For the development of this MHMP, the Committee utilized the CPRI method to prioritize the hazards they felt affected Elkhart County. Hazards were assigned values based on the probability or likelihood of occurrence, the magnitude or severity of the incident, as well as warning time and duration of the incident itself. A weighted CPRI was calculated based on the percent of the county's population present in the individual communities. **Table 29** summarizes the CPRI values for the various hazards studied within this MHMP.

Table 29: All CPRI Scores Combined

Type of Hazard	List of Hazards	Average CPRI Rating
Natural	Drought	
	Earthquake	
	Extreme Temperatures	
	Fire/Wildfire	
	Flood	
	Hail/Thunder/Windstorm	
	Landslide/Subsidence	
	Tornado	
	Winter Storm/Ice	
Technological	Dam & Levee Failure	
	Hazardous Materials Incident	

It is important to understand the cause-and-effect relationship between the hazards selected by the Committee. **Table 30** can be utilized to identify those relationships. For example, a winter storm (along the side of the table) can result in a flood (along the top of the table). In a similar fashion, a hazardous

materials incident (along the top of the table) can be caused by an earthquake; flood; tornado; or a winter storm or ice storm (along the side of the table).

Table 30. Hazard Reference Table

EFFECT → / CAUSE ↓	Drought	Earthquake	Extreme Temperature	Fires and Wildfire	Flood	Hailstorm/ Thunderstorm/ Windstorm	Landslide / Subsidence	Tornado	Winter Storm / Ice	Dam & Levee Failure	Hazardous Materials
Drought				X							
Earthquake				X			X			X	X
Extreme Temperature											X
Fires and Wildfire											X
Flood							X			X	X
Hailstorm/ Thunderstorm / Windstorm				X	X		X			X	X
Landslide / Subsidence/ FEH					X						X
Tornado				X						X	X
Winter Storm/ Ice					X					X	X
Dam & Levee Failure					X		X				X
Hazardous Materials				X							

As a method of better identifying the potential relationships between hazards, the community exhibits can be referenced to indicate the proximity of one or more known hazard areas such as the delineated floodplains and the locations of EHS facilities. For this reason, many of the communities in Elkhart County may be impacted by more than one hazard at a time, depending on certain conditions. It can be anticipated that if a flood were to occur within these areas, there would be a potentially increased risk of a facility experiencing a hazardous materials incident. These areas may also be at a greater risk of a dam or non-levee embankment failure.

Future development in areas where multiple known hazard areas (dam failure inundation areas, floodplains and surrounding hazardous materials facilities) overlap should undergo careful design,

review, and construction protocol to reduce the risk of social, physical, and economic losses due to a hazard incident. While it may certainly be difficult, critical infrastructure should not be constructed within these regions.

4.0 MITIGATION GOALS AND PRACTICES

This section identifies the overall goal for the development and implementation of the Elkhart County MHMP. A summary of existing and proposed mitigation practices discussed by the Committee is also provided.

4.1 MITIGATION GOAL

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

The Committee reviewed the mitigation goals as outlined within the 2017 Elkhart County MHMP and determined that the goals remain valid and effective. In summary, the overall goal of the Elkhart County MHMP is to reduce the social, physical, and economic losses associated with hazard incidents through emergency services, natural resource protection, prevention, property protection, public information, and structural control mitigation practices.

4.2 MITIGATION PRACTICES

REQUIREMENT §201.6(c)(3)(ii):

[The mitigation strategy shall include a] section that identifies and analyzed a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

REQUIREMENT §201.6(c)(3)(iii):

[The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

In 2005, the Multi-Hazard Mitigation Council conducted a study about the benefits of hazard mitigation. This study examined grants over a 10-year period (1993-2003) aimed at reducing future damages from earthquakes, wind, and flood. It found that mitigation efforts were cost-effective at reducing future losses; resulted in significant benefits to society; and represented significant potential savings to the federal treasury in terms of reduced hazard-related expenditures. This study found that every $1 spent on mitigation efforts resulted in an average of $4 savings for the community. The study also found that FEMA mitigation grants are cost-effective since they often lead to additional non-federally funded mitigation activities and have the greatest benefits in communities that have institutionalized hazard mitigation programs.

A more recent (2017) study by the National Institute of Building Sciences, reviewed over 20 years of federally funded mitigation grants, not only from FEMA but also from the US Economic Development Administration (EDA) and the US Department of Housing and Urban Development (HUD). From this broadened review, it has been determined that for every $1 spent on mitigation, $6 is saved on disaster costs. In addition, by designing and construction buildings which exceed select items in the 2015 International Code, $4 can be saved for every $1 invested in those changes.

Six primary mitigation practices defined by FEMA are:

- **Emergency Services** – measures that protect people during and after a hazard.
- **Natural Resource Protection** – opportunities to preserve and restore natural areas and their function to reduce the impact of hazards.
- **Prevention** – measures that are designed to keep the problem from occurring or getting worse.
- **Property Protection** – measures that are used to modify buildings subject to hazard damage rather than to keep the hazard away.
- **Public Information** – those activities that advise property owners, potential property owners, and visitors about the hazards, ways to protect themselves and their property from the hazards.
- **Structural Control** – physical measures used to prevent hazards from reaching a property.

4.2.1 Existing Mitigation Practices

As part of this planning effort, Committee members were forwarded a copy of the prior MHMP's mitigation actions. Team members reviewed those actions and were asked to consider any and all other mitigation actions based on the hazards discussed in meeting #1. At the second planning team meeting, the Committee discussed the strengths and weaknesses of existing mitigation practices and made recommendations for improvements, as well as suggested new practices. The committee also examined practices employed by neighboring communities assessing the viability of those actions within Elkhart County. The following is a summary of existing hazard mitigation practices within Elkhart County. Mitigation measures that were included in the 2017 Elkhart County MHMP are noted as such. A list of the former mitigation actions included in the 2017 MHMP and their status may be found in **Appendix 12.**

Emergency Services

- Three stream gages are utilized for flood monitoring, forecasting, and flood warnings for the various streams in the county.
- Training and table-top exercises are conducted by the LEPC and include response agencies such as police, fire, and local EMS agencies.
- The county has outdoor warning sirens located to cover all areas where there are concentrations of people (cities towns and census designated places) and maintains them in operational condition. The sirens are operated and are regularly tested using a centralized system.

Natural Resource Protection

- Nine homes were acquired in the Little Wabash River floodplain.
- Current facility maps and response plans are on file for all Tier II HazMat facilities.

Prevention

- Elkhart County LEPC provides training regarding the proper storage, transport, and disposal of hazardous materials.
- Information related to natural hazards has been incorporated into plans and guidance materials to better guide future growth and development.
- The county is using the FEMA RAPT tool to identify areas of special needs populations within the county.

Property Protection

- Drainage system maintenance, including repair and replacement of culverts, occurs routinely throughout the county.
- A countywide flood response plan was developed and implemented in 2019.
- Reduced the frequency of nuisance flooding through the removal of the low head dam in Elkhart.
- Critical facilities have been moved to Victory Noll Hill.

Public Information

- Outreach materials and hazard preparedness materials are routinely provided online, within offices and agencies in Elkhart County, at large public events, speaking opportunities within schools, etc.)
- The EMA and response agencies utilize websites and social media to convey messages to the public prior to, during and following hazardous events.
- Elkhart County communities utilize applications and social media pages to keep the community members informed.
- The EMA presented at the Elkhart University Emergency Management Program.
- The EMA staff worked with local Boy Scout Troops to help them earn their emergency management badges.

Structural Control

- County drainage ditches are cleared and are maintained to prevent localized flooding, increased erosion, and material deposition because of rainfall or snowmelt.
- Utilities throughout the county perform routine tree canopy maintenance along rights of way to reduce damages from trees to electrical lines as well as nearby structures.
- Utilities have been burying lines in new developments and new construction to reduce the impact of hazards.

4.2.2 Proposed Mitigation Practices

After reviewing existing mitigation practices, the Committee reviewed mitigation ideas for each of the hazards studied and identified which of these they felt best met their needs as a community according to selected social, technical, administrative, political, and legal criteria. The following identifies the key considerations for each evaluation criteria:

- **Social** – mitigation projects will have community acceptance, they are compatible with present and future community values, and do not adversely affect one segment of the population.
- **Technical** – mitigation projects will be technically feasible, reduce losses in the long-term, and will not create more problems than they solve.
- **Administrative** – mitigation projects may require additional staff time, alternative sources of funding, and have some maintenance requirements.
- **Political** – mitigation projects will have political and public support.
- **Legal** – mitigation projects will be implemented through the laws, ordinances, and resolutions that are in place.
- **Economic** – mitigation projects can be funded in current or upcoming budget cycles.
- **Environmental** – mitigation projects may have negative consequences on environmental assets such as wetlands, threatened or endangered species, or other protected natural resources.

Table 31 lists a summary of all proposed mitigation practices identified for all hazards, as well as information on the local status, local priority, benefit-cost ratio, project location, responsible entities, and potential funding sources, associated with each proposed practice. The proposed mitigation practices are listed in order of importance to Elkhart County for implementation. Projects identified by the Committee to be of "high" local priority may be implemented within five years from final Plan adoption. Projects identified to be of "moderate" local priority may be implemented within 5-10 years from final Plan adoption, and projects identified by the Committee to be of "low" local priority may be implemented within 10+ years from final Plan adoptions. However, depending on availability of funding, some proposed mitigation projects may take longer to implement.

As part of the process to identify potential mitigation projects, the Planning Committee weighed the benefit derived from each mitigation practice against the estimated cost of that practice. This basic benefit-cost ratio was based on experience and professional judgement and was utilized to identify the mitigation practices as having a high, moderate, or low benefit-cost ratio. Preparing detailed benefit-cost ratios was beyond the scope of this planning effort and the intent of the MHMP.

The update of this MHMP is a necessary step of a multi-step process to implement programs, policies, and projects to mitigate the effect of hazards in Elkhart County. The intent of this planning effort was to identify the hazards and the extent to which they affect Elkhart County and to determine what type of mitigation strategies or practices may be undertaken to mitigate these hazards. A FEMA-approved MHMP is required to apply for and/or receive project grants under the BRIC, HMGP, and FMA. Although this MHMP meets the requirements of DMA 2000 and eligibility requirements of these grant programs additional detailed studies may need to be completed prior to applying for these grants. **Section 5.0** of this plan includes an implementation plan for all high priority mitigation practices identified by the Committee.

The CRS program credits NFIP communities a maximum of 97 points for setting goals to reduce the impact of flooding and other known natural hazards (2 points); identifying mitigation projects that include activities for prevention, property protection, natural resource protection, emergency services, structural control projects, and public information (up to 95 points).

Table 31. Proposed Mitigation Measures

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Stormwater 1. Minimize impacts of flooding by diverting or retaining Stormwater on site using green infrastructure practices 2. Maintain channels and regulated drains to prevent localized flooding 3. Educate community and leaders about the value of wetlands and their relationship to SWQMP (Storm water Quality Management Plan)	☐ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☒ Structural Control	☐ Drought ☐ Earthquake ☐ Extreme Temperature ☐ Fire ☒ Flood ☐ Hail/Thunder/Wind ☐ Landslide/Subsidence ☐ Tornado ☐ Winter Storm/Ice ☐ Dam Failure ☐ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☐ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1. MS4 program is actively working to reduce impacts of flooding. 2. Maintaining regulated drains and channels. **Proposed Enhancements –** 1. Continue to implement practices outlined in the SWQMP and enforce applicable stormwater ordinances. 2. Continue to maintain channels and regulated drains to prevent localized flooding 3. Educate community and leaders about the value of wetlands and their relationship to SWQMP (Storm water Quality Management Plan)	High - #1, #3 Medium - #2	Moderate to High	MS4 program leads – City of Elkhart, City of Goshen, Town of Bristol, Elkhart County and Elkhart Co SWCD County Surveyor	General Budget Stormwater Utility Fund
Management of High Hazard Dams 1. Review regular inspection and maintenance records of high hazard dams regardless of ownership 2. Complete the IEAP Annual Exercise 3. Protect existing critical facilities in dam break inundation areas 4. Establish hazard overlay zones in the zoning ordinance to restrict development, especially critical structures, in known hazard areas or require setbacks of noncritical structures 5. Encourage the use of innovative planning tools such as open space planning, cluster development, low impact development, greenways development, and conservation easements to limit development in known hazard areas. 6. Incorporate hazard information, risk assessment, and hazard mitigation practices into the Comprehensive Land Use Plan and Development Review to better guide future growth and development 7. Consider the removal of 2 low head dams in the county. 8. Renew IEAPs 6 years old and older 9. Retain riparian buffers whenever dams are removed.	☒ Emergency Services ☐ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☒ Structural Control	☐ Drought ☐ Earthquake ☐ Extreme Temperature ☐ Fire ☐ Flood ☐ Hail/Thunder/Wind ☐ Landslide/Subsidence ☐ Tornado ☐ Winter Storm/Ice ☒ Dam Failure ☐ HazMat Incident	☒ Safety and Security ☐ Food, Water, Shelter ☐ Health & Medical ☐ Energy ☐ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1. City of Goshen recently completed updates on the Goshen Pond Dam. **Proposed Enhancements –** 1.Ensure inspections are and reported and required improvements and repairs are completed in a timely manner. 2.Encourage and/or complete IEAP annual exercise for existing High Hazard dams - Elkhart Dam (Electric Co Owned), Goshen Pond (govt owned) 3.Utilize inundation areas to evaluate the appropriateness of proposed locations of new critical infrastructure 4.Increase the number of hazards considered, more definitively outline higher risk areas and those that should be avoided for future development 5.Provide stronger encouragement of innovation, especially in hazard areas 6.Review plans and incorporate hazard planning in each area 7.Consider the removal of 2 low head dams in the county. 8.Renew IEAPs 6 years old and older 9.Retain riparian buffers whenever dams are removed	High - #1, #2, #3, #5, #7, #8 Medium - #4, #6, #9	High	County EMA City of Goshen City of Elkhart Planning and Zoning Departments of County and the cities and towns.	General Budget DNR Grant for IEAP US Fish and Wildlife Grant

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Hazardous Materials 1. Maintain LEPC reporting and training efforts as required through SARA Title III and ensure current facility maps and response plans are on file for Tier II facilities. 2. Increase digital capabilities to share facility maps, response plans, and associated files between various response agencies 3. Conduct Hazardous Materials exercise with all departments. 4. Train all fire departments on the Tier II program and secure logons for each department. 5. Improve Countywide Hazardous material response Hold a technician level class in the county	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	☐ Drought ☐ Earthquake ☐ Extreme Temperature ☐ Fire ☐ Flood ☐ Hail/Thunder/Wind ☐ Landslide/Subsidence ☐ Tornado ☐ Winter Storm/Ice ☐ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☐ Communications ☒ Transportation ☒ Hazardous Materials	Ongoing – 5. Goshen is expanding their technician level staff. Proposed Enhancements – 1. Efforts should be strengthened to ensure tier II requirements are met. 2. The local HMRT should be maintained with adequate staff and supplies such as collaborative digital capabilities for planning, response and recovery 3. Conduct Hazardous Materials exercise with all departments. 4. Train all fire departments on the Tier II program and secure logons for each department. 5. Improve Countywide Hazardous material response - Hold a technician level class in the county	High - #2, #3, #5 Medium - #4 Low - #1	High	LEPC Chair County EMA City of Elkhart and City of Goshen Hazardous Materials Teams I	HMEP Grants FEMA Training an Assistance to Firefighters Grants OCRA grant funding Township Fire Department Budgets

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Emergency Preparedness and Warning 1. Inventory mobile and permanent electronic messaging boards and develop protocol to provide current hazard information. 2. Coordinate with private business owners utilizing large dynamic message boards for business to provide messages during hazardous events and recovery efforts. 3. Improve planning and coordination among event coordinators, facility owners, and emergency response teams 4. Evaluate and utilize flood forecasting capabilities including stream gages, flood forecast maps, and flood alerts 5. Convey flood height warnings from the USGS river gages in terms the general public can understand 6. Evaluate outdoor warning sirens coverage to determine if adequate to alert population of severe weather conditions 7. Develop a centralized system for testing, maintenance, and operation of outdoor warning sirens 8. Propose and adopt an ordinance to require developers for new developments to pay into a siren fund. 9. Require weather radios in all critical infrastructure and encourage use by residents and businesses. 10. Improve disaster preparedness and emergency response at the local level through the CERT program. 11. Explore alternative ways to provide warnings to visually and hearing-impaired community members 12. Large events planning process should be improved and involve all potential entities. 13. Request additional gauges on St. Joseph River and Elkhart River for better forecasts and earlier warnings. 14. Conduct outreach efforts to help people understand flood height warning terms and what it means to community members. 15. Continue providing smoke detectors and fire safety training and include CO detectors and education as well. 16. Add antennas and repeaters to enhance the RACES communications system. Consider equipment needs for the EOC base locations as well. 17. Update command vehicle communications with equipment updates	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	☒ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☒ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1 Project was not started **Proposed Enhancements –** 1. Complete inventory and develop protocol 2. Coordinate with private business owners 3. Improve planning and coordination following events 4. Evaluate and increase flood forecasting abilities 5. Discuss flood height warnings in easy-to-understand terms 6. Complete evaluation of siren coverage 7. Develop centralized system for testing and maintenance of outdoor warning sirens 8. Adopt outdoor warning siren ordinance to establish fund 9. Increase use of weather radios 10. Increase number of CERT certified representatives 11. Explore alternative ways to provide warnings to visually and hearing-impaired community members 12. Large events planning process should be improved and involve all potential entities. 13. Request additional gauges on St. Joseph River and Elkhart River for better forecasts and earlier warnings. 14. Conduct outreach efforts to help people understand flood height warning terms and what it means to community members. 15. Continue providing smoke detectors and fire safety training and include CO detectors and education as well. 16. Add antennas and repeaters to enhance the RACES communications system. Consider equipment needs for the EOC base locations as well. 17. Update command vehicle communications with equipment updates	High # 1, #3,#4, #6, #7, #10, #12, #13 Medium – #11, #14, #15, #16, #17 Low - #2, #5, #8, #9	High to Moderate	County EMA Township, City, and Town Fire Chiefs Planning Department – Events Permitting Floodplain Administrators from County and Cities and Towns	General Budget Community Foundation Grants Special Interest Groups/ Fraternal Organizations

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Transportation 1. Require warning at each intersection between rail and road to reduce the potential for train/vehicular crashes. 2. Develop a traffic diversion plan 3. Consider conducting a study for elevating railroad crossing due to frequent trains stopping at crossing causing 3–4-mile detours	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	☒ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☐ Communications ☒ Transportation ☐ Hazardous Materials	**Ongoing –** **Proposed Enhancements –** 1. Inventory crossings and install devices as able. 2. Develop a traffic diversion plan. 3. Consider conducting a study for elevating railroad crossing due to frequent trains stopping at crossing causing 3–4-mile detours	High – #1 Medium - #2, #3	Moderate to High	County EMA Law Enforcement	General budgets Safe Streets Programs Philanthropic Organizations
Emergency Response and Recovery 1. Add mobile data terminals to emergency response vehicles 2. Maintain a database of accurate and community specific information following each hazard event including extent, magnitude, cost, response, and recovery efforts 3. Inventory positions and level of training needed to increase the personnel available to identify and assess a hazmat situation 4. Develop and implement a voluntary immunization program for all emergency responders, inspection staff, and families 5. Increase supply reserves for basic personal protective equipment to be utilized following a hazard event or resulting mass casualty 6. Establish procedures to alert and evacuate the population in known hazard areas. 7. Increase water rescue capabilities with staff training and additional equipment to include but not be limited to boat, life vests, dry suits and decontamination equipment. 8. Identify existing boat launch areas and improve areas for easier access to launch rescue vessels. 9. Acquire the Plymouth MCI trailer and additional supplies as needed	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☐ Property Protection ☒ Public Information ☐ Structural Control	☒ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☐ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1. MDTS are still needed, continue with action. **Proposed Enhancements –** 1. Complete inventory of mobile data terminal needs 2. Establish standard protocols for documentation and sharing of hazard information 3. Determine need for training 4. Develop enhanced immunization program 5. Increase the supply 6. Establish procedures 7. Increase water rescue capabilities with staff training and additional equipment to include but not be limited to boat, life vests, dry suits and decontamination equipment. 8. Identify existing boat launch areas and improve areas for easier access to launch rescue vessels. 9. Acquire the Plymouth MCI trailer and additional supplies as needed	High - #3, #6, #7 Medium - #1, #2, #5, #8, #9 Low - #4	High	County EMA All County Fire Chiefs Police Chiefs and Sherriff County 911/ Communication Center City of Elkhart Communication Center Health Department	Health Grants Assistance to Firefighter Grants Foundation Grants IPSIC(State Communication Lead)
Power Back Up Generators 1. Investigate potential fuel reserves to ensure critical infrastructure can run on power back-up generators for extended periods of time 2. Encourage power back-up generators in all critical infrastructure 3. Retrofit public facilities and/or critical infrastructure with appropriate wiring and electrical capabilities (including transfer switch) for utilizing a large generator for power back-up 4. Explore utilization and acquisition of a solar generator trailer.	☒ Emergency Services ☐ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☐ Structural Control	☐ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☒ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1. **Proposed Enhancements –** 1. Investigate and develop contractual agreements with fuel providers 2. Encourage new critical infrastructure is constructed with generator capabilities as feasible 3. Retrofit facilities as prioritized and as funding is available 4. Explore utilization and acquisition of a solar generator trailer.	High - #4 Medium - #1, #2, #3	Moderate	County EMA City and Town Building and Planning Departments.	FEMA BRIC Grants State Revolving Loan Funds General Budget Donations

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Building Protection 1. Prohibit development of new critical infrastructure in known hazard areas 2. Protect existing critical structures in floodplains 3. Relocate, buyout, or floodproof (non-residential) existing non-critical structures that are subject to repetitive flooding. (2007 Measure) 4. Increase setbacks in high hazard areas 5. Consider developing a tornado strapping program for mobile and manufactured homes	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☐ Public Information ☒ Structural Control	☐ Drought ☒ Earthquake ☐ Extreme Temperature ☐ Fire ☐ Flood ☒ Hail/Thunder/Wind ☐ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☐ Dam Failure ☐ HazMat Incident	☒ Safety and Security ☐ Food, Water, Shelter ☒ Health & Medical ☒ Energy ☒ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** **Proposed Enhancements –** 1. Continue to prohibit development within floodplains. 2. Study and implement protection measures 3. Prioritize structures located in floodplains or other known hazard areas and work with facility owners to relocate, buyout, or floodproof these structures to a minimum of 500-year protection with flood-free access. 4. Increase setbacks in high hazard areas 5. Consider developing a tornado strapping program for mobile and manufactured homes	High – #3 Medium - #4, #5 Low - #1. #2,	Moderate	EMA Planning and Zoning Departments of Cities and County City Town and County Floodplain Administrators	General Budget IDHS HMGP Grants FEMA BRIC Code Plus Program Grants
Safer Rooms and Community Shelters 1. Clearly advertise or announce locations of safe rooms and community shelters for large gatherings of people. (football games, 4H Fair, etc.) 2. Develop temporary and/or long-term shelter agreements within the County 3. Encourage safe rooms and community shelters in vulnerable locations 4. Provide educational materials and information related to safe room features and standards 5. Create a countywide events planning process and include safe areas designations as a part of that process 6. Consider increasing emergency capacity for sheltering pets and medically needy clients 7. Review and enhance shelter agreements to ensure availability and ADA access 8. Explore short term housing capacity building and prepare documentation to avoid loss of institutional memory when management changes take place.	☒ Emergency Services ☐ Nat. Res. Protection ☐ Prevention ☐ Property Protection ☐ Public Information ☒ Structural Control	☒ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☐ Health & Medical ☐ Energy ☐ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1. The fire departments are set up for short term shelters. **Proposed Enhancements –** 1. Increase announcements and postings indicating the location of safe areas during large gatherings and events 2. Increase the number of "pet friendly" shelters and shelters that are capable of housing moderate medically needy clients 3. During pre-construction meetings for buildings in vulnerable locations, encourage the development of a safe room or safer area 4. Create and distribute materials 5. Create a countywide events planning process and include safe areas designations as a part of that process 6. Consider increasing emergency capacity for sheltering pets and medically needy clients 7. Review and enhance shelter agreements to ensure availability and ADA access 8. Explore short term housing capacity building and prepare documentation to avoid loss of institutional memory when management changes take place.	High – #5 Medium – #1, #2, #6 Low - #3, #4, #7, #8	Moderate	County EMA Building and Planning Depts. City and County Public Information offices and Outreach teams from City of Elkhart, City of Goshen City of Nappanee, and the towns of Bristol, Middlebury, Millersburg and Wakarusa	General Budget Churches/ Shelter Locations Donations
Community Rating Service (CRS) 1. Reduce flood insurance premiums through increased participation or advancement in the NFIP's CRS Program. *(2007 Measure)* (Will assist with NFIP compliance)	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☒ Structural Control	☐ Drought ☐ Earthquake ☐ Extreme Temperature ☐ Fire ☒ Flood ☐ Hail/Thunder/Wind ☐ Landslide/Subsidence ☐ Tornado ☐ Winter Storm/Ice ☒ Dam Failure ☐ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☐ Health & Medical ☐ Energy ☐ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** **Proposed Enhancements –** 1. Encourage participation in the CRS program through education and outreach with the floodplain administrators from Elkhart County or other municipalities	Medium - #1	High	City County and Town Floodplain Administrators County EMA	General Budget FEMA CRS Outreach Team

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Public Education and Outreach 1. Provide multi-lingual hazard preparedness literature (warning sirens, radio stations, go-kits, insurance protection, lightning rods, etc.) during Severe Weather Awareness Week, at public facilities and events and to populations within known hazard areas such as floodplains, downstream of a dam, near hazmat facilities, etc. (2007 Measure) 2. Educate the population in known hazard areas 3. Insert safety brochure or information in local utility bills or community newsletters 4. Post information/warning signs in local parks and other public gathering places explaining what to do in case of a hazard event. 5. Maintain StormReady designation 6. Make available weather radio programming for citizens at various community events. 7. Establish a training program for new community leaders (cities, towns and county leaders) 8. Develop a flood response plan to inform downstream property owners and communities about flood risks	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☐ Structural Control	☒ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☐ Energy ☐ Communications ☐ Transportation ☐ Hazardous Materials	**Ongoing –** 1. The EMA provides year-round outreach materials through social media. **Proposed Enhancements –** 1. Encourage the enhancement of the messages provided to various cultural groups and neighborhoods. 2. Educate landowners within the dam inundation areas of the potential dangers and what to do in an emergency. Such as encourage voluntary purchase of federally subsidized flood insurance; formalize a neighborhood or local campaign where community representatives familiar with the culture and language provide residents with emergency information and protocols. 3. Provide hazard related information through utility bill inserts or a community newsletter 4. Post information in public places that describes what should be done and where to go during a hazard event 5. Maintain StormReady designation 6. Make available weather radio programming for citizens at various community events. 7. Establish a training program for new community leaders (cities, towns and county leaders) 8. Develop a flood response plan to inform downstream property owners and communities about flood risks	Medium #2, #3, #4, #5, #6, #7, #8 Low #1	Moderate	County EMA County EMS Health Dept. and Hospital City of Goshen Floodplain Administrator and Public Information Office City of Elkhart Floodplain Administrator and Public Information Office	FEMA HMGP Grants and Materials District Health Coalition Donations Foundation Grants
Geographic Information Systems (GIS) 1. Update and coordinate GIS layers with location and attributes of critical infrastructure 2. Train GIS staff in HAZUS-MH to quantitatively estimate losses in "what if scenarios" and continue to use the most recent GIS data in land use planning efforts.	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☒ Structural Control	☒ Drought ☒ Earthquake ☒ Extreme Temperature ☒ Fire ☒ Flood ☒ Hail/Thunder/Wind ☒ Landslide/Subsidence ☒ Tornado ☒ Winter Storm/Ice ☒ Dam Failure ☒ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☒ Health & Medical ☒ Energy ☒ Communications ☒ Transportation ☒ Hazardous Materials	**Ongoing –** **Proposed Enhancements –** 1. Coordinate consistent layers county-wide 2. Additional training for GIS staff	Medium - #1 Low - #2	High	GIS leaders – County, City of Elkhart and City of Goshen	General budget

Mitigation Practice	Mitigation Strategy	Hazard Addressed	Lifeline Addressed	Status	Priority	Benefit-Cost Ratio	Responsible Entity	Funding Source
Floodplain Management 1. Conduct detailed flood protection studies for focused flooding problem areas and/or areas with repetitive flooding problems 2. Support FEMA flood depth mapping (Risk MAP) to better understand the flood risk potential 3. Complete a Floodplain Prioritization Study for unstudied streams in Elkhart County 4. Encourage restoration of the natural stream corridor in new and redevelopment projects 5. Conduct detailed hydraulic analyses of areas with repetitive flooding problems, unstudied, understudied, and unnumbered Zone A streams to determine exact floodplain boundaries. (2007 Measure) 6. Complete fluvial erosion hazard mapping to identify and protect critical infrastructure that may be impacted by natural stream movement	☒ Emergency Services ☒ Nat. Res. Protection ☒ Prevention ☒ Property Protection ☒ Public Information ☒ Structural Control	☐ Drought ☐ Earthquake ☐ Extreme Temperature ☐ Fire ☒ Flood ☐ Hail/Thunder/Wind ☒ Landslide/Subsidence ☐ Tornado ☐ Winter Storm/Ice ☐ Dam Failure ☐ HazMat Incident	☒ Safety and Security ☒ Food, Water, Shelter ☐ Health & Medical ☐ Energy ☐ Communications ☒ Transportation ☐ Hazardous Materials	**Ongoing –** **Proposed Enhancements –** 1. Implement flood protection study recommendations as feasible 2. Participate in Risk MAP process and utilize products for future planning, growth, and ordinance development 3. Complete a prioritization study 4. Provide incentives for restoration 5. Conduct additional studies 6. Investigate fluvial hazard mapping process	Medium #1 Low - #2, #3, #4, #5, #6	High to Moderate	County, City and Town Floodplain Administrators County Surveyor MS 4 Programs from Cities, Towns, and County Floodplain and MS$ program leaders for cities, Towns and County	INAFSM USDA DNR OCRA Surveyor Budget

5.0 IMPLEMENTATION PLAN

The following is a proposed plan for implementing all high priority mitigation practices identified in this Plan. It should be noted that implementation of each of these proposed practices may involve several preparatory or intermediary steps. However, to maintain clarity, not all preparatory or intermediary steps are included. Medium and low priority categories are listed but will not show implementation steps. Implementation steps for the medium and low priority actions will be developed as the actions draw closer to execution.

5.1 STORMWATER

Continue to implement practices outlined in the SWQMP and enforce applicable stormwater ordinances.

- Examine current implementation processes and enforcement processes of the applicable stormwater ordinances
- Identify what is working well and where challenges exist. Identify those provisions of the ordinance that are most frequently not in compliance.
- Identify ways which the compliance issues can be addressed such as increased education, introductions to best practices employed by others in similar industry, more frequent site inspections, etc.
- Celebrate successes with companies and organizations which are doing well in the plan implementation. .

Educate community and leaders about the value of wetlands and their relationship to SWQMP (Storm water Quality Management Plan)

- Identify the target audience members and their preferred learning style and background.
- Prepare a mix of direct learning opportunities such as classes and/or presentations and indirect learning opportunities such as site visits or visits from a community which is finding great benefit from wetlands and their integration into the SWQMP.
- Create an outreach schedule to spread the information out over time and make the learning process a natural part of the everyday opportunities for the community leaders.

5.2 MANAGEMENT OF HIGH HAZARD DAMS

Ensure inspections are and reported and required improvements and repairs are completed in a timely manner.

- Identify on a calendar when inspections are due and monitor inspection report submissions to the EMA by the DNR. Or reach out to dam owners and request a copy of their inspection reports when they receive the report form their engineering firm or state inspector.
- Monitor required repairs identified in the inspection report.
- Encourage dam owner compliance and if possible, help them identify potential funding assistance for required repairs.

Encourage and/or complete IEAP annual exercise for existing High Hazard dams - Elkhart Dam (Electric Co Owned), Goshen Pond (govt owned)

- Reach out to dam owners either via phone call or email. Provide updated contact information for the notification processes outlined in the IEAP.
- Inquire when an exercise will be held.
- Consider ways to make exercise process easier for dam owners such as hosting a dam safety day where multiple plans can be exercised on the same day.

Utilize inundation areas to evaluate the appropriateness of proposed locations of new critical infrastructure.

- Incorporate the dam breach inundation areas in the flood hazard maps for the area.
- Encourage building staff and permits staff to become familiar with the specific site inundation areas and what each area means.
- Actively discourage construction of critical facilities in or near the inundation and flood prone areas, identified on the GIS maps.

Provide stronger encouragement of the use of innovative planning tools such as open space planning, cluster development, low impact development, greenways development, and conservation easements , especially in hazard areas

- Identify potential incentives the communities can provide to developers and planners.
- Host an outreach event highlighting an innovative planning tool and show the financial benefits of investing in these technologies.
- Identify resources where planners and developers can get assistance in implementing one the of technologies.

Consider the removal of 2 low head dams in the county.

- Identify ownership of the low head dam structures and their current purpose if any.
- Reach out to US Fish and Wildlife, IN DNR LARE program, and similar programs to identify what kind of funding and permits are required to complete a removal.
- Seek out contactors to provide estimates for the removal of the low head dam as well as restoration of the stream to natural functionality and conditions.

Renew IEAPs 6 years old and older

- Identify dam owners which currently have IEAPs in place or who are required to have IEAPs.
- Reach out to the dam owners making them aware of the 6-year renewal requirement outlined in the recent state law changes.
- Volunteer to provide updated contact information and directions to how to go about updating the dam breach inundation modeling and IEAP updates.

5.3 HAZARDOUS MATERIALS

The local HMRT (Hazardous Materials Response Team) should be maintained with adequate staff and supplies such as collaborative digital capabilities for planning, response and recovery

- Bring together hazardous Materials Response Teams and identify minimum membership requirements and ideal staffing levels desired.
- Evaluate current levels of staffing and identify any challenges to maintaining staff levels.

- Develop an inventory of supplies and costs. Prioritize the inventory as well as including potential funding sources for each item.

Conduct Hazardous Materials exercise with all departments

- Plan a hazardous materials exercise which includes agencies and departments with lesser hazardous materials response capabilities to increase understanding of roles each agency is expected to fulfill.
- Identify training gaps and planning gaps at the exercise and use the gap analysis to structure future training and equipment purchases to fill gaps.
- Conduct the exercise with adequate prior notice for maximum participation. Set future exercise schedules to involve those who may have not been able to participate in prior events.

Improve Countywide Hazardous material response - Hold a technician level class in the county

- Determine interest in technician level training and availability to attend class.
- Identify costs and potential ways to reduce costs for each agency participating.
- Advertise well in advance of the course dates and registration. Make training location accessible for all communities/fire departments and agencies to be able to attend.

5.4 EMERGENCY PREPAREDNESS AND WARNING

Inventory mobile and permanent electronic messaging boards and develop protocol to provide current hazard information.

- Update existing inventory or sign/messaging boards and categorize by fixed and mobile.
- Organize a team to develop the protocol for board utilization and access. Include representatives of the board owners as well as agencies that will be posting hazard information and messages on the boards.
- Adjust general protocol to address specific issues associated with fixed boards vs mobile boards. Include items such as set up, message length, message construction, duration of postings, return to normal operations and return to owners.

Improve planning and coordination among event coordinators, facility owners, and emergency response teams, and community agencies.

- Bring all communities which have a coordination process in place together to discuss current existing processes and protocols.
- Identify differenece and minimum requirements which all communities will need to assure the planning process is effective and meets all the various community and county agency needs.
- Prepare a process for the entire county to use which is consistent with the minimum requirements. Individual communities may then add community specific ad-ons as needed.

Evaluate and increase flood forecasting abilities including but not limited to stream gages, flood alerts, and flood forecast maps.

- Identify all the current flood forecasting capabilities within Elkhart County, both countywide and location specific.
- Identify what additional forecasting capabilities are needed and location of those needs.
- Examine newer technologies, forecasting abilities used in other communities both in Indiana and out of state, and evaluate usefulness of those abilities to meet the needs of Elkhart County and its communities.
- Prioritize capabilities and procure as funding allows.

Complete the evaluation of siren coverage.

- Review existing siren coverage doucmentation. Determine the validity of the existing information for the current evaluation.
- Complete any technical documentation and/or testing to verify coverage of each siren.
- Identify siren coverage gaps and any at risk populations which would benefit from outdoor warnings in their area. Prioritize areas and identify the type of sirens that would best serve the area(s) of interest.

Develop centralized system for testing and maintenance of outdoor warning sirens

- Inventory siren ownership and maintenance responsibilities. Review existing protocols and maintenance schedules, replacement schedules, etc.
- Identify any similarities in processes and schedules which currently exist.
- Form a team to develop a unified system which all siren owners will utilize to test and maintain the outdoor warning sirens under their control.

Increase number of CERT certified representatives

- Reach our to potential membership groups, including large businesses and industries in the area, and invite them to become a part of the CERT team. Include a clear definition of expectations and responsibiities of members as well as benefits of membership.
- Schedule a CERT open house and invite community members to visit. Encourage attendace with small give aways, coupons to local eateries, etc.
- Post a listing of CERT training opportunities that include various days of the week and times of day to encompass the potential volunteer pool.

Large events planning process should be improved and involve all potential entities.

- Identify all agencies which have an interest in large events occuring in the communities in Elkhart County. This should include health department, fire departments, buidling and soning, permitting, etc.
- Have each agencies identify the interest they have and processes which are employed and timing of those processes. Include lead times needed and any inspections, personnel on site, etc. that would require coordination with the event managers and promoters.
- Prepare a planning process document the includes applications, notifications, lead times and turnaround times for permits so both community planners as well as event promoters are aware of the process and what will be needed to make the process flow smoothly.

Request additional guages on St. Joseph River and Elkhart River for better forecasts and earlier warnings.

- Identify desired locations and reasoining for those particular locations. Also identify potential owners/sponsors of the guages.
- Determine the type of guages desired. Remote, continuous readout, staff guages read by local community members, or something in between.
- Reach out to the USGS and DNR Division of Water to inform them of the need and desire to explore with the agencies the potential for installation of one or more guages.
- Secure funding for intial purchase as well as long term operation and maintenance costs.

5.5 TRANSPORATION

Inventory railroad crossings and install safety devices as able

- Use GIS to identify the location of all the railroad corssings in the county.
- Evaluate the need for safety devices at each location. (crossing arms and alarms, just flashing lights and bells, stop signs, etc.) Include in the evaluation any recent, within the last 5 year minimum, incidents at the crossing.
- Prioritize the crossings based on highest risk as well as type of safety device needed.
- Identify cost for each safety mechanism and installation. Identify funding sources to procure and install devices.

5.6 EMERGENCY RESPONSE AND RECOVERY

Inventory positions and level of training needed to increase the personnel available to identify and assess a hazmat situation. Determine the need for training.

- Using current state and federal training requirements, identify the types of positions that fall under each training certification classification.
- Review existing staffing levels, training certifications, and desired response capability.
- Identify gaps between desired response capabilities and current training levels for each agency/fire department.
- Identify the number of courses required to achieve the desired response capabilities and determine interest in attending the needed classroom and practical skills training .

Establish procedures to alert and evacuate the population in known hazard areas

- Working with GIS office, identify known hazard areas – floodplains, dam inundation areas, proximity to a Tier II or hazardous materials facility.
- For each hazard area identify critical and essential facilities, major infrastructure which would be impacted, businesses and residences located within.
- Identify a variety of notification methods (redundant methods) to be used to notify the impacted community. Prepare statements about the emergency situation at hand and where to find instructions on what to do, where to go, how to get there and what they should take with them. Make clear the best routes as well as routes to not take.

Increase water rescue capabilities with staff training and additional equipment to include but not be limited to boat, life vests, dry suits and decontamination equipment.

- Inventory training needs of water rescue staff including level or training and well as team capabilities desired.
- Inventory existing water rescue equipment. Assess condition of equipment which may need to be replaced as well as equipment needs to fulfill the mission safely.
- Prioritize equipment needs, identifying costs as well as potential funding sources available.

5.7 ENERGY SECURITY - POWER BACKUP GENERATORS

Explore utilization and acquisition of a solar generator trailer.

- Identify communities which have experience using trailer mounted solar generators . Contact the communities to determine the effectiveness of the units, duration of ownership and use, and challenges or learning experiences to be shared. Select a variety of locations including some in the Midwest, if possible, with similar sunlight conditions.
- Identify locations that would most benefit from a solar generator and their power needs. Does the facility already have back up power hook ups available? Would this be a primary or back up power source during an event?
- Evaluate cost of the units compared to gasoline, diesel, propane and/or natural gas-powered units. Include maintenance costs and well as fueling costs to determine a potential break even point using solar vs fossil fuels.

5.8 BUILDING PROTECTION

Prioritize structures located in floodplains or other known hazard areas and work with facility owners to relocate, buyout, or floodproof these structures to a minimum of 500-year protection with flood-free access.

- Using the GIS create a listing of facilities, businesses, industry and homes .located in the hazardous areas.
- Identify those at most risk based on life safety and property protection. Create a priority list base on the risks.
- Using the priority list, determine if a long-term solution is available to protect the structure and/or the people in the structure. Identify pros and cons for each solution and the viability of deploying each solution for the particular structure.

5.9 SAFE ROOMS AND SHELTERS

Create a countywide events planning process and include safe areas designations as a part of that process

- Form a countywide committee to prepare a unified event planning process.
- Use existing processes and include all agencies which would have an interest in the event including but not limited to fire department, law enforcement, health department, permitting, etc.
- Using the county wide events planning process, identify locations that could serve as safe areas for guests and visitors during the event. Identify the amount of space available,

ADA accessibility, ease of access during the event, and notification means to alert people where to go.

5.10 COMMUNITY RATIING SERVICE (CRS)

This category is a medium priority. Implementation steps will be identified when the community is ready to proceed with the mitigation action.

5.11 PUBLIC EDUCATION AND OUTREACH

This category is a medium priority. Implementation steps will be identified when the community is ready to proceed with the mitigation action.

5.12 GEOGRAPHIC INFORMATION SERVICES (GIS)

This category is a medium priority. Implementation steps will be identified when the community is ready to proceed with the mitigation action.

5.13 FLOODPLAIN MANAGEMENT

This category is a medium priority. Implementation steps will be identified when the community is ready to proceed with the mitigation action.

6.0 PLAN MAINTENANCE PROCESS

6.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

REQUIREMENT §201.6(c)(4)(i):

[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

To effectively reduce social, physical, and economic losses in Elkhart County, it is important that implementation of this MHMP be monitored, evaluated, and updated. The EMA Director is ultimately responsible for the MHMP. As illustrated in Section 4.2 Mitigation Practices, this Plan contains mitigation program, projects, and policies from multiple departments within each incorporated community. Depending on grant opportunities and fiscal resources, mitigation practices may be implemented independently, by individual communities, or through local partnerships. Therefore, the successful implementation of this MHMP will require the participation and cooperation of the entire Committee to successfully monitor, evaluate, and update the Elkhart County MHMP.

The EMA Director will reconvene the MHMP Committee on an annual basis and following a significant hazard incident. The team will examine each mitigation action within the plan to evaluate its effectiveness answering the following questions:

- Has the nature, magnitude, and/or type of risk changed? If so, what new mitigation actions are needed to address this change?
- Are the current resources appropriate for implementation? If not, what additional resources are needed to address the shortfall?
- Are there implementation problems, such as technical, political, legal, or coordination issues with other agencies? How can these issues be addressed?
- Have the outcomes occurred as expected? If not, is something else needed to achieve the desired outcome?
- Have the agencies and other partners participated as originally proposed? If not, determine why and how the action outcomes can be met?

During the annual meetings, the Implementation Checklist provided in **Appendix 10** will be helpful to track any progress, successes, and problems experienced. This will also be a tool to follow up on the progress made and effectiveness of the planned actions.

The data used to prepare this MHMP was based on "best available data" or data that was readily available during the development of this Plan. Because of this, there are limitations to the data. As more accurate data becomes available, updates should be made to the list of essential facilities and infrastructure, the risk assessment, and vulnerability analysis.

DMA 2000 requires local jurisdictions to update and resubmit their MHMP within five years (from the date of FEMA approval) to continue to be eligible for mitigation project grant funding. In Elkhart County, the EMA Director will once again reconvene the MHMP Committee for a series of meetings designed to replicate the original planning process. Information gathered following individual hazard incidents and annual meetings will be utilized along with updated vulnerability assessments to assess the risks associated with each hazard common in Elkhart County. These hazards, and associated mitigation goals and practices will be prioritized and detailed as in Section 3.0 this MHMP. Sections 4.0 and 5.0 will be updated to reflect any practices implemented within the interim as well as any additional practices discussed by the Committee during the update process. The plan update process will incorporate new planning guidance and best practices as planning requirements are updated.

Prior to submission of the updated MHMP, at a public meeting, such as the county commissioners meeting, a representative of the planning team will present information about the plan to residents of Elkhart County and will provide them an opportunity for review and comment of the draft MHMP. A media release will be issued providing information related to the update, the planning process, and details of the public invitation to review and comment on the plan update.

6.2 INCORPORATION INTO EXISTING PLANNING MECHANISMS

REQUIREMENT §201.6(c)(4)(ii):

[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as the comprehensive or capital improvements, when appropriate.

Many of the mitigation practices identified as part of this planning process are ongoing with some enhancement needed. Where needed, modifications will be proposed for each NFIP communities' planning documents and ordinances during the regularly scheduled update including comprehensive plans, floodplain management plans, zoning ordinances, site development

regulations, and permits. Modifications include discussions related to hazardous material facility buffers, floodplain areas, and discouraging development of new essential facilities and infrastructure in known hazard areas.

The MHMP will be used to update stormwater, subdivision and zoning ordinances based upon recommendations from the plan. For example, information in this plan provides documentation to encourage local officials to make changes to reduce release rates, protect floodplains, provide no net loss in special flood hazard areas, and manage erosion and sediment control. These measures would help mitigate flooding. New ordinances and studies could be initiated by the recommendations, such as flood studies, flood response studies, and watershed management studies to protect against floods. The information included in this plan can be very helpful in preparing comprehensive plans, transportation plans, and emergency plans to mitigate hazard material impacts and response to hazards such as tornados. These plans also illustrate the importance of planning on the unserved populations and how to develop mitigation efforts that include them in future plans.

In Elkhart County this is a similarly timed process. As the county or one of the Cities embarks upon their ordinance updates, information is shared with the incorporated communities. Each community, then, evaluates the materials provided and will seek adoption or incorporation on a similar schedule. This process has worked well in the past and is the anticipated method of future incorporation of materials into plan and ordinance updates. In a similar fashion the updating of comprehensive community plan, parks plans, etc. will be able to incorporate at risk population information as well as mitigation action opportunities. **Table 32** is an example of the process the communities use to incorporate planning elements into other community plans and ordinances.

Table 32 MHMP Incorporation Process

Step	Description of Process Action
1	Adopt MHMP at Commissioner Meeting, City Council Meeting, or Town Board Meeting
2	Identify document update cycles for each of the following:
	a) Comprehensive Plan b) Capital Improvement Plan c) Zoning Ordinances d) Floodplain Ordinance e) Stormwater Plans f) Other plans not listed above
3	Present applicable data to the planning team and team leads for inclusion
4	Highlight applicable mitigation actions to be included in the plan
5	Assist with incorporation and adoption of the plans, as needed.

6.3 CONTINUED PUBLIC INVOLVEMENT

REQUIREMENT §201.6(c)(4)(iii):

[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

Continued public involvement is critical to the successful implementation of the Elkhart County MHMP. Comments gathered from the public on the MHMP will be received by the EMA Director and forwarded to the MHMP Committee for discussion. Education efforts for hazard mitigation will be the focus of the annual Severe Weather Awareness Week as well as incorporated into existing stormwater planning, land use planning, and special projects/studies efforts. Once adopted, a copy of this Plan will be available for the public to review in the EMA Office and the Elkhart County website. Periodic reminder notices will be placed on social media to continue to solicit feedback and input on changes for the future plans.

Updates or modifications to the Elkhart County MHMP require a public notice, reconvening the planning committee in accordance with FEMA local mitigation planning guidance and meeting with the incorporated community leaders prior to submitting revisions to the individual jurisdictions for approval and re-adoption.

The CRS program credits NFIP communities a maximum of 28 points for adopting the Plan (2 points); establishing a procedure for implementation, review, and updating the Plan; and submitting an annual evaluation report (up to 26 points).

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