

# Lancaster County Hazard Mitigation Plan 2025 Update



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# EXECUTIVE SUMMARY

The 2025 Lancaster County Hazard Mitigation Plan (HMP) is an update to the 2019 county HMP, prepared in accordance with the Disaster Mitigation Act of 2000 (DMA 2000). DMA 2000 regulations require formal updates and adoptions of local plans every 5 years, reassessing risks, and updating local strategies to manage and mitigate those risks. States and local governments require a current approved HMP in order to remain eligible for certain pre-disaster mitigation grant funds and funds made available in the wake of federally declared disasters. DMA 2000 requires participating municipalities to document their hazard mitigation planning process and to identify hazards, potential losses, and mitigation goals and strategies.

The Lancaster County HMP represents the work of citizens, elected and appointed government officials, business leaders, and volunteer and nonprofit groups to protect community assets, preserve economic viability of the community, and save lives. Extensive outreach efforts by Lancaster County Department of Public Safety’s Emergency Management Division (LCEMD) resulted in participation by 58 of the county’s 60 municipalities, as listed in Table ES-1; Table ES-2 identifies how each jurisdiction participated. Upon completion and approval of the HMP, participating jurisdictions will continue to address and implement findings and recommendations of this plan update.

**Table ES-1. Participating Jurisdictions in the 2025 Lancaster County HMP Update**

Participating Jurisdictions				
Adamstown (B)	Akron (B)	Bart (Twp)	Brecknock (Twp)	Caernarvon (Twp)
Christiana (B)	Clay (Twp)	Colerain (Twp)	Columbia (B)	Conestoga (Twp)
Conoy (Twp)	Denver (B)	Drumore (Twp)	Earl (Twp)	East Cocalico (Twp)
East Donegal (Twp)	East Drumore (Twp)	East Hempfield (Twp)	East Lampeter (Twp)	East Petersburg (B)
Eden (Twp)	Elizabeth (Twp)	Elizabethtown (B)	Ephrata (B)	Ephrata (Twp)
Fulton (Twp)	Lancaster (City)	Lancaster (Twp)	Leacock (Twp)	Lititz (B)
Little Britain (Twp)	Manheim (B)	Manheim (Twp)	Manor (Twp)	Marietta (B)
Martic (Twp)	Millersville (B)	Mount Joy (B)	Mount Joy (Twp)	Mountville (B)
New Holland (B)	Paradise (Twp)	Penn (Twp)	Pequea (Twp)	Providence (Twp)
Quarryville (B)	Rapho (Twp)	Sadsbury (Twp)	Salisbury (Twp)	Strasburg (B)
Strasburg (Twp)	Upper Leacock (Twp)	Warwick (Twp)	West Cocalico (Twp)	West Donegal (Twp)
West Earl (Twp)	West Hempfield (Twp)	West Lampeter (Twp)		
Other Participating Jurisdictions				
Bainbridge Water Authority	Cocalico SD	Columbia Borough SD	Conestoga Valley SD	Donegal SD
East Cocalico Twp Water and Sewer Authority	Elizabethtown Area SD	Ephrata Area SD	Hempfield SD	Lampeter-Strasburg SD
Lancaster Area Sewer Authority	Lancaster Bible College	Lancaster County Conservation District	Lancaster SD	Lancaster-Lebanon Intermediate Unit
Manheim Area Water and Sewer Authority	Manheim Central SD	Manheim Township SD	Octara Area SD	Penn Manor SD
Penn State Health	Solanco SD	Warwick SD	Well Span Health	

Note: B = Borough; SD = School District; Twp = Township





Table ES-2. How Jurisdictions Participated in the 2025 Lancaster County HMP Update

Submitted Worksheets Only				
Akron (B)	Bainbridge Water Authority	Bart (Twp)	Brecknock (Twp)	Caernarvon (Twp)
Christiana (B)	Clay (Twp)	Cocalico SD	Colerain (Twp)	Columbia Borough SD
Conestoga Valley SD	Conoy (Twp)	Drumore (Twp)	East Cocalico (Twp)	East Donegal (Twp)
East Drumore (Twp)	East Lampeter (Twp)	Elizabethtown Area SD	Elizabeth (Twp)	Ephrata (Twp)
Fulton (Twp)	Hempfield SD	Lampeter-Strasburg SD	Lancaster-Lebanon Intermediate Unit	Lancaster SD
Leacock (Twp)	Little Britain (Twp)	Manheim (Twp)	Manheim Central SD	Manheim Township SD
Manor (Twp)	Mountville (B)	New Holland (B)	Octara Area SD	Paradise (Twp)
Penn Manor SD	Providence (Twp)	Solanco SD	Strasburg (B)	Strasburg (Twp)
Upper Leacock (Twp)	Warwick SD	West Cocalico (Twp)	West Earl (Twp)	
Attended Meetings Only				
Donegal SD	Lancaster Bible College	Lancaster County Conservation District	Penn State Health	Well Span Health
Submitted Worksheets and Attended Meetings				
Adamstown (B)	Columbia (B)	Conestoga (Twp)	Denver (B)	Earl (Twp)
East Hempfield (Twp)	East Petersburg (B)	Eden (Twp)	Elizabethtown (B)	Ephrata Area SD
Ephrata (B)	Lancaster (City)	Lancaster (Twp)	Lititz (B)	Manheim (B)
Marietta (B)	Martic (Twp)	Millersville (B)	Mount Joy (B)	Mount Joy (Twp)
Penn (Twp)	Pequea (Twp)	Quarryville (B)	Rapho (Twp)	Sadsbury (Twp)
Salisbury (Twp)	Warwick (Twp)	West Donegal (Twp)	West Hempfield (Twp)	West Lampeter (Twp)
Did Not Participate				
East Earl (Twp)	Eastern Lancaster County SD	Pequea Valley SD	Terre Hill (B)	

Note: B = Borough; SD = School District; Twp = Township

During the plan update process, Lancaster County and participating municipalities engaged in the following planning process steps:

1. Identified and prioritized hazards that may affect the county and its municipalities
2. Assessed the county’s and all municipalities’ vulnerabilities to these hazards
3. Identified mitigation actions that can reduce those vulnerabilities
4. Developed a strategy for implementing the mitigation actions, including identifying the agencies responsible for each action’s implementation

Throughout the planning process, the general public was offered an opportunity to comment on the existing HMP and provide suggestions for the updated version. The county hosted a Steering Committee meeting that was open to the public, during which residents could provide input on the HMP.

The following hazards were identified by the Planning Team as presenting the highest risk to the county and its municipalities:

- Flood, flash flood, ice jam
- Cyber incident
- Subsidence, sinkhole
- Radon exposure
- Utility interruption
- Transportation accident





This HMP also includes hazard profiles for the following hazards (listed in order of risk factor analysis ranking):

- Environmental hazards – gas and liquid pipelines
- Terrorism
- Winter storm
- Wildfire
- Hailstorm
- Pandemic and infectious disease
- Tornado, windstorm
- Environmental hazards – hazardous materials
- Substance use disorder and mental health
- Nuclear incident
- Drought and water supply deficiencies
- Invasive species
- Dam failure
- Earthquake

To mitigate the effects of those hazards, the Planning Team identified the following goals for hazard mitigation over the next 5 years, with italics indicating changes from the previous HMP:

- **Goal 1:** Prevent injury/death and damage from natural and human-caused hazards in Lancaster County.
- **Goal 2:** Protect the citizens of Lancaster County as well as public and private property from the impacts of natural and human-caused hazards.
- **Goal 3:** Improve emergency services and capabilities in Lancaster County to protect citizens from natural and human-caused hazards.
- **Goal 4:** Increase public education and awareness of existing and potential *natural and human-caused hazards* in Lancaster County.
- **Goal 5:** *Reduce the risk of natural hazards for socially vulnerable populations.*
- **Goal 6:** *Address long-term vulnerabilities from high hazard dams.*

Objectives and actions to be implemented are discussed in the Mitigation Action Plan in Section 6.4 of this HMP.

LCEMD will meet annually to evaluate the status of plan implementation and prepare a summary report on HMP status and any needed updates; the evaluation will be shared and reviewed with local emergency management coordinators. The mitigation evaluation will address changes as new hazard events occur, as the area develops, and as more information becomes available pertaining to hazards and their impacts. The evaluation will include an assessment of whether the planning process and actions have been effective, whether development or other issues warrant changes to the HMP or its priorities, if progress toward the communities’ goals is satisfactory, and whether changes are warranted. The public is encouraged to give feedback by directly contacting the County Hazard Mitigation Plan Coordinator, during recurring review meetings, and during the 5-year revision process.

To request information or provide comments regarding this plan, please contact the Lancaster County Emergency Management Division:

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Appendix I Critical Facilities (Confidential)



## SECTION 1 INTRODUCTION

### 1.1 BACKGROUND

Across the United States, natural and human-caused disasters have led to increasing levels of deaths, injuries, property damage, and interruptions of business and government services. The time, money, and effort spent to recover from these disasters exhaust resources, diverting attention from important public programs and private efforts.

“Hazard mitigation” describes actions taken to prevent, reduce, or eliminate the long-term risks to life and property caused by a disaster. Pre-disaster mitigation actions taken in advance of a hazard event are a key component to breaking the typical disaster cycle. Communities that sustain damage from hazard events and rebuild the same way may undergo the same kind of damage again from a later event. With careful selection, mitigation actions can be long-term, cost-effective measures taken to reduce the risk of loss.

Lancaster County, Pennsylvania, has been included in a significant number of commonwealth-wide or county-specific disaster declarations since the first federal declarations were issued in the 1950s. The emergency management community, citizens, elected officials, and other stakeholders in Lancaster County recognize the impact of disasters on their community and have concluded that proactive efforts need to be taken to reduce the impact of natural and human-caused hazards. For that purpose, Lancaster County is committed to updating and maintaining the Lancaster County HMP. The HMP is a pre-disaster, multi-hazard mitigation plan that will guide the county toward greater disaster resistance while respecting the character and needs of the community.

The HMP update is the result of several months of collaboration between the county’s citizens and officials, led by the Lancaster County Hazard Mitigation Planning Team and Steering Committee. The Planning Team was composed of officials from Lancaster County, Lancaster City, East Hempfield Township, East Petersburg Borough, and the Lancaster Conservation District. The Steering Committee was composed of additional Lancaster County officials, municipal representatives, emergency responders, and representatives from academia, utility companies, and commonwealth and federal agencies. Lancaster County contracted with the consulting firm Tetra Tech to prepare the 2025 HMP update.

### 1.2 PURPOSE

The purpose of this HMP is to minimize the effects that natural and human-caused hazards have on the people, property, environment, and business operations within Lancaster County. It provides background information and a rationale for the mitigation actions that the Planning Team, Steering Committee, and municipal and district representatives have chosen to implement across the county.

The document is governed by the Disaster Mitigation Act of 2000 (DMA 2000) and its implementing regulations (Title 44 Code of Federal Regulations [CFR] Part 201, published February 26, 2002). Local jurisdictions must comply with DMA 2000 and the regulations in 44 CFR 201.6 to remain eligible for funding and technical assistance from commonwealth and federal hazard mitigation programs.

### 1.3 SCOPE

This hazard mitigation plan update covers essential topics about the hazards that face Lancaster County and measures to mitigate those hazards. It includes an overview of county characteristics relevant to hazard mitigation planning and describes how key hazards of concern for the county were identified. For each of those hazards, a risk assessment is provided that explains the nature of the hazard in general and specifically how it poses risk to Lancaster County. An assessment is provided of the capabilities available to Lancaster County and the jurisdictions within it for acting to mitigate hazards. Mitigation actions are listed for each participating jurisdiction that would address the hazard-related risks identified in this HMP. A plan is presented for



implementing those actions, monitoring their effectiveness, and preparing a new update to the HMP over the five-year period following approval of this update.

## **1.4 AUTHORITY AND REFERENCE**

This HMP was prepared in accordance with the following regulations and guidance:

- Local Mitigation Planning Policy Guide, Federal Emergency Management Agency (FEMA). April 19, 2022.
- Local Mitigation Planning Handbook. FEMA, May 2023
- Plan Integration: Linking Local Planning Efforts. FEMA, July 2015
- DMA 2000 (Public Law 106-390). October 30, 2000
- 44 CFR Parts 201 and 206 (including Feb. 26, 2002, October 1, 2002, October 28, 2003, and September 13, 2004, Interim Final Rules)
- Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards. FEMA, January 2013
- Pennsylvania Hazard Mitigation Plan Standard Operating Guide. 2020

Appendix A contains a full set of references used in updating this HMP.



## SECTION 2 COUNTY PROFILE

### 2.1 GEOGRAPHY AND ENVIRONMENT

Lancaster County covers 946 square miles in the southeastern portion of Pennsylvania (Figure 2-1). The County is bordered to the north by Dauphin, Lebanon, and Berks County, to the east by Chester County, to the south by Cecil County (Maryland), and to the west by York County, across the Susquehanna River.

The built environment in the County includes agricultural communities and farmlands, roads and other infrastructure, and suburban and rural development; the natural environment features an extensive network of rivers and streams, the wooded slopes of Furnace Hills and Welsh Mountain, and the Susquehanna River gorge (Lancaster County Planning Commission 2011).

#### 2.1.1 Topography and Geology

Lancaster County is relatively flat (less than 8 percent slopes). Its geology consists of three broad bands of rock types (FEMA 2018):

- In the north are Triassic sediments, deposited when a rift was created during the last opening of the Atlantic Ocean, and igneous rock intruding into the rift. The gently dipping sediments (sandstones and shales) are generally good aquifers, while igneous rocks are generally poor aquifers. The current hills are the result of resistance to weathering.
- The central region is composed of folded and overturned carbonates (limestone sedimentary rocks). The carbonates provide excellent quantities of water. However, the solution channels and sinkholes that characterize this geology make groundwater highly vulnerable to contamination.
- The very southern portion of the County is dominated by metamorphic schist with some quartzites and some serpentines.

The central and southern bands of metamorphic and sedimentary rocks represent an ocean shelf environment at the former edge of the continent. The carbonates are shallow warm water deposits. The schists are derived from clay-rich muds found at depth offshore. The quartzites are derived from sandstone.

#### 2.1.2 Hydrography and Hydrology

A watershed is the area of land that drains into a body of water, such as a river, lake, stream, or bay. It is separated from other systems by high points such as hills or slopes. It includes the waterway itself as well as the entire land area that drains to it. Much of Lancaster County empties into Susquehanna River Sub-basin which in turn drains to the Chesapeake Bay Drainage Basin. Lancaster County is also part of the Chiques, Cocalico, Conestoga, Conewago, Conowingo, Donegal, Little Chiques, Little Conestoga, Mill, Octoraro, and Pequea watersheds (Lancaster County Conservation District 2018). Figure 2-2 shows the 12 watersheds in Lancaster County.

In addition to the Susquehanna River on the county's western border, major water courses are Big Beaver Creek, Chiques Creek, Cocalico Creek, Conestoga Creek, Conewago Creek, Conowingo Creek, Conoy Creek, Donegal Creek, East Branch Octoraro Creek, Fishing Creek, Hammer Creek, Lititz Creek, Little Chiques Creek, Little Cocalico Creek, Little Conestoga Creek, Middle Creek, Mill Creek, Octoraro Creek, Pequea Creek, West Branch Brandywine Creek, West Branch Little Conestoga Creek, and West Branch Octoraro Creek (Lancaster County Watersheds n.d.).



Figure 2-1. Lancaster County

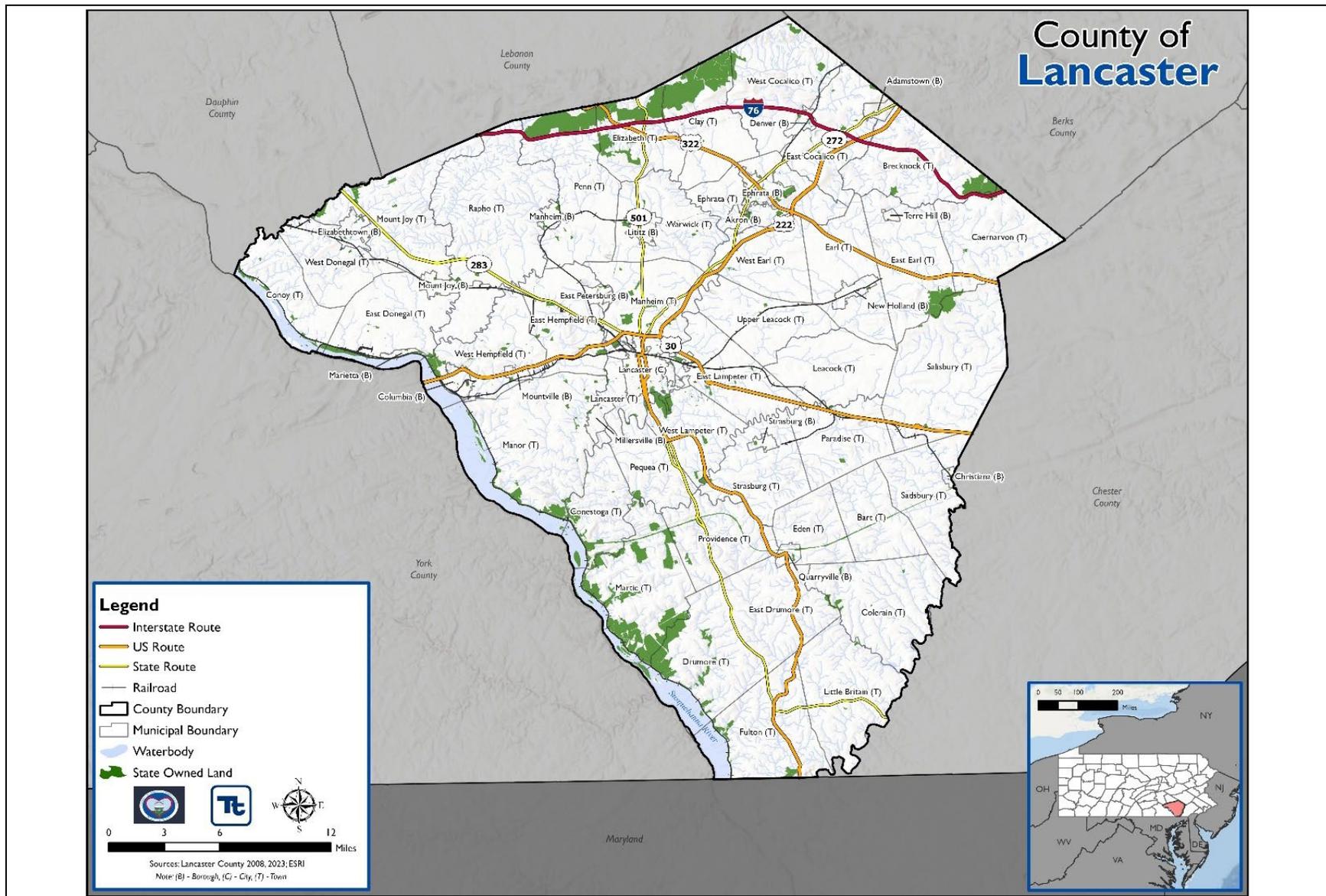
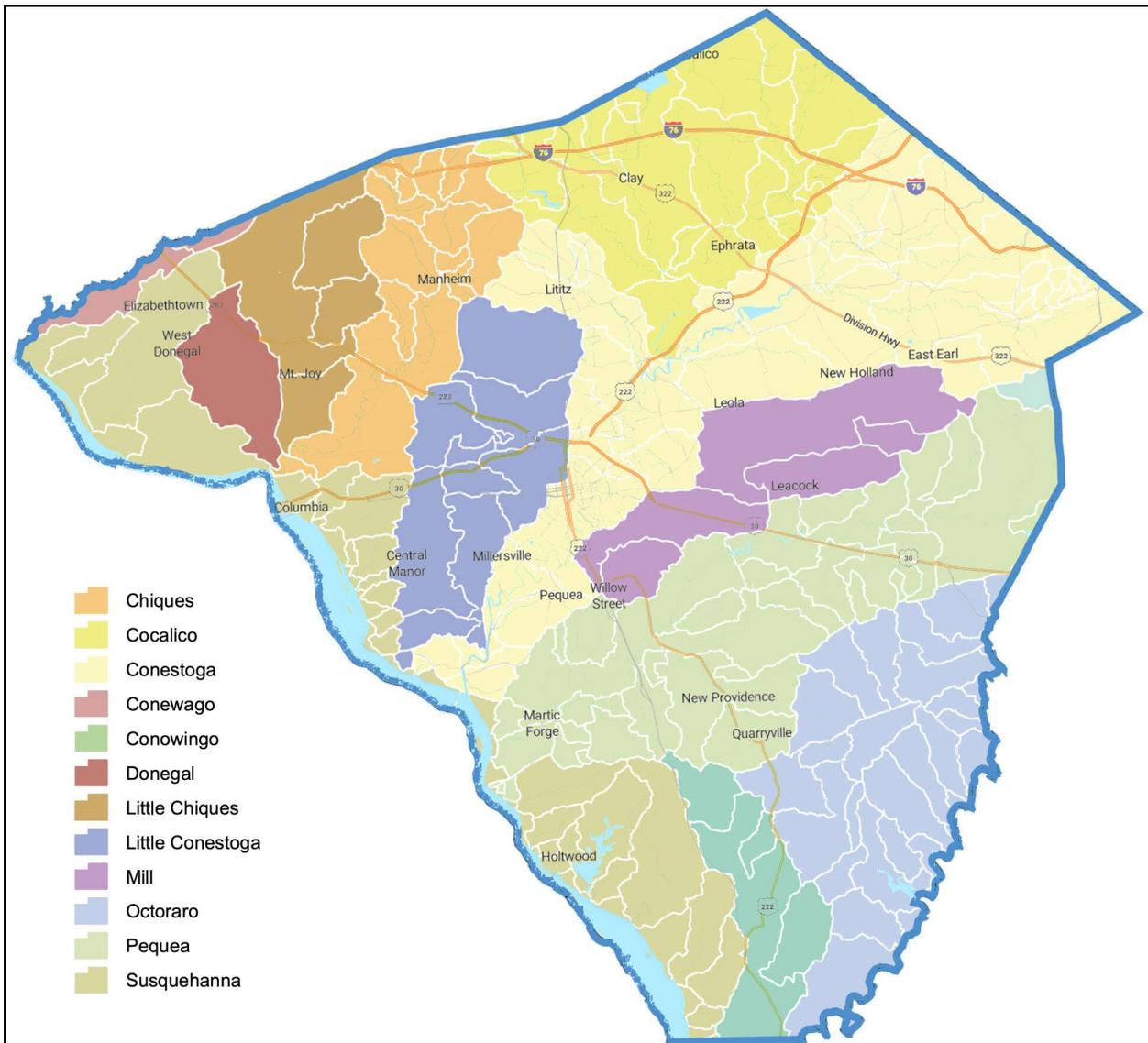




Figure 2-2. Watersheds Located Within Lancaster County



Source: Lancaster County Watersheds 2018

### 2.1.3 Climate

Lancaster County’s climate is continental but modified by the effects of the Atlantic Ocean. The mean annual temperature is in the low 50s degrees Fahrenheit (°F), with extremes rarely rising above 100 °F or falling below 0 °F. The annual precipitation averages approximately 40 inches, and the annual snowfall is 24 inches. Precipitation is well distributed throughout the year, with slightly more than half falling from April through September. During the summer, the area is regularly subject to afternoon and evening thunderstorms, often accompanied by heavy rains and damaging winds. In addition, remnants of hurricanes originating in the tropics occasionally pass through the area, bringing prolonged periods of heavy rainfall. Major regional floods are attributed to either large tropical disturbances (hurricanes) or combined events, as when heavy rains occur during a snowmelt (FEMA 2018).



## Climate Projections

The May 2021 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures and precipitation in the 21<sup>st</sup> century. Increased average temperatures as a result of climate change make the occurrence of extreme heat more likely (Commonwealth of Pennsylvania 2021). While increased average temperatures would make the occurrence of extreme cold less likely, some climatologists have suggested that warming in the Arctic could impact the position of the jet stream, allowing for more extreme cold weather events to occur. While some research supports this concept, others do not and the impact of climate change on cold weather events is not fully understood (National Geographic 2019). Extreme heat and cold result in greater strain on utilities, increasing the likelihood of utility interruption.

An increase in the intensity of severe weather events is anticipated as the climate continues to change. This will include wind events such as hurricanes, tornadoes, and wind associated with thunderstorms, among other phenomena. More storms with higher winds will increase the chance that the utility infrastructure will be impacted by these storms. Additionally, an increase in precipitation is projected, which could come in the form of heavy downpours or winter weather thus causing additional utility interruptions. Increased risk of drought may also threaten water utilities (Commonwealth of Pennsylvania 2021).

Lancaster County has dealt with significant drought conditions and periods of intense rainfall within just the past year. Meteorologist Kyle Elliott, Director of the Weather Information Center at Millersville University, has emphasized the County can anticipate continuing seeing this trend of infrequent, but intense, periods of rainfall and longer periods of warmer, dry months.

## 2.2 COMMUNITY FACTS

Lancaster County was established as Pennsylvania’s fourth county in 1729. The area became a haven for those seeking religious freedom, leading to the Mennonites settling in 1710, closely followed by Amish, German, and English settlers.

As the rural areas of Lancaster County grew and prospered, settlements and small towns appeared. The pinnacle of this development was the City of Lancaster, located at the center of the County and serving as the county seat today. Lancaster County today includes 41 townships, 18 boroughs, and the City of Lancaster.

Many of the travel routes in Lancaster County were established by the original Native American inhabitants prior to 1729 and validated as a system of trade routes that evolved into well-traveled and interconnected roadways over centuries of use and technical advancements. Today’s transportation routes in the northern portion of the County are concentrated on Interstate 76 and U.S. Route 322 and PA Route 283 for eastbound and westbound travel. PA Route 501 in the north leads to U.S. Route 322 for north-south destinations. The major population centers in the County are primarily located at the intersection of the major roadways such as U.S. Route 222 and PA Route 501, or PA Route 283 and U.S. Routes 30 and 222 in the City of Lancaster.

Nearby population centers include the City of York 13 miles to the west; the City of Harrisburg 15 miles to the northwest; Philadelphia 42 miles to the east; and the Allentown–Bethlehem–Easton Area 40 miles to the northeast.

Lancaster County has a strong economy due to its diversity. Educational services combined with health care and social assistance represent the largest workforce in Lancaster County, employing close to 65,000 workers. The manufacturing industry employs over 42,000 workers. Retail trade is the third largest industry in Lancaster County, employing over 33,000 workers (U.S. Census Bureau 2022). Also, tourism and agriculture are strong contributors to the economy due to Lancaster’s fertile land and historical heritage.



## 2.3 POPULATION AND DEMOGRAPHICS

Population and demographic data provide baseline information about residents. Changes in demographics or population may be used to identify higher-risk populations. Maintaining up-to-date data on demographics allows the County to better assess magnitudes of hazards and develop more specific mitigation plans.

### 2.3.1 Historical and Current Population

According to the U.S. Census, Lancaster County had a 2020 population of 552,984, which represents a 6.5 percent increase from the 2010 U.S. Census population of 519,445. Table 2-1 presents population statistics for Lancaster County based on the 2000, 2010, and 2020 decennial U.S. Census, and 2022 American Community Survey 5-year estimates (the most current available) data. Table 2-2 provides details regarding the demographics for Lancaster County. The decennial census is the official national population count taken every 10 years.

Based on 2020 Census data, the population density of Lancaster County is 585.4 persons per square mile, which is considerably higher than the Pennsylvania statewide average of 290.6 persons per square mile. Figure 2-3 displays the population density in the county. Most municipalities in Lancaster County have population densities above the statewide average, though many have low population density. Dispersing information, instructions, and resources during a disaster response effort to residents in low-density areas is more difficult than in more densely populated areas because individuals are not centralized. On the other hand, a low population density means that hazards will not affect as many people. For example, diseases may not spread as quickly because citizens are in contact with fewer people. Similarly, fires are less likely to spread to other structures because of the large distances between them. The magnitude of an event is typically smaller in a less-populated area because each event affects fewer people and properties.

**Table 2-1. Lancaster County Population Statistics**

Municipality	Decennial Census			2022 Estimate	Population Change, 2010-2022	
	2000	2010	2020		Number	Percent
Adamstown Borough	1,201	1,772	1,916	2,402	630	35.55%
Akron Borough	4,046	3,876	4,152	4,135	259	6.68%
Bart Township	3,003	3,094	3,181	3,188	94	3.04%
Brecknock Township	6,699	7,199	7,557	7,567	368	5.11%
Caernarvon Township	4,278	4,748	4,609	4,608	-140	-2.95%
Christiana Borough	1,124	1,168	1,112	956	-212	-18.15%
Clay Township	5,173	6,308	6,857	6,858	550	8.72%
Colerain Township	3,261	3,635	3,883	3,881	246	6.77%
Columbia Borough	10,311	10,400	10,207	10,203	-197	-1.89%
Conestoga Township	3,749	3,776	3,914	3,904	128	3.39%
Conoy Township	3,067	3,194	3,361	3,340	146	4.57%
Denver Borough	3,332	3,861	3,792	3,789	-72	-1.86%
Drumore Township	2,243	2,560	2,561	2,582	22	0.86%
Earl Township	6,183	7,024	7,144	7,142	118	1.68%
East Cocalico Township	9,954	10,310	10,767	10,820	510	4.95%
East Donegal Township	5,405	7,755	8,684	8,626	871	11.23%
East Drumore Township	3,535	3,791	3,936	3,932	141	3.72%
East Earl Township	5,723	6,507	6,699	6,729	222	3.41%
East Hempfield Township	21,399	23,522	26,304	26,287	2,765	11.75%
East Lampeter Township	13,556	16,424	17,776	17,684	1,260	7.67%
East Petersburg Borough	4,450	4,506	4,573	4,588	82	1.82%
Eden Township	1,856	2,094	2,239	2,238	144	6.88%



Municipality	Decennial Census				Population Change, 2010-2022	
	2000	2010	2020	2022 Estimate	Number	Percent
Elizabeth Township	3,833	3,886	3,985	3,981	95	2.44%
Elizabethtown Borough	11,887	11,545	11,639	11,805	260	2.25%
Ephrata Borough	13,213	13,394	13,794	13,738	344	2.57%
Ephrata Township	8,026	9,400	10,386	10,480	1,080	11.49%
Fulton Township	2,826	3,074	3,214	3,201	127	4.13%
Lancaster City	56,348	59,322	58,039	57,970	-1,352	-2.28%
Lancaster Township	13,944	16,149	18,642	18,485	2,336	14.47%
Leacock Township	4,878	5,220	5,652	5,641	421	8.07%
Lititz Borough	9,029	9,369	9,381	9,559	190	2.03%
Little Britain Township	3,514	4,106	4,118	4,135	29	0.71%
Manheim Borough	4,784	4,858	5,046	5,028	170	3.50%
Manheim Township	33,697	38,133	43,977	43,757	5,624	14.75%
Manor Township	16,498	19,612	21,849	21,798	2,186	11.15%
Marietta Borough	2,689	2,588	2,623	2,769	181	6.99%
Martic Township	4,990	5,190	5,221	5,214	24	0.46%
Millersville Borough	7,774	8,168	7,903	8,426	258	3.16%
Mount Joy Borough	6,765	7,410	8,325	8,274	864	11.66%
Mount Joy Township	7,944	9,873	10,721	10,708	835	8.46%
Mountville Borough	2,444	2,802	3,017	3,002	200	7.14%
New Holland Borough	5,092	5,378	5,743	5,734	356	6.62%
Paradise Township	4,698	5,131	5,672	5,646	515	10.04%
Penn Township	7,312	8,789	10,210	10,156	1,367	15.55%
Pequea Township	4,358	4,605	5,474	5,550	945	20.52%
Providence Township	6,651	6,897	6,995	7,004	107	1.55%
Quarryville Borough	1,994	2,576	2,843	2,833	257	9.98%
Rapho Township	8,578	10,442	12,024	11,987	1,545	14.80%
Sadsbury Township	3,025	3,395	3,536	3,518	123	3.62%
Salisbury Township	10,012	11,062	11,494	11,488	426	3.85%
Strasburg Borough	2,800	2,809	3,117	3,097	288	10.25%
Strasburg Township	4,021	4,182	4,457	4,457	275	6.58%
Terre Hill Borough	1,237	1,295	1,357	1,030	-265	-20.46%
Upper Leacock Township	8,229	8,708	8,921	8,919	211	2.42%
Warwick Township	15,475	17,783	19,022	19,037	1,254	7.05%
West Cocalico Township	6,967	7,280	7,456	7,523	243	3.34%
West Donegal Township	6,539	8,260	8,944	8,945	685	8.29%
West Earl Township	6,766	7,868	8,560	8,504	636	8.08%
West Hempfield Township	15,128	16,153	17,020	17,052	899	5.57%
West Lampeter Township	13,145	15,209	17,383	17,292	2,083	13.70%
<b>Lancaster County</b>	<b>470,658</b>	<b>519,445</b>	<b>552,984</b>	<b>553,202</b>	<b>33,757</b>	<b>6.50%</b>

Source: U.S. Census Bureau 2010, and 2020; ACS 2022



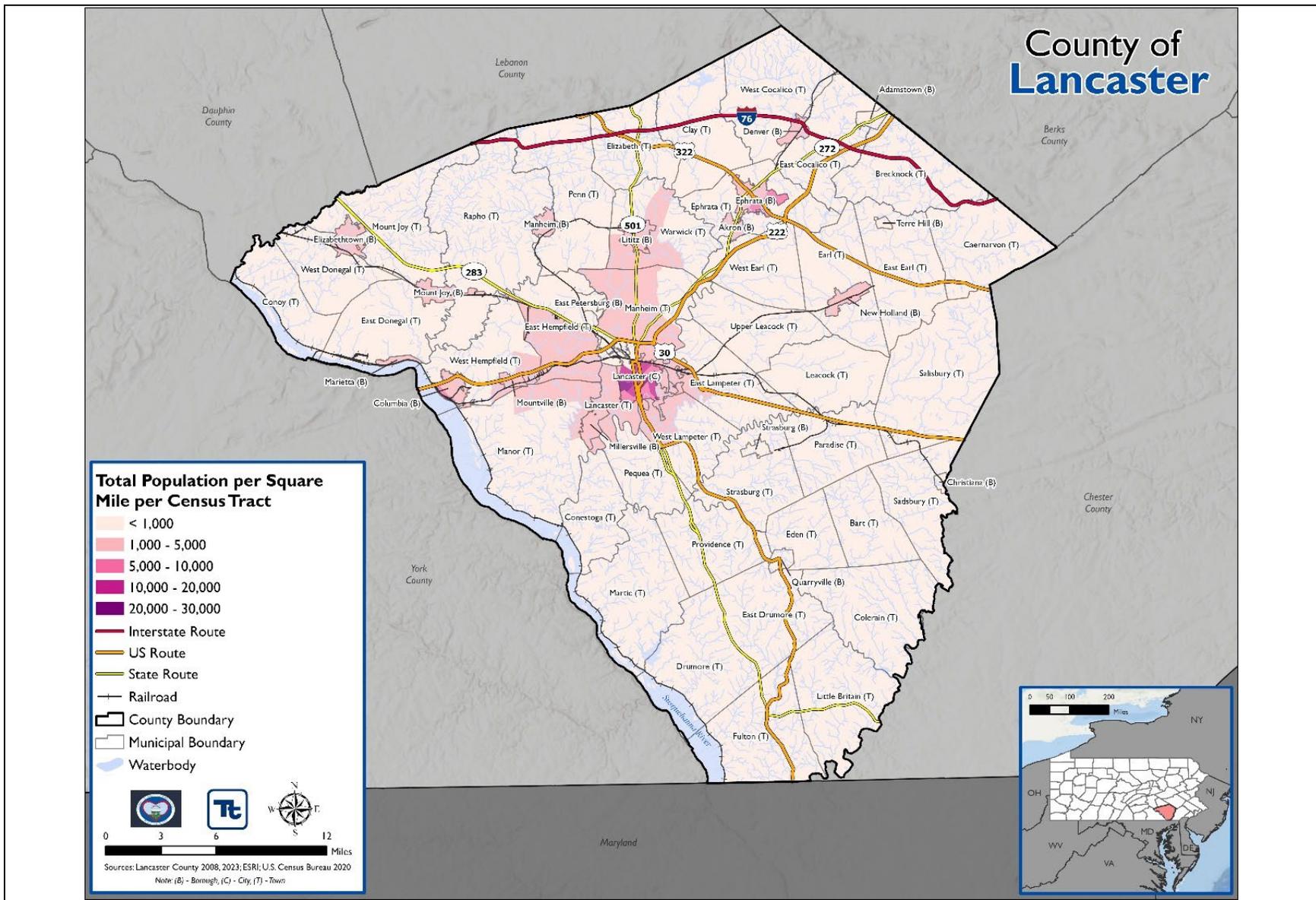
**Table 2-2. Demographics for Lancaster County**

Demographics	2010 Decennial Census	2020 Decennial Census	2022 Estimate
Total population	519,445	552,984	553,202
Male	253,836	269,868	272,524
Female	265,609	283,116	280,678
Median age (years)	38.2	39.3	39.4
Under 5 years	35,521	34,100	34,709
18 years and over	390,430	425,314	424,860
65 years and over	77,780	106,134	104,082
Total Households	193,602	216,502	216,592

Source: U.S. Census Bureau 2011; U.S. Census Bureau 2022; U.S. Census Bureau 2020



Figure 2-3. Population Density in Lancaster County

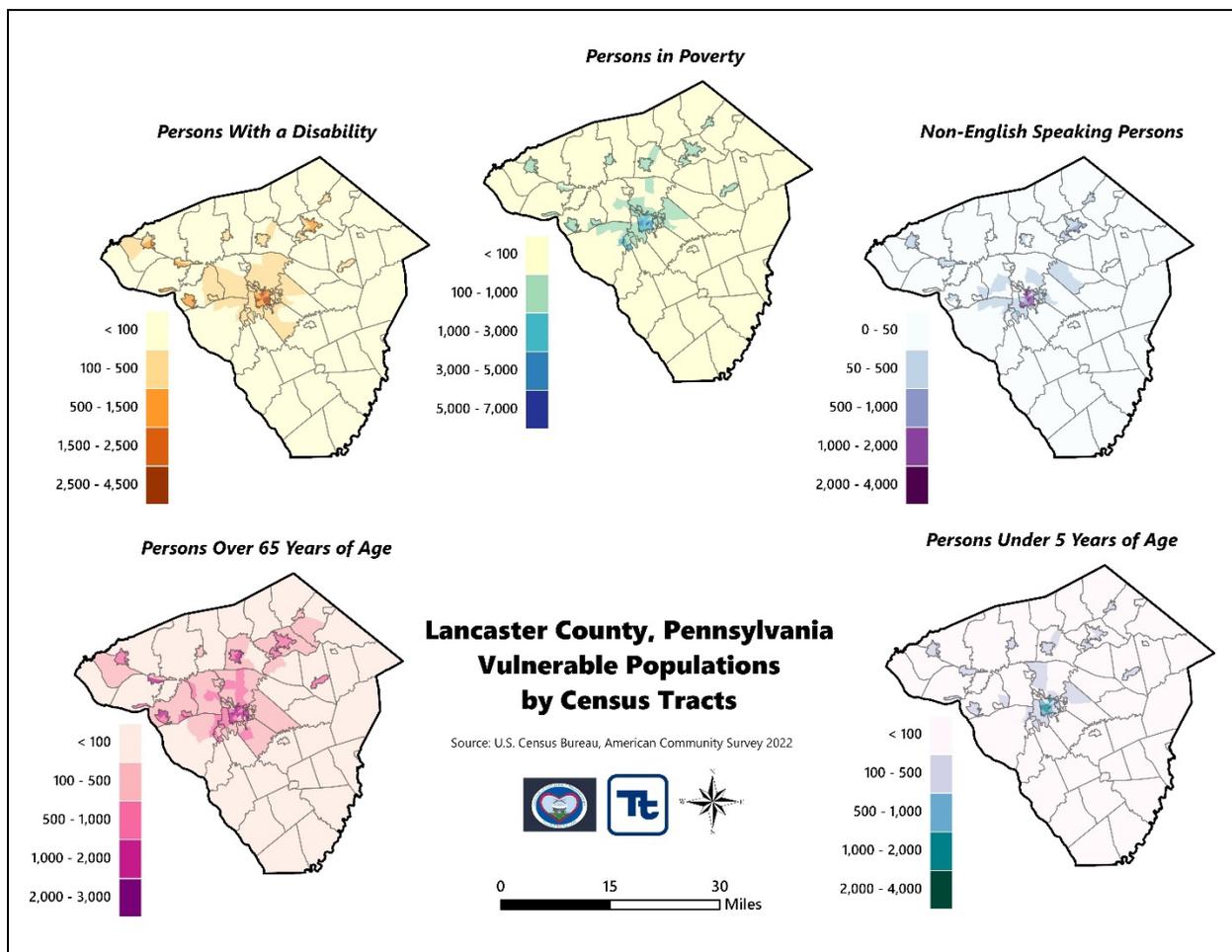




### 2.3.2 Vulnerable Populations

Under federal planning requirements, HMPs must consider hazard risks to socially vulnerable populations. These populations can be more susceptible to hazard events due to physical or financial limitations or the location and construction quality of their housing. Vulnerable populations have unique needs that should be taken into consideration by public officials to help ensure the safety of populations with a higher level of risk. Identifying concentrations of vulnerable populations can assist communities in targeting preparedness, response, and mitigation actions. For the purposes of this planning process, vulnerable populations in Lancaster County include people under the age of 5 or over 65, people living in poverty, people with disabilities, and non-English speakers. Figure 2-4 shows the distribution of these vulnerable populations across the county. In some cases, such as the accessibility to receive transportation and emergency alerts, the general population may also be considered vulnerable.

Figure 2-4. Socially Vulnerable Populations in Lancaster County



#### Age

Older adults are more likely than the general population to experience the following vulnerabilities to hazards:

- Lacking the physical and economic resources necessary to respond to hazard events
- Being more likely to contract certain diseases or suffer health-related consequences





- Living in senior care and living facilities where emergency preparedness occurs at the discretion of facility operators
- Being unable to drive or otherwise having more difficulty evacuating their homes if living on their own, thus requiring special evacuation plans
- Having hearing or vision impairments that make it difficult to receive emergency instructions

Children are considered vulnerable to hazard events because they are dependent on others to safely access resources during emergencies and may experience increased health risks from hazard exposure.

According to the 2022 American Community Survey 5-Year Estimates, 18.8 percent of Lancaster County’s population is 65 or older, and 6.3 percent of the county’s population is under the age of 5. The county’s combined population under 5 years of age and over 65 years of age represents 25.1 percent of its total population. The median age in Lancaster County is 38.7 years (U.S. Census Bureau 2022).

### Poverty

People living in poverty also may lack resources to prepare for hazard events in advance or respond to the impacts of an event afterward. Some low-income families and individuals may not own vehicles, and therefore could be more vulnerable during an evacuation in response to a hazard event. Emergency responders may have difficulty connecting with individuals within this economic bracket for several reasons, including less access to the Internet within these communities. The U.S. Census Bureau identifies households with two adults and two children with an annual household income below \$29,678 per year as “low income” (U.S. Census Bureau 2023).

Table 2-3 summarizes economic characteristics of Lancaster County’s population. In 2022 (the most current data available), the median household income in the County was \$81,458, which was higher than the Commonwealth of Pennsylvania’s estimated median household income (\$73,170). The County’s 2022 estimated per capita income of \$39,872 was slightly below the Commonwealth’s 2022 estimated per capita income of \$41,234. Individuals with incomes below the poverty level accounted for 9.1 percent of the County’s population (U.S. Census Bureau 2024).

**Table 2-3. Economic Characteristics in Lancaster County**

Economic Characteristics	2010 Census	2020 Census	2022 Estimates
Median household income	\$51,740	\$73,688	\$81,458
Median family income	\$61,760	\$87,835	\$100,506
Per capita income	\$24,871	\$35,609	\$39,872
Families with income below the poverty level	7.4%	5.3%	5.7%
Individuals with income below the poverty level	10.5%	8.6%	9.1%

Source: U.S. Census Bureau 2022; U.S. Census Bureau 2023; U.S. Census Bureau 2011

### Individuals Experiencing Homelessness

Individuals experiencing homelessness are at greater risk for many of the hazards identified in this plan. Natural hazards such as extreme temperatures and severe weather leave unsheltered individuals exposed to the elements and without adequate resources to shelter-in-place, access food, and access healthcare when needed (CDC 2024).

According to the Lancaster County Homelessness Coalition, as of 2024 there were approximately 597 persons in Lancaster County experiencing homelessness. This number represents a “point-in-time count” (PIT) of people who are literally homeless as defined by the U.S. Department of Housing and Urban Development. This was a 13.5 percent increase in the number of people experiencing homelessness since 2023 (526). The 2024 Winter PIT Count revealed a total of 475 persons were sheltered in Emergency Shelter or Transitional Housing programs and 122 persons remained unsheltered (Lancaster County Redevelopment Authority 2024).



The COVID-19 Pandemic highlighted the increased risk of those experiencing homelessness. People experiencing homelessness are known to have a higher risk of exposure to infectious diseases and often lack adequate access to resources, healthcare, and treatment needed to prevent and treat infectious diseases (CDC 2024).

**Physical or Mental Disability**

Persons with a disability include those who have physical, sensory, or cognitive impairment that might limit a major life activity (Centers for Disease Control and Prevention 2020). These impairments may increase the level of difficulty that individuals face during an emergency. Cognitive impairments may reduce an individual’s capacity to receive, process, and respond to emergency information or warnings. Individuals with a physical or sensory disability may face issues of mobility, sight, hearing, or reliance on specialized medical equipment. According to the 2017-2021 American Community Survey 5-Year Estimates, 11.2 percent of residents of Lancaster County are living with a disability (U.S. Census Bureau 2022).

**Language**

Individuals who do not possess a working proficiency in English are vulnerable because they may have difficulty understanding information being conveyed to them. Cultural differences can also add complexity to how information is conveyed to populations with limited proficiency of English (Centers for Disease Control and Prevention 2021). According to the 2017-2021 American Community Survey 5-Year Estimates, 17 percent of Lancaster County residents over the age of 5 primarily speak a language other than English at home. Of the 31,784 individuals who reported speaking English “less than very well,” 2.8 percent speak Spanish, 2.4 percent speak other Indo-European languages, 0.6 percent speak Asian and Pacific Island Languages, and 0.4 percent speak other languages (U.S. Census Bureau 2022). Future hazard mitigation strategies should consider addressing language barriers to ensure that all residents can receive emergency instructions. Table 2-4 summarizes race and ethnicity population information for Lancaster County.

**Table 2-4. Race and Ethnicity in Lancaster County**

Race and Ethnicity	2010 Census % of Population	2020 Census % of Population
White	88.6%	87.6%
Black or African American	4.1%	5.8%
American Indian and Alaska Native	0.2%	1.3%
Asian	2.1%	3.2%
Native Hawaiian and Other Pacific Islander	0.0%	0.1%
Hispanic or Latino	9.8%	11.1%

Source: U.S. Census Bureau 2020; U.S. Census Bureau 2010

**2.3.3 Population and Demographic Trends**

Population trends can provide a basis for making decisions on the type of mitigation approaches to consider and the locations in which these approaches should be applied. This information can also be used to support planning decisions regarding future development in vulnerable areas. Population changes at the municipal level provide a better understanding of changing populations within the county and where the concentration of population resides. Maintaining up-to-date data on demographics will allow Lancaster County to better assess magnitudes of hazards and develop more specific mitigation plans and strategies.

Table 2-5 shows historical population changes for each municipality based on Census data and projections for future (2040) population based on 2018 estimates by the Lancaster County Planning Department. The 2018 Lancaster County Planning Department’s Comprehensive Plan *Places2040* provided an estimate of county and municipal projections for the years 2030 and 2040 (Lancaster County Planning 2018).



Table 2-5. Lancaster County Population Projections by Municipality

Municipality	Historical Census Data			Projections			
	2000	2010	2020	2025	2030	2035	2040
Adamstown Borough	1,201	1,772	1,916	2,012	2,107	2,176	2,244
Akron Borough	4,046	3,876	4,152	4,158	4,164	4,129	4,094
Bart Township	3,003	3,094	3,181	3,210	3,239	3,233	3,227
Brecknock Township	6,699	7,199	7,557	7,770	7,982	8,095	8,208
Caernarvon Township	4,278	4,748	4,609	4,671	4,733	4,745	4,756
Christiana Borough	1,124	1,168	1,112	1,112	1,118	1,111	1,104
Clay Township	5,173	6,308	6,857	7,063	7,268	7,378	7,487
Colerain Township	3,261	3,635	3,883	3,980	4,077	4,122	4,167
Columbia Borough	10,311	10,400	10,207	10,150	10,093	9,959	9,824
Conestoga Township	3,749	3,776	3,914	3,941	3,968	3,953	3,938
Conoy Township	3,067	3,194	3,361	3,415	3,468	3,481	3,494
Denver Borough	3,332	3,861	3,792	3,886	3,979	4,026	4,073
Drumore Township	2,243	2,560	2,561	2,607	2,653	2,669	2,685
Earl Township	6,183	7,024	7,144	7,305	7,465	7,536	7,606
East Cocalico Township	9,954	10,310	10,767	11,010	11,253	11,358	11,463
East Donegal Township	5,405	7,755	8,684	9,213	9,742	10,147	10,552
East Drumore Township	3,535	3,791	3,936	3,998	4,059	4,074	4,088
East Earl Township	5,723	6,507	6,699	6,824	6,949	6,993	7,036
East Hempfield Township	21,399	23,522	26,304	27,030	27,755	28,109	28,462
East Lampeter Township	13,556	16,424	17,776	18,402	19,027	19,398	19,768
East Petersburg Borough	4,450	4,506	4,573	4,593	4,613	4,587	4,561
Eden Township	1,856	2,094	2,239	2,280	2,320	2,333	2,345
Elizabeth Township	3,833	3,886	3,985	4,001	4,017	3,994	3,970
Elizabethtown Borough	11,887	11,545	11,639	11,721	11,802	11,758	11,714
Ephrata Borough	13,213	13,394	13,794	13,900	14,005	13,962	13,918
Ephrata Township	8,026	9,400	10,386	10,725	11,064	11,253	11,442
Fulton Township	2,826	3,074	3,214	3,263	3,311	3,322	3,332
Lancaster City	56,348	59,322	58,039	58,216	58,392	58,024	57,656
Lancaster Township	13,944	16,149	18,642	19,206	19,770	20,061	20,351
Leacock Township	4,878	5,220	5,652	5,740	5,828	5,847	5,866
Lititz Borough	9,029	9,369	9,381	9,458	9,534	9,511	9,488
Little Britain Township	3,514	4,106	4,118	4,263	4,408	4,500	4,592
Manheim Borough	4,784	4,858	5,046	5,045	5,044	4,999	4,953
Manheim Township	33,697	38,133	43,977	45,473	46,968	47,803	48,637
Manor Township	16,498	19,612	21,849	22,662	23,475	23,965	24,454
Marietta Borough	2,689	2,588	2,623	2,601	2,579	2,539	2,498
Martic Township	4,990	5,190	5,221	5,285	5,348	5,353	5,357
Millersville Borough	7,774	8,168	7,903	7,888	7,873	7,794	7,714
Mount Joy Borough	6,765	7,410	8,325	8,508	8,690	8,761	8,831
Mount Joy Township	7,944	9,873	10,721	11,221	11,720	12,067	12,413
Mountville Borough	2,444	2,802	3,017	3,122	3,226	3,288	3,349
New Holland Borough	5,092	5,378	5,743	5,849	5,995	5,989	6,022
Paradise Township	4,698	5,131	5,672	5,789	5,905	5,948	5,990



Municipality	Historical Census Data			Projections			
	2000	2010	2020	2025	2030	2035	2040
Penn Township	7,312	8,789	10,210	10,581	10,951	11,166	11,380
Pequea Township	4,358	4,605	5,474	5,564	5,653	5,673	5,692
Providence Township	6,651	6,897	6,995	7,062	7,128	7,118	7,108
Quarryville Borough	1,994	2,576	2,843	2,982	3,120	3,217	3,313
Rapho Township	8,578	10,442	12,024	12,445	12,865	13,104	13,343
Sadsbury Township	3,025	3,395	3,536	3,616	3,695	3,370	3,764
Salisbury Township	10,012	11,062	11,494	11,770	12,045	12,172	12,298
Strasburg Borough	2,800	2,809	3,117	3,157	3,197	3,199	3,200
Strasburg Township	4,021	4,182	4,457	4,518	4,579	4,587	4,595
Terre Hill Borough	1,237	1,295	1,357	1,364	1,371	1,365	1,358
Upper Leacock Township	8,229	8,708	8,921	9,057	9,193	9,224	9,254
Warwick Township	15,475	17,783	19,022	19,777	20,532	21,025	21,517
West Cocalico Township	6,967	7,280	7,456	7,615	7,773	7,839	7,905
West Donegal Township	6,539	8,260	8,944	9,321	9,698	9,945	10,192
West Earl Township	6,766	7,868	8,560	8,784	9,008	9,115	9,222
West Hempfield Township	15,128	16,153	17,020	17,373	17,725	17,860	17,994
West Lampeter Township	13,145	15,209	17,383	18,168	18,952	19,477	20,002
<b>Lancaster County</b>	<b>470,658</b>	<b>519,445</b>	<b>552,984</b>	<b>565,708</b>	<b>578,431</b>	<b>584,149</b>	<b>589,866</b>

Sources: Lancaster County Planning 2018

## 2.4 LAND USE AND DEVELOPMENT

### 2.4.1 Housing

Housing units are vulnerable to various natural hazards, particularly those located in defined hazard areas. Damage to residential properties is costly to repair and devastating to the displaced residents. Lancaster County has 218,987 housing units, as of 2022 estimates. According to the U.S. Census, 3.2 percent of the County’s residential properties are vacant; most vacancies are due to units available for rent. Vacant buildings are vulnerable to arson and criminal activity. Because vacant properties are not inhabited year-round or may not be adequately maintained, many are structurally deficient and at risk of collapse.

People living in rented housing account for 30.3 percent of the County’s population. Because renters are more transient than homeowners, communicating with renters may be more difficult than communicating with homeowners. Communication strategies should be developed to ensure that renters, as well as tourists staying temporarily, receive proper notifications. Table 2-6 summarizes characteristics of the residential properties in Lancaster County.

**Table 2-6. Housing Characteristics in Lancaster County**

Housing Characteristics	2010	2020	2022
Total housing units	203,175	215,288	218,987
Owner-occupied housing units	134,960	144,547	147,859
Renter-occupied housing units	59,068	62,744	64,157
Vacant housing units	9,147	7,997	6,971
Median value (dollars)	\$187,400	\$229,300	\$287,200
Housing units with a mortgage	87,394	90,480	90,638
Housing units without a mortgage	47,566	54,067	57,221





Source: U.S. Census Bureau 2022; U.S. Census Bureau 2023; U.S. Census Bureau 2011

Individuals experiencing homelessness are at greater risk for many of the hazards identified in this plan. Natural hazards such as extreme temperatures and severe weather leave unsheltered individuals exposed to the elements and without adequate resources to shelter-in-place, access food, and access healthcare when needed (CDC 2024). Refer to 2.3.2 for more information on unhoused and homeless populations.

### 2.4.2 General Building Stock

The asset inventory developed for this HMP includes 285,764 structures identified from available tax data and spatial data. These structures account for a replacement cost value (RCV) of \$427 billion. This total includes \$217 billion for replacement of building structures and \$210 billion for replacement of content. Table 2-7 summarizes the distribution of the general building stock inventory by occupancy class.

Table 2-7. Distribution of General Building Stock by Occupancy Class

	Number of Buildings	% of Total Buildings	RCV	% of Total RCV
Residential	127,056	44.5%	\$86,140,490,068	20.1%
Commercial	146,875	51.4%	\$242,228,424,735	56.7%
Industrial	1,464	0.5%	\$35,515,456,280	8.3%
Other <sup>a</sup>	10,369	3.6%	\$63,670,594,816	14.9%
<b>Total</b>	<b>285,764</b>	<b>100.0%</b>	<b>\$427,554,965,900</b>	<b>100.0%</b>

a. Other = Government, Religion, Agricultural, and Education

Figure 2-5 through Figure 2-7 show the distribution of value density for residential, commercial, and industrial buildings in Lancaster County. Value density is the dollar value of structures per unit area, including building content value. The densities are shown in units of \$1,000 per square mile. Value distribution maps can assist in visualizing areas of high loss potential and in evaluating aspects of the study area in relation to hazard risks.

### 2.4.3 Land Use and Land Cover

Lancaster County is well known for its agriculture. The County’s extensive and productive agricultural soils are considered among the best non-irrigated farmland in the world. More than 50 percent of the County has soils classified as prime farmland by the U.S. Natural Resources Conservation Service and 76 percent is classified as prime farmland or soils of statewide importance (Lancaster Farmland Trust 2021). Approximately half of the County’s land is zoned for agriculture, with 5,108 farms comprising nearly 393,949 acres identified in the 2017 Census of Agriculture (US Department of Agriculture 2017).

Lancaster’s agricultural industry has strongly contributed to the County’s cultural identity. The County is known for its Amish farming communities, and the Amish share of Lancaster farms has steadily increased over time (40 percent of farms and nearly 100,000 acres). The 2022 USDA Agricultural Census showed that Lancaster County had 19 percent of Pennsylvania’s agricultural sales—\$1.8 million including livestock, poultry, and products. Roughly \$270,000 was spent in Lancaster County on repairs, supplies, and maintenance costs for farm production expenses, a 27 percent increase from 2017 (USDA 2022).

Most of the County’s forested land was cleared in the past to allow for farming. but forested areas can be found in the northern and northeastern parts of the County and along the Susquehanna River. Wooded areas are also found bordering streams and other water bodies throughout the County. The Lancaster County Conservancy has identified approximately 12,000 acres of important natural habitats that should be preserved as “Natural Gems,” due to the presence of water bodies, wetland, forestland, grassland, geologic features, plants, animals, and adjacency to other preserved tracts. Figure 2-8 shows County land cover.



Figure 2-5. Distribution of Residential Building Stock Value Density in Lancaster County

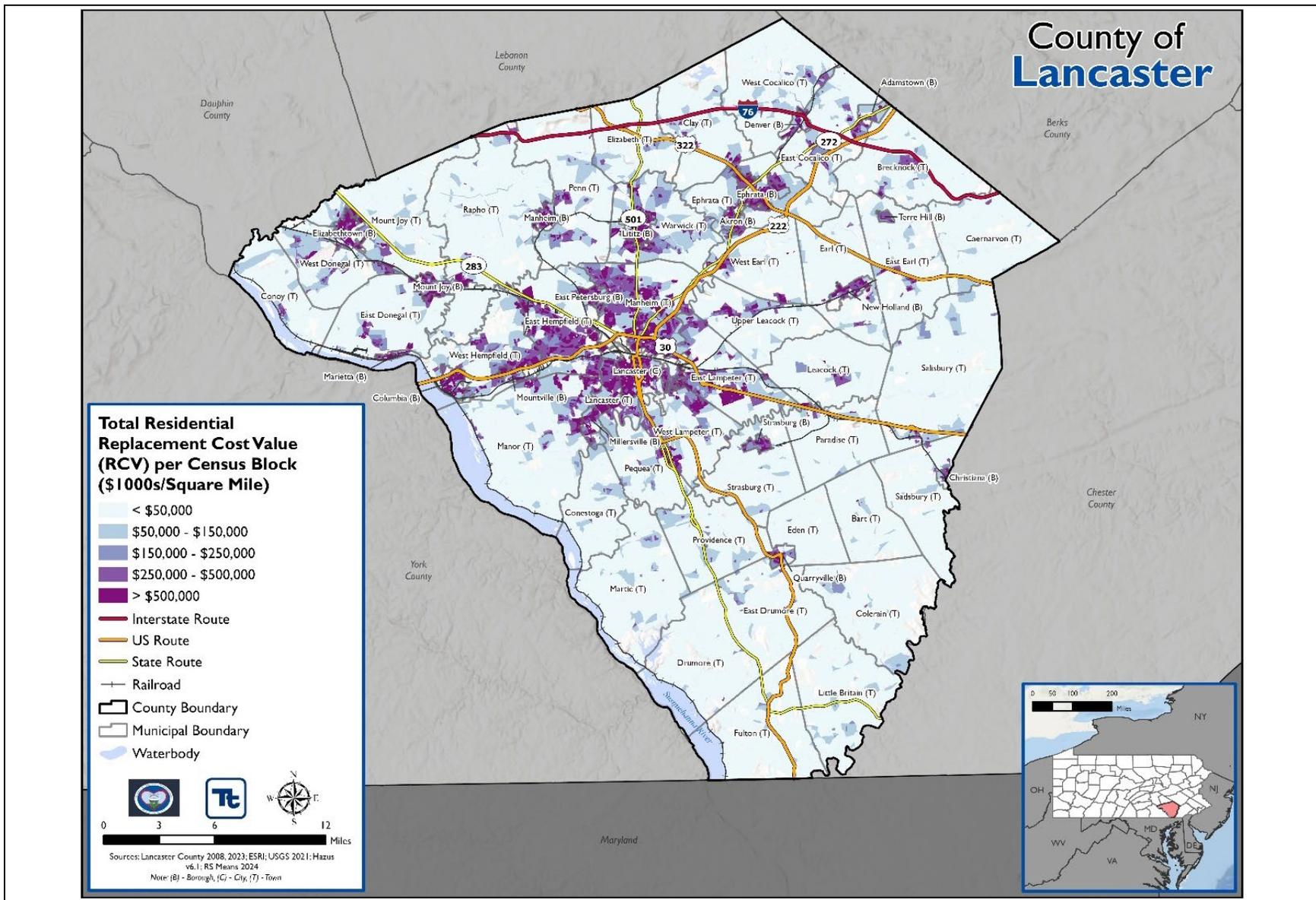




Figure 2-6. Distribution of Commercial Building Stock Value Density in Lancaster County

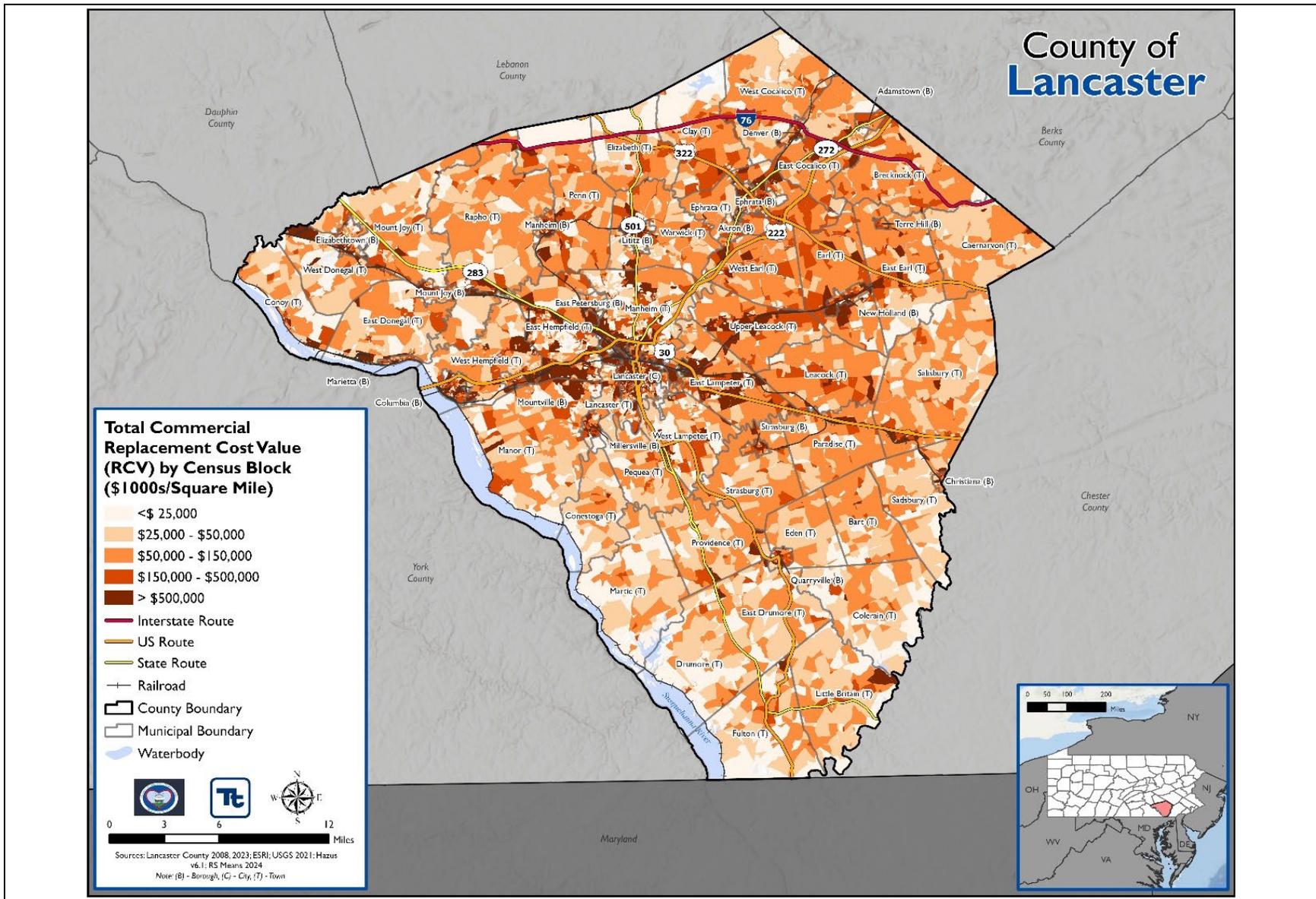




Figure 2-7. Distribution of Industrial Building Stock Value Density in Lancaster County

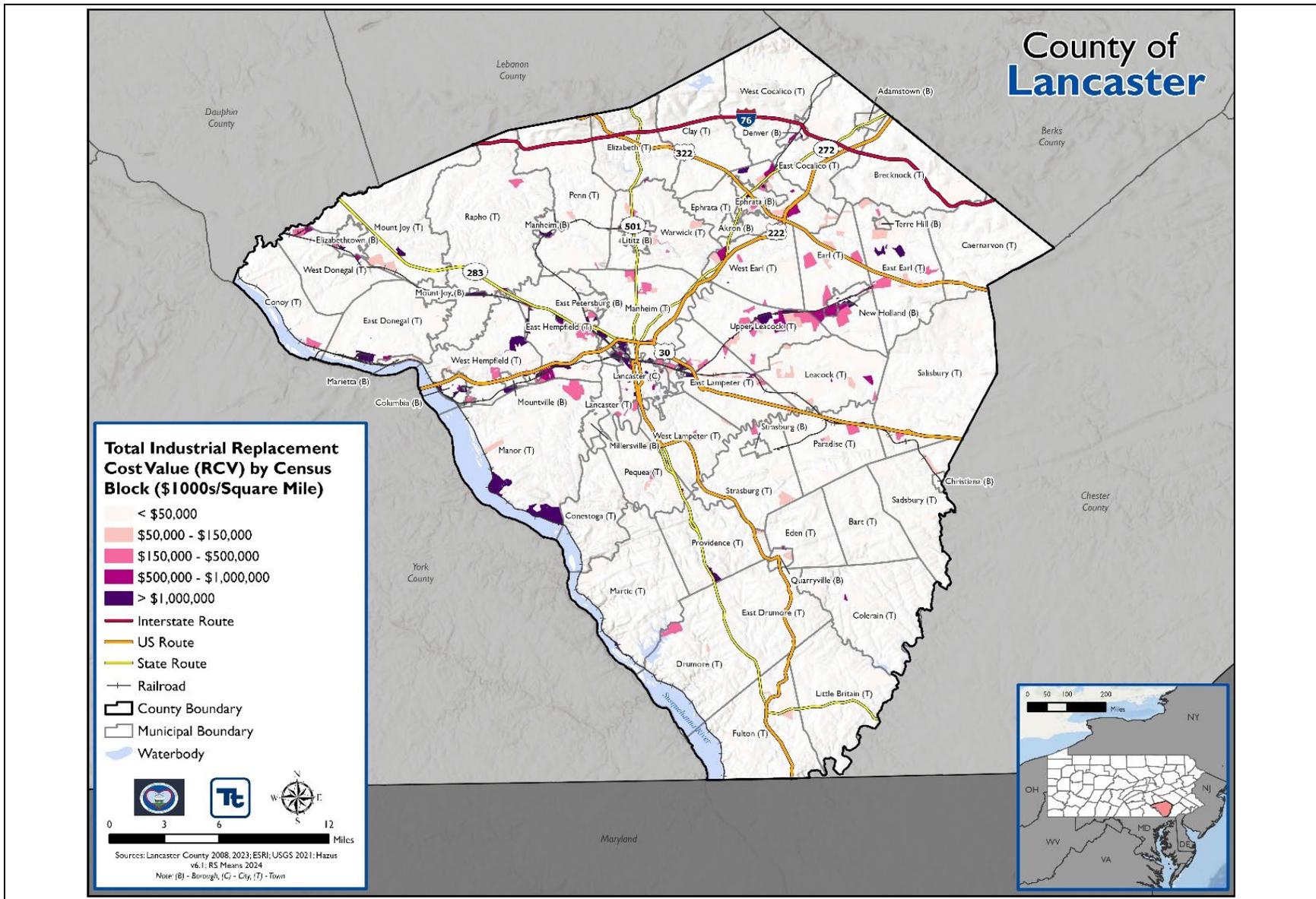
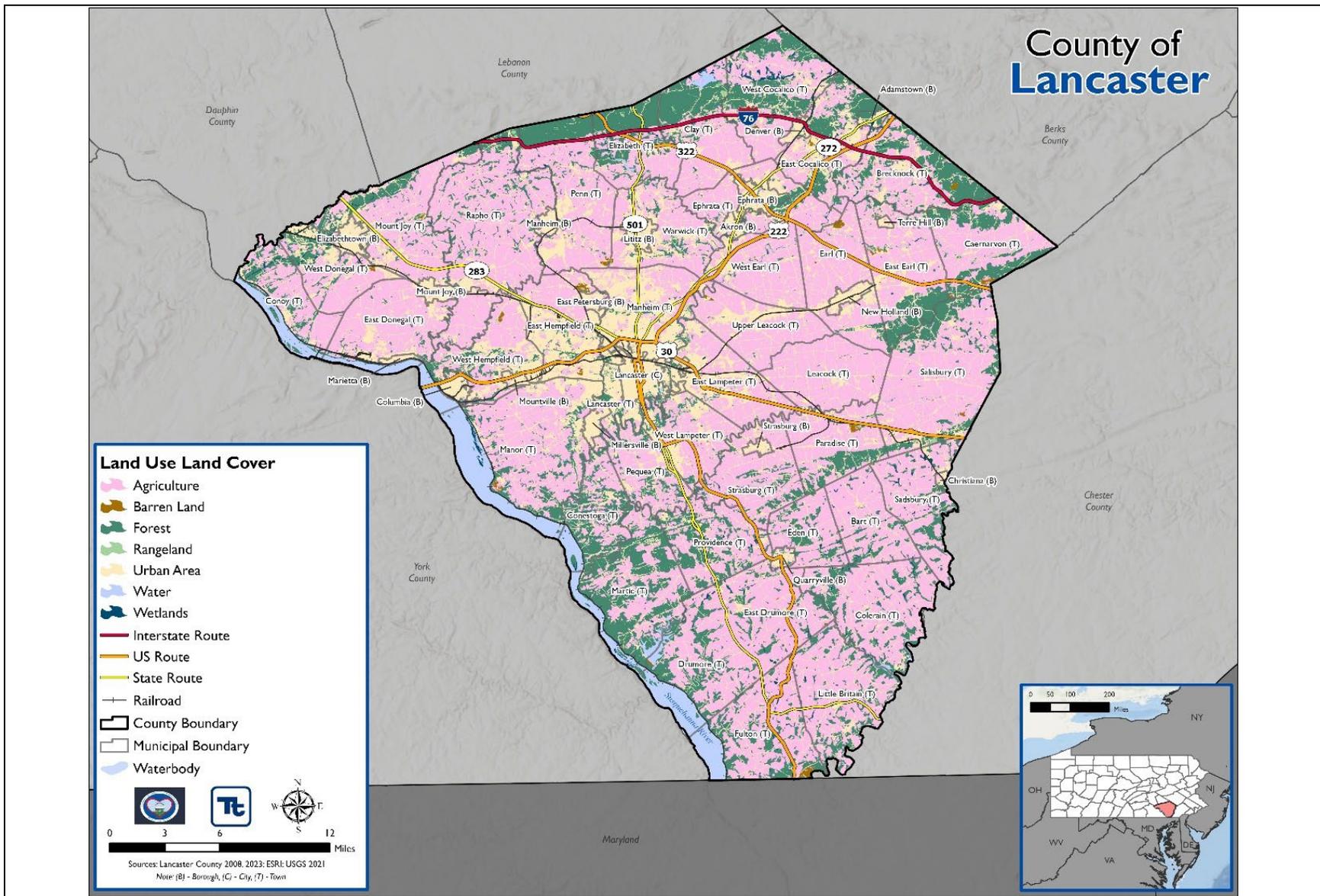




Figure 2-8. Lancaster County Land Cover





## 2.4.4 Community Lifelines and Other Critical Facilities

### The Community Lifeline Concept

Community lifelines, as defined by FEMA, are the most fundamental functions of a community. Lifelines are all the services, capabilities, and physical assets that are used day-to-day to support a community's ongoing needs. When stabilized and working properly, community lifelines enable all other aspects of society to function. The following are the basic community lifelines (in alphabetical order) and multiple components of each, as defined by FEMA (FEMA 2019):

- **Communications**—Communications infrastructure; responder communications; alerts, warnings, and messages; finance; 911; and dispatch
- **Energy**—Power grids and fuel supplies
- **Food, hydration, shelter**—Food and water suppliers, shelter locations, agriculture
- **Hazardous material**—Hazardous materials facilities, pollutants, and contaminants
- **Health and medical**—Medical care, public health, patient movement, medical supply chain, and fatality management
- **Safety and security**—Law enforcement, security, fire services, search and rescue services, government services, and community safety (including dams)
- **Transportation**—Highway, roadway, and motor vehicle networks; mass transit; railways; aviation; and maritime facilities
- **Water systems**—Potable water and wastewater infrastructure

FEMA further defines subcomponents for each of the above components—nearly 100 altogether. These subcomponents include physical facilities as well as public and private services, capabilities, activities, and systems. The essential subcomponents that make up community lifelines range from police stations to farm animals, from public records to the food supply chain, and from medical treatment to banking services.

### Lifelines Identified for This Plan's Risk Assessment

It is an essential element of hazard mitigation planning to identify the community lifelines whose function can be negatively impacted by hazard events and to develop mitigation actions that will minimize the potential for such impacts. For this hazard mitigation plan, the assessment of community lifelines focuses on physical assets—the critical facilities and infrastructure that can be geographically located within mapped hazard areas and for which quantitative estimates can be made of current value and potential loss.

Table 2-8 summarizes counts of identified physical community lifeline assets in Lancaster County by category, based on the best data available at the time of this plan. This information is subject to change as new information about such structures becomes available during the performance period for this plan.



Table 2-8. Community Lifelines in Lancaster County

FEMA Lifeline Category	Total Number of Lifelines
Communications	149
Energy	70
Food, Water, Shelter	12
Hazardous Materials	731
Health and Medical	1,147
Safety and Security	1,340
Transportation	44
Water Systems	449
Other Critical Facilities <sup>a</sup>	2,534
<b>Total</b>	<b>6,476</b>

a. Facilities designated as critical within Lancaster County that do not fit into any of FEMA’s community lifeline categories.

### 2.4.5 Development Trends

Lancaster County is a rural, agricultural community that has seen an increase in development over the last 15 years. Famous for the cultural heritage of the “Plain Sect” farming community who came to America from Germany in the sixteenth century, the County is listed on the World Monument Watch List, which identifies the world’s 100 historical and cultural sites most endangered by development pressures. Currently, 54.5 percent of the land is agricultural, while only 20 percent is considered to be developed; however, this number continues to grow year after year.

Lancaster County’s existing land use and growth management policies influence and are influenced by land use and growth policies of neighboring counties. Transportation systems provide the County with a high level of accessibility to major urban centers, such as the Cities of Harrisburg, Baltimore, and Philadelphia. As a result, the County has experienced a tremendous amount of growth and development stemming outward. The transportation corridor consisting of PA 283, U.S. 30, and U.S. 222 has been the focus of development in Lancaster County, and future growth is expected to continue in these areas.

Land use regulations have not been consistent with the County Comprehensive Plan’s Growth Management Element, though recent multi-municipal planning efforts have worked to correct this. Most recent development in the County has taken place near major corridors or within designated Urban or Village Growth Areas. While other developments have taken place outside of growth areas, they largely have occurred near existing development. Continued growth is projected for the County, with an anticipated 38,000 acres of development by 2030. The County has identified the preservation of farmland as a goal and has committed to preservation through the Agricultural Easement Purchase program administered by the Agricultural Preserve Board, which has protected approximately 50,000 acres in the County.

## 2.5 DATA SOURCES AND LIMITATIONS

This County profile was developed with information from the following sources, in addition to those noted in Appendix A:

1. Center for Rural Pennsylvania. 2023. County Profile.
2. FEMA. 2018. Flood Insurance Study.
3. Lancaster County. 2018. Lancaster County Comprehensive Plan. “places2040.”
4. Pennsylvania Department of Environmental Protection. 2012. Population Projections Report.
5. Lancaster Farmland Trust. 2021. State of Farmland Preservation in Lancaster County.





6. U.S. Census Bureau. 2010.
7. U.S. Census Bureau. 2020.
8. U.S. Census Bureau. 2022. American Factfinder—2017-2021 American Community Survey Lancaster County.

These sources were key in understanding the current demographic makeup of the community as well as in framing the foundation of the HMP. They provided the underlying context of the Plan and allowed the Planning Team to understand critical vulnerabilities in the County. Data sources used to perform geographic information system (GIS) analysis for the risk assessment are listed in Section 4.4.1.

Throughout the course of the planning process, the Planning Team continually sought additional data sources to augment the information included in the Plan. The Planning Team made multiple requests for existing jurisdictional documents (e.g., jurisdictional hazard mitigation plans and other relevant information). The response to these data requests was limited.



## SECTION 3 PLANNING PROCESS

A successful planning process builds partnerships and brings together members representing government agencies, the public, and other stakeholders to reach consensus on ways the community will prepare for and respond to those hazards most likely to occur. Participants involved in a comprehensive and transparent HMP planning process gain better understanding of problems and issues and can help devise solutions for the community. This helps to define common community values and garner widespread support for directing financial, technical, and human resources to agreed-upon actions. This section describes the planning process used to update the HMP, with participation from 82 of the county's 60 municipalities, special districts, and education institutions.

### 3.1 UPDATE PROCESS AND PARTICIPATION SUMMARY

In accordance with federal requirements for hazard mitigation planning, this HMP documents the following:

- Planning process
- Hazard identification
- Risk assessment
- Mitigation strategy: goals, actions, and projects
- Formal adoption by the participating jurisdictions
- Pennsylvania Emergency Management Agency (PEMA) and FEMA approval

Public participation and planning meetings served as the main forum for gathering information to update the HMP. The Steering Committee and Planning Team were afforded access to information in relevant and approved plans, policies, and procedures for Lancaster County. Opportunities for public participation included public meetings, a public survey, distribution of information at municipal meetings, and chances to review and comment on the draft HMP update. To develop all sections of the HMP, the Planning Team used meetings, e-mail correspondence, and teleconferences to solicit input from county, municipal, and other stakeholders, including members of the general public. Most information received for this update came from Lancaster County, its municipalities, and the Steering Committee. Information and feedback received was reviewed by the Planning Team and incorporated as vetted. Through this planning process, the county established a comprehensive approach to reduce effects of hazards on the county and its municipalities.

### 3.2 PLANNING TEAMS

#### 3.2.1 Planning Team

The Lancaster County Emergency Management Division led the update to the 2025 HMP. Community Resilience Coordinator Brooke Goodling developed a Planning Team to provide guidance and direction to the planning effort and to ensure that the resulting document will be accepted by local leadership and by the planning area general population. Ms. Goodling served as chair of the Planning Team, the lead planner, and point of contact for the planning process. The Planning Team was comprised of the following individuals, also noted in Table 3-1:

- Brooke Goodling, Community Resilience Coordinator & Volunteer Liaison, Lancaster County Emergency Management Division
- Ben Herskowitz, Deputy Director of Emergency Management, Lancaster County Emergency Management Division
- Kristine Niehaus, Health and Medical Preparedness Coordinator, Lancaster County Health and Human Services
- Sharon Cino, Senior Planner, Lancaster County Planning Department



- Christopher Thompson, District Manager, Lancaster County Conservation District
- Chris DeLong, Deputy Chief, Lancaster City Bureau of Fire; Emergency Management Coordinator, Lancaster City
- Diane Garber, Emergency Management Coordinator, East Hempfield Township
- Katharine DeSantis, Public Policy Coordinator, Lancaster Chamber
- Violet DeStefano, Emergency Management Coordinator, East Petersburg Borough
- Tony Subbio, Original Project Manager, Tetra Tech
- Jessica Stokes, Final Project Manager, Tetra Tech
- Emily Vassallo, Lead Planner, Tetra Tech

The Planning Team was charged with the following tasks:

- Providing guidance and overseeing the planning process on behalf of the general planning partnership.
- Attending and participating in Planning Team meetings.
- Assisting with the following planning elements:
  - Reviewing and updating the hazards of concern
  - Developing a public and stakeholder outreach program
  - Ensuring the data and information used in the plan update process is best available
  - Reviewing and updating the hazard mitigation planning goals and objectives
  - Identifying and screening appropriate mitigation strategies and activities
  - Reviewing and updating plan maintenance procedures
- Reviewing and commenting on plan documents prior to submittal to PEMA and FEMA.

Table 3-1. Planning Team Participants

Name	Title	Affiliation
Diane Garber	Emergency Management Coordinator	East Hempfield Township
Violet DeStefano	Emergency Management Coordinator	East Petersburg Borough
Katharine DeSantis	Public Policy Coordinator	Lancaster Chamber
Chris DeLong	Deputy Chief; Emergency Management Coordinator	Lancaster City Bureau of Fire; Lancaster City
Christopher Thompson	District Manager	Lancaster County Conservation District
Brooke Goodling	Community Resilience Coordinator & Volunteer Liaison	Lancaster County Emergency Management Division
Ben Herskowitz	Deputy Director of Emergency Management	Lancaster County Emergency Management Division
Kristine Niehaus	Health and Medical Preparedness Coordinator	Lancaster County Health and Human Services
Sharon Cino	Senior Planner	Lancaster County Planning Department
Tony Subbio	Former Project Manager	Tetra Tech
Jessica Stokes	Final Project Manager	Tetra Tech
Emily Vassallo	Lead Planner	Tetra Tech

### 3.2.2 Steering Committee

A Steering Committee was assembled to represent each of the municipalities participating in the HMP update, as well as stakeholders and members of the Planning Team. The organizations listed in Table 3-2 were invited to participate on the Steering Committee. Table 3-3 identifies those who participated as members of the Steering Committee.



**Table 3-2. Steering Committee Invited Organizations**

Lancaster County Municipalities				
Adamstown (B)	Akron (B)	Bart (Twp)	Brecknock (Twp)	Caernarvon (Twp)
Christiana (B)	Clay (Twp)	Colerain (Twp)	Columbia (B)	Conestoga (Twp)
Conoy (Twp)	Denver (B)	Drumore (Twp)	Earl (Twp)	East Cocalico (Twp)
East Donegal (Twp)	East Drumore (Twp)	East Earl (Twp)	East Hempfield (Twp)	East Lampeter (Twp)
East Petersburg (B)	Eden (Twp)	Elizabeth (Twp)	Elizabethtown (B)	Ephrata (B)
Ephrata (Twp)	Fulton (Twp)	Lancaster (C)	Lancaster (Twp)	Leacock (Twp)
Lititz (B)	Little Britain (Twp)	Manheim (B)	Manheim (Twp)	Manor (Twp)
Marietta (B)	Martic (Twp)	Millersville (B)	Mount Joy (B)	Mount Joy (Twp)
Mountville (B)	New Holland (B)	Paradise (Twp)	Penn (Twp)	Pequea (Twp)
Providence (Twp)	Quarryville (B)	Rapho (Twp)	Sadsbury (Twp)	Salisbury (Twp)
Strasburg (B)	Strasburg (Twp)	Terre Hill (B)	Upper Leacock (Twp)	Warwick (Twp)
West Cocalico (Twp)	West Donegal (Twp)	West Earl (Twp)	West Hempfield (Twp)	West Lampeter (Twp)
Special Districts				
Bainbridge Water Authority	East Cocalico Township Water and Sewer Authority	Lancaster Area Sewer Authority	Lancaster County Conservation District	Manheim Area Water and Sewer Authority
Educational Institutions				
Cocalico SD	Columbia Borough SD	Conestoga Valley SD	Donegal SD	Eastern Lancaster County SD
Elizabethtown Area SD	Elizabethtown College	Ephrata Area SD	Franklin and Marshall College	Harrisburg Area Community College, Lancaster Campus
Hempfield SD	Lampeter-Strasburg SD	Lancaster Bible College	Lancaster County Christian School	Lancaster County Community Career and Technology Center
Lancaster County Intermediate Unit	Lancaster County Public Safety Training Center	Lancaster School of Cosmetology and Therapeutic Bodywork	Lancaster SD	Lancaster-Lebanon Intermediate Unit
Manheim Central SD	Manheim Township SD	Millersville University	Penn Manor SD	Pennsylvania College of Health Sciences
Pennsylvania College of Art and Design	Pequea Valley SD	Solanco SD	Warwick SD	Thaddeus Stevens College of Technology
Hospitals				
Lancaster General Hospital-Penn Medicine	UPMC Pinnacle Lancaster	UPMC Pinnacle Lititz	WellSpan Ephrata Community Hospital	
Fire Departments				
Adamstown Fire Department	Akron Fire Department	Bainbridge Fire Department	Bareville Fire Department	Bart Fire Department
Bird-In-Hand Fire Department	Blue Rock Fire Department	Bowmansville Fire Department	Brickerville Fire Department	Brunnerville Fire Department
Caernarvon Fire Department	Christiana Fire Department	Columbia Borough Fire Department	Conestoga Fire Department	Denver Fire Department
Durlach & Mount Airy Fire Department	East Petersburg Fire Department	Eden Fire Department	Elizabethtown Fire Department	Ephrata Fire Department



Farmersville Fire Department	Fivepointville Fire Department	Gap Fire Department	Gordonville Fire Department	Hempfield Fire Department
Intercourse Fire Department	Kinzer Fire Department	Lafayette Fire Department	Lampeter Fire Department	Lancaster County Hazardous Materials Response Team
Lancaster Airport Fire Department	Lancaster City Fire Department	Lancaster Twp Fire Department	Lincoln Fire Department	Lititz Fire Department
Manheim Fire Department	Marietta Fire Department	Martindale Fire Department	Mastersonville Fire Department	Maytown Fire Department
Mount Joy Fire Department	Mount Joy Twp Forest Fire Crew	Mountville Fire Department	Neffsville Fire Department	New Danville Fire Department
New Holland Fire Department	Paradise Fire Department	Penryn Fire Department	Quarryville Fire Department	Rawlinsville Fire Department
Reamstown Fire Department	Refton Fire Department	Reinholds Fire Department	Rheems Fire Department	Robert Fulton Fire Department
Rohrerstown Fire Department	Ronks Fire Department	Rothsville Fire Department	Schoeneck Fire Department	Southern Manheim Twp Fire Department
Stevens Fire Department	Strasburg Fire Department	Upper Leacock Fire Department	Weaverland Valley Fire Department	West Earl Fire Department
West Hempfield Fire Department	West Willow Fire Department	White Horse Fire Department	Willow Street Fire Department	Witmer Fire Department
<b>Police Departments</b>				
Akron Borough Police Department	Christiana Borough Police Department	Columbia Borough Police Department	East Cocalico Township Police Department	East Earl Township Police Department
East Hempfield Township Police Department	East Lampeter Township Police Department	Ephrata Police Department	Elizabethtown Borough Police Department	Franklin & Marshall Public Safety
Lancaster County Parks	Lancaster County Sheriff	Lancaster Police Department	Lititz Borough Police Department	Manheim Borough Police Department
Manheim Township Police	Manheim Township Police Substation	Manor Township Police Department	Millersville Borough Police Department	Millersville University Police Department
Mount Joy Borough Police Department	New Holland Police Department	Northern Lancaster County Regional Police Department	Northwest Regional Police Department	Pennsylvania Fish Commission
Pennsylvania State Police	Quarryville Borough Police Department	Southern Regional Police Department	Strasburg Borough Police Department	Susquehanna Regional Police Department
West Earl Township Police Department	West Hempfield Township Police Department	West Lampeter Township Police Department		
<b>Emergency Medical Services (EMS) Agencies</b>				
Christiana EMS	Ephrata Community Hospital EMS	Ephrata EMS	Fivepointville EMS	Gordonville EMS
Lancaster EMS	Leola EMS	Manheim Township EMS	New Holland EMS	Northwest EMS
Reamstown EMS	Reinholds EMS	Rothsville EMS	Susquehanna Valley EMS	Wakefield EMS
Warwick EMS	White Horse EMS			
<b>Retirement, Personal Care, and Nursing Homes</b>				
Brethren Village	Calvary Fellowship Homes	Conestoga View	Elizabethtown Nursing and Rehabilitation	Ephrata Manor



Fairmount Homes	Garden Spot Village	Gardens at Lititz	Gardens at Stevens	Harrison Senior Living in Christiana
Homestead Village	Lakeside at Willow Valley	Lancashire Hall	Lancaster Care and Rehabilitation Center	Landis Homes
Manorcare Health Services: Lancaster	Maple Farm	Masonic Village at Elizabethtown	Mennonite Home Communities	Moravian Manor
Mount Hope Nazarene	Neffsville Nursing and Rehabilitation	Pleasant View Retirement Community	Quarryville Presbyterian Retirement Community	Susquehanna Valley Nursing and Rehabilitation
United Zion Retirement Community	Welsh Mountain Home	Zerbe Sisters Nursing Center		
<b>Neighboring Jurisdictions</b>				
Berks County (PA) Department of Emergency Services	Berks County (PA) Planning Commission	Cecil County (MD) Department of Emergency Services	Cecil County (MD) Planning and Zoning Division	Chester County (PA) Department of Emergency Services
Chester County (PA) Planning Commission	Dauphin County (PA) Department of Public Safety	Dauphin County (PA) Department of Planning	Delaware County (PA) Department of Emergency Services	Delaware County (PA) Planning Department
Harford County (MD) Department of Emergency Services	Harford County (MD) Department of Planning and Zoning	Lebanon County (PA) Department of Emergency Services	Lebanon County (PA) Planning Department	Tri-County Regional Planning Commission
York County (PA) Office of Emergency Management	York County (PA) Planning Commission			
<b>Other Stakeholders</b>				
American Red Cross	Delaware Valley Regional Planning Commission	Federal Emergency Management Agency	Pennsylvania Department of Environmental Protection	Pennsylvania Emergency Management Agency
Pennsylvania Turnpike Commission	Salvation Army	Southeastern Pennsylvania Regional Task Force	Southeastern Pennsylvania Transit Authority	

*B = Borough; C = City; EMS = Emergency Medical Services; MESA = Municipal Emergency Services Authority; SD = School District; Twp = Township; UPMC = University of Pittsburgh Medical Center*



Table 3-3. Steering Committee Participants

Name	Title	Affiliation
Ezra Rothman	President	EDC Lancaster County
Jack Fowler	Project Manager	EDC Lancaster County
Katharine DeSantis	Public Policy Coordinator	Lancaster Chamber
Bob Devonshire	Director of General Services	Lancaster County
Tim Klein	Facilities Director	Lancaster County Career and Technology Center
Ray D'Agostino	County Commissioner	Lancaster County Commissioner's Office
Alice Yoder	County Commissioner	Lancaster County Commissioner's Office
Christopher Thompson	District Manager	Lancaster County Conservation District
John Wettlaufer	Detective Sergeant/SERT Commander	Lancaster County District Attorney's Office
Brooke Goodling	Community Resilience Coordinator & Volunteer Liaison	Lancaster County Emergency Management Division
Ben Herskowitz	Deputy Director of Emergency Management	Lancaster County Emergency Management Division
Richard Steeg	Volunteer	Lancaster County Emergency Management Division
Bobby Jo Epstein	Intern	Lancaster County Emergency Management Division
Zachary Gibbons	Hazardous Materials Administrator	Lancaster County Emergency Management Division
Brett Fassnacht	Training & Exercise Coordinator	Lancaster County Emergency Management Division
Jay Robertson	Volunteer	Lancaster County Emergency Management Division
Kristine Niehaus	Health and Medical Preparedness Coordinator	Lancaster County Health and Human Services
Justin Eby	Executive Director	Lancaster County Housing & Redevelopment Authority
Sean Krumpe	Housing and Community Development Practitioner	Lancaster County Housing & Redevelopment Authority
Sharon Cino	Senior Planner	Lancaster County Planning Department
Mary Frey	Principal Planner	Lancaster County Planning Department
Todd Kirkpatrick	Director	Lancaster County Public Safety Training Center
Milimar Armer	Buyer III	Lancaster County Purchasing Department
Vincent Cash	Buyer I	Lancaster County Purchasing Department
Jose G. Valdes	Lieutenant Sheriff	Lancaster County Sheriff's Office
Chris Riggs	Chief	Lancaster County Sheriff's Office
Andrew Lavin	Training Supervisor	Lancaster County Wide Communications
Drew Fredericks	Director	Lancaster County Youth Intervention Center
Thomas Bold	Environmental Group Manager	Pennsylvania Department of Environmental Protection



Name	Title	Affiliation
Amanda Reilly	Founder	Pennsylvania Furniture Mission
Stephen Darby	Employee	Pennsylvania Furniture Mission
Linda Slaseman	Employee	Pennsylvania Furniture Mission
Pashk Sokoli	Founder	Pennsylvania Furniture Mission
Terry Trego	Office Representative	Senator Scott Martin’s Office
Tony Subbio	Former Project Manager	Tetra Tech
Jessica Stokes	Final Project Manager	Tetra Tech
Emily Vassallo	Lead Planner	Tetra Tech
John Schmidt	Mayor	Adamstown (B)
Timothy Soley	Emergency Management Coordinator	Adamstown (B)
Sean Molchany	Borough Manager / Zoning Officer	Akron (B)
Bill Howard	Emergency Management Coordinator	Akron (B)
Michael Hoover	Emergency Management Coordinator	Bart (Twp)
Cathy Snyder	Secretary / Treasurer	Bart (Twp)
Andrew Baum	Township Supervisor / Roadmaster	Brecknock (Twp)
Kathryn Norris	Secretary / Treasurer	Caernarvon (Twp)
Terry Martin	Township Supervisor / Roadmaster	Caernarvon (Twp)
Bobbi Maser	Borough Manager	Christiana (B)
Bruce Leisey	Township Manager	Clay (Twp)
Carmen Wiker	Secretary / Treasurer	Colerain (Twp)
Mark Deimler	Zoning Officer	Colerain (Twp)
Jay Barninger	Emergency Management Coordinator	Columbia (B)
Heather Zink	Borough Council President	Columbia (B)
Leo Lutz	Mayor	Columbia (B)
Joanne Price	Borough Councilperson	Columbia (B)
Mike Burke	Borough Councilperson	Columbia (B)
Mark Stivers	Borough Manager	Columbia (B)
Jessie Ebersole	Secretary / Treasurer	Conestoga (Twp)
Mike Hall	Emergency Management Coordinator	Conestoga (Twp)
Shannon Sinopoli	Secretary / Zoning Officer	Conoy (Twp)
Sarah Ames	Deputy Emergency Management Coordinator	Denver (B)
Michael Hession	Borough Manager / Secretary	Denver (B)
Dwight Eshleman	Chairperson	Drumore (Twp)
Mark Deimler	Zoning Officer	Drumore (Twp)
Jamie Weir	Emergency Management Coordinator	Earl (Twp)
Lavern Zimmerman	Deputy Emergency Management Coordinator	Earl (Twp)
Amanda Martin	Secretary / Treasurer	Earl (Twp)
Thomas Ryan	Township Manager	East Cocalico (Twp)
Jeffrey Butler	Township Manager	East Donegal (Twp)
Craig Underwood	Floodplain Administrator	East Donegal (Twp)
Scott Kingsboro	Assistant Township Manager	East Donegal (Twp)
James Landis	Township Supervisor	East Drumore (Twp)
Mark Deimler	Zoning Officer	East Drumore (Twp)
Diane Garber	Emergency Management Coordinator	East Hempfield (Twp)



Name	Title	Affiliation
John Kottmyer	Chief Fire Official	East Hempfield (Twp)
Colin Siesholtz	Director of Planning	East Lampeter (Twp)
Tara Hitchens	Assistant Township Manager	East Lampeter (Twp)
Violet DeStefano	Emergency Management Coordinator	East Petersburg (B)
Debra Miller	Borough Council President	East Petersburg (B)
James Malone	Mayor	East Petersburg (B)
John Herr	Borough Councilperson	East Petersburg (B)
Kevin Martin	Public Works Supervisor	East Petersburg (B)
Jeff Moseman	MS4 Supervisor	East Petersburg (B)
Rick Ely	Emergency Management Coordinator	Eden (Twp)
Jason Skonberg	Deputy Emergency Management Coordinator	Eden (Twp)
Mark Deimler	Zoning Officer	Eden (Twp)
Loren Miller	Township Manager	Elizabeth (Twp)
Duane Ober	Deputy Emergency Management Coordinator	Elizabeth (Twp)
Dennis Strauss	Emergency Management Coordinator	Elizabeth (Twp)
Curtis Thompson	Emergency Management Coordinator	Elizabethtown (B)
Ann Roda	Borough Manager	Elizabethtown (B)
Randy Gockley	Emergency Management Coordinator	Ephrata (B)
Steven Sawyer	Township Manager	Ephrata (Twp)
Mike Church	Vice Chairman	Fulton (Twp)
Chris DeLong	Deputy Chief / Emergency Management Coordinator	Lancaster (City)
Danene Sorace	Mayor	Lancaster (City)
Douglas Smith	Chief Planner	Lancaster (City)
Brett Fassnacht	Emergency Management Coordinator	Lancaster (Twp)
Gene Duncan	Deputy Emergency Management Coordinator	Lancaster (Twp)
Christopher Slaymaker	Township Manager	Leacock (Twp)
Jim Houser	Emergency Management Coordinator	Leacock (Twp)
Duane Ober	Emergency Management Coordinator and Fire Commissioner	Lititz (B)
Ronald Criswell	Emergency Management Coordinator	Little Britain (Twp)
Jim Fisher	Former Borough Manager	Manheim (B)
Jim Williams	Former Interim Borough Manager	Manheim (B)
Joel Mutschler	Borough Manager	Manheim (B)
Scott Little	Emergency Management Coordinator / Fire Chief	Manheim (Twp)
Duane Hagelgans	Emergency Management Coordinator	Manor (Twp)
Steve Bailey	Emergency Management Coordinator	Marietta (B)
Jeff Hudson	Borough Councilperson	Marietta (B)
Julie Hall	Secretary / Treasurer	Marietta (B)
Judith Kennedy	Councilwoman	Marietta (B)
Miles Lauver	Councilman	Marietta (B)
Fred States	Borough Council President	Marietta (B)
Karen Sellers	Township Manager	Martic (Twp)



Name	Title	Affiliation
Mike Hall	Emergency Management Coordinator	Martic (Twp)
Joseph Lane	Borough Council President	Millersville (B)
David Aichele	Mayor	Millersville (B)
Rebecca DeSantis-Randall	Borough Manager	Millersville (B)
Duane Hagelgans	Emergency Management Coordinator	Millersville (B)
Philip Colvin	Emergency Management Coordinator	Mount Joy (B)
Mark G. Pugliese	Borough Manager	Mount Joy (B)
Curtis Thompson	Emergency Management Coordinator	Mount Joy (Twp)
Justin Evans	Zoning Officer	Mount Joy (Twp)
Joe Iacono	Emergency Management Coordinator	Mountville (B)
Nick Oakes	Deputy Emergency Management Coordinator	Mountville (B)
J. Richard Fulcher	Emergency Management Coordinator	New Holland (B)
David Thompson	Township Manager	Paradise (Twp)
Mark Hiester	Township Manager	Penn (Twp)
Mike Hall	Emergency Management Coordinator	Pequea (Twp)
Vicki Eldridge	Township Manager	Providence (Twp)
Diane Hastings	Borough Councilperson	Quarryville (B)
Scott Peiffer	Borough Manager	Quarryville (B)
Lori Shenk	Emergency Management Coordinator	Rapho (Twp)
Randall Wenger	Township Manager	Rapho (Twp)
Erik Lofgren	Emergency Management Coordinator	Sadsbury (Twp)
Joe Kennedy	Emergency Management Coordinator	Salisbury (Twp)
Steven Echternach	Emergency Management Coordinator / Borough Manager	Strasburg (B)
Tammy Jamison	Secretary	Strasburg (Twp)
Nelson Dagen	Emergency Management Coordinator	Upper Leacock (Twp)
Duane Ober	Emergency Management Coordinator and Fire Commissioner	Warwick (Twp)
Carolyn Hildebrand	Township Manager	West Cocalico (Twp)
Curtis Thompson	Emergency Management Coordinator	West Donegal (Twp)
John Yoder	Township Manager	West Donegal (Twp)
Jenna Reigle	Township Manager	West Earl (Twp)
Sara Service	Zoning Officer	West Earl (Twp)
Bill Howard	Emergency Management Coordinator	West Earl (Twp)
Andrew Stern	Township Manager	West Hempfield (Twp)
Nick Oakes	Emergency Management Coordinator	West Hempfield (Twp)
Ken Barton	Emergency Management Coordinator	West Lampeter (Twp)
Rebecca Denlinger	Township Manager	West Lampeter (Twp)
Angela Pantanella	Office Manager	Bainbridge Water Authority
Stephen Melnyk	Assistant to the Superintendent	Cocalico SD
Erin Birk	Safety and Security Coordinator	Columbia Borough SD
Jonathan Werner	Director of Safety and Security	Conestoga Valley SD
Mark Heckaman	Director of Operations and Safety	Donegal SD
Robert Meringer	Maintenance Supervisor	Donegal SD
Mike Galley	Compliance Manager	East Cocalico (Twp) Water and Sewer



Name	Title	Affiliation
Garret Rain	Safety and Security Coordinator	Elizabethtown Area SD
Jacy Clugston Hess	Assistant Superintendent	Ephrata Area SD
John Hirneisen	School Resource Officer	Ephrata Area SD
William Gleason	Safety and Security Supervisor	Hempfield SD
Glenn Davis	Director of Buildings and Grounds	Lampeter-Strasburg SD
Keith Stoltzfus	Business Manager	Lampeter-Strasburg SD
Michael J. Wolgemuth	Executive Director	Lancaster Area Sewer Authority
Bob Wegman	Director-Public Safety	Lancaster Bible College
Chris Thompson	District Manager	Lancaster County Conservation District
Christopher Krokos	School Safety Coordinator	Lancaster SD
Stephen Halstead	Safety and Security Coordinator / Chief	Lancaster-Lebanon Intermediate Unit
Charlie Heisey	Executive Director	Manheim Area Water and Sewer Authority
Amy Flannery	Assistant Superintendent	Manheim Central SD
Dale Reimann	Assistant Superintendent	Manheim Township SD
Chris Steppat	Student	Millersville University
R. Scott Domowicz	Chief Financial Officer	Octara Area School District
Philip Gale	Superintendent of Schools	Penn Manor SD
Cameron Zettlemoyer	Emergency Manager	Penn State Health
Robert Dangler	Assistant Superintendent	Solanco SD
Tom Shumaker	Safety Coordinator	Warwick SD
Dr. Steve Szobocsan	Assistant Superintendent	Warwick SD
Kim Stonebraker	Emergency Manager	Well Span Health

*B = Borough; C = City; EMS = Emergency Medical Services; MESA = Municipal Emergency Services Authority; SD = School District; Twp = Township*

Only jurisdictions that participated in the plan update process may adopt this plan and will be eligible for commonwealth and federal hazard mitigation funding. For the purpose of this plan, jurisdictional participation was defined as completion and submission of an Evaluation of Identified Hazards Worksheet, Capability Assessment Survey, National Flood Insurance Program (NFIP) Survey, and/or Mitigation Strategy 5-Year Plan Review Worksheet, and attendance by an official municipal representative at a planning or public meeting, or participation in individual outreach conducted as part of the planning process. Appendices C, D, and E include complete lists of individual invitees and participants, attendance at meetings, completion of worksheets, and submittal of comments.

### 3.2.3 Contract Consultant

As the contract consultant, Tetra Tech guided the Planning Team and Steering Committee through the HMP update planning process. Tetra Tech was tasked with the following:

- Assisting with the organization of a Planning Team and Steering Committee
- Assisting with the development and implementation of a public and stakeholder outreach program
- Collecting data
- Facilitating and recording attendance at meetings
- Assisting with the review, update, and ranking of the hazards of concern, and hazard profiling, and risk assessment
- Assisting with the review and update of mitigation planning goals and objectives
- Assisting with the review of progress of past mitigation strategies
- Assisting with the screening of mitigation actions and the identification of appropriate actions





- Assisting with the prioritization of mitigation actions
- Authoring of the draft and final HMP documents

### 3.3 MEETINGS AND DOCUMENTATION

Tetra Tech assisted the county in drafting planning documents, preparing meeting materials, and facilitating meetings. The Steering Committee reviewed documentation, provided validation, and acted as an advocate for the HMP update. Table 3-4 lists dates and descriptions of meetings held by the Lancaster County Steering Committee and Planning Team. The Planning Team followed up each meeting with meeting notes that documented all agenda topics, decisions, and action items identified. The meeting minutes were posted to the project website. Appendix C includes documentation from all meetings.

Table 3-4. Public and Planning Meetings

Date	Description of Meeting
September 25, 2023	Kickoff meeting with the Planning Team
October 31, 2023	Kickoff meeting with Steering Committee members, including 5-year plan review and plan update process, evaluation of identified hazards, capability assessment, and mitigation strategy review.
April 9, 2024	Meeting with Steering Committee members at the Emergency Management Coordinator meeting to discuss and evaluate hazards of concern and identify problem areas in Lancaster County
April 24, 2024	Hazard mitigation planning discussed at the Lancaster County Boroughs Association meeting.
August 15, 2024	Hazard mitigation plan status review discussed at the Lancaster County Planning Department meeting.
September 23, 2024	Planning Team meeting to review the results of the risk assessment. The Planning Team members identified problem areas and issues throughout the County for each hazard.
October 16, 2024	Steering Committee meeting to review the results of the risk assessment. The Steering Committee members identified problem areas and issues throughout the County for each hazard.
December 2024	Mitigation strategy workshop to review mitigation goals, objectives, actions, and current plan status with the Steering Committee.
October 2023 – November 2024	Direct outreach and teleconference discussions with municipalities, to garner as much participation in the planning process as possible.
January 31, 2025	Planning Team meeting to receive comments on the draft HMP
January 31, 2025	Steering Committee and Public HMP meeting to receive comments on the draft HMP.
TBD	HMP adoption by County Commissioners.

### 3.4 PUBLIC AND STAKEHOLDER PARTICIPATION

To maximize effectiveness of the HMP, the Steering Committee fostered continual public and stakeholder engagement. Input was encouraged and collected through a variety of methods. Lancaster County residents were informed of the planning process through newspaper-announced public notices and announcements on the Lancaster County HMP project website (<https://www.lancastercountypa.gov/2940/2022---2025-Hazard-Mitigation-Planning-P>). Supporting documentation provided to county residents is included in Appendix E (Public and Stakeholder Participation).

Five worksheets/surveys were given to representatives from each municipality in Lancaster County:

- Hazard/risk identification survey
- Municipal risk factor analysis
- Capabilities assessment survey
- NFIP survey
- Mitigation strategy 5-year plan review worksheet





Of the county’s 60 municipalities, special districts, and 17 educational institutions, 78 jurisdictions (the county, 58 municipalities, special districts, and education institutions) provided information so that their input could be reviewed and incorporated into the updated HMP.

The following entities with vested interest in development of the updated HMP were given the opportunity to participate in the planning process by attending a Steering Committee or public meeting, completing a stakeholder survey, or offering comments on the project website:

- Local, state, and federal agencies
- Neighboring jurisdictions (i.e., Berks, Chester, Dauphin, Delaware, Lebanon, and York Counties in Pennsylvania; Cecil and Harford Counties in Maryland)
- Community leaders
- Educators
- Healthcare facilities
- Other relevant private and nonprofit groups.

Invitations to participate in meetings were sent to those stakeholders. Appendix E includes a copy of the Steering Committee meeting invitation list and sample copies of invitation letters sent. Meeting invitations were also sent to all municipalities, including elected officials and emergency management coordinators. Direct outreach by phone or one-on-one meetings was conducted with municipality representatives unable to attend other meetings or who had questions about worksheets, participation requirements, the planning process, or mitigation project selection. Of the 60 municipalities, special district, and 17 educational institutions, 35 had representatives attend at least one meeting; six participating municipalities provided information through individual contact.

Through emails, in-person outreach events, and social media posts, the stakeholders and the general public were invited to visit the project website, review the draft HMP update, and send comments to the Lancaster County Emergency Management Division. Appendix E includes copies of the public notices and other forms of public and stakeholder outreach.

Over the course of the planning process, the following stakeholder organizations participated:

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>• Chester County, Pennsylvania, Department of Emergency Services</li> <li>• Conestoga Valley School District</li> <li>• Dauphin County, Pennsylvania, Department of Public Safety</li> <li>• Elizabethtown Area School District</li> <li>• Ephrata Police Department</li> <li>• Harford County, Maryland, Department of Emergency Services</li> <li>• Hempfield School District</li> </ul> | <ul style="list-style-type: none"> <li>• Lampeter-Strasburg School District</li> <li>• Lancaster County Conservation District</li> <li>• Lancaster County-Wide Communications</li> <li>• Lancaster-Lebanon Intermediate Unit</li> <li>• Lebanon County, Pennsylvania, Department of Emergency Services</li> <li>• Mennonite Home Communities</li> <li>• Mount Hope Nazarene</li> <li>• Neffsville Nursing and Rehabilitation</li> </ul> | <ul style="list-style-type: none"> <li>• Northwest Emergency Medical Services and Municipal Emergency Services Authority of Lancaster County</li> <li>• Penn Manor School District</li> <li>• Pennsylvania Department of Environmental Protection</li> <li>• UPMC Pinnacle Lititz</li> <li>• Warwick School District</li> <li>• Welsh Mountain Home</li> <li>• York County (PA) Office of Emergency Management</li> </ul> |
|---|---|---|



### 3.5 MULTI-JURISDICTIONAL PLANNING

Lancaster County took a multi-jurisdictional approach to preparing the HMP, so that the HMP would apply to the county and all participating municipalities. The county was able to provide resources (e.g., data, geographic information system [GIS], etc.) to which the municipalities may not have had access. However, Lancaster County depended on municipal buy-in because the municipalities have the legal authority to enforce compliance with land use planning and development directives. Lancaster County undertook an intensive effort to involve all 60 municipalities and 18 special districts in the update process.

Each municipality was given the opportunity to participate in this process. Municipal officials and representatives were invited to attend Steering Committee and public meetings, were provided with worksheets to update the hazards of concern, capabilities, and mitigation strategy, and were asked to review and prioritize the mitigation actions. Municipal participation culminated in formal adoption of the HMP; copies of municipal adoption resolutions are in Appendix F. Table 3-5 and Table 3-6 indicate the ways each municipality participated in the planning process. In some cases, a municipality was unable to attend a Steering Committee meeting; therefore, an individual follow-up meeting with each municipality was held by the Hazard Mitigation Plan Coordinator and/or the contracted consultant to cover the meeting material and provide municipal support on the topics presented.



Table 3-5. Participation Matrix—Meetings

Jurisdiction	Meetings										Individual Contact
	PT Kick-Off Meeting 9/25/23	SC Kick-Off Meeting 10/31/23	EMC Meeting 4/9/24	LCBA Meeting 4/24/24	Planning Dept. Meeting 8/15/24	PT RA Meeting 9/23/24	SC RA Meeting 10/16/24	Mitigation Strategy Workshop 12/4/24	PT HMP Draft Review Meeting 1/30/25	SC/Public HMP Draft Review Meeting 1/30/25	
Lancaster County	X	X	X	X	X	X	X	X	X	X	
Adamstown (B)			X				X				
Akron (B)											
Bart (Twp)											
Brecknock (Twp)											
Caernarvon (Twp)											
Christiana (B)											
Clay (Twp)											
Colerain (Twp)											
Columbia (B)			X	X			X				
Conestoga (Twp)											X
Conoy (Twp)											
Denver (B)			X	X							
Drumore (Twp)											
Earl (Twp)			X				X				
East Cocalico (Twp)											
East Donegal (Twp)											
East Drumore (Twp)											
East Earl (Twp)											
East Hempfield (Twp)	X	X	X				X				
East Lampeter (Twp)											
East Petersburg (B)	X	X	X	X		X	X	X		X	
Eden (Twp)		X	X				X			X	
Elizabeth (Twp)											
Elizabethtown (B)			X	X							
Ephrata (B)		X	X				X	X			



Jurisdiction	Meetings										Individual Contact
	PT Kick-Off Meeting 9/25/23	SC Kick-Off Meeting 10/31/23	EMC Meeting 4/9/24	LCBA Meeting 4/24/24	Planning Dept. Meeting 8/15/24	PT RA Meeting 9/23/24	SC RA Meeting 10/16/24	Mitigation Strategy Workshop 12/4/24	PT HMP Draft Review Meeting 1/30/25	SC/Public HMP Draft Review Meeting 1/30/25	
Ephrata (Twp)											
Fulton (Twp)											
Lancaster (City)	X	X	X	X		X	X	X	X	X	
Lancaster (Twp)			X				X	X			
Leacock (Twp)											
Lititz (B)		X	X				X	X			
Little Britain (Twp)											
Manheim (B)				X							
Manheim (Twp)											
Manor (Twp)											
Marietta (B)			X	X							
Martic (Twp)											X
Millersville (B)				X							
Mount Joy (B)		X	X	X			X	X			
Mount Joy (Twp)			X								
Mountville (B)											
New Holland (B)											
Paradise (Twp)											
Penn (Twp)		X									
Pequea (Twp)			X								X
Providence (Twp)											
Quarryville (B)				X							
Rapho (Twp)			X				X	X			X
Sadsbury (Twp)			X				X				
Salisbury (Twp)											
Strasburg (B)											
Strasburg (Twp)											
Terre Hill (B)											



Jurisdiction	Meetings										Individual Contact
	PT Kick-Off Meeting 9/25/23	SC Kick-Off Meeting 10/31/23	EMC Meeting 4/9/24	LCBA Meeting 4/24/24	Planning Dept. Meeting 8/15/24	PT RA Meeting 9/23/24	SC RA Meeting 10/16/24	Mitigation Strategy Workshop 12/4/24	PT HMP Draft Review Meeting 1/30/25	SC/Public HMP Draft Review Meeting 1/30/25	
Upper Leacock (Twp)											
Warwick (Twp)		X	X				X	X		X	
West Cocalico (Twp)											
West Donegal (Twp)			X								
West Earl (Twp)											
West Hempfield (Twp)							X				
West Lampeter (Twp)			X				X				
Cocalico SD											
Columbia Borough SD											
Conestoga Valley SD											
Donegal SD		X									
Eastern Lancaster County SD											
Elizabethtown Area SD											
Ephrata Area SD		X									
Hempfield SD											
Lampeter-Strasburg SD											
Lancaster SD											
Lancaster-Lebanon Intermediate Unit											
Manheim Central SD											
Manheim Township SD								X			
Penn Manor SD											
Pequea Valley SD											
Solanco SD											
Warwick SD		X									
Lancaster County Conservation District								X		X	



Jurisdiction	Meetings										Individual Contact
	PT Kick-Off Meeting 9/25/23	SC Kick-Off Meeting 10/31/23	EMC Meeting 4/9/24	LCBA Meeting 4/24/24	Planning Dept. Meeting 8/15/24	PT RA Meeting 9/23/24	SC RA Meeting 10/16/24	Mitigation Strategy Workshop 12/4/24	PT HMP Draft Review Meeting 1/30/25	SC/Public HMP Draft Review Meeting 1/30/25	
East Cocalico Township Water and Sewer Authority								X			
Lancaster Area Sewer Authority											X
Bainbridge Water Authority											
Well Span Health		X					X	X		X	
Penn State Health		X									
Manheim Area Water and Sewer Authority											X

Notes: EMC = Emergency Management Coordinator; Dept. = Department; LCBA = Lancaster County Boroughs Association; N/A = Not applicable; NFIP = National Floodplain Insurance Program; PT = Planning Team; RA = Risk Assessment; SC = Steering Committee; SD = School District; TBD = To be determined.



Table 3-6. Participation Matrix—Worksheets

Jurisdiction	Worksheets						2025 Plan Adoption Date
	Hazard Evaluation	Risk Ranking Review	Capability Assessment	NFIP	Mitigation Strategy Review	New Action Development	
Lancaster County	X	X	X	N/A	X	X	TBD
Adamstown (B)					X		TBD
Akron (B)	X	X	X	X	X	X	TBD
Bart (Twp)	X	X	X	X	X	X	TBD
Brecknock (Twp)	X		X	X			TBD
Caernarvon (Twp)	X	X	X	X	X	X	TBD
Christiana (B)	X		X	X	X		TBD
Clay (Twp)	X		X	X	X		TBD
Colerain (Twp)	X	X	X	X	X	X	TBD
Columbia (B)	X	X	X	X	X	X	TBD
Conestoga (Twp)	X	X	X	X	X	X	TBD
Conoy (Twp)	X		X	X	X		TBD
Denver (B)	X	X	X	X	X	X	TBD
Drumore (Twp)	X		X	X	X		TBD
Earl (Twp)	X		X	X	X	X	TBD
East Cocalico (Twp)	X	X	X	X	X	X	TBD
East Donegal (Twp)	X	X	X	X	X	X	TBD
East Drumore (Twp)	X		X	X			TBD
East Earl (Twp)							TBD
East Hempfield (Twp)	X		X	X	X		TBD
East Lampeter (Twp)	X	X	X	X	X	X	TBD
East Petersburg (B)	X		X	X	X	X	TBD
Eden (Twp)	X	X	X	X	X	X	TBD
Elizabeth (Twp)	X	X	X	X	X	X	TBD
Elizabethtown (B)	X		X	X	X		TBD
Ephrata (B)	X	X	X	X	X		TBD
Ephrata (Twp)	X		X	X	X		TBD
Fulton (Twp)		X			X		TBD
Lancaster (City)	X	X	X	X	X	X	TBD



Jurisdiction	Worksheets						2025 Plan Adoption Date
	Hazard Evaluation	Risk Ranking Review	Capability Assessment	NFIP	Mitigation Strategy Review	New Action Development	
Lancaster (Twp)	X	X	X	X	X		TBD
Leacock (Twp)	X	X	X	X	X	X	TBD
Lititz (B)	X	X	X	X	X	X	TBD
Little Britain (Twp)	X		X	X	X		TBD
Manheim (B)	X	X	X	X	X	X	TBD
Manheim (Twp)	X	X	X	X	X	X	TBD
Manor (Twp)	X	X	X	X	X	X	TBD
Marietta (B)	X		X	X	X		TBD
Martic (Twp)	X	X	X	X	X	X	TBD
Millersville (B)	X	X	X	X	X	X	TBD
Mount Joy (B)	X	X	X	X	X	X	TBD
Mount Joy (Twp)	X	X	X	X	X	X	TBD
Mountville (B)		X				X	TBD
New Holland (B)	X		X	X	X		TBD
Paradise (Twp)	X		X	X	X		TBD
Penn (Twp)	X		X	X	X		TBD
Pequea (Twp)	X	X				X	TBD
Providence (Twp)	X		X	X	X		TBD
Quarryville (B)	X	X	X	X	X	X	TBD
Rapho (Twp)	X	X	X	X	X	X	TBD
Sadsbury (Twp)	X		X	X	X	X	TBD
Salisbury (Twp)							TBD
Strasburg (B)	X		X	X	X		TBD
Strasburg (Twp)	X		X	X	X		TBD
Terre Hill (B)							TBD
Upper Leacock (Twp)	X		X	X	X		TBD
Warwick (Twp)	X	X	X	X	X	X	TBD
West Cocalico (Twp)	X		X	X	X		TBD
West Donegal (Twp)	X		X	X	X		TBD
West Earl (Twp)	X	X	X	X	X	X	TBD
West Hempfield (Twp)	X	X	X	X	X	X	TBD



Jurisdiction	Worksheets						2025 Plan Adoption Date
	Hazard Evaluation	Risk Ranking Review	Capability Assessment	NFIP	Mitigation Strategy Review	New Action Development	
West Lampeter (Twp)	X	X	X		X		TBD
Cocalico SD	X		X	N/A	X	X	TBD
Columbia Borough SD		X		N/A		X	TBD
Conestoga Valley SD	X		X	N/A	X		TBD
Donegal SD				N/A			TBD
Eastern Lancaster County SD				N/A			TBD
Elizabethtown Area SD	X		X	N/A	X	X	TBD
Ephrata Area SD	X	X		N/A		X	TBD
Hempfield SD			X	N/A	X	X	TBD
Lampeter-Strasburg SD	X	X	X	N/A	X		TBD
Lancaster SD	X		X	N/A	X		TBD
Lancaster-Lebanon Intermediate Unit	X		X	N/A			TBD
Manheim Central SD		X		N/A			TBD
Manheim Township SD				N/A			TBD
Penn Manor SD	X		X	N/A	X		TBD
Pequea Valley SD				N/A			TBD
Solanco SD	X		X	N/A	X		TBD
Warwick SD	X	X	X	N/A	X	X	TBD
Lancaster County Conservation District				N/A			TBD
East Cocalico Township Water and Sewer Authority	X	X	X	N/A	X	X	TBD
Octara Area School District		X		N/A			TBD
Bainbridge Water Authority		X		N/A		X	TBD
Manheim Area Water and Sewer Authority				N/A			TBD
Lancaster Area Sewer Authority		X		N/A		X	TBD
Well Span Health				N/A			TBD
Penn State Health				N/A			TBD

Notes: N/A = Not Applicable; NFIP = National Floodplain Insurance Program; SD = School District; TBD = To be determined after plan is approved-pending adoption by FEMA Region 3

\* Though the worksheet was not received, the related information was collected during an interview with officials.



## SECTION 4 RISK ASSESSMENT

FEMA defines risk as the potential for damage, loss, or other impacts created by the interaction of natural hazards with community assets (FEMA 2023). A risk assessment is a process that involves measuring the potential loss of life, personal injury, economic losses, and property damage resulting from identified hazards. It allows planning personnel to address and reduce hazard impacts and emergency management personnel to establish early response priorities by identifying potential hazards and vulnerable assets. Results of the risk assessment are used in subsequent mitigation planning processes, including determining and prioritizing mitigation actions that reduce each jurisdiction’s risk to a specified hazard. Past, present, and future conditions must be evaluated to assess risk most accurately for the county and each jurisdiction. The process focuses on the following elements:

- **Identify Hazards**—Use all available information to determine what types of hazards might affect a jurisdiction
- **Profile Hazards**—Understand each hazard in terms of:
  - Location – geographic area most affected by the hazard
  - Extent – severity of each hazard
  - Range of magnitude
  - Previous occurrences and losses
  - Probability of future hazard events
- **Assess Risk:**
  - **Vulnerability identification**—Estimate the total number of assets in the jurisdiction that are likely to experience a hazard event by overlaying hazard maps with asset inventories.
  - **Impact identification and loss estimation**—Assess the impact of hazard events on the people, property, environment, economy, and lands of the region, including estimates of the cost of potential damage or costs that could be avoided by mitigation.

### 4.1 UPDATE PROCESS SUMMARY

The Steering Committee acknowledged that important steps in developing a comprehensive HMP included identifying hazards that specifically affect Lancaster County, and assessing their likelihood of occurrence, along with potential damage to the people, property, and environment of the county. The Planning Team and Steering Committee evaluated hazard events in the county since the last plan update. Team members completed worksheets indicating whether the hazards profiled in the 2019 HMP have changed and whether hazards not profiled in the 2019 HMP should be included in the current update. The Planning Team reviewed responses from the worksheets to identify a list of hazards to profile in the 2025 HMP. The Planning Team developed current inventories of community assets, which were reviewed by the Steering Committee. The Planning Team then used the updated inventories to assess risks associated with each hazard. The risk assessment is organized into the following sections:

- Section 4.2 outlines the hazard identification process for natural and human-caused hazards of concern for further profiling and evaluation.
- Section 4.3 profiles the hazards of concern (location and extent, range of magnitude, past occurrence, and future occurrence) and assesses vulnerability.
- Section 4.4 summarizes the risk assessment methodology, ranking results, potential losses, and future development and vulnerability.



## 4.2 HAZARD IDENTIFICATION

To determine hazards of concern for this HMP update, the Steering Committee and Planning Team reviewed the hazards of concern detailed in the 2019 Lancaster County HMP as well as those identified in Pennsylvania’s 2023 HMP. They considered the history of hazard events occurring in Lancaster County as well as additional events that occurred after the completion of the 2019 HMP.

### 4.2.1 Disaster Declarations

Federal major disaster (DR) and emergency (EM) declarations are issued when it has been determined that state and local governments need assistance in responding to a disaster event. Since 1955, declarations have been issued for various hazard events, including hurricanes or tropical storms, severe winter storms, and flooding. Table 4-1 lists declarations that affected Lancaster County, issued from 1972 through 2024. Additional declarations can be found on the FEMA website at: <https://www.fema.gov/disasters>.

**Table 4-1. Federal Disaster and Emergency Declarations Affecting Lancaster County**

Declaration Number	Date	Event
DR-4506	March 2020	Covid-19 Pandemic
EM-3441	March 2020	Covid-19
DR-4267	March 2016	Severe Winter Storm and Snowstorm
EM-3367	February 2014	Severe Winter Storm
EM-3356	October 2012	Hurricane Sandy
DR-4030	September 2011	Tropical Storm Lee
EM-3340	September 2011	Remnants of Tropical Storm Lee
DR-1898	April 2010	Severe Winter Storms and Snowstorms
DR-1649	June 2006	Severe Storms, Flooding, and Mudslides
EM-3235 <sup>a</sup>	September 2005	Hurricane Katrina Evacuation
DR-1557	September 2004	Tropical Depression Ivan
DR-1555	September 2004	Severe Storms and Flooding Associated with Tropical Depression Frances
EM-3180	March 2003	Snowstorm
DR-1294	September 1999	Hurricane Floyd
DR-1093	January 1996	Flooding
DR-1085	January 1996	Blizzard
DR-1015	March 1994	Winter Storm, Severe Storm
EM-3105	March 1993	Blizzard
DR-523	October 1976	Severe Storms, Flooding
DR-485	September 1975	Severe Storms, Heavy Rains, Flooding
DR-400	July 1973	Severe Storms, Flooding
DR-340	June 1972	Flood (Agnes)

Source: FEMA 2024

a. Presidential Emergency Declaration 3235, issued in September 2005, declared that a state of emergency existed for the Commonwealth of Pennsylvania and ordered federal aid to supplement Commonwealth and local response efforts to help people affected by Hurricane Katrina to evacuate from their homes.

Between 1958 and 2024, Lancaster County was affected by 32 events that warranted Pennsylvania gubernatorial disaster declarations or proclamations, as listed in Table 4-2 (PEMA 2024).



Table 4-2. Gubernatorial Disaster Declarations or Proclamations Affecting Lancaster County

Date	Event
February 2021	Proclamation of Disaster Emergency—Severe Winter Weather
August 2021	Proclamation of Disaster Emergency—Hurricane Ida
March 2020	Proclamation of Disaster Emergency—COVID-19 Pandemic
December 2020	Proclamation of Disaster Emergency—Severe Winter Weather
January 2019	Proclamation of Disaster Emergency—Severe Winter Weather
August 2018	Proclamation of Disaster Emergency—Severe Weather
June 2018	Proclamation of Disaster Emergency—Severe Weather
January 2016	Proclamation of Disaster Emergency—Severe Winter Weather
June 2015	Proclamation of Disaster Emergency—High Winds, Severe Thunderstorms, Heavy Rains, Tornadoes, and Flooding
January 2015	Proclamation of Disaster Emergency—Severe Winter Weather
February 2014	Proclamation of Emergency—Severe Winter Weather
January 2014	Proclamation of Emergency—Regulations—Severe Cold
June 2013	Proclamation of Emergency—High Winds, Thunderstorms, Heavy Rain, Tornado, Flooding
October 2012	Proclamation of Emergency—Hurricane Sandy
April 2012	Proclamation of Emergency—Spring Winter Storms
August 2011	Proclamation of Emergency—Severe Storms and Flooding (Lee/Irene)
January 2011	Proclamation of Emergency—Severe Winter Storm
February 2010	Proclamation of Emergency—Severe Winter Storm
April 2007	Severe Storm
April 2007	Proclamation of Emergency—Severe Winter Storm
February 2007	Proclamation of Emergency—Severe Winter Storm
February 2007	Proclamation of Emergency—Regulations
September 2006	Proclamation of Emergency—Tropical Depression Ernesto
September 2005	Proclamation of Emergency—Hurricane Katrina
February 2002	Drought and Water Shortage
July 1999	Drought
February 1978	Blizzard
January 1978	Heavy Snow
February 1974	Truckers' Strike
February 1972	Heavy Snow
January 1966	Heavy Snow
February 1958	Heavy Snow

Source: PEMA 2024

U.S. Small Business Administration (SBA) disaster declarations qualify communities for access to affordable, timely, and accessible financial assistance. Table 4-3 lists SBA disaster declarations issued for Lancaster County between 1989 and 2024 (SBA 2024).



Table 4-3. Small Business Administration Disaster Declarations affecting Lancaster County

Date	Event
April 2016	Frost and Freeze
January 2016	Severe Winter Storm and Snowstorm
February 2014	Severe Winter Storms
April 2012	Drought and Excessive Heat
September-October 2011	Tropical Storm Lee
August-September 2011	Excessive Rain, Flooding, and Flash Flooding
August 2011	Hurricane Irene
April-October 2011	Drought and Excessive Heat
May-August 2010	Drought and Excessive Heat
May 2010	Storms with Hail
February 2010	Severe Winter Storm and Snowstorms
July 2009	Fire
January 2009	Fire
June-September 2008	Drought
June 2007	Drought, Excessive Heat
January-September 2007	Drought
June-July 2006	Severe Storms, Flooding, and Mudslides
May 2004	Heavy Rain, High Winds, and Flooding
July 1991	Drought
September 1989	Flood

Source: SBA 2024

#### 4.2.2 Summary of Hazards

The Planning Team and Steering Committee evaluated the 2019 Lancaster County HMP hazards of concern by examining events that have taken place in the county since the last plan update and reviewing Pennsylvania’s 2023 HMP. Planning Team and Steering Committee members completed worksheets to note whether the frequency of occurrence, magnitude of impact, or geographic extent of each hazard profiled in the 2019 HMP has changed since that plan was issued. The worksheet also provided participants with the opportunity to assess hazards not profiled in the 2019 HMP to determine if those hazards should be included as part of the update. The worksheets focused on an all-hazards approach rather than considering natural disasters only.

The Planning Team reviewed responses from the worksheets to identify hazards to profile in the 2025 HMP update. Together with the Steering Committee, the Planning Team decided to retain all 2019 hazards of concern and to add cyber incidents, environmental hazard—gas/liquid pipeline, substance use disorder and mental health, and terrorism as hazards of concern. The resulting hazards of concern for this update are as follows:

- Cyber Incidents
- Dam Failure
- Drought
- Earthquake
- Environmental Hazards—Gas and Liquid Pipelines
- Environmental Hazards—Hazardous Materials Release
- Flood, Flash Flood, Ice Jam
- Hailstorm
- Invasive Species
- Nuclear Incidents
- Pandemic and Infectious Disease
- Radon Exposure
- Subsidence and Sinkholes
- Substance Use Disorder and Mental Health
- Terrorism
- Tornado, Windstorm
- Transportation Accident
- Utility Interruption
- Wildfire
- Winter Storm



### 4.3 HAZARD PROFILES

The following sections profile and assess vulnerability for each hazard of concern. Profiles include a general hazard description and details on hazard location and extent, range of magnitude, past occurrence, and future occurrence. The vulnerability assessment describes risks to life, health and safety, general building stock, critical facilities, the economy, and the environment; it also describes who future change could affect vulnerability and how vulnerability has changed since the previous HMP update. All references utilized in the hazard profiles can be found in Appendix A.

#### 4.3.1 Cyber Incidents

##### Hazard Description

Cyber terrorism refers to acts of terrorism committed using computers, networks, and the Internet. The most widely cited definition comes from Denning’s Testimony before the Special Oversight Panel on Terrorism: “Cyberterrorism...is generally understood to mean unlawful attacks and threats of attack against computers, networks, and the information stored therein when done to intimidate or coerce a government or its people in furtherance of political or social objectives. Further, to qualify as cyberterrorism, an attack should result in violence against persons or property or at least cause enough harm to generate fear.” (PEMA 2023).

A cyber incident involves an unlawful attack or threat against computers, networks, and the information stored on them for profit or to achieve political or social objectives through intimidation or coercion (Denning 2000). These acts can range from taking control of a host website to using networked resources to cause destruction and harm (PEMA 2023). Table 4-4 lists types of cyber incidents as presented in Pennsylvania’s 2023 HMP.

Table 4-4. Methods of Cyber Incidents

Threat	Description
Botnet (zombies)	A collection of computers controlled by an outside party, usually without the knowledge of the owners, using secretly installed software, spread by Trojan horses and viruses. Botnets can be used to launch denial-of-service attacks and transmit spam.
Card Skimming	Use of a skimmer to illegally collect data from the magnetic stripe of a credit or debit card. This information, copied onto another blank card’s magnetic stripe, is then used to make purchases or withdraw cash in the name of the actual account holder. Skimming can take at an ATM or when a user hands a card to an employee
Denial-of-service attack	Flooding the networks or servers of individuals or organizations with false data requests so they are unable to respond to requests from legitimate users.
Malicious code (malware)	Code used to attack a computer by spreading viruses, crashing networks, gathering intelligence, corrupting data, distributing misinformation, or otherwise interfering with normal operations.
Pharming	Email falsely claiming to be a legitimate enterprise in an attempt to scam the user into surrendering private information to be used for identity theft. The email directs the user to visit a false website and update personal information, such as passwords or credit card, social security, or bank account numbers.
Phishing	Using fake email to trick individuals into revealing personal information, such as Social Security numbers, debit and credit card account numbers and passwords, for nefarious uses.
Spam	Unsolicited bulk email that may contain malicious software. Spam is now said to account for around 81 percent of all email traffic.
Spear Phishing	A type of phishing attack that focuses on a single user or department within an organization, addressed from someone within the company in a position of trust and requesting information such as login IDs and passwords. Spear phishing scams often appear to be from a company’s own human resources or technical support divisions and may ask employees to update their username and passwords. Hackers use this data to gain entry into secured networks. Another type of spear phishing attack asks users to click on a link, which deploys spyware that can steal data.
Spoofing	Making a message or transaction appear to come from a source other than the originator.
Spyware	Software that collects information without a user’s knowledge and transfers it to a third party.



Threat	Description
Trojan horse	A destructive program that masquerades as a benign application. Unlike viruses, Trojan horses do not replicate themselves, but they can be just as destructive. One type of Trojan horse claims to rid a computer of viruses but instead introduces viruses onto the computer.
Virus	A program designed to degrade service, cause inexplicable symptoms or damage networks.
Worm	Program that replicates itself over a computer network and performs malicious actions, such as using up the computer’s resources or shutting the system down. A worm, unlike a virus, has the capability to travel without human action and does not need to be attached to another file or program.

Source: PEMA 2023

Cyber incidents can cause severe disruptions to critical infrastructure that is highly dependent on information technology, such as transportation, public safety, utility, or health care services. There are three main categories for attacker motivations (IBM 2022):

- **Criminally motivated** attackers seek financial gain through monetary theft, data theft, or business disruption. Criminals may hack into a bank account to steal money or use scams to trick people into sending money. Hackers may steal data and use it to commit identity theft, sell it on the dark web, or hold it for ransom.
- **Politically motivated** attackers are associated with cyberwarfare or cyberterrorism. In cyberwarfare, nation-state actors often target their enemies’ government agencies or critical infrastructure. Activist hackers may not cause extensive damage but instead seek attention for causes by making attacks known to the public.
- **Personally motivated** attackers primarily seek retribution for perceived slight. Money or sensitive data may be stolen, or disruption to an organization’s systems could occur.

Less common motivations include corporate espionage, in which hackers steal intellectual property to gain an advantage over competitors, and vigilante hackers, who exploit a system’s vulnerabilities to warn others about them. Some hackers enjoy the challenge of breaking into an organization’s data and will perform the action to show intellectual superiority (IBM 2022).

### Location and Extent

Cyber incidents can occur from anywhere. Perpetrators can be difficult to identify because the internet provides a meeting place for individuals from various parts of the world. Individuals or groups planning a cyber incident are not organized in a traditional manner, as they are able to effectively communicate over long distances without delay. Attackers may be local, wishing harm on county governments, officials, or individuals. County residents can also be affected by mass breaches elsewhere in the United States or the world, such as a breach at a bank or credit card institution. Often, the source and location of the cyber incident is unknown. Cyber incidents are unpredictable and typically occur without warning.

### Range of Magnitude

The magnitude of a cyber incident can vary greatly. An attack against an individual can cost a few hundred dollars immediately or much more in cases of identity fraud, which can affect livelihoods years or decades later. Attacks against governments or government officials can create a lack of trust and a loss of reputation. Small businesses can go out of business and cyber incidents at larger businesses can cost shareholders and consumers. Hacked transportation systems can cause delays and impact service.

The magnitude of the effect of a cyber incident varies based upon which system is attacked, the ability to preempt the attack, and the attack’s effect on continuity of operations. The largest threat to institutions from cyber incidents comes from any processes that are networked and controlled via computer.

A worst-case scenario for Lancaster County would be a ransomware attack that costs the County millions of dollars to restore online functionality. This type of cyber incident would stall or halt government functions and programs, including those that support socially vulnerable populations. Such an example of halted government



functions includes the interruption to the County’s dispatch systems. A 2024 cyber incident in neighboring Bucks County, Pennsylvania, disabled automated services powered by the county’s computer-aided dispatch systems and law enforcement officials could not access databases for the Commonwealth Law Enforcement Assistance Network or the National Crime Information Center (NBC Philadelphia 2024).

### Past Occurrence

Cyber incidents have been more frequent in recent years, impacting individuals, businesses, institutions, local governments, and state agencies. The Federal Bureau of Investigation (FBI) reported that 880,418 complaints regarding internet scams were received in 2023 from across the globe, with an estimated \$12.5 billion in total losses. Phishing was the top cybercrime reported in 2023, with nearly 300,000 reported instances (FBI 2024).

Two significant cyber incidents have impacted Lancaster County since 2019. In March 2021, a cyber incident at Millersville University caused a network outage for a number of days, leading to canceled classes, phone outages, and other issues across campus. Personal information was stolen from some individuals (FOX43 2021). In February 2024, a cyber incident impacted all Pennsylvania Courts in the Commonwealth, including in Lancaster County. The incident affected the Administrative Office of Pennsylvania Courts, which includes the judiciary’s web portal, the use of online docket sheets, online fine payment system, and the Guardianship Tracking System.

In neighboring Bucks County in January 2024, a ransomware cyber incident impacted the Bucks County 9-1-1 computer-aided dispatch (CAD) system, shutting down several automated features associated with 9-1-1 calls. The county was temporarily disconnected from the Commonwealth Law Enforcement Assistance Network (CLEAN) and the National Crime Information Center (NCIC) databases (NBC Philadelphia 2024).

### Future Occurrence

Cyber incidents are an emerging hazard that have the potential to impact the County’s computer infrastructure and the systems and services that are provided to the public. Concerns about cyber incidents throughout the United States are growing as they can have crippling effects. Cyber incidents are considered *likely* to occur in any given year in Lancaster County.

Lancaster County takes many steps to prevent and defend against cyberattacks, reduce vulnerability, minimize damage, reduce recovery time, and promote education and awareness. This includes employing multiple layers of security, advanced monitoring, vulnerability testing, data protection, antivirus, spam blocking, mobile device encryption, and other means to protect state systems and data. The County also promotes a culture of cyber awareness throughout its workforce by providing training, assessments, benchmarking, and exercises.

### Vulnerability Assessment

A qualitative assessment was performed to evaluate local assets’ vulnerability to and potential impacts from the cyber incident hazard.

### Life, Health, and Safety

#### General Population

The entire County’s population is vulnerable to cyber incidents personally or at places of employment. The impact of a cyber incident can begin at the government-level and trickle down to affecting those in the County. Even if a cybersecurity threat does not take place within the County, its citizens can be affected by cyber incidents.

Entities or individuals that can be affected by cyber incidents in the County, such as local governments, businesses, medical facilities, and schools, should take steps to prevent and defend against cyber incidents. Employing multiple layers of security limits vulnerability, minimizes damage, and reduces recovery time.



All populations who directly use a computer or receive services from automated systems are vulnerable to cyber incidents. If a cyber incident targeted a facility storing or manufacturing hazardous materials, individuals living adjacent to these facilities would be susceptible to the secondary effects, should the attack successfully cause a critical failure at that facility.

### Socially Vulnerable Population

In general, socially vulnerable populations may not be impacted by cyber incidents to the extent of other social groups and populations. Socially vulnerable populations are often reliant on government or community programs for access to technology, such as laptops and desktops. Access to those items would be indirectly impacted if the agency or organization providing those services were directly impacted. However, certain types of cyberthreats, such as phishing, often target older adults (AARP 2021).

Socially vulnerable populations with existing medical conditions, limited access to cell phone service due to economic hardship, and limited transportation access may be especially vulnerable during cyber incidents. If transportation systems are affected, those with limited transportation access may be unable to travel to obtain essential items such as food and water. Individuals in need of immediate and consistent medical attention may also be unable to contact emergency services.

Certain types of incidents would be most likely to affect specific segments of the population:

- If the cyber incident targeted the County’s power or utility grid, individuals with medical needs would be impacted the most. These populations are most at risk because many of the life-saving systems they rely on require power.
- If an incident occurred during months of extreme hot or cold weather, those 65 years of age and older would be susceptible to the effects of the lack of climate control. These individuals might require a temperature-controlled shelter operating on a backup generator.

For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

### General Building Stock

The entire County has been identified as exposed to this hazard. Therefore, all assets in the County, as described in Section 2, are exposed and vulnerable. Buildings and structures are usually not impacted by cyber incidents, but systems operated by electronics and computers are vulnerable. Cyber incidents can cause physical damage if real assets or end consumers are affected by service disruption. This might occur if cyber incidents target industries related to utilities, life support, transportation, human services, or telecommunications. In many cases, attacks on these systems initially will not be detected, and any malfunction will be thought to be system failure.

### Community Lifelines and Other Critical Facilities

All community lifelines that are operated by electricity and/or a computer system are vulnerable to cyber incidents. Examples of County assets using these systems include critical facilities such as water treatment plants, power grid stations, and other government facilities. A catastrophic cyber incident can have far-ranging effects on public and private infrastructure systems. Cyber incidents may affect structures if any critical electronic systems suffer service disruption. For instance, a cyber incident may cripple the electronic system that controls a cooling system or pressure system within critical infrastructure. This may result in physical damage to the structure from components overheating, or an explosion if pressure relief systems are rendered inoperable.

### Economy

A cyber incident can have significant impacts on the economy. Every person and sector can be affected. Investigations into the stock price impact of cyber incidents show that identified target firms suffer losses of 1 to 5 percent in the days after an attack (Congressional Research Service 2004). A 2020 joint study performed by the Center for Strategic and International Studies and McAfee concluded that cybercrime costs the world economy more than \$1 trillion, or just more than 1 percent of global gross domestic product (GDP) (NASDAQ



2020). A 2022 study revealed the average payment for ransomware attacks was \$812,360, a 4.8 percent increase from 2020 (Sophos 2022).

### Environment

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The natural environment is not vulnerable to cyber incidents and thus would not risk damage. It would only be through a secondary effect that the environment could be affected by a cyber incident, such as the disruption or failure of wastewater treatment facilities.

### Future Changes That May Impact Vulnerability

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#### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across the county. Generally, cyber incidents will not be affected by change in land use and development.

#### Projected Changes in Population

An increase in County population will increase the number of persons who could be impacted by a cyber incident. The likelihood of a cyber incident also will increase with increased reliance on technology.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

#### Climate Change

Research by the U.S. Department of Defense ties climate change to increasing instability that has the potential to increase the risk of certain human-caused hazards, which can include cyber incidents (Department of Defense 2021). A 2023 study by a team of university researchers evaluated cyberthreats targeting critical infrastructure during a hazard event, such as a hurricane or heat wave. The study found that the resulting impact from compound threats increased by more than three times compared to a standalone cyber incident. The compound threats also exacerbate economy-wide losses across sectors, which can lead to daily reductions of up to 3.1 percent in gross domestic product (Avraam, Ceferino and Dvorkin 2023).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Cyber incident is a new hazard of concern identified for the Lancaster County HMP.



### **4.3.2 Dam Failure**

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The dam failure hazard profile is considered confidential due to the sensitive information it contains. This section can be requested from the Lancaster County Department of Public Safety's Emergency Management Division (HMP@lanastercountypa.gov).



### 4.3.3 Drought and Water Supply Deficiencies

#### Hazard Description

Drought is defined as a deficiency of precipitation experienced over an extended period of time, usually a season or more. Drought events are defined by rainfall amounts, vegetation conditions, soil-moisture conditions, water levels in reservoirs, stream flow, agricultural productivity, or economic impacts. This hazard is of particular concern due to the prevalence of farms and other water-dependent industries, water-dependent recreation uses, and residents who depend on wells for drinking water (PEMA 2023).

Drought can be defined or grouped in four ways (National Drought Mitigation Center n.d.):

- **Meteorological drought** is a measure of departure of precipitation from normal, defined solely by reference to relative degree of dryness. Because of climatic differences, dryness considered a drought at one location may not be considered drought at another location.
- **Hydrological drought** is associated with below-normal surface or subsurface water supply resulting from periods of precipitation shortfalls. Hydrological drought is related to effects of precipitation shortfalls on stream flows and water levels in reservoirs, lakes, and groundwater.
- **Agricultural drought** links various characteristics of meteorological or hydrological drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels, and other parameters. Agricultural drought occurs when not enough water is available for a particular crop to grow at a particular time. Agricultural drought is defined in terms of soil moisture deficiencies relative to water demands of plant life, primarily crops.
- **Socioeconomic drought** is associated with supply and demand of an economic good, with elements of meteorological, hydrological, and agricultural drought categories. This differs from the other types of drought because its occurrence depends on supply and demand to identify or classify droughts. Supplies of many economic goods such as water, silage, food grains, fish, and hydroelectric power depend on weather. Socioeconomic drought occurs when demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply.

Drought and water supply deficiencies can affect many sectors of an economy and can reach beyond an area undergoing physical drought. Because water is essential for producing goods and providing services, drought can reduce crop yield, increase fire hazard, lower water levels, and damage wildlife and fish habitats. Further consequences include reductions in crop yields, rangeland, and forest productivity that may lower incomes of farmers and agribusinesses; increase in prices of food and timber; increase in unemployment; reduction of tax revenues as expenditures decline; increase in crime, foreclosures, and migration; and depletion of disaster relief funds. The many impacts of drought can be categorized as economic, environmental, or social.

#### Location and Extent

Droughts and water supply deficiencies are regional in scope and may affect the entirety of Lancaster County rather than only individual municipalities within the county. Droughts and water supply deficiencies may also concurrently affect counties near Lancaster County or even the entire Commonwealth. Generally, areas along waterways reveal drought conditions later than areas away from waterways.

The impact of a drought is generally felt first by the agricultural sector, which is dependent on precipitation and groundwater. Where residents rely on surface water for drinking water, water supplies affected by drought can impact the drought's severity. Residents depending on well water can more easily handle short-term droughts without major inconveniences. However, longer-term droughts inhibit groundwater aquifers from recharging and can thus extend the problems of well owners for an indeterminate amount of time.

Table 4-5 lists the number of domestic wells in each municipality of Lancaster County, as reported in DCNR's Pennsylvania Groundwater Information System. That data system relies on voluntary submissions of well record



data by well drillers; as a result, it is not a complete database of all domestic wells in the county. It is, however, the most complete data set of domestic wells available.

**Table 4-5. Domestic Wells in Lancaster County**

Municipality	Number of Reported Domestic Wells	Municipality	Number of Reported Domestic Wells
Adamstown Borough	17	Little Britain Township	317
Akron Borough	7	Manheim Borough	3
Bart Township	275	Manheim Township	530
Brecknock Township	680	Manor Township	665
Caernarvon Township	337	Marietta Borough	9
Christiana Borough	1	Martic Township	532
Clay Township	334	Millersville Borough	9
Colerain Township	386	Mount Joy Borough	18
Columbia Borough	17	Mount Joy Township	1,229
Conestoga Township	398	Mountville Borough	62
Conoy Township	245	New Holland Borough	86
Denver Borough	15	Paradise Township	482
Drumore Township	229	Penn Township	695
Earl Township	288	Pequea Township	391
East Cocalico Township	348	Providence Township	570
East Donegal Township	198	Quarryville Borough	16
East Drumore Township	348	Rapho Township	978
East Earl Township	465	Sadsbury Township	320
East Hempfield Township	337	Salisbury Township	907
East Lampeter Township	527	Strasburg Borough	7
East Petersburg Borough	21	Strasburg Township	887
Eden Township	217	Terre Hill Borough	0
Elizabeth Township	370	Upper Leacock Township	268
Elizabethtown Borough	32	Warwick Township	885
Ephrata Borough	34	West Cocalico Township	505
Ephrata Township	339	West Donegal Township	683
Fulton Township	334	West Earl Township	185
Lancaster City	44	West Hempfield Township	416
Lancaster Township	73	West Lampeter Township	297
Leacock Township	639	<b>Total</b>	<b>19,519</b>
Lititz Borough	12		

Source: DCNR 2025

In addition to domestic wells in the county, residents may receive water from public water companies such as East Petersburg Water Authority, Western Heights Water Company, Adamstown Borough Water and Sewer Authority, and West Earl Township Water Authority (Planning n.d.).

Jurisdictions that are designated for agricultural use are particularly vulnerable to drought. As of 2022, 378,574 acres of farmland were recorded in Lancaster County. The County has 4,680 farms and most are relatively small, with an average size of 81 acres.



### Range of Magnitude

Effects of droughts vary depending on their severity, timing, duration, and location. Some droughts may exert their greatest impact on agriculture, while others may have stronger effects on water supply or recreational activities. Droughts can adversely affect the following significantly:

- Public water supplies for human consumption
- Rural water supplies for livestock consumption and agricultural operations
- Water quality
- Natural soil water or irrigation water for agriculture
- Water for forests and for fighting forest fires
- Water for navigation and recreation

PA DEP and PEMA manage water supply droughts according to the following four conditions (PEMA 2023):

- **Drought Watch**—This is a period to alert government agencies, public water suppliers, water users, and the public regarding potential for future drought-related problems. Drought watches are invoked when three or more drought indicators are present for a county or group of counties. The focus is on increased monitoring, awareness, and preparation for response in the event that conditions worsen. A request for voluntary water conservation is issued. The objective of voluntary water conservation measures during a drought watch is to reduce water use by 5 percent within the affected areas. Because of varying conditions, individual water suppliers or municipalities may propose more stringent conservation actions.
- **Drought Warning**—This is a drought stage involving a coordinated response to imminent drought conditions and potential water supply shortages through concerted voluntary conservation measures to avoid or reduce shortages; relieve stressed sources; develop new sources; and, if possible, forestall the need to impose mandatory water use restrictions. The objective of voluntary water conservation measures during a drought warning is to reduce overall water use by 10 to 15 percent within the affected areas. Because of varying conditions, individual water suppliers or municipalities may propose more stringent conservation actions.
- **Drought Emergency**—During this drought stage, water management entities assemble all available resources to respond to actual emergency conditions, avoid depletion of water sources, ensure at least minimum water supplies to protect public health and safety, support essential and high-priority water uses, and avoid unnecessary economic upsets. If deemed necessary and if ordered by the Governor during this stage, imposition of mandatory restrictions on nonessential water usage could occur, as provided for in 4 Pennsylvania Code Chapter 119. Objectives of water use restrictions (mandatory or voluntary) and other conservation measures during a drought emergency are to reduce consumptive water use within the affected areas by 15 percent and to reduce total use to the extent necessary to preserve public water system supplies, avoid or mitigate local or area shortages, and ensure equitable sharing of limited supplies.
- **Local Water Rationing**—This fourth condition of drought is not defined as a drought stage. Local municipalities may, with the approval of the PEMA Council, implement local water rationing to share a rapidly dwindling or severely depleted water supply within designated water supply service areas. These individual water rationing plans, authorized through provisions of 4 Pennsylvania Code Chapter 120, require specific limits on individual water consumption to achieve significant reductions in use. Under both mandatory restrictions imposed by the Commonwealth and local water rationing practices, procedures are specified for granting variances in consideration of individual hardships and economic dislocations

Pennsylvania uses five parameters to assess drought conditions: precipitation deficits, stream flows, groundwater level, soil moisture, and reservoir storage levels. These parameters are detailed below (PEMA 2023):

- **Precipitation Deficits**—Because rainfall provides the basis for ground and surface water resources, measuring the difference in precipitation from the normal (30-year average) tends to be the earliest



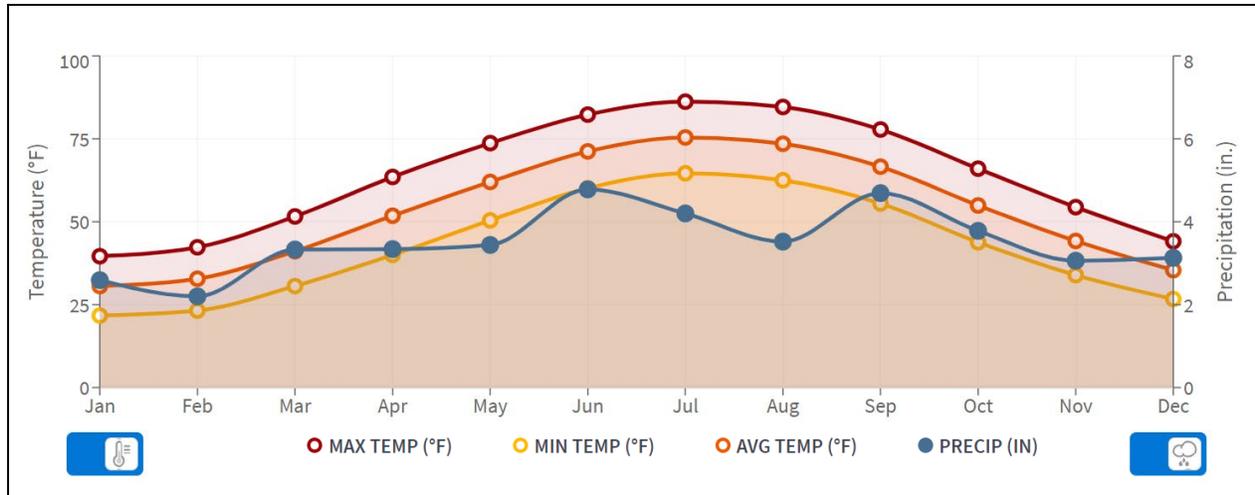
indicator that a drought is possible in an area. The PA DEP compares the cumulative precipitation for varying time periods (minimum of 3 months, maximum of 12 months) each month against the normal 30-year average value for the same time period. A deficit for any period is represented by a percentage less than the normal precipitation. Table 4-6 shows what the deficit values need to be for each time period in order to qualify for each drought stage. Figure 4-1 presents the average, maximum, and minimum precipitation by month from 1991 to 2020 (the most current three-decade data available) in Lancaster County (NOAA n.d.)

Table 4-6. Precipitation Deficit Drought Indicators for Pennsylvania

Duration of Deficit Accumulation (Months)	Deficit as Percent of Normal Precipitation		
	Drought Watch	Drought Warning	Drought Emergency
3	25%	35%	45%
4	20%	30%	40%
5	20%	30%	40%
6	20%	30%	40%
7	18.5%	28.5%	38.5%
8	17.5%	27.5%	37.5%
9	16.5%	26.5%	36.5%
10	15%	25%	35%
11	15%	25%	35%
12	15%	25%	35%

Source: PEMA 2023

Figure 4-1. Average Temperature and Precipitation (from 1991-2020) in Lancaster County



Source: NOAA n.d.

- Stream Flows**—The next earliest indicator that a drought is developing is stream flow measurements. There are 61 USGS stream gages that the PA DEP currently uses to monitor droughts across the state. The PA DEP calculates and maintains 30-day average values for stream flow based on the entire period of recording for each gage. Compared to precipitation, stream flow measurements lag by about a month or two when signaling a drought. Drought status is determined from stream flows based on percentiles, or exceedances, rather than percentages. Exceedances are similar to percentiles; a 75 percent exceedance flow value means that the current 30-day average



flow is exceeded in the stream 75 percent of the time; in other words, the 30-day average flow in the stream is less than that value only 25 percent of the time. Similarly, the 30-day average flows in the stream would be less than that value only 10 percent of the time for the 90 percent exceedance, and only 5 percent of the time for the 95 percent exceedance. For stream flows, the 75, 90, and 95 percent exceedance 30-day average flows are used as indicators for drought watch, warning, and emergency, respectively.

- **Groundwater Levels**—Groundwater levels for each day are used to calculate the average level of the preceding 30 days. This 30-day value is compared to the values derived from historical records, yielding a percentile indicating how much time the groundwater levels have been below the historical average levels. The USGS also maintains a network of groundwater monitoring wells, with at least one well in each county. Groundwater is used to indicate drought status in a manner similar to stream flows. Groundwater level exceedances of 75, 90, and 95 percent are used to indicate watch, warning, and emergency status. In this case, it is the 30-day average depth to groundwater that is measured and monitored, again in relation to long-term 30-day averages based on the period of record for each county well.
- **Soil Moisture**—Soil moisture is measured using an algorithm calibrated for relatively homogeneous regions that measures dryness based on temperature and precipitation in the area, information which is provided by NOAA. This generates a value called the Palmer Drought Severity Index (PDSI), which is compiled weekly by the Climate Prediction Center of the National Weather Service. Table 4-7 lists PDSI classifications. The PDSI uses 0 to reflect normal status, and negative numbers indicate droughts. For example, 0 is no drought, -2 is moderate drought, and -4 is extreme drought. Positive numbers signify excess precipitation.

Table 4-7. PDSI Classifications

Severity Category	PDSI Value	Drought Status
Extremely wet	4.0 or more	None
Very wet	3.0 to 3.99	None
Moderately wet	2.0 to 2.99	None
Slightly wet	1.0 to 1.99	None
Incipient wet spell	0.5 to 0.99	None
Near normal	0.49 to -0.49	None
Incipient dry spell	-0.5 to -0.99	None
Mild drought	-1.0 to -1.99	None
Moderate drought	-2.0 to -2.99	Watch
Severe drought	-3.0 to -3.99	Warning
Extreme drought	-4.0 or less	Emergency

Source: National Drought Mitigation Center 2013

- **Reservoir Storage Levels**—Water level storage in several large public water supply reservoirs (especially three New York City reservoirs in the Upper Delaware River Basin) is the fifth indicator that the PA DEP uses for drought monitoring. Depending on the total quantity of storage and the length of the refill period for the various reservoirs, PA DEP uses varying percentages of storage draw-down to indicate the three drought stages for each of the reservoirs.

The availability and management of water supply are discussed in the 2022 Pennsylvania State Water Plan. As a functional planning tool for all Pennsylvania municipalities, counties, and regional planning partnerships, the State Water Plan addresses drought events and resource constraints and encourages implementation of new technology and use policies to facilitate reduced water uses and resource demands at critical peak times. The State Water Plan provides inventories of water availability, and an assessment of current and future water use



demands and trends. It also offers strategies for improving management of water resources and waterway corridors that aim to reduce damage from extreme drought and flooding conditions (PA DEP 2023).

Past Occurrence

Since 1930, the Commonwealth of Pennsylvania has undergone 10 significant droughts, including one federally declared disaster classified as a drought or water shortage. The disaster (DR-206) was declared on August 18, 1965, and impacted 13 counties in Pennsylvania, not including Lancaster County (FEMA 2023).

According to NOAA’s National Centers for Environmental Information storm events database and the USDA disaster designation database, Lancaster County underwent four drought events between January 1, 1950, and April 31, 2024. Based on all sources researched, drought events between 2017 and April 2024 that have affected Lancaster County are identified in Table 4-8. For events prior to 2017, please see the previous HMP. Not all sources have been identified, so this list may not include all events that have occurred in the county. Table 4-9 lists the crop loss insurance payments on claims in Lancaster County caused by drought events since 2017.

Table 4-8. Past Occurrences of Drought Events from 2017 to 2024

Table with 6 columns: Dates of Event, Event Type, FEMA Declaration Number, USDA Disaster Designation Number, County Designated?, Losses / Impacts / PDSI Value. Rows include events from 2016-2017, 2022, and 2023-2024.

Sources: USDA 2022, NRCC 2021, NOAA National Centers for Environmental Information (NCEI) 2022, PA DEP 2021
Notes: N/A = Not applicable, PDSI = Palmer Drought Severity Index

Table 4-9. Crop Loss Insurance Claims Due to Drought, 2017 to 2024

Table with 3 columns: Crop Year, Crop, Total Claims. Rows show claims for years 2017 through 2024, with specific crop types like Corn and Soybeans.

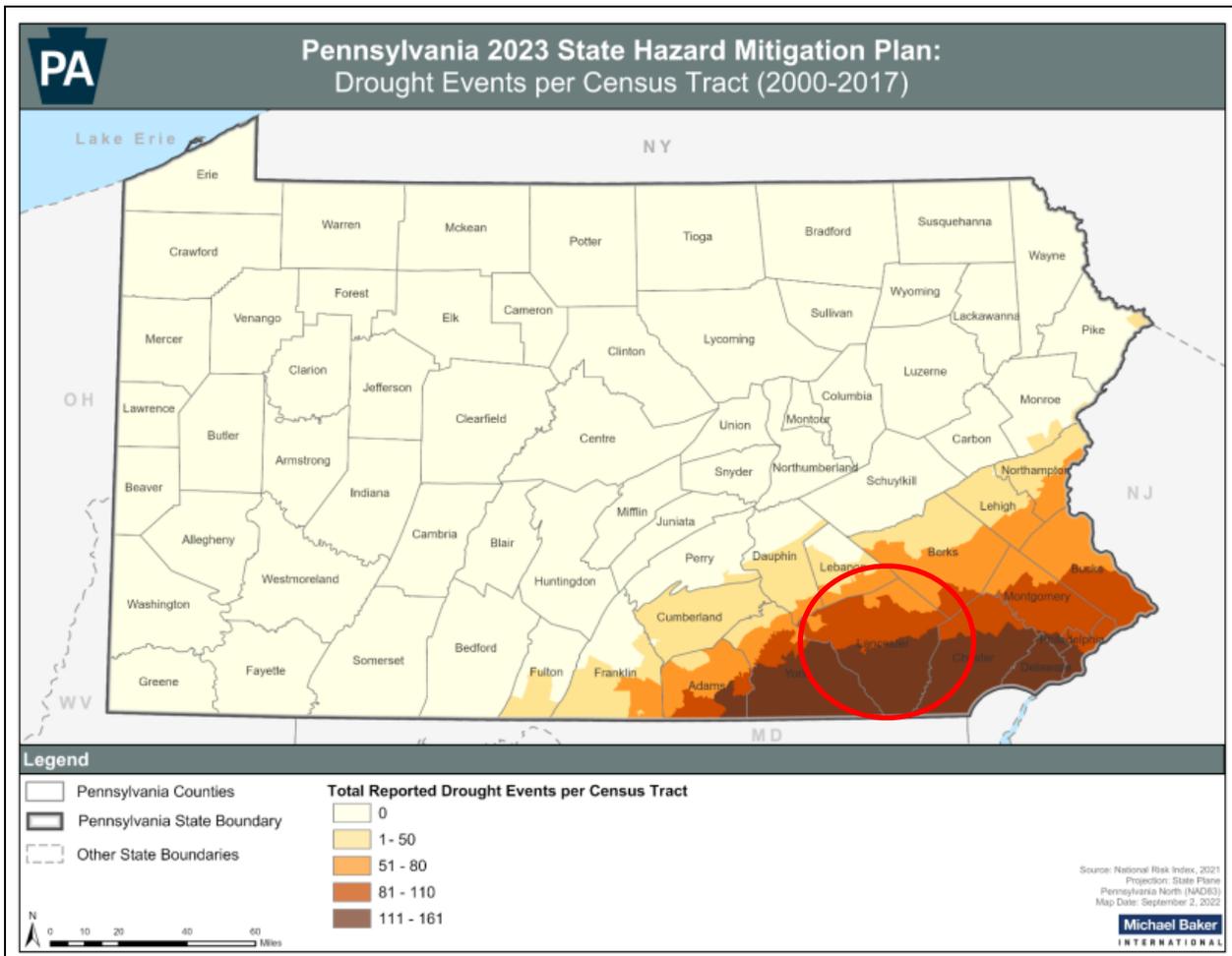
Source: USDA, Disaster Designation Information 2023

Future Occurrence

The entirety of Lancaster County has experienced severe or extreme drought conditions at least once between 2000 and 2017 (see Figure 4-2). For this HMP, future occurrences of drought events are considered likely.



Figure 4-2. Drought Events Per Census Tract (2000-2017)



Source: PEMA 2023

Note: Lancaster County circled in red

### Vulnerability Assessment

All assets (population, structures, critical facilities, and lifelines) identified for this HMP are potentially vulnerable to a drought. A qualitative discussion of vulnerability and potential impacts is provided in the following sections.

#### Life, Health, and Safety

##### General Population

For the purposes of this plan, the entire population of the county is considered vulnerable to drought events. Drought conditions can cause a shortage of water available for human consumption and can reduce local firefighting capabilities. Social impacts of a drought include mental and physical stress, public safety threats (increased threat from forest/grass fires), health threats, conflicts among water users, reduced quality of life, and inequities in distribution of impacts and disaster relief.

##### Socially Vulnerable Populations

Socially vulnerable populations are particularly susceptible to drought and the extreme temperatures that sometimes accompany drought conditions because of their age, health conditions, and limited ability to mobilize



to shelters, cooling centers, and medical sources. Impacts on the economy and environment may have social implications as well (CDC 2020). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

Table 4-10. Socially Vulnerable Lancaster County Populations

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

A drought is not expected to directly affect any structures, and all are expected to be operational during a drought event. However, droughts contribute to conditions conducive to wildfires. Risk to life and property is greatest in regions where forested areas adjoin urbanized areas (high-density residential, commercial, and industrial). Therefore, all assets in and adjacent to these areas, including population, structures, critical facilities, lifelines, and businesses, are considered vulnerable to wildfire.

### Community Lifelines and Other Critical Facilities

Drought events generally do not impact buildings; however, droughts have the potential to impact agriculture-related facilities, critical facilities, and lifelines that are associated with water supplies such as water used for firefighting. The impacts droughts cause to agricultural-related facilities is particularly important to Lancaster County due to its high amount of acreage devoted to farmland. Community lifelines and other critical facilities in and adjacent to wildfire hazard areas are also considered vulnerable to drought.

Water systems distributing to the population may be impacted by drought conditions. The County’s water supply sources are from surface water and unconfined groundwater sources. In terms of annual water withdrawal by sector, the second highest sector is potable water supply. Water use trends, like withdrawal trends, vary from month to month, typically peaking in summer when outdoor and irrigation demands are high (United States Environmental Protection Agency 2010).





**Economy**

Drought can produce a range of impacts that span many economic sectors and can reach beyond an area experiencing physical drought. Water withdrawals are used for potable water, for the commercial, industrial, and mining sectors, and for power generation. A prolonged drought can have serious direct and indirect economic impacts on the county. When drought conditions persist, water restrictions may be put into place by local or state governments. These restrictions may include placing limitations on landscape watering, car washing, or any other recreational or commercial outdoor use of water supplies.

The many impacts of drought can be economic, environmental, or social. Direct and indirect losses include the following (Food and Agriculture Organization of the United Nations 2019):

- Damage to crop quality and crop losses
- Reduced water levels
- Insect infestation leading to crop and tree losses
- Plant diseases leading to loss of agricultural crops and trees
- Reduction in outdoor activities

In exceptional drought conditions, watering of crops may not be an option. If crops are not able to receive water, farmland will dry out and crops will die. This can lead to crop shortages, which, in turn, increases the price of food (North Carolina State University 2013). Table 4-11 lists potential impacts on Lancaster’s agricultural economy. Loss estimates are based on lost agricultural revenues throughout Lancaster County. Table 4-12 enumerates the county’s farmland acreage exposure to the drought hazard as well as the annual market value of all agricultural products sold, as documented in the 2022 USDA Census of Agriculture. If the county loses its agricultural yield because of drought, total losses could amount to nearly \$1.9 billion in sales of crops. Livestock, poultry, and associated products have a potential loss value of nearly \$1.5 billion (USDA 2022).

**Table 4-11. Impacts on the Economy**

Losses to Agricultural Producers	Losses to Livestock Producers
Annual and perennial crop losses and/or damage to the crop quality	Reduced productivity of rangeland
Income loss for farmers because of reduced crop yields	Decreased milk production and stock weights
Reduced productivity of cropland (wind erosion, long-term loss of organic matter, etc.)	Forced reduction of foundation stock
Insect infestation and plant disease	High cost/unavailability of water and feed for livestock that may result in disruption of reproduction cycles (delayed breeding, more miscarriages), high livestock mortality rates and increased predation
Wildlife damage to crops and increased irrigation costs	Cost of new or supplemental water resource development (wells, dams, pipelines)
Cost of new or supplemental water resource development (wells, dams, pipelines)	Increased feed transportation costs
Losses of fishery production, including damage to fish habitats and losses of fish and other aquatic organisms because of decreased flows	Grass fires
Losses to recreation and tourism industry, including losses to manufacturers and sellers of recreational equipment and losses related to curtailed activities: hunting and fishing, bird watching, boating, etc.	Energy-related effects including, increased energy demand and reduced supply because of drought-related power curtailments and costs to the energy industry and consumers associated with substituting more expensive fuels (oil) for hydroelectric power
Losses of Timber Production	Losses to Water Suppliers
Wildland fires	Revenue shortfalls and/or windfall profits
Tree disease and insect infestation	Cost of water transport or transfer



Losses to Agricultural Producers	Losses to Livestock Producers
Impaired productivity of forest land	Cost of new or supplemental water resource development
Direct loss of trees, especially young ones	-
Losses to transportation industry including loss from impaired navigability of streams, rivers, and canals	-
Decline in food production/disrupted food supply, including an increase in food prices as well as an increase in forced importation of food	-

Source: NIDIS 2024; NIDIS 2024; NIDIS 2024

Table 4-12. Estimated County Losses Relating to Agricultural Production

Impacted Farmland Acreage	Market Value of All Agricultural Products
378,574	\$1,854,419,000

Source: USDA 2022

Increased demand for water and electricity can also result in shortages and higher costs for these resources. Industries that rely on water for business could be impacted the most (e.g., landscaping businesses). Although most businesses will still be operational, they may be impacted aesthetically. These aesthetic impacts are most significant within the recreation and tourism industry. Moreover, droughts in another area could impact the food supply and price of food for residents within the County (North Carolina State University 2013).

Environment

Environmental impacts of drought include the following (PEMA 2023):

- Hydrologic effects:
  - Lower water levels in reservoirs, lakes, and ponds
  - Reduced stream flow
  - Loss of wetlands
  - Estuarine impacts
  - Groundwater depletion and land subsidence
  - Reduced groundwater recharge
- Damage to animal species:
  - Lack of food and drinking water
  - Disease
  - Loss of biodiversity
  - Migration or concentration
  - Reduction and degradation of habitat
- Water quality impacts :
  - Salinity
  - Water temperature increases
  - pH changes
  - Dissolved oxygen
  - Turbidity
- Increased risk of brush fires and wildfires due to dried crops, grasses, and dying trees



## Future Changes That May Impact Vulnerability

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### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth will increase demand for water supply. Seasonal outdoor water use is rising statewide and is attributable to continued suburbanization and increases in residential and commercial lawn and landscape maintenance. Changes in water demand by commercial and industrial users will depend on future development and how effectively efficiency techniques are implemented.

### Projected Changes in Population

Any changes in the distribution of the population can impact the source of water resources required to sustain the water demand of each household, agricultural operation, and business operation.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

Climate is defined by average temperature and precipitation and by the type, frequency, and intensity of weather events. Climate change can alter the prevalence and severity of weather extremes, such as droughts.

According to the Pennsylvania Climate Impacts Assessment 2021 Update, a slight increase in drought conditions is probable. The extent of drought conditions remains uncertain, but higher temperatures are projected to increase evaporative demand and thus reduce water availability. The annual maximum in consecutive dry days is projected to increase from 12.5 days historically to 13.4 days by mid-century and 13.9 days by end-of-century. This increase represents a 7 percent increase by mid-century and 11 percent increase by end-of-century (PA DEP 2021).

## Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county.

Collection of additional information and actual loss data specific to the plan participants will further enhance the vulnerability assessment for this hazard.



### 4.3.4 Earthquake

#### Hazard Description

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock usually within the upper 10-20 miles of the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of underground caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area (PEMA 2023).

Most earthquakes occur at the boundaries where the tectonic plates meet (faults); fewer than 10 percent of earthquakes occur within plate interiors. The point in the earth where an earthquake’s energy originates is called the focus or hypocenter. Its location is typically defined by its depth below the earth’s surface (the focal depth) and the geographic position of the surface directly above it (the epicenter) (Shedlock 1997). Earthquakes usually occur without warning and their effects can impact areas of great distance from the epicenter (FEMA 2001).

#### Earthquake Impacts

An earthquake hazard is any earthquake-related disruption that may affect people’s normal activities, including the following (USGS 2012):

- Ground motion (shaking)—Movement of the earth’s surface from earthquakes. The shaking motion is produced by waves generated by a sudden slip on a fault that travel through the earth and along its surface
- Surface faulting—Displacement that reaches the earth’s surface. This commonly occurs with shallow earthquakes—those with a focal depth of less than about 12 miles
- Liquefaction—A process by which water-saturated sediment temporarily loses strength and acts as a fluid, like the wet sand near the water at a beach. Earthquake shaking can cause this effect
- Landslide—Movement of surface material down a slope
- Tsunami—A sea wave that results from large-scale seafloor displacements associated with large earthquakes
- Seiche—Sloshing of a closed body of water, such as a lake or bay, from earthquake shaking

Ground shaking is the primary cause of earthquake damage to structures. Damage can be increased when soft soils amplify the motion of earthquake waves, producing greater ground shaking and increasing stresses on built structures on the land surface. Loose, wet, sandy soils also can cause damage when they lose strength and flow as a fluid when shaken, causing foundations and underground structures to shift and break (Stanford 2003).

#### Seismic Soil Classifications

The National Earthquake Hazard Reduction Program (NEHRP) developed five soil classifications (A to E) distinguished by soil shear-wave velocity that alters severity of an earthquake; the classifications are listed in Table 4-13. Class A soils (hard rock) reduce ground motion from an earthquake, and Class E soils (soft soils) amplify and magnify ground shaking and increase building damage and losses.

Table 4-13. NEHRP Soil Classifications

Soil Classification	Description
A	Hard rock
B	Rock
C	Very dense soil and soft rock
D	Stiff soils
E	Soft soils



Source: FEMA 2021

### Earthquake Monitoring

The Lamont-Doherty Cooperative Seismographic Network (LCSN) monitors earthquakes that occur primarily in the northeastern United States. LCSN operates 40 broadband and short-period seismographic stations in Connecticut, Delaware, Maryland, New Jersey, New York, Pennsylvania, and Vermont. Two stations are in Lancaster County—one at Franklin & Marshall College and one at Millersville University (LCSN 2014).

The USGS operates a global network of seismic stations to monitor seismic activity. The nearest USGS seismic stations to Lancaster County is about 75 miles northwest of the County, between Altoona and State College (USGS n.d.).

The USGS provides the website *Did You Feel It?* (<http://earthquake.usgs.gov/earthquakes/dyfi/>) for citizens to report earthquake experiences and to share information regarding the earthquake and its effects. The website is intended to gather citizens' experiences during an earthquake and incorporate the information into detailed maps to illustrate shaking intensity and damage assessments (USGS 2022).

### Location and Extent

Earthquakes above a magnitude 5.0 can cause damage near their epicenters, and larger-magnitude earthquakes can cause damage over larger, wider areas. Earthquake events in Pennsylvania usually involve very small impact areas (less than about 60 miles in diameter). The most seismically active region in the Commonwealth is in southeastern Pennsylvania in the area of Lancaster County, as shown in Figure 4-3 (PEMA 2023). The County also may be subject to the effects of earthquakes with epicenters outside its boundaries.

Figure 4-3. Pennsylvania Earthquake Hazard Zones





Source: PEMA 2018

Note: Lancaster County is within the blue oval on the map.

### Range of Magnitude

#### Earthquake Measurement Scales

An earthquake’s magnitude and intensity are used to describe the size and severity of the event. Magnitude describes the energy released at the focal point of an earthquake, and intensity describes the overall severity of shaking felt during the event.

Magnitude was formerly expressed by ratings on the Richter scale but is now commonly expressed using the moment magnitude scale. This scale is based on the total moment release of the earthquake (the product of the distance a fault moved and the force required to move it) (USGS 2012).

The intensity of an earthquake is based on observed effects of ground shaking on people, buildings, and natural features and varies with location. The Modified Mercalli Intensity (MMI) scale is a subjective measure of intensity that describes the strength of a shock felt at a particular location. The MMI scale represents intensity of an earthquake’s effects in a given locality according to a scale from I to X. The lower numbers of the intensity scale generally deal with the manner in which the earthquake is felt by people. The higher numbers of the scale are based on observed structural damage. Structural engineers usually contribute information for assigning intensity values of VIII or above (USGS 2021). Descriptions of MMI scales appear in Table 4-14.

Table 4-14. Modified Mercalli Intensity Scale

Intensity	Shaking	Description/Damage
I	Not felt	Not felt except by a very few under especially favorable conditions
II	Weak	Felt only by a few persons at rest, especially on upper floors of buildings.
III	Weak	Felt quite noticeably indoors, especially on upper floors. Most people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
IV	Light	Felt indoors by any, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sounds. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Moderate	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	Very Strong	Damage is negligible in buildings of good design and construction, slight to moderate in well-built ordinary structures, and considerable in [poorly built or badly designed structures; some chimneys are broken.
VIII	Severe	Damage is slight in specially designed structures; considerable in ordinary, substantial buildings. Moving cars become uncontrollable; masonry fractures, poorly constructed buildings damaged.
IX	Violent	Some houses collapse; ground cracks; pipes break open; damage is considerable in specially designed structures; buildings are shifted off foundations.
X	Extreme	Some well-built wooden structures are destroyed; most masonry and frame structures are destroyed along with foundations. Ground cracks profusely; liquefaction and landslides are widespread.

Source: USGS 2021

Quantitative measures of intensity are expressed in terms of peak ground acceleration (PGA) and spectral acceleration (SA). PGA is related to movement experienced on the ground, and SA represents movement





experienced by a building (USGS 2019). PGA and SA are measured in multiples or percentages of the acceleration caused by gravity (g). This means that at a PGA of 100 percent g (1.0 g) (an extremely strong ground motion), objects accelerate sideways at the same rate as they would accelerate vertically if dropped from a height. (USGS 2019). Table 4-15 show the relationship between PGA and the MMI scale.

Table 4-15. Modified Mercalli Intensity and PGA Equivalents

Modified Mercalli Intensity	Peak Ground Acceleration (%g)	Perceived Shaking	Potential Damage
I	<0.17	Not Felt	None
II	0.17 – 1.4	Weak	None
III	0.17 – 1.4	Weak	None
IV	1.4 – 3.9	Light	None
V	3.9 – 9.2	Moderate	Very Light
VI	9.2 – 18	Strong	Light
VII	18 – 34	Very Strong	Moderate
VIII	34 – 65	Severe	Moderate to Heavy

Source: USGS 2021

Damage levels from an earthquake vary with intensity of ground shaking as noted in Table 4-16 (USGS 2019).

Table 4-16. Damage Levels Experienced in Earthquakes

Ground Acceleration	Typical Damage
1-2% g	Motions are widely felt by people; hanging plants and lamps swing strongly, but damage levels, if any, are usually very low.
Below 10% g	Usually causes only slight damage, except in unusually vulnerable facilities.
10-20% g	May cause minor-to-moderate damage in well-designed buildings, with higher levels of damage in poorly designed buildings. At this level of ground shaking, only unusually poor buildings would be subject to potential collapse.
20-50% g	May cause significant damage in some modern buildings and very high levels of damage (including collapse) in poorly designed buildings.
≥50% g	May cause higher levels of damage in many buildings, even those designed to resist seismic forces.

Source: USGS 2019

Note: % g = Peak ground acceleration as a percent of the acceleration due to gravity

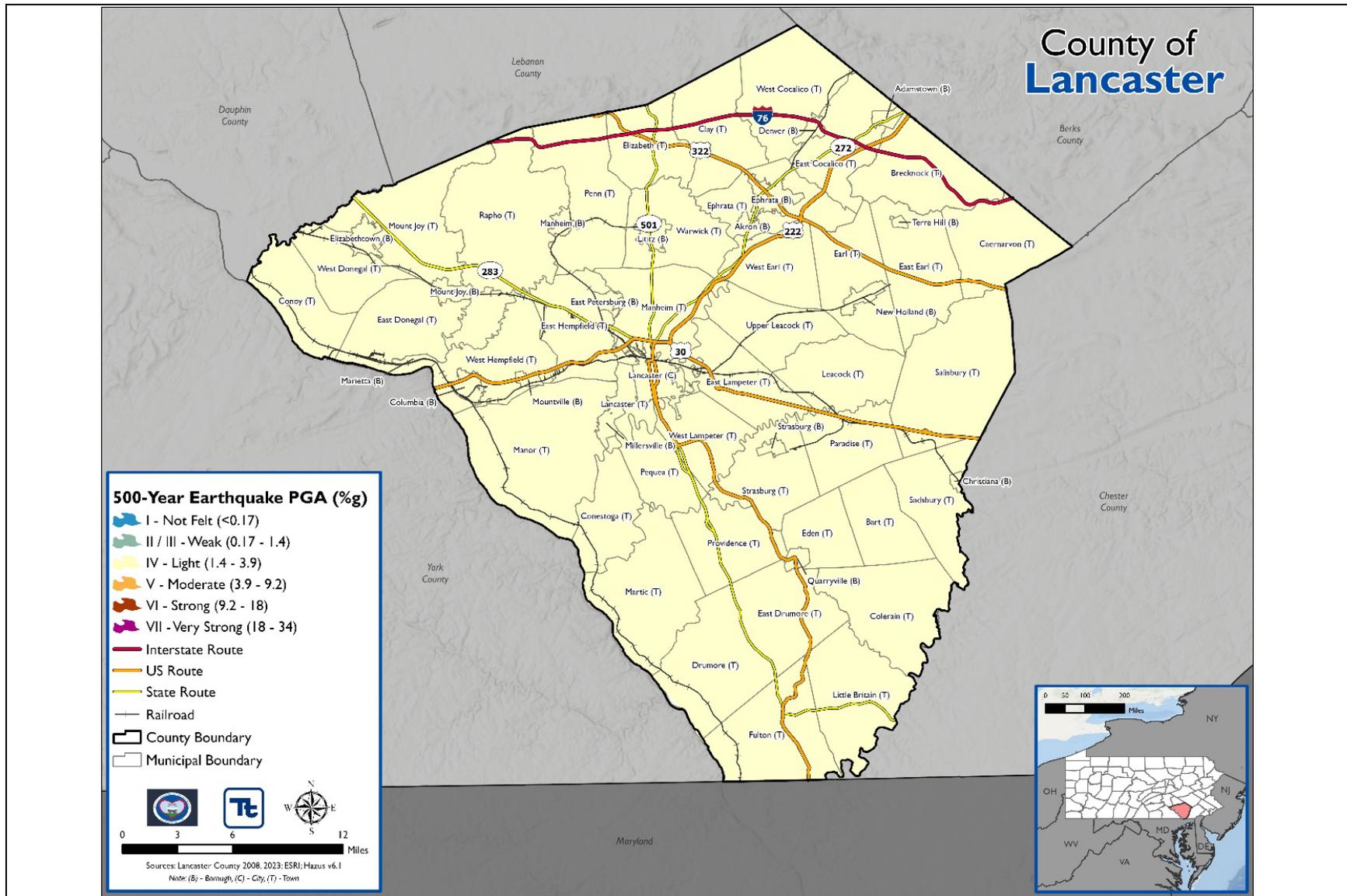
### Earthquake Hazard Mapping for Lancaster County

National maps of earthquake shaking hazards are used to establish seismic design requirements for building codes, insurance rate structures, earthquake loss studies, retrofit priorities, and land use planning applied in the United States. Scientists frequently revise these maps to reflect new information and knowledge. Buildings, bridges, highways, and utilities built to meet modern seismic design requirements are typically able to withstand earthquakes better than those designed earlier, with less damage and disruption. After thoroughly reviewing the studies, professional organizations of engineers update seismic-risk maps and seismic design requirements specified in building codes.

Figure 4-4 shows the Lancaster County PGA values anticipated from a 500-year earthquake event as identified in the USGS 2022 National Seismic Hazard Maps. New seismic, geologic, and geodetic information on earthquake rates and associated ground shaking were incorporated into these revised maps. Earthquakes in Pennsylvania originate deep within the earth’s crust and not on an active fault. No injury or severe damage from earthquake events has been reported in Lancaster County.



Figure 4-4. Peak Ground Acceleration (PGA) 500-Year Mean Return Period for Lancaster County





### Past Occurrence

The historical record of earthquakes in Pennsylvania goes back approximately 200 years. Table 4-17 lists known earthquakes that had an epicenter in Lancaster County. Figure 4-5 is a map of earthquake epicenters across the commonwealth from 1937 to 2022.

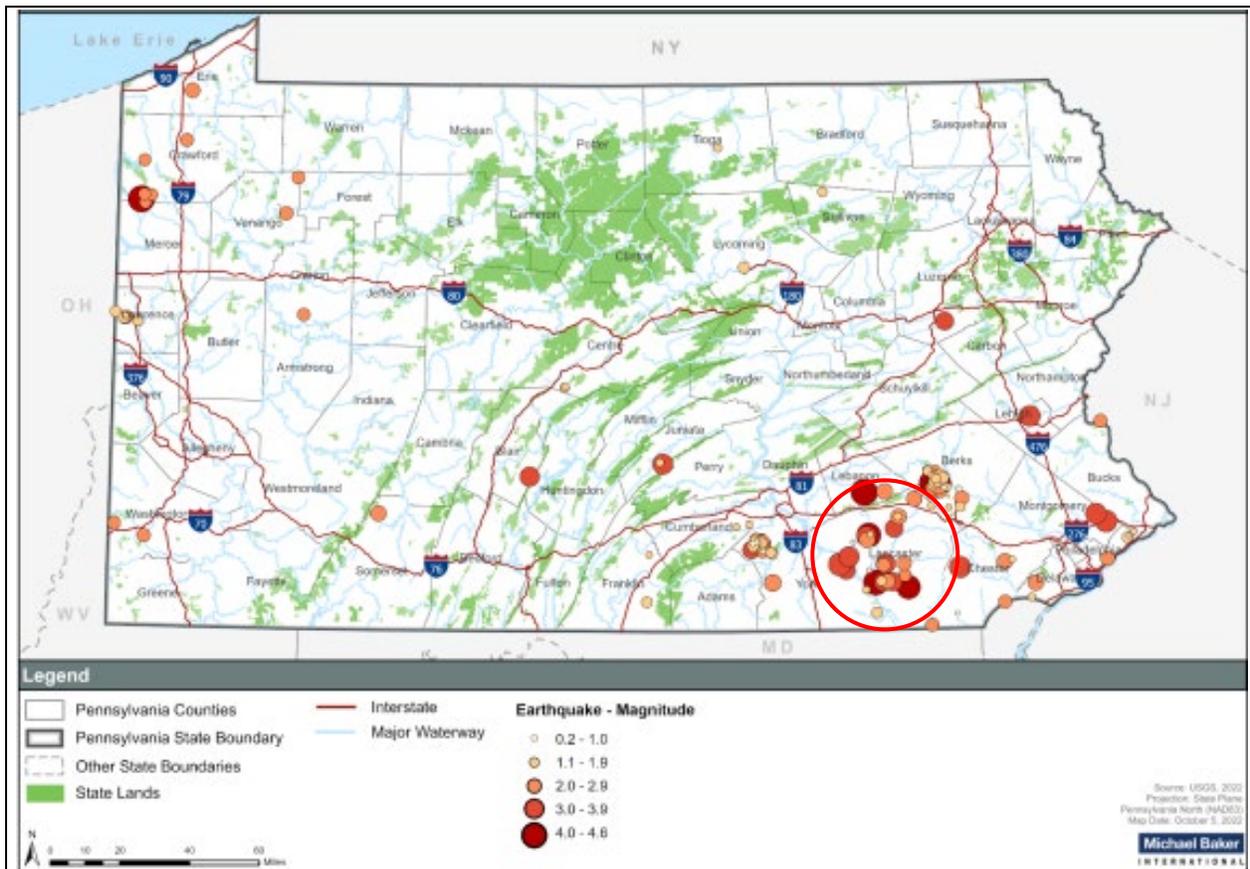
**Table 4-17. Earthquakes with Epicenters in Lancaster County**

Location Nearest Epicenter	Date	Magnitude
Lancaster Area	January 11, 1798	Unknown
Landisville	November 20, 1800	4.1
Lancaster Area	January 27, 1801	Unknown
Lancaster Area	March 19, 1818	Unknown
Columbia	August 21, 1820	3.4
Lancaster Area	May 4, 1822	Unknown
Lancaster Area	September 6, 1829	Unknown
Quarryville	February 5, 1834	4
Martic Forge	September 17, 1865	Unknown
Lancaster Area	November 7, 1866	Unknown
Lancaster Area	March 9, 1885	Unknown
Washington Boro	September 27, 1886	Unknown
Akron	December 8, 1972	3.5
Martic Forge	July 16, 1978	3.1
East Petersburg	October 6, 1978	3
Marticville	April 23, 1984	4.2
Lancaster	September 19, 1984	Unknown
Marticville	May 2, 1986	2.5
Reinholds	July 3, 1990	1.7
Ephrata	January 18, 1994	2.6
Strasburg	May 18, 1994	2.4
Landisville	March 11, 1995	2.7
BlainSPORT	October 28, 1996	2.5
Lititz	November 14, 1997	3
Lancaster	March 22, 2000	1.8
Martic Forge	October 5, 2000	2.1
Conestoga	July 17, 2001	1.8
Adamstown	April 17, 2006	1.2
Landisville	December 27, 2008	3.4
Millersville	July 22, 2011	0.8
Conestoga	January 9, 2014	1.6
Paradise	June 20, 2014	1.4
Lancaster	April 23, 2017	2.3
Rapho	August 21, 2017	0.4
East Peterburg	August 20, 2019	1.0
Clay	October 19, 2019	1.3

Source: PEMA 2023; USGS 2023



Figure 4-5. Earthquake Epicenters in Pennsylvania, 1937 – 2022



Source: PEMA 2023

Note: Lancaster County is within the red circle.

Of the 36 recorded earthquake with epicenters in Lancaster County, 13 had a magnitude greater than 2.5. The lowest magnitude was a 0.4 magnitude earthquake on August 21, 2017, and the largest was a 4.2 magnitude earthquake on April 23, 1984 (USGS 2023). PEMA’s Pennsylvania Disaster History list includes no significant earthquake events in Pennsylvania, and no FEMA major disaster (DR) or emergency (EM) declarations have occurred for significant earthquake events in Pennsylvania (FEMA 2023). According to the USGS “Did You Feel It” website, Lancaster County residents reported having felt two earthquakes in 2017: a 2.3 magnitude earthquake that occurred in Lancaster County and a 1.8 magnitude earthquake that occurred in York County (USGS 2023).

Other earthquakes have occurred in east coast areas, including northern Maryland, eastern Massachusetts, southeastern New York, and northern New Jersey. Moderate earthquakes occurred in southeastern New York and northern New Jersey and were felt in eastern Pennsylvania. If an earthquake of magnitude 6.0 or greater would occur in that area, damage would likely result in easternmost counties of Pennsylvania, including Lancaster County.

### Future Occurrence

Earthquakes cannot be predicted and could occur any time of the day or year. Major earthquakes are infrequent in the Commonwealth and in Lancaster County and may occur only once every few hundred years or longer, but the consequences of major earthquakes could be very high. Based on the historical record, the future probability of damaging earthquakes impacting Lancaster County is *low*. The future occurrence of earthquake events of any magnitude is considered *possible*.



### Vulnerability Assessment

A probabilistic assessment was conducted for the 500-year mean return period (MRP) earthquake event through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates.

#### Life, Health, and Safety

##### General Population

The entire population of Lancaster County (552,984 as of 2020) is exposed to the earthquake hazard. Whether affected directly or indirectly, the entire population would have to contend with consequences of earthquakes to some degree. Business interruption could prevent people from working, road closures could isolate populations, and loss of functions of utilities could affect populations that suffered no direct damage from an event. First responder safety may be at particular risk.

Hazus estimates casualties of an earthquake event based on level of harm and time of day. The times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum, and the 5:00 PM estimate represents peak commute time. The impact of an earthquake on life, health, and safety would depend on the severity of the event. Table 4-18 summarizes the estimated number of casualties as a result of the 500-year MRP event. Risks to public safety from an earthquake in Lancaster County would be minimal, with higher risk in or near buildings, particularly near unreinforced masonry construction which is more susceptible to damage due to seismic shaking.

**Table 4-18. Estimated Number of Casualties from the 500-Year MRP Earthquake Event**

Level of Harm	Number Resulting from 500-Year Mean Return Period Event		
	2:00 AM	2:00 PM	5:00 PM
Injuries without Hospitalization	4	12	5
Injuries Requiring Hospitalization	0	1	0
Deaths	0	0	0

Source: Hazus v 6.1

As a result of a significant earthquake event, residents may be displaced or require temporary to long-term sheltering. The number of people requiring shelter is generally less than the number displaced, as some persons displaced by a disaster event use hotels or stay with family or friends. Hazus indicates there will be no displaced households or persons seeking short-term sheltering from the 500-year MRP earthquake in Lancaster County.

##### Socially Vulnerable Populations

Persons over the age of 65 and individuals living below the Census poverty threshold are particularly susceptible to the earthquake hazard based on their physical or financial ability to respond during a hazard and the locations and construction quality of their housing. According to the 2022 American Community Survey 5-Year population estimates, there are 104,082 persons over 65 in Lancaster County and 8 percent of the total population is living below the poverty level. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.



Table 4-19. Socially Vulnerable Lancaster County Populations

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
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Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

The County’s entire general building stock is vulnerable to the earthquake hazard. A building’s construction determines how well it can withstand the force of an earthquake. Unreinforced masonry buildings are most at risk during an earthquake because the walls are prone to collapse outward; steel and wood buildings absorb more of the earthquake’s energy (FEMA 2023). Additional attributes that affect a building’s capability to withstand an earthquake’s force include its age, number of stories, and quality of construction. A Hazus probabilistic model was run to estimate building losses. Building ages and building types from the inventory prepared for this HMP were incorporated into the Hazus model.

Hazus evaluated potential building damage in the following categories: none, slight, moderate, extensive, and complete. Hazus technical documentation defines these categories for all building types. The following are example definitions for light wood-framed buildings:

- Slight—Small plaster or gypsum-board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer
- Moderate—Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
- Extensive—Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations
- Complete—Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse because of the crippled wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks

Table 4-20 summarizes the damage estimated for the 500-year MRP earthquake event. Damage loss estimates include structural and non-structural damage to the building and loss of contents. Commercial buildings would



face the largest number of impacted structures. Table 4-21 presents the estimated loss values for buildings damaged by the 500-year MRP earthquake event, a total of \$69.7 million countywide. These Hazus estimates are suitable for comparing the risk of one hazard across multiple jurisdictions or the risk of all hazards for a single jurisdiction.

**Table 4-20. Estimated Buildings Damaged by General Occupancy for 500-year MRP Earthquake Event**

Occupancy Class	Total Number of Buildings in Occupancy	Severity of Expected Damage for 500-Year MRP Earthquake	Building Count	Percent of Total Buildings in Occupancy Class
Residential Exposure (Single and Multi-Family Dwellings)	127,056	None	126,604	99.6%
		Slight	421	0.3%
		Moderate	30	<0.1%
		Extensive	1	<0.1%
		Complete	0	0.0%
Commercial Buildings	146,875	None	146,302	99.6%
		Slight	496	0.3%
		Moderate	75	0.1%
		Extensive	2	<0.1%
		Complete	0	0.0%
Industrial Buildings	1,464	None	1,407	96.1%
		Slight	41	2.8%
		Moderate	14	1.0%
		Extensive	2	0.1%
		Complete	0	0.0%
Government, Religion, Agricultural, and Education Buildings	10,369	None	10,270	99.0%
		Slight	87	0.8%
		Moderate	10	0.1%
		Extensive	1	<0.1%
		Complete	0	0.0%

Source: Hazus v6.1, Lancaster County 2023, 2024

**Table 4-21. Estimated Building Value Damaged by the Annualized, 500-Year MRP Earthquake Event**

Jurisdiction	Estimated Losses Caused by the 500-Year Mean Return Period Earthquake Event			
	Total	Residential Structures Only	Commercial Structures Only	All Other Occupancies
Adamstown Borough	\$16,108	\$6,576	\$7,663	\$1,869
Akron Borough	\$34,605	\$15,826	\$9,591	\$9,187
Bart Township	\$124,555	\$16,651	\$71,643	\$36,261
Brecknock Township	\$99,468	\$26,870	\$49,984	\$22,613
Caernarvon Township	\$69,171	\$15,175	\$35,391	\$18,605
Christiana Borough	\$38,638	\$7,402	\$21,050	\$10,186
Clay Township	\$296,601	\$63,690	\$171,956	\$60,955
Colerain Township	\$215,018	\$36,093	\$109,984	\$68,942
Columbia Borough	\$1,007,507	\$173,815	\$352,951	\$480,741
Conestoga Township	\$99,777	\$27,556	\$46,663	\$25,558
Conoy Township	\$105,032	\$16,369	\$53,050	\$35,614
Denver Borough	\$641,140	\$87,166	\$171,236	\$382,738



Jurisdiction	Estimated Losses Caused by the 500-Year Mean Return Period Earthquake Event			
	Total	Residential Structures Only	Commercial Structures Only	All Other Occupancies
Drumore Township	\$206,493	\$19,364	\$98,639	\$88,490
Earl Township	\$2,677,248	\$1,063,888	\$909,109	\$704,251
East Cocalico Township	\$306,630	\$72,638	\$201,778	\$32,214
East Donegal Township	\$1,142,270	\$95,479	\$450,979	\$595,812
East Drumore Township	\$927,242	\$434,044	\$147,370	\$345,827
East Earl Township	\$421,822	\$54,009	\$226,253	\$141,560
East Hempfield Township	\$7,884,468	\$1,544,178	\$2,565,628	\$3,774,663
East Lampeter Township	\$3,519,267	\$886,388	\$1,597,162	\$1,035,717
East Petersburg Borough	\$599,601	\$85,557	\$425,632	\$88,413
Eden Township	\$120,831	\$17,550	\$48,950	\$54,331
Elizabeth Township	\$80,101	\$17,431	\$40,157	\$22,513
Elizabethtown Borough	\$1,093,880	\$117,854	\$216,226	\$759,800
Ephrata Borough	\$2,578,777	\$314,030	\$1,331,225	\$933,522
Ephrata Township	\$952,510	\$194,572	\$513,563	\$244,375
Fulton Township	\$258,329	\$24,224	\$123,401	\$110,703
Lancaster City	\$8,989,583	\$785,716	\$4,476,205	\$3,727,662
Lancaster Township	\$1,724,661	\$355,723	\$1,116,753	\$252,184
Leacock Township	\$1,268,336	\$243,553	\$597,979	\$426,804
Lititz Borough	\$1,162,762	\$73,832	\$255,044	\$833,887
Little Britain Township	\$245,765	\$35,773	\$150,094	\$59,897
Manheim Borough	\$1,142,262	\$79,721	\$490,563	\$571,978
Manheim Township	\$8,967,122	\$2,252,483	\$3,551,390	\$3,163,249
Manor Township	\$1,679,997	\$218,865	\$783,042	\$678,090
Marietta Borough	\$25,608	\$6,539	\$11,940	\$7,129
Martic Township	\$209,591	\$37,114	\$69,878	\$102,599
Millersville Borough	\$670,191	\$72,209	\$74,679	\$523,303
Mount Joy Borough	\$1,138,922	\$145,278	\$537,109	\$456,535
Mount Joy Township	\$747,972	\$77,733	\$205,981	\$464,258
Mountville Borough	\$66,405	\$18,631	\$17,359	\$30,416
New Holland Borough	\$1,714,408	\$141,304	\$818,322	\$754,781
Paradise Township	\$419,417	\$51,272	\$187,661	\$180,484
Penn Township	\$747,627	\$131,295	\$434,431	\$181,901
Pequea Township	\$223,488	\$57,548	\$88,192	\$77,747
Providence Township	\$271,719	\$35,348	\$121,317	\$115,054
Quarryville Borough	\$97,556	\$14,169	\$39,523	\$43,864
Rapho Township	\$787,087	\$148,360	\$443,407	\$195,320
Sadsbury Township	\$182,937	\$35,047	\$99,661	\$48,229
Salisbury Township	\$594,096	\$84,206	\$343,891	\$165,998
Strasburg Borough	\$297,242	\$59,258	\$161,449	\$76,535
Strasburg Township	\$654,244	\$130,429	\$355,358	\$168,457
Terre Hill Borough	\$47,158	\$3,894	\$19,174	\$24,089
Upper Leacock Township	\$2,472,058	\$148,218	\$1,313,454	\$1,010,387
Warwick Township	\$1,176,391	\$553,494	\$512,019	\$110,879
West Cocalico Township	\$162,726	\$42,880	\$92,138	\$27,708



Jurisdiction	Estimated Losses Caused by the 500-Year Mean Return Period Earthquake Event			
	Total	Residential Structures Only	Commercial Structures Only	All Other Occupancies
West Donegal Township	\$467,405	\$108,526	\$268,764	\$90,115
West Earl Township	\$600,984	\$67,705	\$310,195	\$223,084
West Hempfield Township	\$839,419	\$133,826	\$415,034	\$290,559
West Lampeter Township	\$4,431,186	\$3,639,459	\$442,672	\$349,056
<b>Lancaster County</b>	<b>\$69,743,412</b>	<b>\$15,423,801</b>	<b>\$28,801,912</b>	<b>\$25,517,699</b>

Source: Hazus v6.1, Lancaster County 2023, 2024; RS Means 2024

### Community Lifelines and Other Critical Facilities

All critical facilities (essential facilities, transportation systems, lifeline utility systems, high-potential loss facilities, and user-defined facilities) in Lancaster County are considered exposed and vulnerable to the earthquake hazard. Earthquake events can significantly affect road bridges, many of which provide the only access to certain neighborhoods. Because softer soils generally follow floodplain boundaries, bridges that cross water courses should be considered vulnerable. Other key factors in degree of vulnerability include the age and infrastructure of a facility, which correlate with standards in place at time of construction. First responders may have limited access to critical facilities due to damaged infrastructure and may have difficulty traveling to earthquake incidents due to limited access to roads.

Hazus estimates the probability that critical facilities may sustain damage as a result of the 500-year MRP earthquake event. It also estimates percent functionality of each facility in the days after the event. These estimates were developed for the inventory of critical facilities developed for this plan as described in Section 4.4.1. Table 4-22 (500-year MRP earthquake event) lists the average percent probabilities that each class of community lifeline would sustain damage within the Hazus-defined damage categories, along with the percent functionalities after different numbers of days following an earthquake event.



**Table 4-22. Estimated Damage to and Loss of Functionality of Lifelines in Lancaster County for the 500-Year MRP Earthquake Event**

Lifelines	Percent Probability of Sustaining Damage					Percent Functionality			
	None	Slight	Moderate	Extensive	Complete	Day 1	Day 7	Day 30	Day 90
Communications	98.4%	1.2%	0.3%	<0.1%	0.0%	98.4%	99.6%	99.9%	99.9%
Energy	98.4%	1.2%	0.3%	<0.1%	0.0%	98.3%	99.6%	99.9%	99.9%
Food, Hydration, Shelter	98.3%	1.3%	0.4%	<0.1%	0.0%	98.2%	99.5%	99.9%	99.9%
Hazardous Materials	98.3%	1.3%	0.3%	<0.1%	0.0%	98.3%	99.5%	99.9%	99.9%
Health and Medical	99.5%	0.5%	<0.1%	<0.1%	0.0%	99.4%	99.9%	99.9%	99.9%
Safety and Security	98.4%	1.3%	0.3%	<0.1%	0.0%	98.3%	99.5%	99.9%	99.9%
Transportation	99.7%	0.3%	0.1%	<0.1%	0.0%	99.7%	99.9%	100.0%	100.0%
Water Systems	98.3%	1.3%	0.3%	<0.1%	0.0%	98.3%	99.6%	99.9%	99.9%

Source: Hazus v6.1, Lancaster County 2008, 2019, 2023; Homeland Infrastructure Foundation-Level Data (HIFLD) 2022, 2023; National Park Service; National Register of Historic Places



## Economy

Earthquake impacts on the economy include loss of business function, damage to buildings and critical facilities, relocation costs, wage loss, and rental loss during building repair and replacement. Earthquake damage to roadway segments and railroad tracks can cause interruptions of regional transportation and distribution of materials. Losses that result from damage to lifelines could exceed costs of repair.

The 2022 USDA Agricultural Census showed that Lancaster County had 19 percent of Pennsylvania’s agricultural sales—\$1.8 million including livestock, poultry, and products. Roughly \$270,000 was spent in Lancaster County on repairs, supplies, and maintenance costs for farm production expenses, a 27 percent increase from 2017. It can be anticipated that following a significant earthquake, agricultural equipment and property may be damaged by collapses, falling objects, and potential disturbances to the ground itself. The cost for supplies to repair and maintain the equipment and property will increase (USDA 2022).

Debris removal and disposal are major economic costs following an earthquake, and Hazus estimates the volume of debris that may be generated as a result of a given earthquake event. Two types of debris are estimated: reinforced concrete and steel that require special equipment to break up before transport can occur; and brick, wood, and other debris that can be loaded directly onto trucks with bulldozers. Table 4-23 summarizes the estimated debris generated by the 500-year MRP event for Lancaster County. Hazus estimated the generation of over 43,000 tons of total debris during this event. The Township of Manheim would generate the greatest amount of debris at 5,805 tons.

**Table 4-23. Estimated Debris Generated by 500-year MRP Earthquake Event**

Jurisdiction	Estimated Debris Created During the 500-Year Mean Return Period Earthquake Event		
	Brick/Wood (tons)	Concrete/Steel (tons)	Total Debris (tons)
Adamstown Borough	1.3	0.1	1.4
Akron Borough	10.3	1.2	11.5
Bart Township	11.2	2.6	13.8
Brecknock Township	7.5	0.4	7.9
Caernarvon Township	5.7	0.5	6.1
Christiana Borough	7.3	1.2	8.5
Clay Township	32.4	7.2	39.5
Colerain Township	37.0	6.0	43.1
Columbia Borough	570.6	91.0	661.7
Conestoga Township	15.0	2.5	17.5
Conoy Township	31.0	4.5	35.4
Denver Borough	429.6	61.3	490.9
Drumore Township	65.6	9.6	75.2
Earl Township	1,155.9	165.1	1,321.0
East Cocalico Township	22.3	2.6	24.9
East Donegal Township	504.1	79.8	583.9
East Drumore Township	524.7	80.6	605.3
East Earl Township	163.4	19.3	182.7
East Hempfield Township	3,860.0	551.1	4,411.1
East Lampeter Township	1,663.1	269.5	1,932.6
East Petersburg Borough	148.8	27.6	176.5
Eden Township	51.6	6.7	58.3
Elizabeth Township	13.5	1.8	15.4
Elizabethtown Borough	1,230.7	161.6	1,392.3
Ephrata Borough	914.9	158.8	1,073.7



Jurisdiction	Estimated Debris Created During the 500-Year Mean Return Period Earthquake Event		
	Brick/Wood (tons)	Concrete/Steel (tons)	Total Debris (tons)
Ephrata Township	284.1	42.1	326.1
Fulton Township	82.1	12.1	94.1
Lancaster City	4,149.5	751.4	4,900.8
Lancaster Township	367.4	68.6	436.0
Leacock Township	413.7	71.9	485.6
Lititz Borough	1,169.6	146.0	1,315.6
Little Britain Township	24.9	5.5	30.4
Manheim Borough	791.9	131.4	923.3
Manheim Township	4,979.3	825.3	5,804.6
Manor Township	1,019.6	139.5	1,159.1
Marietta Borough	16.8	1.8	18.6
Martic Township	104.0	14.1	118.1
Millersville Borough	466.0	58.5	524.5
Mount Joy Borough	724.8	122.3	847.1
Mount Joy Township	448.1	58.2	506.3
Mountville Borough	36.8	3.2	39.9
New Holland Borough	891.5	151.4	1,042.8
Paradise Township	162.7	22.6	185.3
Penn Township	313.4	46.9	360.2
Pequea Township	78.7	10.9	89.6
Providence Township	161.1	21.4	182.5
Quarryville Borough	41.7	5.4	47.1
Rapho Township	118.4	24.2	142.6
Sadsbury Township	34.4	5.6	40.0
Salisbury Township	153.8	21.9	175.7
Strasburg Borough	71.2	14.1	85.3
Strasburg Township	156.8	30.9	187.7
Terre Hill Borough	21.7	2.2	23.9
Upper Leacock Township	1,320.1	217.9	1,538.0
Warwick Township	430.1	57.1	487.2
West Cocalico Township	8.1	0.9	8.9
West Donegal Township	141.9	22.8	164.7
West Earl Township	203.4	32.1	235.4
West Hempfield Township	426.9	57.2	484.1
West Lampeter Township	2,022.4	227.0	2,249.5
<b>Lancaster County</b>	<b>33,314.2</b>	<b>5,137.0</b>	<b>38,451.2</b>

Source: Hazus v6.1

## Environment

According to USGS, earthquakes can cause damage to the surface of the earth in various forms, depending on the magnitude and distribution of the event. Surface faulting can create wide ruptures in the ground, which can disconnect habitats for miles, isolating animal species or tearing apart plant roots (USGS n.d.). Ground failure as a result of soil liquefaction can have an impact on soil pores and retention of water resources. The greater the seismic activity and liquefaction properties of the soil, the more likely drainage of groundwater can occur, which depletes groundwater resources. In areas where there is higher pressure of groundwater retention, the pores can



build up more pressure and make soil behave more like a fluid rather than a solid, increasing risk of localized flooding and deposition or accumulation of silt (USGS n.d.).

### Future Changes That May Impact Vulnerability

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#### Projected Development

Human exposure and vulnerability to earthquake impacts in newly developed areas are anticipated to be similar to those currently within the county. Development in areas with softer NEHRP soil classes, liquefaction, and landslide-susceptible areas may experience shifting or cracking in the foundation during earthquakes because of the loose soil characteristics of these soil classes. Current building codes require seismic provisions that should render new construction less vulnerable to seismic impacts than older construction that was built to lower standards.

#### Projected Changes in Population

As more persons move into earthquake susceptible areas, an increased amount of the population will be vulnerable to the effects of earthquakes. Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

#### Climate Change

Impacts of global climate change on earthquake probability are unknown. In areas where glaciers are currently present, melting glaciers could induce tectonic activity by shifting weight loads on the earth's crust (NASA 2004). Elsewhere, secondary impacts of earthquakes could be magnified by climate change. Soils saturated by repetitive storms could undergo liquefaction during seismic activity as a result of the increased saturation. Dams storing increased volumes of water as a result of changes in the hydrograph could have a greater likelihood of failure during seismic events. No current models are available to estimate these impacts.

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, the general building stock inventory was updated to set replacement cost value for each building based on RSMeans 2024 building valuations. An updated critical facility dataset was provided by the county. Updated hazard areas were used as well; since the 2019 HMP, an updated version of Hazus was released (v6.1). This updated model includes longer historical records to pull from to generate probabilistic events. Overall, the entire County continues to be vulnerable to earthquakes.



## 4.3.5 Environmental Hazards—Gas and Liquid Pipelines

### Hazard Description

According to the U.S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (PHMSA), in 2021 Pennsylvania had 90,135 miles of natural gas pipelines and 4,254 miles of liquid petroleum pipelines. Failures along these pipelines are considered low-probability events but potential consequences are high due to the hazardous and inflammable materials that may be released. In addition, explosions associated with pipeline failures can cause severe injury to nearby residents and destroy homes and other property (PEMA 2023).

A release of hazardous materials into the local environment can occur at any location along pipelines conveying such materials. Such releases may be the result of carelessness, technical failure, external incidents, or an intentional act. They can immediately and adversely impact the general population, causing effects ranging from evacuations to personal injury and even death. A release also can compromise the local environment through contamination of soil, groundwater, or local flora and fauna. This profile addresses releases from pipelines; refer to Section 4.3.6 for information on other potential sources of hazardous material release.

### Location and Extent

Figure 4-8 shows the routes of hydrocarbon gas liquid pipelines and natural gas pipelines across Lancaster County and quarter-mile buffers along each route. Such pipes are deemed plugged or abandoned when they have reached the end of their life cycle and are no longer safe to operate (USDOL n.d.). Areas closest to a release site are generally at the greatest risk; however, depending on the material, a release can travel great distances or persist over a long period of time, resulting in far-reaching effects on people and the environment.

### Range of Magnitude

The Pipeline and Hazardous Materials Safety Administration (PHMSA) classifies pipeline incidents in the following categories: gas distribution, gas gathering, gas transmission, and liquid natural gas. Pipeline incidents in Lancaster County could range from minor leaks to a large explosion that could lead to loss of life and damage to property, environment, and economy. Severity of an incident varies depending on the type of material released and distance and related response time for emergency response teams.

The worst-case scenario would be a large, uncontrolled release of a toxic gas or liquid from a pipeline or associated pump station in a major urban area. Physical property damage to private wells and public water systems is likely from this type of event. The potential for injury and death to people up to 0.25 miles from the scene is significant. This type of event would likely overwhelm medical care capacity in the county and possibly the region. Businesses nearby could close, and households could be displaced.

### Past Occurrence

One significant incident occurred in Rapho Township on November 3, 2000, when an excavating crew ruptured an 8-inch underground fuel pipeline, thus causing a 40-foot geyser of diesel fuel oil spraying into the environment. The leak flowed for nearly 2.5 hours and released more than 40,000 gallons of diesel fuel. Thanks to the prompt response by emergency crews and early defensive containment, the impact of the spill was limited. In total, the spill took weeks to clean up, and early estimates indicated that the effort would cost in excess of \$1 million (LCEMD 2019).

Another significant incident took place on July 24, 2001, at 2810 Weaver Road, in the village of Neffsville in Manheim Township. An explosion took place as technicians were working on a gasoline pumping station for an underground petroleum line. Conventional unleaded gas was traveling through the line, which ran from Harrisburg to Malvern, Pennsylvania, at the time. After the explosion took place, a huge fireball erupted, reaching 100 feet into the air at times. While crucial valves were shut off gasoline remained in the underground line. Firefighters and hazmat personnel on the scene elected to let this fuel burn off until all of it was gone, but



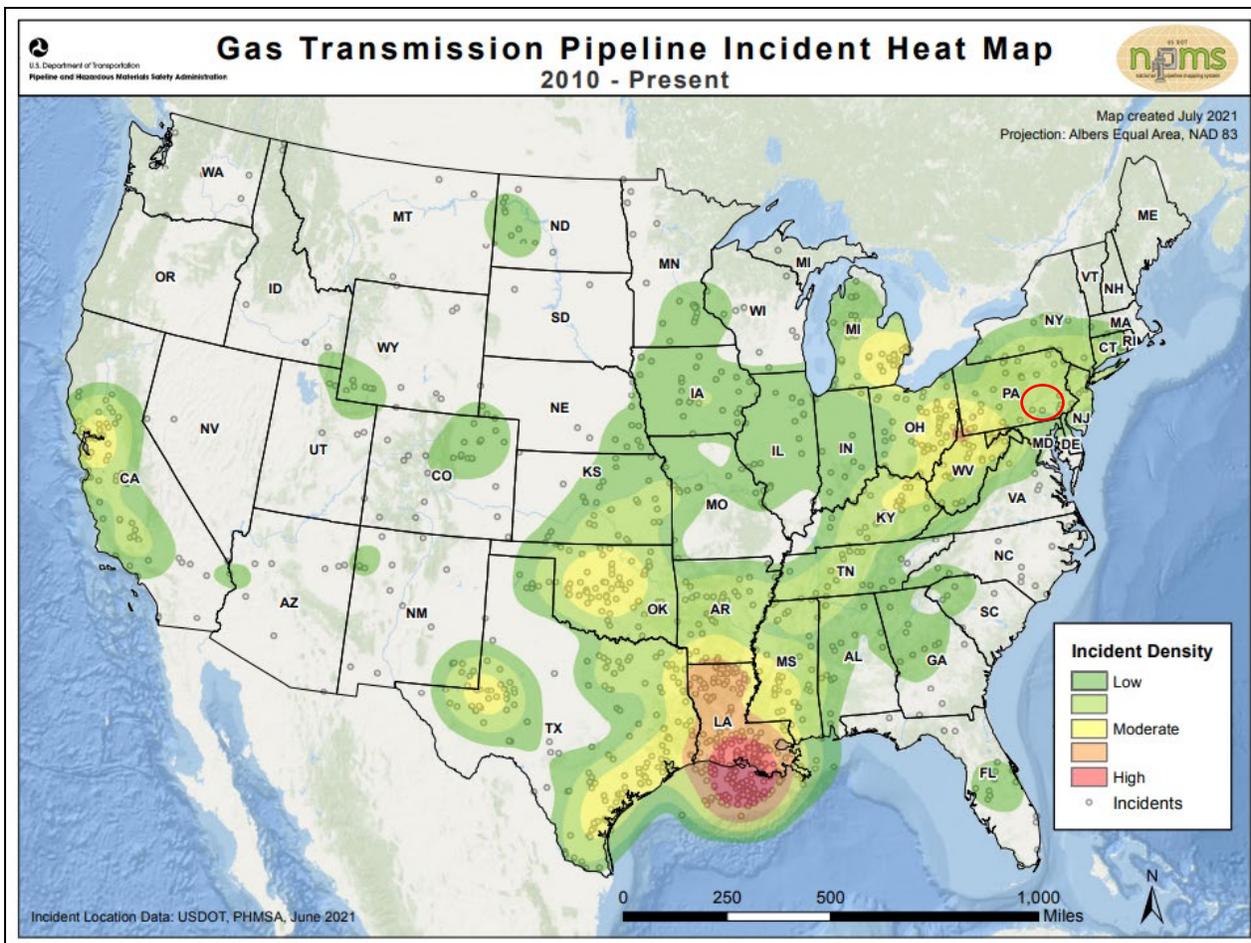
crews remained on the scene through the night and all of the next day to ensure that the incident remained under control (LCEMD 2019).

PHMSA mapping of incidents nationwide from 2010 through 2021 shows Lancaster County in an area of low-moderate density of gas transmission pipeline incidents (Figure 4-6) and a low-moderate density of hazardous liquid pipeline accidents (Figure 4-7) (DOT 2023). Of the 40 respondents to the public survey distributed for this HMP, 9 (23 percent) identified Environmental Hazards—Gas and Liquid Pipelines as a hazard they have experienced in the last five years.

### Future Occurrence

Because of the wide scope of definition of pipeline incidents, ranging from a small spill to a large release of a highly volatile or toxic material, incidents can happen at any time, and will occur in the future. Although the county does not anticipate severe releases on any regular basis, the possibility of a significant release should not be discounted. For this HMP, future occurrences in Lancaster County are considered *possible*.

Figure 4-6. Gas Transmission Pipeline Incident Heat Map, 2010–2021

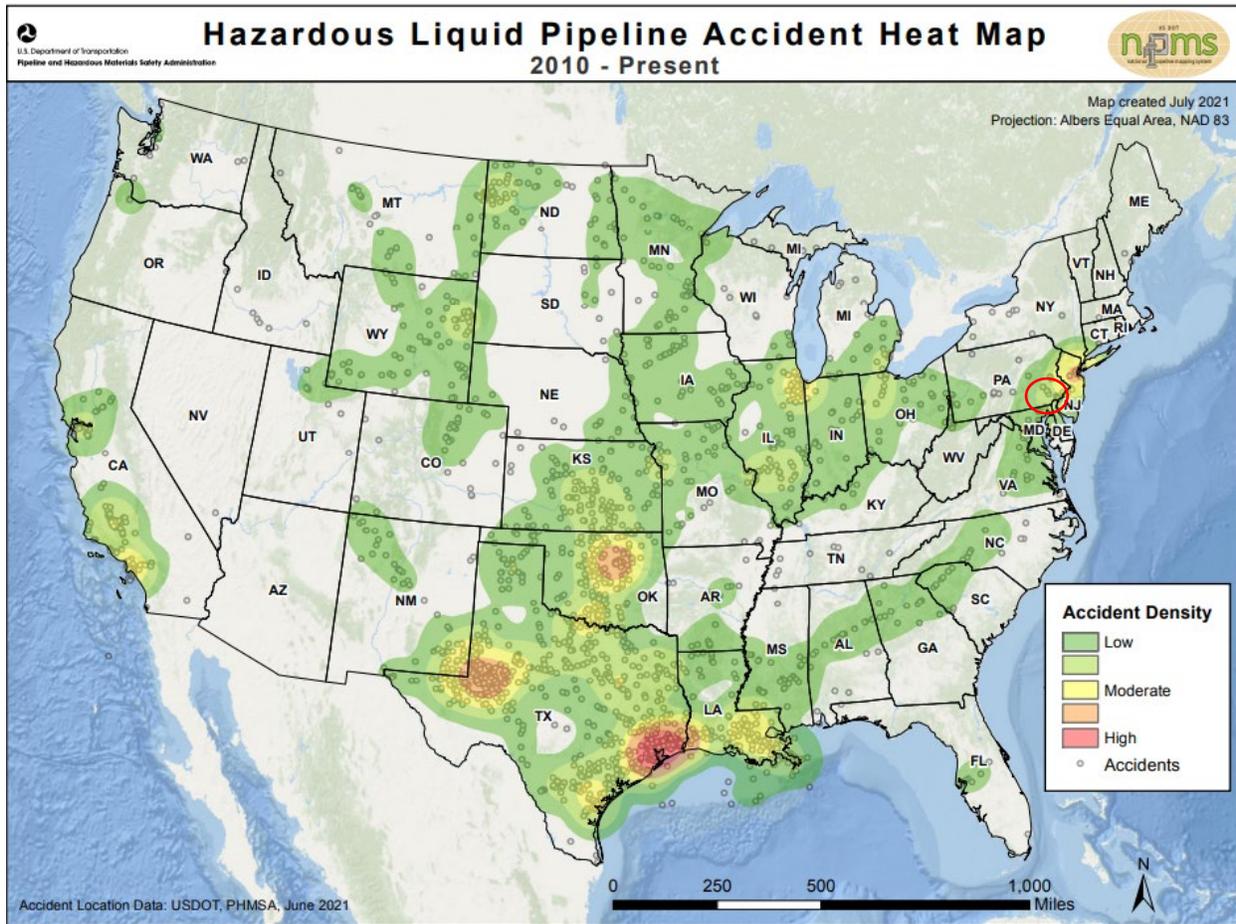


Source: US DOT PHMSA 2021

Note: the red circle is the approximate location of Lancaster County.



Figure 4-7. Hazardous Liquid Pipeline Accident Heat Map, 2010–2021

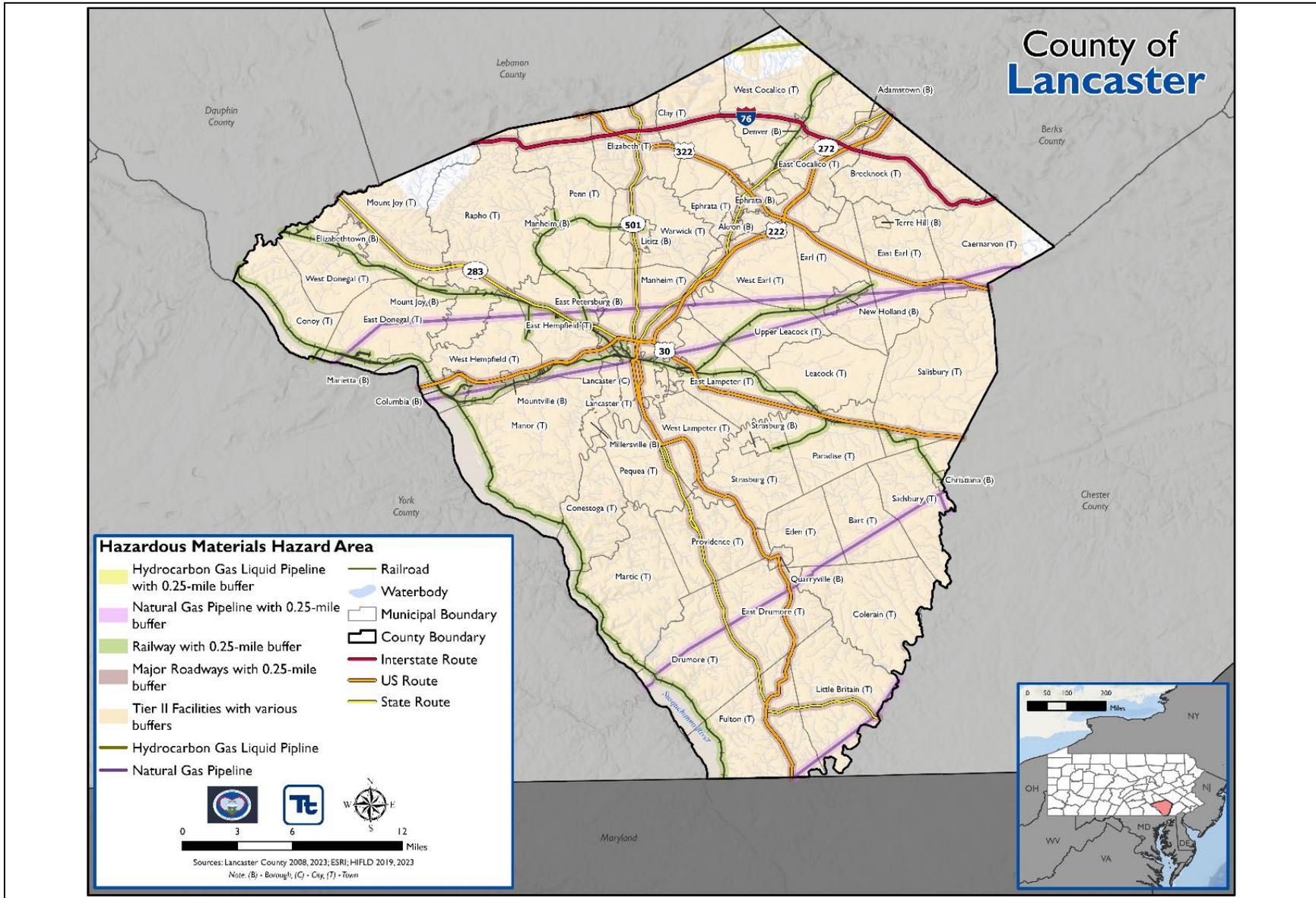


Source: US DOT PHMSA 2021

Note: the red circle is the approximate location of Lancaster County.



Figure 4-8. Hazardous Material Hazard Areas in Lancaster County





### Vulnerability Assessment

To assess vulnerability to the pipeline incident hazard, the hazard area was defined as a quarter-mile buffer along known pipelines in Lancaster County. The updated mapping of assets (population, building stock, and critical facilities) was overlaid to identify assets within the pipeline hazard area.

#### Life, Health, and Safety

##### General Population

Pipeline hazards exert the greatest impact on the residential population in Lancaster County. Table 4-24 summarizes population vulnerable to gas and liquid pipeline hazards. Manheim Township has the greatest number of residents in the pipeline hazard area, with a total of 7,804 people. New Holland Borough has the highest percentage of residents in the hazard area, at 60.7 percent. First responders are at risk during on-scene operations.

Table 4-24. Lancaster County Population in Pipeline Hazard Areas

Jurisdiction	Total Population (2020 Decennial Census)	Population in the Pipeline Hazard Areas	
		Number of Persons	Percent of Total
Adamstown Borough	1,916	0	0.0%
Akron Borough	4,152	0	0.0%
Bart Township	3,181	232	7.3%
Brecknock Township	7,557	0	0.0%
Caernarvon Township	4,609	938	20.4%
Christiana Borough	1,112	8	0.7%
Clay Township	6,857	0	0.0%
Colerain Township	3,883	144	3.7%
Columbia Borough	10,207	3,297	32.3%
Conestoga Township	3,914	0	0.0%
Conoy Township	3,361	0	0.0%
Denver Borough	3,792	0	0.0%
Drumore Township	2,561	248	9.7%
Earl Township	7,144	1,426	20.0%
East Cocalico Township	10,767	0	0.0%
East Donegal Township	8,684	2,012	23.2%
East Drumore Township	3,936	80	2.0%
East Earl Township	6,699	1,170	17.5%
East Hempfield Township	26,304	4,450	16.9%
East Lampeter Township	17,776	548	3.1%
East Petersburg Borough	4,573	1,028	22.5%
Eden Township	2,239	10	0.4%
Elizabeth Township	3,985	0	0.0%
Elizabethtown Borough	11,639	0	0.0%
Ephrata Borough	13,794	0	0.0%
Ephrata Township	10,386	0	0.0%
Fulton Township	3,214	58	1.8%
Lancaster City	58,039	3,706	6.4%
Lancaster Township	18,642	1,362	7.3%
Leacock Township	5,652	0	0.0%



Jurisdiction	Total Population (2020 Decennial Census)	Population in the Pipeline Hazard Areas	
		Number of Persons	Percent of Total
Lititz Borough	9,381	0	0.0%
Little Britain Township	4,118	203	4.9%
Manheim Borough	5,046	0	0.0%
Manheim Township	43,977	7,804	17.7%
Manor Township	21,849	601	2.8%
Marietta Borough	2,623	0	0.0%
Martic Township	5,221	0	0.0%
Millersville Borough	7,903	0	0.0%
Mount Joy Borough	8,325	0	0.0%
Mount Joy Township	10,721	0	0.0%
Mountville Borough	3,017	1,708	56.6%
New Holland Borough	5,743	3,488	60.7%
Paradise Township	5,672	0	0.0%
Penn Township	10,210	0	0.0%
Pequea Township	5,474	0	0.0%
Providence Township	6,995	0	0.0%
Quarryville Borough	2,843	0	0.0%
Rapho Township	12,024	46	0.4%
Sadsbury Township	3,536	165	4.7%
Salisbury Township	11,494	60	0.5%
Strasburg Borough	3,117	0	0.0%
Strasburg Township	4,457	0	0.0%
Terre Hill Borough	1,357	0	0.0%
Upper Leacock Township	8,921	387	4.3%
Warwick Township	19,022	0	0.0%
West Cocalico Township	7,456	47	0.6%
West Donegal Township	8,944	0	0.0%
West Earl Township	8,560	951	11.1%
West Hempfield Township	17,020	2,319	13.6%
West Lampeter Township	17,383	0	0.0%
<b>Lancaster County</b>	<b>552,984</b>	<b>38,496</b>	<b>7.0%</b>

Source: U.S. Census Bureau 2020; Lancaster County 2023, 2024

### Socially Vulnerable Populations

Older adults and young children may be more at risk due to limited mobility, communication, and dependency on others. Cascading impacts of exposure to leaked hazardous materials may affect those who have compromised immune systems and additional medical needs. Communities of color, certain immigrant groups, low-income groups, and those with limited English proficiency are more at risk because they may live in locations that are prone to hazardous materials exposure, may have limited financial resources to evacuate, and may experience cultural, language, and citizenship barriers that restrict communication and access to emergency information relating to a pipeline incident (EPA 2023). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population in the hazard area over 65 (3,262), and Lancaster City has the highest population in the hazard area of people under 5 (1,155), non-English speaking



persons (1,267), people with disabilities (2,618), and the people living in poverty (2,987). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

**Table 4-25. Socially Vulnerable Lancaster County Population in Pipeline Hazard Areas**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	0	0	0	0	0
Akron Borough	0	0	0	0	0
Bart Township	27	25	13	23	10
Brecknock Township	0	0	0	0	0
Caernarvon Township	161	68	26	100	73
Christiana Borough	1	0	0	1	0
Clay Township	0	0	0	0	0
Colerain Township	22	16	10	10	26
Columbia Borough	702	111	82	627	531
Conestoga Township	0	0	0	0	0
Conoy Township	0	0	0	0	0
Denver Borough	0	0	0	0	0
Drumore Township	31	16	13	27	18
Earl Township	367	129	43	141	141
East Cocalico Township	0	0	0	0	0
East Donegal Township	300	145	5	179	71
East Drumore Township	20	5	0	9	5
East Earl Township	251	67	49	114	40
East Hempfield Township	1,171	151	76	457	135
East Lampeter Township	87	42	25	59	48
East Petersburg Borough	219	35	0	140	69
Eden Township	1	1	0	0	0
Elizabeth Township	0	0	0	0	0
Elizabethtown Borough	0	0	0	0	0
Ephrata Borough	0	0	0	0	0
Ephrata Township	0	0	0	0	0
Fulton Township	8	7	2	4	4
Lancaster City	343	251	276	570	651
Lancaster Township	300	101	70	135	119
Leacock Township	0	0	0	0	0
Lititz Borough	0	0	0	0	0
Little Britain Township	42	15	12	24	19
Manheim Borough	0	0	0	0	0
Manheim Township	1,785	404	129	860	427
Manor Township	113	34	38	71	58
Marietta Borough	0	0	0	0	0
Martic Township	0	0	0	0	0
Millersville Borough	0	0	0	0	0
Mount Joy Borough	0	0	0	0	0
Mount Joy Township	0	0	0	0	0
Mountville Borough	448	89	0	181	177



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
New Holland Borough	699	222	27	397	196
Paradise Township	0	0	0	0	0
Penn Township	0	0	0	0	0
Pequea Township	0	0	0	0	0
Providence Township	0	0	0	0	0
Quarryville Borough	0	0	0	0	0
Rapho Township	10	2	0	5	1
Sadsbury Township	20	21	2	14	17
Salisbury Township	6	5	2	4	3
Strasburg Borough	0	0	0	0	0
Strasburg Township	0	0	0	0	0
Terre Hill Borough	0	0	0	0	0
Upper Leacock Township	58	26	25	38	31
Warwick Township	0	0	0	0	0
West Cocalico Township	6	5	0	3	3
West Donegal Township	0	0	0	0	0
West Earl Township	187	85	26	68	33
West Hempfield Township	448	130	77	301	67
West Lampeter Township	0	0	0	0	0
<b>Lancaster County</b>	<b>7,833</b>	<b>2,208</b>	<b>1,028</b>	<b>4,562</b>	<b>2,973</b>

Source: U.S. Census Bureau 2022; Lancaster County 2023, 2024

### General Building Stock

Potential losses to buildings in the pipeline incident hazard area may include contamination or structural and content losses if an explosion occurs. Table 4-26 lists buildings in the total pipeline hazard area. However, if a pipeline release were to occur, the incident would not be located along all pipelines in the county but only a section of the total pipeline hazard area. Therefore, the total exposure does not represent a complete vulnerability should a hazard event occur. For comparative purposes, Manheim Township has the greatest number of buildings that would be impacted by a pipeline event (2,999) and New Holland Borough has the highest percentage of buildings in the hazard area (64.4 percent). The City of Lancaster has the highest value of buildings in the hazard area (\$5.15 billion) and Mountville Borough has the highest percentage of total building value in the hazard area (66.8 percent).

Table 4-27 list the buildings in the pipeline hazard area by general occupancy. The greatest number of buildings in the hazard area are residential (8,973), followed by commercial (8,605)

**Table 4-26. Total Building Exposed to a Pipeline Incident**

Jurisdiction	Jurisdiction Total Buildings		Number of Buildings		Replacement Cost Value	
	Count	Replacement Cost Value	Count	% of Jurisdiction Total	Value	% of Jurisdiction Total
Adamstown Borough	1,061	\$567,784,670	0	0.0%	\$0	0.0%
Akron Borough	1,946	\$780,121,864	0	0.0%	\$0	0.0%
Bart Township	2,746	\$1,885,029,231	244	8.9%	\$150,795,117	8.0%
Brecknock Township	6,458	\$3,832,548,357	0	0.0%	\$0	0.0%
Caernarvon Township	3,617	\$2,383,292,372	658	18.2%	\$262,309,784	11.0%



Section 4.3.5. Risk Assessment: Environmental Hazards—Gas and Liquid Pipelines

Jurisdiction	Jurisdiction Total Buildings		Number of Buildings		Replacement Cost Value	
	Count	Replacement Cost Value	Count	% of Jurisdiction Total	Value	% of Jurisdiction Total
Christiana Borough	584	\$307,647,839	10	1.7%	\$7,187,358	2.3%
Clay Township	4,929	\$3,411,423,294	0	0.0%	\$0	0.0%
Colerain Township	3,177	\$2,533,877,481	112	3.5%	\$60,385,298	2.4%
Columbia Borough	4,036	\$4,983,733,544	1,337	33.1%	\$1,018,564,516	20.4%
Conestoga Township	2,953	\$1,420,507,504	0	0.0%	\$0	0.0%
Conoy Township	2,599	\$1,789,579,577	0	0.0%	\$0	0.0%
Denver Borough	1,918	\$2,747,960,874	0	0.0%	\$0	0.0%
Drumore Township	2,426	\$1,886,590,595	252	10.4%	\$189,139,668	10.0%
Earl Township	5,290	\$10,279,323,543	712	13.5%	\$3,923,095,526	38.2%
East Cocalico Township	7,428	\$5,177,824,554	0	0.0%	\$0	0.0%
East Donegal Township	4,506	\$6,877,402,214	980	21.7%	\$1,045,370,165	15.2%
East Drumore Township	3,043	\$3,747,277,368	180	5.9%	\$730,685,277	19.5%
East Earl Township	5,648	\$6,797,710,925	717	12.7%	\$494,352,131	7.3%
East Hempfield Township	11,417	\$42,919,064,493	2,087	18.3%	\$4,448,075,381	10.4%
East Lampeter Township	8,359	\$16,552,653,977	238	2.8%	\$654,143,327	4.0%
East Petersburg Borough	2,033	\$1,076,855,572	431	21.2%	\$257,979,995	24.0%
Eden Township	1,797	\$1,268,005,230	28	1.6%	\$20,537,581	1.6%
Elizabeth Township	3,194	\$2,173,694,928	0	0.0%	\$0	0.0%
Elizabethtown Borough	4,454	\$6,918,177,890	0	0.0%	\$0	0.0%
Ephrata Borough	6,357	\$13,348,895,113	0	0.0%	\$0	0.0%
Ephrata Township	5,383	\$6,162,339,672	0	0.0%	\$0	0.0%
Fulton Township	3,035	\$2,732,951,621	47	1.5%	\$24,226,884	0.9%
Lancaster City	14,223	\$49,154,384,225	1,114	7.8%	\$5,147,984,408	10.5%
Lancaster Township	5,365	\$16,948,222,966	325	6.1%	\$157,033,871	0.9%
Leacock Township	4,771	\$5,521,489,045	0	0.0%	\$0	0.0%
Lititz Borough	4,389	\$10,053,673,662	0	0.0%	\$0	0.0%
Little Britain Township	3,545	\$3,060,610,596	164	4.6%	\$582,118,104	19.0%
Manheim Borough	2,956	\$4,013,795,389	0	0.0%	\$0	0.0%
Manheim Township	16,101	\$25,203,355,402	2,999	18.6%	\$5,033,004,881	20.0%
Manor Township	10,400	\$20,927,614,237	297	2.9%	\$381,884,974	1.8%
Marietta Borough	1,402	\$754,834,832	0	0.0%	\$0	0.0%
Martic Township	4,469	\$2,359,595,108	0	0.0%	\$0	0.0%
Millersville Borough	2,611	\$4,408,036,349	0	0.0%	\$0	0.0%
Mount Joy Borough	3,925	\$4,719,474,554	0	0.0%	\$0	0.0%
Mount Joy Township	5,918	\$7,127,138,587	0	0.0%	\$0	0.0%
Mountville Borough	1,189	\$1,106,163,051	744	62.6%	\$739,400,829	66.8%
New Holland Borough	2,819	\$5,086,885,413	1,815	64.4%	\$2,060,133,692	40.5%
Paradise Township	4,470	\$4,125,868,997	0	0.0%	\$0	0.0%
Penn Township	6,163	\$6,256,819,382	0	0.0%	\$0	0.0%
Pequea Township	3,612	\$2,379,058,553	0	0.0%	\$0	0.0%
Providence Township	4,666	\$3,832,302,966	0	0.0%	\$0	0.0%
Quarryville Borough	1,451	\$1,138,506,005	0	0.0%	\$0	0.0%
Rapho Township	8,253	\$7,968,083,321	90	1.1%	\$91,093,565	1.1%



Section 4.3.5. Risk Assessment: Environmental Hazards—Gas and Liquid Pipelines

Jurisdiction	Jurisdiction Total Buildings		Number of Buildings		Replacement Cost Value	
	Count	Replacement Cost Value	Count	% of Jurisdiction Total	Value	% of Jurisdiction Total
Sadsbury Township	2,765	\$2,150,137,506	195	7.1%	\$173,382,039	8.1%
Salisbury Township	8,204	\$7,541,703,016	69	0.8%	\$121,174,164	1.6%
Strasburg Borough	1,716	\$965,120,267	0	0.0%	\$0	0.0%
Strasburg Township	3,777	\$4,508,049,956	0	0.0%	\$0	0.0%
Terre Hill Borough	840	\$352,866,296	0	0.0%	\$0	0.0%
Upper Leacock Township	5,549	\$12,221,244,032	745	13.4%	\$896,662,475	7.3%
Warwick Township	8,483	\$13,241,309,844	0	0.0%	\$0	0.0%
West Cocalico Township	5,957	\$3,405,206,014	103	1.7%	\$34,705,413	1.0%
West Donegal Township	4,332	\$7,574,423,332	0	0.0%	\$0	0.0%
West Earl Township	5,356	\$5,324,536,861	458	8.6%	\$337,959,066	6.3%
West Hempfield Township	8,662	\$10,809,249,135	1,189	13.7%	\$1,528,708,848	14.1%
West Lampeter Township	7,031	\$18,752,932,700	0	0.0%	\$0	0.0%
<b>Lancaster County</b>	<b>285,764</b>	<b>\$427,554,965,900</b>	<b>18,340</b>	<b>6.4%</b>	<b>\$30,572,094,336</b>	<b>7.2%</b>

Source: Lancaster County 2023, 2024; RS Means 2024

**Table 4-27. Buildings within 0.25 Miles of Hazardous Materials Pipelines by General Occupancy Class**

Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Adamstown Borough	0	0	0	0
Akron Borough	0	0	0	0
Bart Township	42	186	0	16
Brecknock Township	0	0	0	0
Caernarvon Township	192	454	0	12
Christiana Borough	2	8	0	0
Clay Township	0	0	0	0
Colerain Township	28	77	0	7
Columbia Borough	710	590	1	36
Conestoga Township	0	0	0	0
Conoy Township	0	0	0	0
Denver Borough	0	0	0	0
Drumore Township	53	178	1	20
Earl Township	247	392	26	47
East Cocalico Township	0	0	0	0
East Donegal Township	488	440	6	46
East Drumore Township	18	141	0	21
East Earl Township	273	411	1	32
East Hempfield Township	1,198	807	14	68
East Lampeter Township	122	99	2	15
East Petersburg Borough	309	120	0	2
Eden Township	2	23	0	3
Elizabeth Township	0	0	0	0
Elizabethtown Borough	0	0	0	0
Ephrata Borough	0	0	0	0



Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Ephrata Township	0	0	0	0
Fulton Township	12	34	0	1
Lancaster City	444	605	31	34
Lancaster Township	274	51	0	0
Leacock Township	0	0	0	0
Lititz Borough	0	0	0	0
Little Britain Township	46	106	1	11
Manheim Borough	0	0	0	0
Manheim Township	2,009	929	11	50
Manor Township	149	147	0	1
Marietta Borough	0	0	0	0
Martic Township	0	0	0	0
Millersville Borough	0	0	0	0
Mount Joy Borough	0	0	0	0
Mount Joy Township	0	0	0	0
Mountville Borough	368	361	1	14
New Holland Borough	942	821	15	37
Paradise Township	0	0	0	0
Penn Township	0	0	0	0
Pequea Township	0	0	0	0
Providence Township	0	0	0	0
Quarryville Borough	0	0	0	0
Rapho Township	11	73	0	6
Sadsbury Township	31	142	0	22
Salisbury Township	12	50	0	7
Strasburg Borough	0	0	0	0
Strasburg Township	0	0	0	0
Terre Hill Borough	0	0	0	0
Upper Leacock Township	81	595	6	63
Warwick Township	0	0	0	0
West Cocalico Township	12	88	0	3
West Donegal Township	0	0	0	0
West Earl Township	219	200	4	35
West Hempfield Township	679	477	4	29
West Lampeter Township	0	0	0	0
<b>Lancaster County</b>	<b>8,973</b>	<b>8,605</b>	<b>124</b>	<b>638</b>

Sources: Lancaster County 2023, 2024

### Community Lifelines and Other Critical Facilities

Potential losses of community lifelines and other critical facilities caused by a gas and liquid pipeline incident include inaccessibility, loss of service, contamination, or structural and content losses if an explosion occurs. Table 4-28 summarizes critical facilities and lifelines located within the pipeline hazard area. The analysis indicates that 538 of the 6,476 critical facilities in the County are within the pipeline hazard area. The greatest numbers of these are “other” critical facilities (178) and health and medical facilities (132).



**Table 4-28. Lifeline Facility Exposure to Pipeline Incidents**

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located within 1/4 Mile of Hazardous Materials Pipelines
Communications	149	11
Energy	70	3
Food, Hydration, Shelter	12	0
Hazardous Materials	731	90
Health and Medical	1,147	132
Safety and Security	1,340	97
Transportation	44	2
Water Systems	449	25
Other Critical Facilities	2,534	178
<b>Total</b>	<b>6,476</b>	<b>538</b>

Source: Lancaster County 2008, 2019, 2023; HIFLD 2022, 2023; National Park Service; National Register of Historic Places

### Economy

Economic loss from pipeline incidents can amount to millions of dollars. A significant incident in an urban area would cause various economic losses. Pipeline incidents can lead to closures of major transportation routes. Waterway, railroad, airport, and highway closures caused by these incidents can hinder delivery of goods and services. Potential impacts may be local, regional, or statewide depending on the magnitude of the event and the extent of disruptions to services. In 2019, Pennsylvania experienced 19 pipeline incidents, causing \$13.4 million in damage (DOT 2023).

### Environment

Gas and liquid pipeline incidents and explosion incidents can profoundly affect the surrounding environment. Contamination of soil, surface water, and groundwater can result in many direct impacts on surrounding populations and ecosystems. When a large volume of product is released, much of it remains unrecovered as it disperses into the environment (Belvederesi, et al 2018). This can have an immense and lasting impact on the local flora and fauna.

### Future Changes That May Impact Vulnerability

#### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by the pipeline hazard. Any development near pipelines will increase the County’s overall risk. Therefore, the County should take precautions with the location of new development and its proximity to gas and liquid pipelines. The County may also want to consider implementing designs into new development that enable improved evacuation or protection from residual impacts from gas and liquid pipelines.

#### Projected Changes in Population

Any changes in the density of population can impact the number of persons living near gas and liquid pipelines.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).



### Climate Change

As temperatures change, excessive heat on pipelines may alter their material properties. In addition, pipeline locations in the floodplain may experience an increase in flood events due to projected changes in increased precipitation events, magnitude, and frequency.

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Environmental hazards—gas and liquid pipeline is a new hazard of concern identified for the Lancaster County HMP.



## 4.3.6 Environmental Hazards—Hazardous Materials Releases

### Hazard Description

Hazardous material releases can contaminate air, water, and soils and have the potential to cause injury or death. Dispersion can take place rapidly when transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. The severity of the incident is dependent on the weather, geographical conditions, the type of material released, and the distance and related response time for emergency response teams (PEMA 2023).

Hazardous materials (hazmat) can be released to the environment from a fixed facility or from a transport vehicle moving along a highway, railroad, or other transportation route. A “release” of a chemical means emission to the air or water, or placement in some type of land disposal. Such releases may be the result of carelessness, technical failure, external incidents, or an intentional act against the facility or container. Transportation of hazardous materials on highways involves tanker trucks or trailers, which are responsible for the greatest number of hazmat incidents. Volatility of products stored or transported, along with potential impact on a local community, may increase the risk of intentional acts against a facility or transport vehicle.

Release of certain products considered hazardous materials can immediately and adversely impact the general population, ranging from the inconvenience of evacuations to personal injury and even death. Moreover, any release can compromise the local environment through contamination of soil, groundwater, or local flora and fauna. The U.S. Department of Transportation (DOT) categorizes hazardous materials (hazmat) into classes based on the materials involved:

- Class 1: Explosives
- Class 2: Gases
- Class 3: Flammable liquids
- Class 4: Flammable solids
- Class 5: Oxidizers and organic pesticides
- Class 6: Poisons and etiologic materials
- Class 7: Radioactive materials
- Class 8: Corrosives
- Class 9: Miscellaneous

A release of any of these products in large quantity would pose a threat to the local population, economy, and environment, resulting in lost revenue, injuries, and deaths. The U.S. Environmental Protection Agency (EPA) tracks over 650 toxic chemicals that pose a threat to human health and the environment through the Toxic Release Inventory (TRI). EPA publishes all TRI data in a publicly accessible database in Envirofacts.

Facilities that use, manufacture, or store hazardous materials in Pennsylvania must comply with both Title III of the federal Superfund Amendments and Reauthorization Act (SARA, also known as the Emergency Planning and Community Right-to-Know Act), and Pennsylvania’s reporting requirements under the Hazardous Materials Emergency Planning and Response Act (1990-165). Under SARA, facilities in certain industries that use or house these chemicals in amounts exceeding specified levels must submit annual reports on how each chemical is managed through recycling, energy recovery, treatment, and releases to the environment. Facilities subject to this reporting requirement are called Tier II facilities.

### Location and Extent

Hazardous materials are transported via rail and along I-76, US-30, US-222, US-322, PA-72, PA-272, PA-283, PA-372, and PA-501. At several points, these transportation routes cross streams within the watersheds that are part of the county’s domestic water supply. Lists of hazmat travel routes are not maintained by the county or regional planning entities. Rail lines and highways that transport hazardous materials are shown in Figure 4-9, along with hazard areas around fixed facilities where hazardous materials are kept.



### *Section 4.3.6. Risk Assessment: Environmental Hazards—Hazardous Materials Releases*

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Lancaster County currently has two hazardous materials waste Superfund sites that utilize, ship, or house chemicals considered hazardous. These two Superfund sites are also listed on the National Priorities List for Superfund cleanup. In 2021, 64 TRI facilities in Lancaster County were reported to EPA, as shown in Figure 4-10 (EPA 2021). The County is home to 203 SARA Tier II facilities.



Figure 4-9. Major Transportation Routes and Railways with Buffer in Lancaster County, Pennsylvania

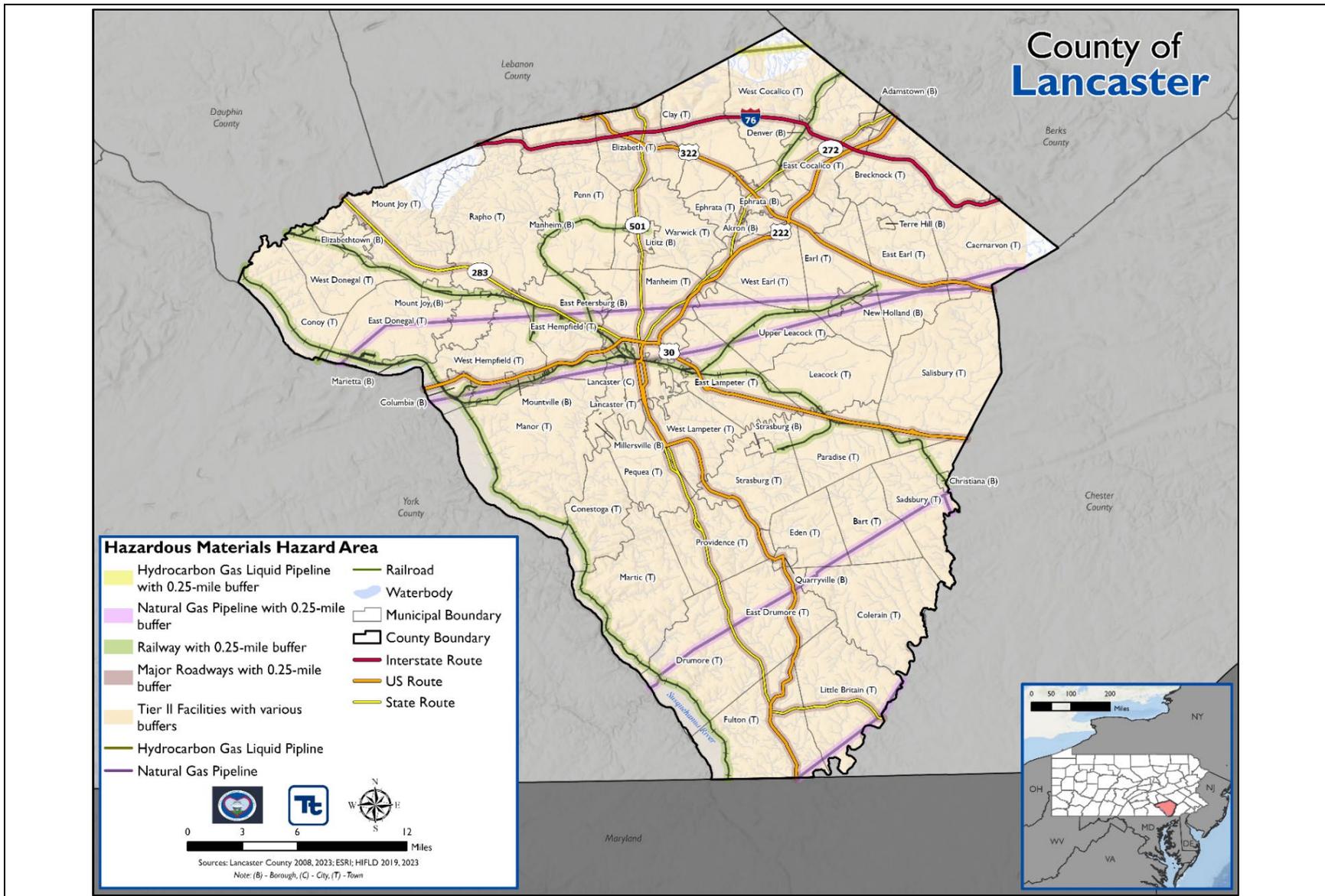
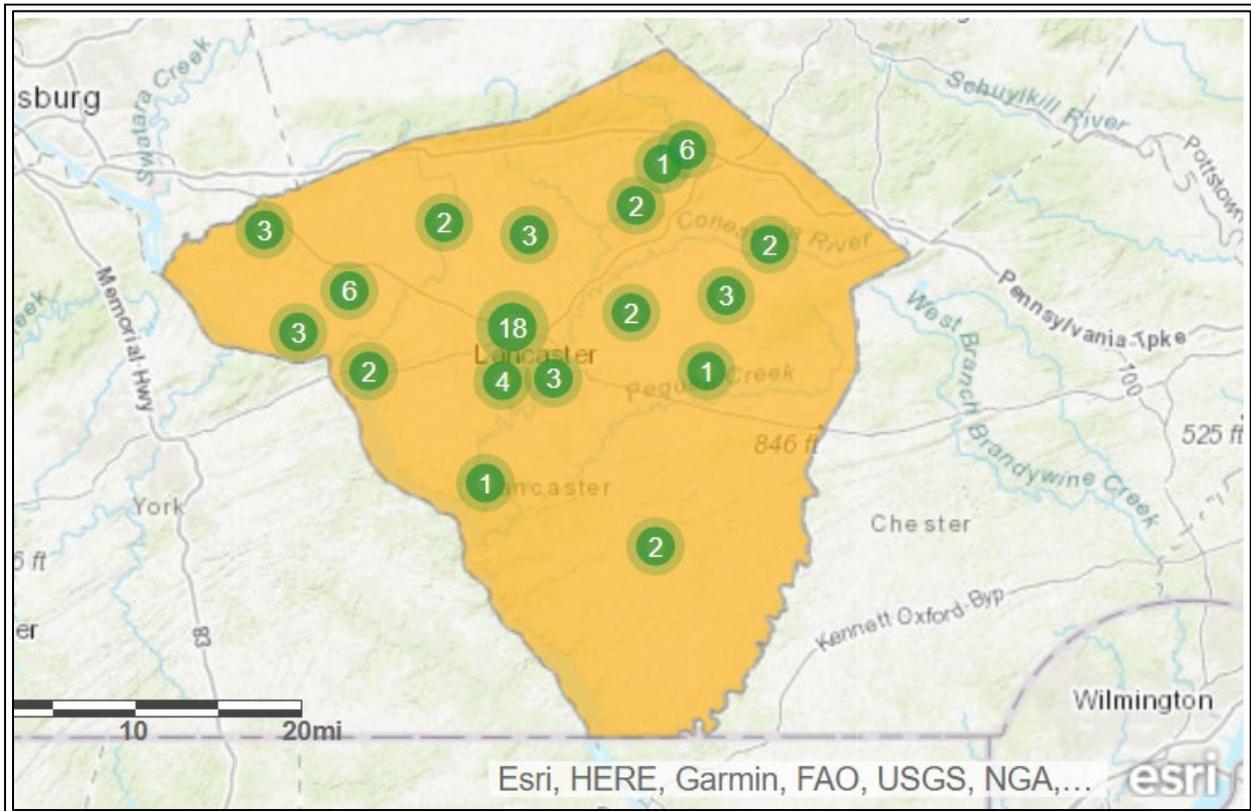




Figure 4-10. Toxic Release Inventory for Lancaster County



Source: EPA, 2021

Lancaster County is home to many manufacturing facilities and industries, mostly including metal manufacturing, health care product manufacturing, and food and beverage manufacturing and packaging. Some manufacturing companies located in Lancaster County include Kellogg Company, Land O’Lakes Inc., Mars Inc., Packaging Corporation of America, Arconic, GlaxoSmithKline, and more. According to EPA, the County’s five industrial manufacturing companies with the highest total chemical releases in 2021 were Armstrong World Industries (total 361,510 pounds), LSC Communications (total 155,442 pounds), Perdue Agribusiness LLC (total 152,172 pounds), Tyson Poultry Inc. (total 182,222 pounds), and Mars Inc. (total 94,178 pounds) (EPA 2021). Table 4-29 shows the amount in pounds of chemical releases by release site for the top five facilities.

Table 4-29. Top Five Facilities by Total Chemical Releases in Lancaster County, PA

Facility Name	Release Site	Total Releases (pounds)
Armstrong World Industries	Air	166,559
Armstrong World Industries	Water	2,782
Armstrong World Industries	Off-Site Disposal or Other Releases	192,169
LSC Communications	Air	151,970
LSC Communications	Off-Site Disposal or Other Releases	3,472
Perdue Agribusiness LLC	Air	152,072
Tyson Poultry Inc.	Water	110,032
Tyson Poultry Inc.	Off-Site Disposal or Other Releases	7,900
Mars Inc.	Off-Site Disposal or Other Releases	94,178

Source: (EPA 2021)



### Range of Magnitude

Hazardous materials incidents in Lancaster County could range from minor petroleum spills to large facility-based incidents that could lead to loss of life and damage to property, environment, and economy. Severity of an incident varies with type of material released and distance and related response time for emergency response teams. Areas closest to the releases are generally at the greatest risk; however, depending on the material, a release can travel great distances or persist over a long time (e.g., nuclear radiation), resulting in far-reaching effects on people and the environment. A hazmat release can be exacerbated or mitigated by specific circumstances such as the following:

- **Noncompliance with applicable codes (e.g., fire and building codes) and maintenance failures (e.g., fire protection and containment features)**—Can substantially increase damage to a facility and to surrounding buildings.
- **Geographic location of hazmat site**—If occurring within a Special Flood Hazard Area (SFHA), a materials release could cause large-scale water contamination during a flood incident, or a flood incident could compromise production and storage of hazardous chemicals. Stormwaters and floodwaters can also move toxic chemicals swiftly across great distances.
- **Weather conditions**—Affect how the hazard develops.
- **Micro-meteorological effects of buildings and terrain**—Alter dispersion of materials.
- **Shielding in the form of sheltering-in-place**—Protects people and property from harmful effects.

The most likely scenario for a hazardous material release in Lancaster County is a transportation accident resulting in a rupture of a truck's fuel tank, spilling a small quantity of diesel fuel onto the roadway.

A worst-case scenario would be a large, uncontrolled release of a toxic gas within a major urban area. In Lancaster County, this could take the form of an accident and major rupture of a tanker hauling a toxic or flammable gas in or near Lancaster City. While little physical property damage is likely from this type of event, the potential for injury and death to people up to 0.25 miles from the scene is significant. This event would likely overwhelm the medical care capacity within the County, and possibly the region. In addition, an event such as this would likely close County offices, causing a major disruption to government operations.

### Past Occurrence

The county has undergone hazmat release accidents at facilities and along roadways. The 2023 Pennsylvania Hazard Mitigation Plan stated there were 220 hazardous material spill incidents in Lancaster County between 2018 and April 2022; the 2019 Lancaster County Hazard Mitigation Plan stated there were 404 hazardous material spill incidents in Lancaster County between 2012 and September 2018. The Lancaster County Hazmat Team had provided on-scene response for 194 incidents out of the 404 total between 2012 and 2018. Most of these events were vehicle accidents or fires (60 incidents). East Hempfield Township had the most cases, with 23 incidents. Past hazmat releases in Lancaster County have been accidental rather than terrorist or criminal acts. Several incidents were related to petroleum spills that may have resulted from motor vehicle incidents.

Of the 40 respondents to the public survey distributed for this HMP, 9 (23 percent) identified hazmat incidents as a hazard they have experienced in the last five years. Specific incidents cited by those respondents were a release associated with a train derailment and releases at local industries (Armstrong, JAG Trucking, GSK, Texas Eastern).

In August 2017, 250 people were evacuated from the Manheim Auto Auction in Penn Township due to an unknown odor. Seven people were treated on site, and six people were taken to Lancaster General Hospital for observation. Manheim Fire Department and Lancaster County hazmat were dispatched to the site to inspect and clear the scene. The source of the odor was not determined, and the site returned to normal operations later that day (LCEMD 2019).



### Future Occurrence

Hazardous material incidents can happen at any time. Probability of future occurrence in Lancaster County is compounded by the fact that the county is home to 203 SARA Tier II facilities. Although these facilities follow applicable safety and health regulations and best practices, proximity of facilities to population centers is a concern for the county.

Smaller incidents, such as fuel spills, will affect the county many times each year, most likely along I-76 or during refilling of home heating oil tanks, and may not be reported. Although the county does not anticipate severe releases on any regular basis, the possibility of a significant release should not be discounted. For this HMP, future occurrences in Lancaster County are considered *possible*.

### Vulnerability Assessment

A spatial analysis was conducted using hazard areas defined by various lengths of buffer radius around hazardous material facilities and transportation networks:

- 0.25 miles around a major highway
- 0.25 miles around a rail line
- Unique radius for each SARA Tier II facility

These hazard areas represent the most likely affected area surrounding the release point of hazardous material. County assets inside these areas are considered to be vulnerable to the hazard.

### Life, Health, and Safety

#### General Population

Table 4-30 summarizes population exposure to hazardous material incidents by jurisdiction. There are 104,577 persons, 57,263 persons, and 551,061 persons living within 0.25 miles of roadways, within 0.25 miles of railways, and within the defined buffers of Tier II facilities, respectively. Lancaster City has the greatest number of people living within 0.25 miles of roadways and the defined buffers of Tier II facilities, with 17,005 and 58,039 persons, respectively. East Hempfield Township has the greatest number of people living within 0.25 miles of railways, with 5,710 persons. First responders’ safety may also be at risk during on-scene operations.

**Table 4-30. Estimated Lancaster County Population Vulnerable to Hazardous Materials Releases**

Jurisdiction	Total Population (2020 Decennial Census)	Estimated Population Living in the Hazardous Materials Hazard Areas					
		Within 1/4 Mile of Roadway		Within 1/4 Mile of Railroad		Within SARA Tier II Site Buffer	
		Number of Persons	Percent of Total	Number of Persons	Percent of Total	Number of Persons	Percent of Total
Adamstown Borough	1,916	1,665	86.9%	0	0.0%	1,916	100.0%
Akron Borough	4,152	1,508	36.3%	0	0.0%	4,151	100.0%
Bart Township	3,181	0	0.0%	0	0.0%	3,181	100.0%
Brecknock Township	7,557	1,772	23.4%	0	0.0%	7,557	100.0%
Caernarvon Township	4,609	786	17.1%	0	0.0%	4,305	93.4%
Christiana Borough	1,112	0	0.0%	930	83.6%	1,112	100.0%
Clay Township	6,857	1,968	28.7%	0	0.0%	6,856	100.0%
Colerain Township	3,883	0	0.0%	0	0.0%	3,883	100.0%
Columbia Borough	10,207	3,111	30.5%	4,546	44.5%	10,207	100.0%
Conestoga Township	3,914	0	0.0%	103	2.6%	3,914	100.0%
Conoy Township	3,361	0	0.0%	1,280	38.1%	3,361	100.0%



Section 4.3.6. Risk Assessment: Environmental Hazards—Hazardous Materials Releases

Jurisdiction	Total Population (2020 Decennial Census)	Estimated Population Living in the Hazardous Materials Hazard Areas					
		Within 1/4 Mile of Roadway		Within 1/4 Mile of Railroad		Within SARA Tier II Site Buffer	
		Number of Persons	Percent of Total	Number of Persons	Percent of Total	Number of Persons	Percent of Total
Denver Borough	3,792	1,552	40.9%	2,147	56.6%	3,791	100.0%
Drumore Township	2,561	272	10.6%	164	6.4%	2,560	100.0%
Earl Township	7,144	704	9.9%	820	11.5%	7,143	100.0%
East Cocalico Township	10,767	4,098	38.1%	684	6.4%	10,767	100.0%
East Donegal Township	8,684	0	0.0%	552	6.4%	8,684	100.0%
East Drumore Township	3,936	1,114	28.3%	0	0.0%	3,935	100.0%
East Earl Township	6,699	1,719	25.7%	38	0.6%	6,698	100.0%
East Hempfield Township	26,304	2,478	9.4%	5,710	21.7%	26,304	100.0%
East Lampeter Township	17,776	3,791	21.3%	2,383	13.4%	17,776	100.0%
East Petersburg Borough	4,573	0	0.0%	795	17.4%	4,572	100.0%
Eden Township	2,239	0	0.0%	0	0.0%	2,239	100.0%
Elizabeth Township	3,985	1,834	46.0%	0	0.0%	3,985	100.0%
Elizabethtown Borough	11,639	640	5.5%	1,579	13.6%	11,638	100.0%
Ephrata Borough	13,794	7,482	54.2%	0	0.0%	13,794	100.0%
Ephrata Township	10,386	3,019	29.1%	4	<0.1%	10,385	100.0%
Fulton Township	3,214	1,374	42.8%	174	5.4%	3,213	100.0%
Lancaster City	58,039	17,005	29.3%	3,873	6.7%	58,039	100.0%
Lancaster Township	18,642	44	0.2%	14	0.1%	18,641	100.0%
Leacock Township	5,652	183	3.2%	479	8.5%	5,652	100.0%
Lititz Borough	9,381	4,148	44.2%	2,572	27.4%	9,381	100.0%
Little Britain Township	4,118	679	16.5%	0	0.0%	4,118	100.0%
Manheim Borough	5,046	0	0.0%	1,731	34.3%	5,045	100.0%
Manheim Township	43,977	14,261	32.4%	1,689	3.8%	43,976	100.0%
Manor Township	21,849	0	0.0%	899	4.1%	21,848	100.0%
Marietta Borough	2,623	0	0.0%	2,446	93.3%	2,623	100.0%
Martic Township	5,221	0	0.0%	175	3.4%	5,220	100.0%
Millersville Borough	7,903	0	0.0%	0	0.0%	7,902	100.0%
Mount Joy Borough	8,325	0	0.0%	5,110	61.4%	8,324	100.0%
Mount Joy Township	10,721	1,576	14.7%	757	7.1%	9,928	92.6%
Mountville Borough	3,017	1,146	38.0%	1,763	58.4%	3,016	100.0%
New Holland Borough	5,743	0	0.0%	3,362	58.5%	5,743	100.0%
Paradise Township	5,672	2,137	37.7%	1,445	25.5%	5,672	100.0%
Penn Township	10,210	388	3.8%	404	4.0%	10,209	100.0%
Pequea Township	5,474	1,653	30.2%	0	0.0%	5,473	100.0%
Providence Township	6,995	1,880	26.9%	0	0.0%	6,995	100.0%
Quarryville Borough	2,843	2,041	71.8%	0	0.0%	2,842	100.0%
Rapho Township	12,024	433	3.6%	117	1.0%	11,586	96.4%
Sadsbury Township	3,536	26	0.7%	475	13.4%	3,535	100.0%
Salisbury Township	11,494	1,907	16.6%	1,618	14.1%	11,493	100.0%
Strasburg Borough	3,117	0	0.0%	35	1.1%	3,117	100.0%
Strasburg Township	4,457	914	20.5%	126	2.8%	4,457	100.0%
Terre Hill Borough	1,357	0	0.0%	0	0.0%	1,357	100.0%



Jurisdiction	Total Population (2020 Decennial Census)	Estimated Population Living in the Hazardous Materials Hazard Areas					
		Within 1/4 Mile of Roadway		Within 1/4 Mile of Railroad		Within SARA Tier II Site Buffer	
		Number of Persons	Percent of Total	Number of Persons	Percent of Total	Number of Persons	Percent of Total
Upper Leacock Township	8,921	0	0.0%	1,942	21.8%	8,920	100.0%
Warwick Township	19,022	2,276	12.0%	8	<0.1%	19,021	100.0%
West Cocalico Township	7,456	819	11.0%	1,151	15.4%	7,096	95.2%
West Donegal Township	8,944	0	0.0%	1,535	17.2%	8,944	100.0%
West Earl Township	8,560	2,698	31.5%	221	2.6%	8,559	100.0%
West Hempfield Township	17,020	2,039	12.0%	1,407	8.3%	17,020	100.0%
West Lampeter Township	17,383	5,437	31.3%	0	0.0%	17,382	100.0%
<b>Lancaster County</b>	<b>552,984</b>	<b>104,577</b>	<b>18.9%</b>	<b>57,263</b>	<b>10.4%</b>	<b>551,061</b>	<b>99.7%</b>

Source: U.S. Census Bureau 2020; Lancaster County 2023, 2024

### Socially Vulnerable Populations

Older adults and young children may be more at risk due to limited mobility, communication, and dependency on others. Cascading impacts of exposure to hazardous materials may affect those who have compromised immune systems and additional medical needs. Communities of color, certain immigrant groups, low-income groups, and those with limited English proficiency are more at risk because they may live in locations that are prone to hazardous materials exposure, may have limited financial resources, and may experience cultural, language, and citizenship barriers that restrict communication and access to emergency information relating to hazardous materials (EPA 2023). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2. Key findings of the assessment of the three hazard areas are as follows:

- **Population within 0.25 miles of a hazardous materials roadway** (Table 4-31)—Manheim Township has the highest population over 65 (3,262), and Lancaster City has the highest population under 5 (1,155), the largest population of non-English speaking persons (1,267), the largest disabled population (2,618), and the greatest population of individuals living in poverty (2,987).
- **Population within 0.25 miles of a hazardous materials railway** (Table 4-32)—East Hempfield Township has the highest population over 65 (1,503), Mount Joy Borough the highest population under the age of 5 (270), Lancaster city the largest population of non-English speaking persons (288), and Columbia Borough the largest disabled population (865) and greatest population of individuals living in poverty (733)
- **Population within a Tier II facility buffer zone** (Table 4-33)—Manheim Township has the highest population over 65 (10,059), and Lancaster City has the largest population under the age of 5 (3,943), the largest population of non-English speaking persons (4,326), the highest disabled population (8,934), and the greatest population of individuals living in poverty (10,196).

**Table 4-31. Vulnerable Persons Living Within 0.25 Miles of Hazardous Materials Roadways**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	217	167	28	97	205
Akron Borough	287	143	43	182	136
Bart Township	0	0	0	0	0
Brecknock Township	252	142	7	103	47
Caernarvon Township	135	57	22	83	61
Christiana Borough	0	0	0	0	0
Clay Township	345	131	30	152	105



*Section 4.3.6. Risk Assessment: Environmental Hazards—Hazardous Materials Releases*

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Colerain Township	0	0	0	0	0
Columbia Borough	663	104	77	592	501
Conestoga Township	0	0	0	0	0
Conoy Township	0	0	0	0	0
Denver Borough	252	85	46	133	104
Drumore Township	34	18	14	29	19
Earl Township	181	64	21	70	70
East Cocalico Township	771	151	88	428	208
East Donegal Township	0	0	0	0	0
East Drumore Township	281	79	0	132	81
East Earl Township	369	98	73	167	60
East Hempfield Township	652	84	42	254	75
East Lampeter Township	604	293	173	412	338
East Petersburg Borough	0	0	0	0	0
Eden Township	0	0	0	0	0
Elizabeth Township	399	125	0	115	84
Elizabethtown Borough	100	29	27	87	44
Ephrata Borough	1,301	503	626	1,262	688
Ephrata Township	600	131	118	330	160
Fulton Township	196	185	53	118	102
Lancaster City	1,578	1,155	1,267	2,618	2,987
Lancaster Township	9	3	2	4	3
Leacock Township	27	13	5	10	11
Lititz Borough	1,069	249	42	421	151
Little Britain Township	142	51	43	81	65
Manheim Borough	0	0	0	0	0
Manheim Township	3,262	740	237	1,572	780
Manor Township	0	0	0	0	0
Marietta Borough	0	0	0	0	0
Martic Township	0	0	0	0	0
Millersville Borough	0	0	0	0	0
Mount Joy Borough	0	0	0	0	0
Mount Joy Township	230	103	13	140	67
Mountville Borough	300	60	0	121	118
New Holland Borough	0	0	0	0	0
Paradise Township	268	183	29	219	181
Penn Township	91	20	2	29	16
Pequea Township	301	108	0	158	75
Providence Township	417	89	15	257	186
Quarryville Borough	318	139	0	265	341
Rapho Township	102	21	0	48	13
Sadsbury Township	3	3	0	2	2
Salisbury Township	195	181	63	140	110
Strasburg Borough	0	0	0	0	0
Strasburg Township	151	106	0	58	76



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Terre Hill Borough	0	0	0	0	0
Upper Leacock Township	0	0	0	0	0
Warwick Township	468	110	23	190	127
West Cocalico Township	110	90	5	61	68
West Donegal Township	0	0	0	0	0
West Earl Township	531	243	73	194	94
West Hempfield Township	394	115	68	265	59
West Lampeter Township	1,675	200	31	648	172
<b>Lancaster County</b>	<b>19,280</b>	<b>6,571</b>	<b>3,406</b>	<b>12,247</b>	<b>8,790</b>

Sources: U.S. Census Bureau 2022; Lancaster County 2023, 2024

Table 4-32. Vulnerable Persons Living Within 0.25 Miles of Hazardous Materials Railways

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	0	0	0	0	0
Akron Borough	0	0	0	0	0
Bart Township	0	0	0	0	0
Brecknock Township	0	0	0	0	0
Caernarvon Township	0	0	0	0	0
Christiana Borough	189	56	5	122	74
Clay Township	0	0	0	0	0
Colerain Township	0	0	0	0	0
Columbia Borough	969	153	113	865	733
Conestoga Township	18	2	0	13	6
Conoy Township	192	91	0	177	92
Denver Borough	348	117	63	184	144
Drumore Township	21	11	8	17	12
Earl Township	211	74	24	81	81
East Cocalico Township	128	25	14	71	34
East Donegal Township	82	39	1	49	19
East Drumore Township	0	0	0	0	0
East Earl Township	8	2	1	3	1
East Hempfield Township	1,503	194	97	587	173
East Lampeter Township	380	184	109	259	212
East Petersburg Borough	169	27	0	108	53
Eden Township	0	0	0	0	0
Elizabeth Township	0	0	0	0	0
Elizabethtown Borough	248	72	67	215	110
Ephrata Borough	0	0	0	0	0
Ephrata Township	0	0	0	0	0
Fulton Township	24	23	6	14	12
Lancaster City	359	263	288	596	680
Lancaster Township	3	1	0	1	1



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Leacock Township	71	35	13	27	28
Lititz Borough	663	154	26	261	93
Little Britain Township	0	0	0	0	0
Manheim Borough	195	177	12	228	191
Manheim Township	386	87	28	186	92
Manor Township	170	51	57	106	87
Marietta Borough	660	164	0	405	313
Martic Township	24	17	0	21	11
Millersville Borough	0	0	0	0	0
Mount Joy Borough	936	270	104	695	548
Mount Joy Township	111	49	6	67	32
Mountville Borough	463	92	0	187	182
New Holland Borough	674	214	26	382	189
Paradise Township	181	124	20	148	122
Penn Township	95	21	2	30	16
Pequea Township	0	0	0	0	0
Providence Township	0	0	0	0	0
Quarryville Borough	0	0	0	0	0
Rapho Township	27	5	0	13	3
Sadsbury Township	59	60	7	42	50
Salisbury Township	165	153	54	118	93
Strasburg Borough	9	2	0	3	2
Strasburg Township	20	14	0	8	10
Terre Hill Borough	0	0	0	0	0
Upper Leacock Township	295	133	128	194	156
Warwick Township	1	0	0	0	0
West Cocalico Township	155	127	7	86	95
West Donegal Township	578	59	0	217	93
West Earl Township	43	19	6	15	7
West Hempfield Township	272	79	47	183	41
West Lampeter Township	0	0	0	0	0
<b>Lancaster County</b>	<b>11,105</b>	<b>3,440</b>	<b>1,339</b>	<b>6,984</b>	<b>4,891</b>

Sources: U.S. Census Bureau 2022; Lancaster County 2023, 2024

**Table 4-33. Vulnerable Persons Living Within Tier II Facility Buffer Areas**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	192	33	111	236
Akron Borough	792	394	120	503	376
Bart Township	380	350	180	317	147
Brecknock Township	1,076	609	32	440	202
Caernarvon Township	739	315	120	459	337
Christiana Borough	226	66	7	146	89



*Section 4.3.6. Risk Assessment: Environmental Hazards—Hazardous Materials Releases*

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Clay Township	1,202	456	105	530	369
Colerain Township	606	442	280	283	704
Columbia Borough	2,175	343	255	1,942	1,645
Conestoga Township	690	110	0	509	238
Conoy Township	504	240	0	465	244
Denver Borough	616	208	113	324	254
Drumore Township	329	173	136	279	187
Earl Township	1,841	650	216	710	710
East Cocalico Township	2,027	396	231	1,127	548
East Donegal Township	1,296	626	25	775	307
East Drumore Township	993	278	0	469	289
East Earl Township	1,438	384	285	654	234
East Hempfield Township	6,925	895	450	2,704	798
East Lampeter Township	2,836	1,377	814	1,931	1,586
East Petersburg Borough	974	155	0	624	309
Eden Township	284	259	28	139	97
Elizabeth Township	868	272	0	251	184
Elizabethtown Borough	1,834	531	494	1,586	812
Ephrata Borough	2,400	928	1,155	2,327	1,268
Ephrata Township	2,066	451	406	1,137	552
Fulton Township	458	433	126	275	238
Lancaster City	5,385	3,943	4,326	8,934	10,196
Lancaster Township	4,110	1,387	964	1,856	1,632
Leacock Township	844	422	162	322	337
Lititz Borough	2,418	565	94	953	341
Little Britain Township	863	314	262	494	396
Manheim Borough	571	516	36	666	558
Manheim Township	10,059	2,281	732	4,848	2,406
Manor Township	4,134	1,255	1,400	2,589	2,122
Marietta Borough	708	176	0	435	336
Martic Township	735	526	25	629	347
Millersville Borough	1,030	144	49	873	1,809
Mount Joy Borough	1,525	441	170	1,133	893
Mount Joy Township	1,454	650	83	885	425
Mountville Borough	791	158	0	319	312
New Holland Borough	1,152	365	46	653	322
Paradise Township	712	487	78	583	481
Penn Township	2,413	536	66	776	423
Pequea Township	996	358	0	525	248
Providence Township	1,552	331	55	957	695
Quarryville Borough	444	193	0	370	476
Rapho Township	2,751	585	0	1,293	364
Sadsbury Township	445	449	54	313	379
Salisbury Township	1,177	1,090	383	845	664
Strasburg Borough	821	176	0	310	192



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Strasburg Township	741	521	0	287	371
Terre Hill Borough	144	102	0	139	118
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,916	922	196	1,590	1,066
West Cocalico Township	960	785	48	530	590
West Donegal Township	3,366	346	0	1,264	546
West Earl Township	1,684	771	233	618	298
West Hempfield Township	3,292	959	569	2,214	496
West Lampeter Township	5,355	641	99	2,072	550
<b>Lancaster County</b>	<b>103,731</b>	<b>34,543</b>	<b>16,331</b>	<b>62,186</b>	<b>44,067</b>

Sources: U.S. Census Bureau 2022; Lancaster County 2023, 2024

### General Building Stock

Potential losses to the general building stock from a hazmat release may include inaccessibility, loss of service, contamination, or structural and content losses if an explosion occurs. To estimate the buildings exposed to a hazardous material event, the hazmat buffer areas were overlaid on the mapping of the updated general building stock inventory. Building count and replacement cost values were totaled for structures with their centers in the hazard areas (Table 4-34).

The exposure analysis estimates there are 52,535 buildings worth \$114 billion within 0.25 miles of all roadways, 32,924 buildings worth \$110 billion within 0.25 miles of all railways, and 283,655 buildings worth \$425 billion, within the buffer zones of SARA Tier II facilities. Manheim Township has the greatest number of buildings within 0.25 miles of a roadway (5,753). East Hempfield Township has the largest number of buildings within 0.25 miles of a railway (3,375). Lancaster City has the most buildings within the buffer areas of SARA Tier II facilities (14,223).

Table 4-35 through Table 4-37 list the buildings within the hazardous materials incident hazard areas by general occupancy. The commercial occupancy is the most exposed within all three hazard areas.



Table 4-34. Buildings Within the Hazardous Material Hazard Areas

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Buildings within 1/4 Mile of Hazardous Materials Roadways		Buildings within 1/4 Mile of Hazardous Materials Railways		Buildings within SARA Tier II Facility Buffer Zones	
			Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value
Adamstown Borough	1,061	\$567,784,670	888	\$482,663,331	0	\$0	1,061	\$567,784,670
Akron Borough	1,946	\$780,121,864	797	\$317,126,613	0	\$0	1,946	\$780,121,864
Bart Township	2,746	\$1,885,029,231	0	\$0	0	\$0	2,746	\$1,885,029,231
Brecknock Township	6,458	\$3,832,548,357	1,317	\$854,890,719	0	\$0	6,458	\$3,832,548,357
Caernarvon Township	3,617	\$2,383,292,372	499	\$192,691,620	0	\$0	3,352	\$2,145,785,846
Christiana Borough	584	\$307,647,839	0	\$0	466	\$227,989,742	584	\$307,647,839
Clay Township	4,929	\$3,411,423,294	1,328	\$1,054,684,876	0	\$0	4,929	\$3,411,423,295
Colerain Township	3,177	\$2,533,877,481	0	\$0	0	\$0	3,177	\$2,533,877,481
Columbia Borough	4,036	\$4,983,733,544	1,071	\$1,285,422,996	1,886	\$2,736,599,513	4,036	\$4,983,733,544
Conestoga Township	2,953	\$1,420,507,504	0	\$0	68	\$18,615,362	2,953	\$1,420,507,504
Conoy Township	2,599	\$1,789,579,577	0	\$0	862	\$576,099,004	2,599	\$1,789,579,577
Denver Borough	1,918	\$2,747,960,874	692	\$424,585,981	1,171	\$1,815,680,128	1,918	\$2,747,960,874
Drumore Township	2,426	\$1,886,590,595	245	\$199,893,158	77	\$44,914,558	2,426	\$1,886,590,595
Earl Township	5,290	\$10,279,323,543	638	\$1,496,478,652	394	\$1,339,724,017	5,290	\$10,279,323,543
East Cocalico Township	7,428	\$5,177,824,554	2,678	\$2,250,174,589	620	\$419,224,342	7,428	\$5,177,824,554
East Donegal Township	4,506	\$6,877,402,214	0	\$0	292	\$1,554,136,143	4,506	\$6,877,402,213
East Drumore Township	3,043	\$3,747,277,368	922	\$1,526,603,804	0	\$0	3,043	\$3,747,277,368
East Earl Township	5,648	\$6,797,710,925	1,108	\$1,053,300,384	37	\$267,013,653	5,648	\$6,797,710,925
East Hempfield Township	11,417	\$42,919,064,493	1,596	\$8,740,578,612	3,375	\$16,982,039,922	11,417	\$42,919,064,493
East Lampeter Township	8,359	\$16,552,653,977	1,869	\$5,445,235,024	1,649	\$6,852,575,155	8,359	\$16,552,653,976
East Petersburg Borough	2,033	\$1,076,855,572	0	\$0	348	\$333,236,776	2,033	\$1,076,855,572
Eden Township	1,797	\$1,268,005,230	0	\$0	0	\$0	1,797	\$1,268,005,230
Elizabeth Township	3,194	\$2,173,694,928	1,475	\$1,169,610,590	0	\$0	3,194	\$2,173,694,929
Elizabethtown Borough	4,454	\$6,918,177,890	211	\$60,353,411	753	\$4,182,045,324	4,454	\$6,918,177,890
Ephrata Borough	6,357	\$13,348,895,113	3,862	\$12,055,779,808	0	\$0	6,357	\$13,348,895,113
Ephrata Township	5,383	\$6,162,339,672	1,537	\$2,583,394,977	66	\$285,369,259	5,383	\$6,162,339,672
Fulton Township	3,035	\$2,732,951,621	1,099	\$1,474,483,505	168	\$38,768,702	3,035	\$2,732,951,621
Lancaster City	14,223	\$49,154,384,225	5,396	\$26,526,048,664	1,492	\$18,710,436,221	14,223	\$49,154,384,225
Lancaster Township	5,365	\$16,948,222,966	47	\$53,493,127	6	\$27,884,877	5,365	\$16,948,222,966
Leacock Township	4,771	\$5,521,489,045	79	\$142,324,394	373	\$384,754,239	4,771	\$5,521,489,045
Lititz Borough	4,389	\$10,053,673,662	2,163	\$2,796,867,762	1,717	\$7,955,084,778	4,389	\$10,053,673,663
Little Britain Township	3,545	\$3,060,610,596	558	\$380,666,928	0	\$0	3,545	\$3,060,610,596



Section 4.3.6. Risk Assessment: Environmental Hazards—Hazardous Materials Releases

Jurisdiction	Total Number of Buildings	Total Replacement Cost Value	Buildings within 1/4 Mile of Hazardous Materials Roadways		Buildings within 1/4 Mile of Hazardous Materials Railways		Buildings within SARA Tier II Facility Buffer Zones	
			Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value
Manheim Borough	2,956	\$4,013,795,389	0	\$0	1,107	\$2,852,381,692	2,956	\$4,013,795,389
Manheim Township	16,101	\$25,203,355,402	5,753	\$12,301,824,366	1,193	\$7,451,144,013	16,101	\$25,203,355,402
Manor Township	10,400	\$20,927,614,237	0	\$0	598	\$3,745,429,420	10,400	\$20,927,614,237
Marietta Borough	1,402	\$754,834,832	0	\$0	1,319	\$733,192,417	1,402	\$754,834,832
Martic Township	4,469	\$2,359,595,108	0	\$0	113	\$190,471,673	4,469	\$2,359,595,109
Millersville Borough	2,611	\$4,408,036,349	0	\$0	0	\$0	2,611	\$4,408,036,349
Mount Joy Borough	3,925	\$4,719,474,554	0	\$0	2,795	\$4,167,163,026	3,925	\$4,719,474,554
Mount Joy Township	5,918	\$7,127,138,587	772	\$1,803,650,228	411	\$520,480,913	5,135	\$6,596,555,121
Mountville Borough	1,189	\$1,106,163,051	442	\$358,355,811	793	\$766,954,450	1,189	\$1,106,163,051
New Holland Borough	2,819	\$5,086,885,413	0	\$0	1,934	\$3,376,647,550	2,819	\$5,086,885,412
Paradise Township	4,470	\$4,125,868,997	1,308	\$2,007,804,220	1,086	\$1,889,540,866	4,470	\$4,125,868,996
Penn Township	6,163	\$6,256,819,382	325	\$335,071,532	443	\$572,055,507	6,163	\$6,256,819,382
Pequea Township	3,612	\$2,379,058,553	879	\$405,099,112	0	\$0	3,612	\$2,379,058,554
Providence Township	4,666	\$3,832,302,966	1,185	\$1,429,286,459	0	\$0	4,666	\$3,832,302,966
Quarryville Borough	1,451	\$1,138,506,005	1,030	\$801,212,024	0	\$0	1,451	\$1,138,506,005
Rapho Township	8,253	\$7,968,083,321	549	\$1,179,120,723	148	\$451,155,458	7,817	\$7,588,004,340
Sadsbury Township	2,765	\$2,150,137,506	34	\$16,950,582	261	\$274,162,578	2,765	\$2,150,137,506
Salisbury Township	8,204	\$7,541,703,016	1,033	\$2,413,737,881	762	\$1,958,452,815	8,204	\$7,541,703,016
Strasburg Borough	1,716	\$965,120,267	0	\$0	17	\$10,102,876	1,716	\$965,120,267
Strasburg Township	3,777	\$4,508,049,956	625	\$483,464,066	150	\$449,176,277	3,777	\$4,508,049,956
Terre Hill Borough	840	\$352,866,296	0	\$0	0	\$0	840	\$352,866,296
Upper Leacock Township	5,549	\$12,221,244,032	0	\$0	1,309	\$5,338,750,985	5,549	\$12,221,244,033
Warwick Township	8,483	\$13,241,309,844	1,008	\$2,470,575,308	57	\$38,163,100	8,483	\$13,241,309,843
West Cocalico Township	5,957	\$3,405,206,014	737	\$381,789,619	704	\$310,342,844	5,332	\$2,912,891,049
West Donegal Township	4,332	\$7,574,423,332	0	\$0	836	\$5,139,975,884	4,332	\$7,574,423,332
West Earl Township	5,356	\$5,324,536,861	1,339	\$1,931,056,930	141	\$111,667,109	5,356	\$5,324,536,861
West Hempfield Township	8,662	\$10,809,249,135	1,061	\$1,814,875,733	927	\$5,529,122,184	8,662	\$10,809,249,135
West Lampeter Township	7,031	\$18,752,932,700	2,380	\$11,659,468,817	0	\$0	7,031	\$18,752,932,699
Lancaster County	285,764	\$427,554,965,900	52,535	\$114,360,696,936	32,924	\$110,628,725,350	283,655	\$425,914,481,964

Sources: Lancaster County 2023, 2024; RS Means 2024





**Table 4-35. Buildings Within 1/4 Mile of Hazardous Materials Roadways by General Occupancy Class**

Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Adamstown Borough	473	407	0	8
Akron Borough	428	362	0	7
Bart Township	0	0	0	0
Brecknock Township	446	827	0	44
Caernarvon Township	161	330	0	8
Christiana Borough	0	0	0	0
Clay Township	473	826	0	29
Colerain Township	0	0	0	0
Columbia Borough	670	377	10	14
Conestoga Township	0	0	0	0
Conoy Township	0	0	0	0
Denver Borough	420	259	5	8
Drumore Township	58	175	0	12
Earl Township	122	460	6	50
East Cocalico Township	1,137	1,500	6	35
East Donegal Township	0	0	0	0
East Drumore Township	249	617	2	54
East Earl Township	401	660	9	38
East Hempfield Township	667	826	30	73
East Lampeter Township	843	963	9	54
East Petersburg Borough	0	0	0	0
Eden Township	0	0	0	0
Elizabeth Township	545	867	3	60
Elizabethtown Borough	148	63	0	0
Ephrata Borough	1,852	1,899	35	76
Ephrata Township	660	815	20	42
Fulton Township	284	735	6	74
Lancaster City	2,037	3,101	45	213
Lancaster Township	9	36	0	2
Leacock Township	33	40	0	6
Lititz Borough	1,082	1,023	11	47
Little Britain Township	154	380	0	24
Manheim Borough	0	0	0	0
Manheim Township	3,671	1,985	21	76
Manor Township	0	0	0	0
Marietta Borough	0	0	0	0
Martic Township	0	0	0	0
Millersville Borough	0	0	0	0
Mount Joy Borough	0	0	0	0
Mount Joy Township	362	375	8	27
Mountville Borough	247	185	0	10
New Holland Borough	0	0	0	0
Paradise Township	448	794	13	53



Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Penn Township	99	212	0	14
Pequea Township	447	420	4	8
Providence Township	431	704	3	47
Quarryville Borough	530	482	1	17
Rapho Township	103	414	7	25
Sadsbury Township	5	27	0	2
Salisbury Township	376	626	6	25
Strasburg Borough	0	0	0	0
Strasburg Township	210	387	0	28
Terre Hill Borough	0	0	0	0
Upper Leacock Township	0	0	0	0
Warwick Township	565	421	3	19
West Cocalico Township	205	514	0	18
West Donegal Township	0	0	0	0
West Earl Township	621	649	15	54
West Hempfield Township	597	435	17	12
West Lampeter Township	1,309	1,026	4	41
<b>Lancaster County</b>	<b>23,578</b>	<b>27,204</b>	<b>299</b>	<b>1,454</b>

Sources: Lancaster County 2023, 2024

**Table 4-36. Buildings Within 1/4 Mile of Hazardous Materials Railways by General Occupancy Class**

Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Adamstown Borough	0	0	0	0
Akron Borough	0	0	0	0
Bart Township	0	0	0	0
Brecknock Township	0	0	0	0
Caernarvon Township	0	0	0	0
Christiana Borough	226	231	0	9
Clay Township	0	0	0	0
Colerain Township	0	0	0	0
Columbia Borough	979	845	14	48
Conestoga Township	30	37	0	1
Conoy Township	374	454	6	28
Denver Borough	581	543	22	25
Drumore Township	35	39	0	3
Earl Township	142	224	16	12
East Cocalico Township	190	421	0	9
East Donegal Township	134	143	10	5
East Drumore Township	0	0	0	0
East Earl Township	9	19	8	1
East Hempfield Township	1,537	1,659	50	129
East Lampeter Township	530	989	28	102
East Petersburg Borough	239	104	4	1



*Section 4.3.6. Risk Assessment: Environmental Hazards—Hazardous Materials Releases*

Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Eden Township	0	0	0	0
Elizabeth Township	0	0	0	0
Elizabethtown Borough	365	359	18	11
Ephrata Borough	0	0	0	0
Ephrata Township	1	55	5	5
Fulton Township	36	130	0	2
Lancaster City	464	906	110	12
Lancaster Township	3	3	0	0
Leacock Township	86	256	5	26
Lititz Borough	671	959	32	55
Little Britain Township	0	0	0	0
Manheim Borough	513	553	25	16
Manheim Township	435	709	36	13
Manor Township	223	311	38	26
Marietta Borough	680	599	11	29
Martic Township	51	57	4	1
Millersville Borough	0	0	0	0
Mount Joy Borough	1,302	1,386	42	65
Mount Joy Township	174	216	7	14
Mountville Borough	380	394	1	18
New Holland Borough	908	970	16	40
Paradise Township	303	713	16	54
Penn Township	103	318	2	20
Pequea Township	0	0	0	0
Providence Township	0	0	0	0
Quarryville Borough	0	0	0	0
Rapho Township	28	105	2	13
Sadsbury Township	89	164	4	4
Salisbury Township	319	421	6	16
Strasburg Borough	11	6	0	0
Strasburg Township	29	109	1	11
Terre Hill Borough	0	0	0	0
Upper Leacock Township	406	789	70	44
Warwick Township	2	45	2	8
West Cocalico Township	288	403	1	12
West Donegal Township	375	434	9	18
West Earl Township	51	87	0	3
West Hempfield Township	412	468	17	30
West Lampeter Township	0	0	0	0
<b>Lancaster County</b>	<b>13,714</b>	<b>17,633</b>	<b>638</b>	<b>939</b>

Sources: Lancaster County 2023, 2024





**Table 4-37. Buildings within the SARA Tier II Facility Buffer Zones by General Occupancy Class**

Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Adamstown Borough	544	509	0	8
Akron Borough	1,178	755	0	13
Bart Township	575	2,003	2	166
Brecknock Township	1,901	4,333	1	223
Caernarvon Township	881	2,299	1	171
Christiana Borough	270	303	0	11
Clay Township	1,648	3,126	1	154
Colerain Township	750	2,157	9	261
Columbia Borough	2,198	1,721	18	99
Conestoga Township	1,134	1,696	1	122
Conoy Township	982	1,476	15	126
Denver Borough	1,026	829	27	36
Drumore Township	546	1,709	3	168
Earl Township	1,237	3,576	84	393
East Cocalico Township	2,987	4,277	13	151
East Donegal Township	2,106	2,167	39	194
East Drumore Township	879	1,972	4	188
East Earl Township	1,562	3,702	63	321
East Hempfield Township	7,080	4,002	68	267
East Lampeter Township	3,952	4,074	42	291
East Petersburg Borough	1,374	633	10	16
Eden Township	428	1,249	0	120
Elizabeth Township	1,184	1,872	3	135
Elizabethtown Borough	2,689	1,673	28	64
Ephrata Borough	3,414	2,801	41	101
Ephrata Township	2,270	2,846	42	225
Fulton Township	664	2,180	10	181
Lancaster City	6,952	6,677	180	414
Lancaster Township	3,750	1,529	20	66
Leacock Township	1,014	3,361	53	343
Lititz Borough	2,447	1,814	35	93
Little Britain Township	933	2,388	4	220
Manheim Borough	1,495	1,384	29	48
Manheim Township	11,320	4,530	56	195
Manor Township	5,415	4,550	68	367
Marietta Borough	729	633	11	29
Martic Township	1,513	2,783	8	165
Millersville Borough	1,584	929	2	96
Mount Joy Borough	2,121	1,689	42	73
Mount Joy Township	2,280	2,597	23	235
Mountville Borough	650	516	1	22
New Holland Borough	1,551	1,191	25	52
Paradise Township	1,189	3,063	27	191



Jurisdiction	Residential	Commercial	Industrial	Government, Religion, Agricultural, and Education
Penn Township	2,601	3,304	19	239
Pequea Township	1,480	1,984	22	126
Providence Township	1,603	2,845	13	205
Quarryville Borough	738	676	8	29
Rapho Township	2,754	4,596	22	445
Sadsbury Township	662	1,887	10	206
Salisbury Township	2,266	5,457	22	459
Strasburg Borough	968	730	1	17
Strasburg Township	1,024	2,516	13	224
Terre Hill Borough	437	384	5	14
Upper Leacock Township	1,865	3,303	95	286
Warwick Township	4,721	3,500	30	232
West Cocalico Township	1,775	3,391	3	163
West Donegal Township	2,184	2,000	10	138
West Earl Township	1,970	3,030	36	320
West Hempfield Township	4,983	3,484	36	159
West Lampeter Township	4,185	2,684	9	153
<b>Lancaster County</b>	<b>126,618</b>	<b>145,345</b>	<b>1,463</b>	<b>10,229</b>

Sources: Lancaster County 2023, 2024; RS Means 2024

### Community Lifelines and Other Critical Facilities

Potential losses of community lifelines and other critical facilities caused by a hazmat incident may include inaccessibility, loss of service, contamination, or structural and content losses if an explosion occurs. The closure of waterways, railroads, airports, and highways as a result of a hazmat incident has the potential to impact the ability to deliver goods and services efficiently. As shown in Table 4-38, 1,783 lifelines are exposed to a roadway hazardous material event, 1,143 lifelines are exposed to a railway hazardous material event, and 6,450 lifelines are exposed to a SARA Tier II facility hazardous material event.

**Table 4-38. Lifeline Facility Exposure to Hazardous Material Facility Buffer Areas**

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located within 1/4 Mile of Hazardous Materials Roadways	Number of Lifelines Located within 1/4 Mile of Hazardous Materials Railways	Number of Lifelines Located within SARA Tier II Facility Buffer Zones
Communications	149	48	32	149
Energy	70	19	39	70
Food, Hydration, Shelter	12	8	1	12
Hazardous Materials	731	206	314	731
Health and Medical	1,147	535	198	1,145
Safety and Security	1,340	307	169	1,335
Transportation	44	9	6	43
Water Systems	449	87	87	339
Other Critical Facilities	2,534	564	297	2,516
<b>Total</b>	<b>6,476</b>	<b>1,783</b>	<b>1,143</b>	<b>6,450</b>

Source: Lancaster County 2008, 2019, 2023; HIFLD 2022, 2023; National Park Service; National Register of Historic Places





### Economy

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A significant hazmat incident within an urban area may force businesses to close for an extended period of time because of contamination or because of direct damage caused by an explosion. The closure of waterways, railroads, airports, and highways as a result of a hazmat incident has the potential to impact the ability to deliver goods and services efficiently. Potential impacts may have local, regional, or statewide effects depending on the magnitude of the event and level of service disruptions.

Contamination of agriculture, livestock, and production can lead to loss of commerce with other regions. Hazardous materials released into the environment could enter the food chain and ultimately contaminate the human food supply.

### Environment

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Release of toxins, waste, and other pollutants into water bodies can greatly impact surrounding habitats. Many of hazmat sites were intentionally constructed in locations believed to be removed from exposure-increasing factors, but floodplain boundary changes increase the likelihood that water may reach hazardous material and waste sites. Certain chemicals and hazardous materials can be toxic to plants and animals, damaging their habitats and food sources.

### Future Changes That May Impact Vulnerability

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#### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any development near hazmat transit routes and facilities will increase the County's overall risk. Therefore, the County should take precautions with the location of new development near hazardous material facilities and transit routes. The County may also want to consider implementing designs into new development that enables improved evacuation or protection from residual impacts from hazardous materials.

#### Projected Changes in Population

Any changes in the density of population can impact the number of persons living near hazardous materials facilities and transit routes.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

#### Climate Change

As temperatures change, excessive heat on containers that contain hazardous materials may alter the material properties. In addition, hazardous substances stored at fixed locations in the floodplain may experience an increase in flood events due to projected increases in precipitation event magnitude and frequency. Extreme weather conditions may make in-transit hazmat releases more likely as transportation accidents are more likely to occur.

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county.

Overall, the County's vulnerability has not changed, and the entire County will continue to be exposed and vulnerable to hazardous materials incidents. This HMP update evaluated distance buffers around three hazardous



material areas: within 0.25 miles of all railways, within 0.25 miles of all roadways, and within the unique radius of SARA Tier II facilities. The assessment identified vulnerable populations and potential structural and economic losses associated with this hazard of concern. Collection of additional information and actual loss data specific to the plan participants will further enhance the vulnerability assessment for this hazard.



### 4.3.7 Flood, Flash Flood, Ice Jam

#### Hazard Description

Flooding is the temporary condition of partial or complete inundation of normally dry land, and it is the most frequent and costly of all natural hazards in Pennsylvania. A large amount of rainfall over a short time span, like a cloudburst, can result in flash flood conditions. Small amounts of rain can result in floods in locations where the soil is frozen or saturated from a previous wet period or if the rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, or other impervious developed areas. Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly (PEMA 2023).

Floods are one of the most common natural hazards in the United States. In Pennsylvania, floods are the most prevalent type of natural disaster and have caused loss of lives, disruption of economic activities, millions of dollars in annual property damage to residential and commercial buildings, bridge and road closures, transit service disruptions, and damage to electrical and communication networks (PEMA 2023).

A variety of flood types can threaten a community:

- Riverine overbank flooding
- Flash floods
- Alluvial fan floods
- Local draining or high groundwater levels
- Fluctuating lake levels
- Ice jams
- Coastal flooding

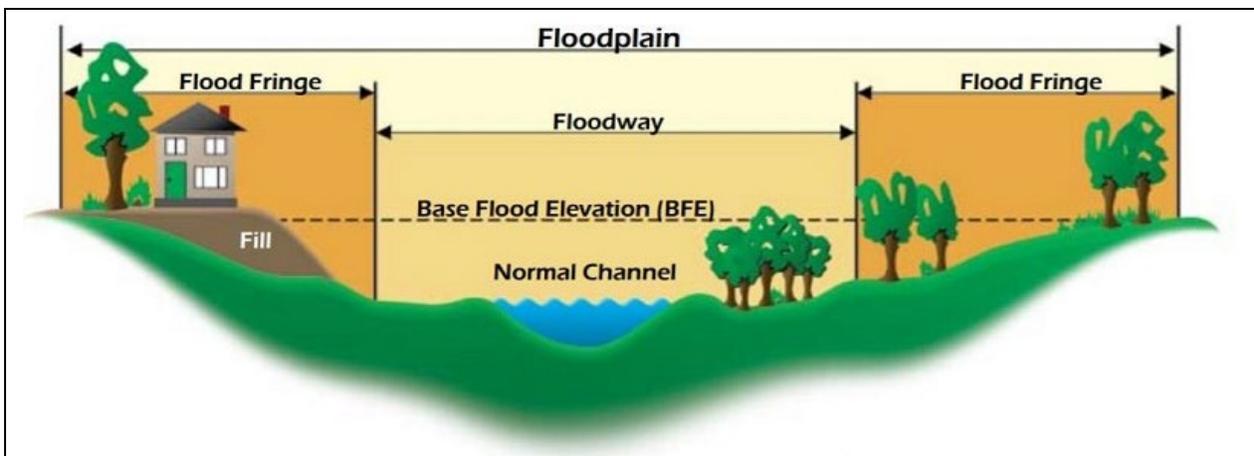
The flood types discussed below have been identified as those of greatest concern for this HMP update.

#### Riverine Floods

Riverine floods are the most common flood type. When a river, creek, stream, or ditch receives too much water, the excess water flows over its banks and inundates low-lying areas (FEMA 2019). The normally dry land that becomes inundated with water during a flood is called a floodplain. A floodplain is made up of different sections, as shown in Figure 4-11 (FEMA 2019, US DHS 2019):

- **Floodway**—The channel of the water course and the adjacent land that is reserved to carry and discharge the overflow of water caused by flooding.
- **Flood Fringe**—The area within the floodplain but outside the floodway; this area extends from the outer banks of a floodway to the edge of the river valley, where the elevation begins to rise.

Figure 4-11. Characteristics of a Floodplain





Source: FEMA 2022

FEMA prepares maps of expected flooding, called Flood Insurance Rate Maps (FIRMs), that depict floodplain boundaries. The mapping shows the Special Flood Hazard Area (SFHA) which is the area that will be inundated by the flood event having a 1 percent chance of being equaled or exceeded in any given year (also called the base flood). A structure within a 1 percent annual chance floodplain has a 26 percent chance of undergoing flood damage during the term of a 30-year mortgage.

The SFHA on a FIRM is the area where the NFIP's floodplain management regulations must be enforced, and the area where mandatory purchase of flood insurance applies. FIRMs also identify water surface elevations within the SFHA; these are referred to as the base flood elevation (BFE). The BFE describes the elevation of the water that will result from a given discharge level, which is one of the most important factors used in estimating potential damage from flooding (FEMA 2020). The SFHA is a convenient tool for assessing risk in flood-prone communities because many communities have maps showing the extent of the base flood and the floodwater depths that could occur (FEMA 2020). FIRMs use a variety of designations for SFHAs based on their location or available information. These include Zone A, Zone AO, Zone AH, Zones A1-A30, Zone AE, Zone A99, Zone AR, Zone AR/AE, Zone AR/AO, Zone AR/A1-A30, Zone AR/A, Zone V, Zone VE, and Zones V1-V30.

Floodplains of different sizes are defined by different flooding recurrence intervals. A 1 percent annual chance floodplain is smaller than the floodplain associated with a flood that has a 0.2 percent annual chance of occurring. These areas are determined by statistical analyses of records of river flow, storm tides, and rainfall; information obtained through consultation with the community; floodplain topographic surveys; and hydrologic and hydraulic analyses. Areas subject to 2 percent and 10 percent annual chance events are not shown on maps; however, water surface elevations associated with these events are included in the flood source profiles contained in the Flood Insurance Study.

FEMA flood maps focus on existing surface water courses and do not consider future changes to flooding conditions (from factors such as sea level rise and changes in rainfall) or the effects of flooding caused when constructed storm drainage systems in urban areas are overwhelmed. As such, floodplain maps may underestimate flood risk in many areas, and the public may underestimate risk. When floodplain maps are updated, they typically account for changes in land use, the amount of impervious surface, the placement of obstructing structures in floodways, changes in precipitation and runoff patterns, improvements in technology for measuring topographic features, and utilization of different hydrologic modeling techniques (USGS 2016).

FEMA also prepares Flood Insurance Studies (FISs) of entire counties and individual jurisdictions. These studies aid in administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. They are narrative reports of countywide flood hazards, including descriptions of flood areas studied and engineered methods used, principal flood problems, flood protection measures, and graphic profiles of flood sources (FEMA 2020).

### Flash Floods

Flash floods are floods caused by heavy rainfall over a short period, generally less than 6 hours. Flash floods can occur within minutes or a few hours of excessive rainfall. (NWS 2009). They normally occur in the summer during the thunderstorm season. This type of flood can be deadly because it produces rapid rises in water levels and has devastating flow velocities. Urban areas are more susceptible to flash floods because a high percentage of the surface area is impervious (PEMA 2023).

A flash flood can have a dangerous wall of water that carries rocks, mud, and other debris (FEMA 2020). The most severe flooding conditions usually occur when direct rainfall is augmented by snowmelt. If the soil is saturated or frozen, stream flow may increase because of inability of the soil to absorb additional precipitation (NWS 2019).



### Ice Jam Floods

An ice jam occurs when pieces of floating ice are carried with a stream’s current and accumulate behind any obstruction to the stream flow. Obstructions may include river bends, mouths of tributaries, points where the river slope decreases, dams, or bridges. The water held back by this obstruction can cause flooding upstream. If the obstruction breaks suddenly, flash flooding can occur (NESEC 2021).

Ice jams are most likely to occur where the channel slope naturally decreases, in culverts, and along shallows where channels may freeze solid. Ice jam flooding can occur at different times of the year: fall freeze-up from the formation of frazil ice; mid-winter periods when stream channels freeze solid, forming anchor ice; and spring breakup when rising water levels from snowmelt or rainfall break existing ice cover into pieces that accumulate at bridges or other types of obstructions (FEMA 2018).

#### Ice Jams At a Glance

- Freeze-up jams occur when floating ice slows or stops due to an obstruction or a change in water slope.
- Breakup jams occur during periods of thaw, generally in late winter and early spring.

Source: FEMA 2018

### Location and Extent

Floodplain maps of each Lancaster County jurisdiction, provided at the end of this section, show locations of the 1 percent annual chance and 0.2 percent annual chance floodplains based on FEMA’s April 2016 Digital Flood Insurance Rate Map (DFIRM), the best available data at the time this plan was written. Figure 4-12 shows overall flood zone mapping for Lancaster County. Table 4-39 lists total land areas within the flood hazard areas.

The countywide FIS for Lancaster County, last reprinted with corrections in February 2018, documents the major flooding problems in the county. According to the FIS, major regional floods are attributed to either large tropical disturbances (hurricanes) or combined events, as when heavy rains occur during a snowmelt.

The major flooding sources in Lancaster County are the Susquehanna River, along the southwest boundary of county, the Conestoga River in the center of the county, and creeks throughout the county: Cocalico Creek, Chiques Creek, Lees Creek, Little Chiques Creek, Conewago Creek East, Conoy Creek, Tributary No. 1 to Conoy Creek, Groff Creek, Indian Run, Lees Creek, Lititz Run, Little Cocalico Creek, Little Muddy Creek, Mill Creek, Muddy Creek, Octoraro Creek, Pequea Creek, Rife Run, Snitz Creek, Stony Run, Strickler Run, and Tributary 2.

### Range of Magnitude

The factors that determine severity of floods include rainfall intensity and duration, topography, ground cover, and rate of snowmelt. Rainfall in Pennsylvania is about average for the eastern United States. Amounts of precipitation can be classified as follows (PEMA 2023):

- Very light rain—Precipitation rate of <0.01 inches per hour
- Light rain—Precipitation rate between 0.01 inches and 0.04 inches per hour
- Moderate rain—Precipitation rate between 0.04 inches and 0.16 inches per hour
- Heavy rain—Precipitation rate between 0.16 inches and 0.63 inches per hour
- Very heavy rain—Precipitation rate between 0.63 inches and 2 inches per hour
- Extreme rain—Precipitation rate greater than 2 inches per hour

Flood severity is affected by the land’s ability to manage the water that falls. When it rains, soil acts like a sponge that can infiltrate water so that it does not run off and cause flooding. Once the soil becomes saturated or frozen, infiltration into the ground slows, and any more water that accumulates must flow as runoff (Harris 2008). Water runoff is greater in areas with steep slopes and little or no vegetative ground cover (PEMA 2023).



Figure 4-12. FEMA Flood Hazard Areas in Lancaster County

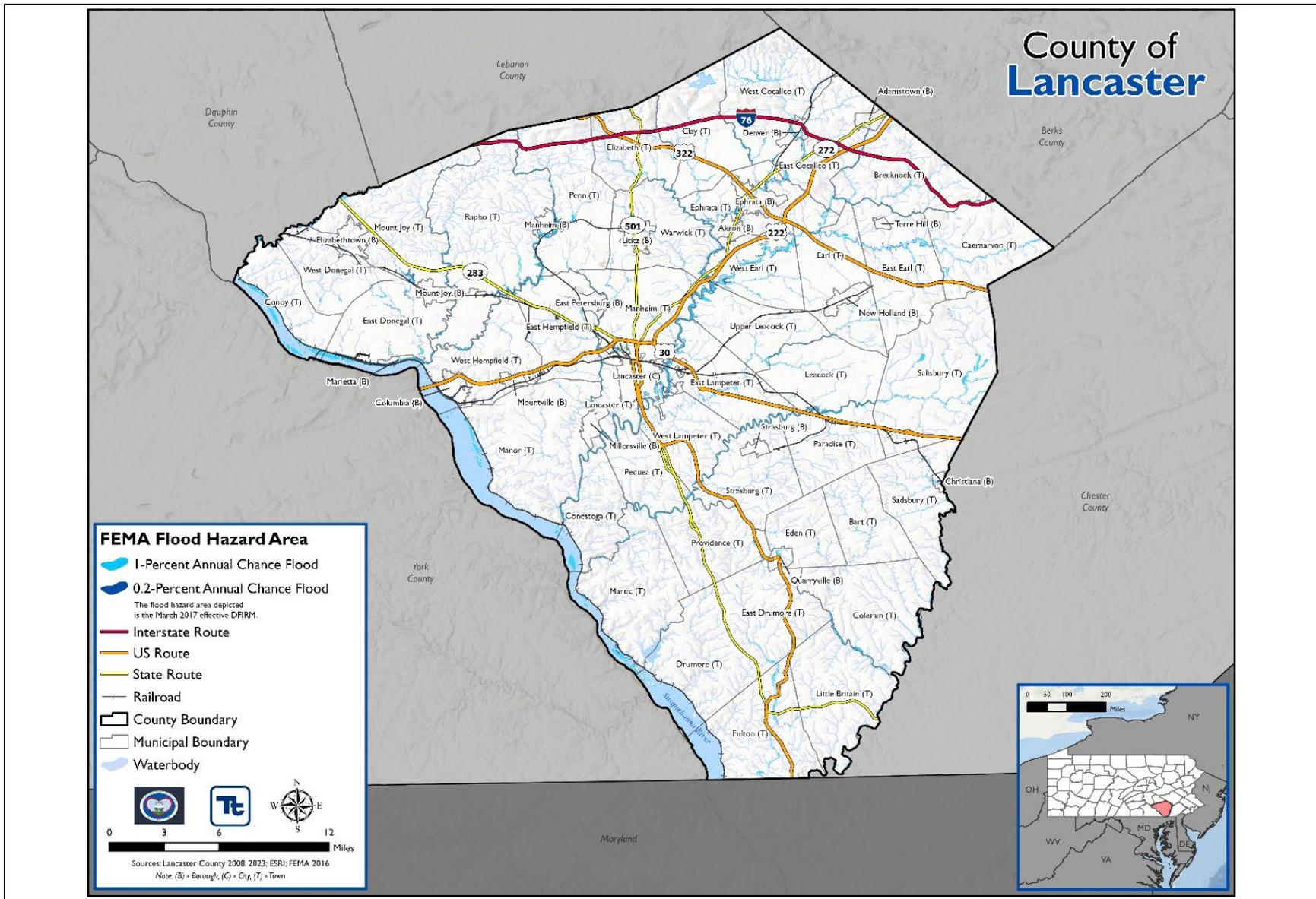




Table 4-39. Land Area in the 1 Percent and 0.2 Percent Annual Chance Flood Hazard Areas

Jurisdiction	NFIP Participating Community	Total Land Area (acres)	1 Percent Annual Chance Flood Hazard Area		0.2 Percent Annual Chance Flood Hazard Area	
			Total Area (acres)	% of Jurisdiction Total	Total Area (acres)	% of Jurisdiction Total
Adamstown Borough	Yes	866.6	52.9	6.1%	56.1	6.5%
Akron Borough	Yes	783.1	12.7	1.6%	16.7	2.1%
Bart Township	Yes	10,488.2	410.6	3.9%	421.2	4.0%
Brecknock Township	Yes	15,762.2	858.7	5.4%	861.1	5.5%
Caernarvon Township	Yes	14,695.6	665.2	4.5%	666.1	4.5%
Christiana Borough	Yes	333.9	55.8	16.7%	60.4	18.1%
Clay Township	Yes	14,097.3	647.3	4.6%	650.7	4.6%
Colerain Township	Yes	18,179.0	949.6	5.2%	955.7	5.3%
Columbia Borough	Yes	1,535.7	99.8	6.5%	125.9	8.2%
Conestoga Township	Yes	9,373.0	413.7	4.4%	499.6	5.3%
Conoy Township	Yes	9,409.1	1,001.0	10.6%	1,137.1	12.1%
Denver Borough	Yes	819.8	118.1	14.4%	143.8	17.5%
Drumore Township	Yes	15,247.9	487.3	3.2%	493.8	3.2%
Earl Township	Yes	14,062.3	832.1	5.9%	910.6	6.5%
East Cocalico Township	Yes	13,083.4	723.9	5.5%	822.4	6.3%
East Donegal Township	Yes	13,797.0	1,080.7	7.8%	1,266.8	9.2%
East Drumore Township	Yes	14,798.2	465.6	3.1%	467.0	3.2%
East Earl Township	Yes	15,726.6	716.7	4.6%	839.6	5.3%
East Hempfield Township	Yes	13,484.2	714.2	5.3%	817.8	6.1%
East Lampeter Township	Yes	12,611.2	788.0	6.2%	933.4	7.4%
East Petersburg Borough	Yes	769.0	12.5	1.6%	17.5	2.3%
Eden Township	Yes	8,013.4	194.3	2.4%	196.1	2.4%
Elizabeth Township	Yes	11,187.4	593.3	5.3%	593.3	5.3%
Elizabethtown Borough	Yes	1,688.2	61.9	3.7%	67.2	4.0%
Ephrata Borough	Yes	2,193.4	149.5	6.8%	223.2	10.2%
Ephrata Township	Yes	10,407.0	753.9	7.2%	895.0	8.6%
Fulton Township	Yes	16,526.0	942.7	5.7%	942.7	5.7%
Lancaster City	Yes	4,617.7	266.8	5.8%	361.6	7.8%
Lancaster Township	Yes	3,758.1	327.6	8.7%	435.4	11.6%
Leacock Township	Yes	13,152.9	612.9	4.7%	634.3	4.8%
Lititz Borough	Yes	1,475.0	106.2	7.2%	114.5	7.8%
Little Britain Township	Yes	17,440.0	752.2	4.3%	765.2	4.4%
Manheim Borough	Yes	885.9	216.8	24.5%	283.7	32.0%
Manheim Township	Yes	15,280.3	747.9	4.9%	970.6	6.4%
Manor Township	Yes	24,579.9	1,084.6	4.4%	1,225.8	5.0%
Marietta Borough	Yes	481.6	177.6	36.9%	246.4	51.2%
Martic Township	Yes	18,628.4	746.1	4.0%	833.8	4.5%
Millersville Borough	Yes	1,234.2	14.1	1.1%	16.1	1.3%
Mount Joy Borough	Yes	1,539.3	36.7	2.4%	36.8	2.4%
Mount Joy Township	Yes	17,850.2	725.3	4.1%	856.6	4.8%
Mountville Borough	Yes	553.3	5.4	1.0%	6.0	1.1%



Jurisdiction	NFIP Participating Community	Total Land Area (acres)	1 Percent Annual Chance Flood Hazard Area		0.2 Percent Annual Chance Flood Hazard Area	
			Total Area (acres)	% of Jurisdiction Total	Total Area (acres)	% of Jurisdiction Total
New Holland Borough	No	1,243.4	0.0	0.0%	0.0	0.0%
Paradise Township	Yes	11,917.8	542.1	4.5%	557.7	4.7%
Penn Township	Yes	18,893.8	746.8	4.0%	783.7	4.1%
Pequea Township	Yes	8,597.1	409.3	4.8%	476.0	5.5%
Providence Township	Yes	12,739.4	462.2	3.6%	485.7	3.8%
Quarryville Borough	Yes	828.7	43.7	5.3%	48.1	5.8%
Rapho Township	Yes	30,390.9	1,457.3	4.8%	1,565.8	5.2%
Sadsbury Township	Yes	12,525.4	598.9	4.8%	609.7	4.9%
Salisbury Township	Yes	26,717.1	1,560.0	5.8%	1,563.7	5.9%
Strasburg Borough	Yes	614.1	1.1	0.2%	1.1	0.2%
Strasburg Township	Yes	12,791.2	694.3	5.4%	716.4	5.6%
Terre Hill Borough	No	291.3	0.0	0.0%	0.0	0.0%
Upper Leacock Township	Yes	11,596.7	599.7	5.2%	687.6	5.9%
Warwick Township	Yes	12,675.3	644.9	5.1%	726.6	5.7%
West Cocalico Township	Yes	17,535.8	1,131.7	6.5%	1,145.9	6.5%
West Donegal Township	Yes	10,087.4	306.5	3.0%	339.8	3.4%
West Earl Township	Yes	11,371.3	1,074.3	9.4%	1,424.4	12.5%
West Hempfield Township	Yes	11,808.9	355.5	3.0%	454.2	3.8%
West Lampeter Township	Yes	10,496.0	481.8	4.6%	556.5	5.3%
<b>Lancaster County</b>	-	<b>604,537</b>	<b>30,733</b>	<b>5.1%</b>	<b>34,010.7</b>	<b>5.6%</b>

Source: Lancaster County 2019, 2023; FEMA 2016

Note: Land areas listed exclude water bodies.

When a river reaches flood stage, the NWS assigns flood severity categories based on property damage and public threat (NWS 2011):

- Minor Flooding—Minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding—Some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding—Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations are necessary.

Injuries and deaths can occur when people are swept away by flood currents or bacteria and disease are spread by moving or stagnant floodwaters. Most property damage results from inundation by sediment-filled water (PEMA 2023). Past building practices often resulted in homes being constructed in the FEMA-designated floodplains, exacerbating flooding problems within certain communities.

### Historical Flood Magnitude in Lancaster County

According to the FIS report for Lancaster County, major flooding is not a widespread or frequent problem Lancaster County. The lack of severe flooding conditions in most of the county is attributable to the physical features of the watersheds and stream channels. Of equal importance is the fact that local residents have generally not attempted to develop the low-lying stream banks and floodplains (FEMA 2018).



Flooding conditions along the Susquehanna River have been historically aggravated by the effects of ice jams. In extreme cases, ice-jam flooding has caused flood elevations approximately 10 feet higher than the previously published 1 percent annual chance water-surface elevations. In 1978 and 1996, the gage at Stamans Run recorded peak ice-jam related flood elevations of 243.60 feet and 243.03 feet, respectively (FEMA 2018).

**Water Gages**

The NWS uses flood categories as forecast points that describe the severity of flood impacts in a given stream reach. The categories are tied to water surface elevations recorded at the following water gage locations:

- A gage at Marietta (MRTP1) on the Susquehanna River
- A gage at Mount Joy (MJYP1) on Little Chiques Creek
- A gage at Lancaster (LNCP1) on the Conestoga River
- A gage at Conestoga (CNSP1) on the Conestoga River
- A gage at Paradise (PRDP1) on Pequea Creek
- Martic Forge (MFGP1) on Pequea Creek

Table 4-40 summarizes the flood categories based on water surface readings at three of these gages. Table 4-41 summarizes the top historic crests at three of the gages.

**Table 4-40. Flood Categories at the Marietta, Lancaster, and Mount Joy Gages**

Flood Category	Flood Category Definition	Gage Water Surface Reading (feet)		
		Marietta	Lancaster	Mount Joy
Major Flood Stage	Life-threatening and extensive inundation of structures and roads; significant evacuations are expected at this stage.	54	15	-
Moderate Flood Stage	Inundation of buildings usually begins at this stage; roads are likely to be closed and some areas cut off (evacuations may be necessary).	52	13	-
Flood Stage	Gage height above which a rise in water surface level begins to create a hazard to lives, property or commerce; issuance of flood warnings is linked to flood stage.	49	11	12
Action Stage	Level where the NWS needs to take some type of mitigation action in preparation for possible significant hydrologic activity.	44	9	11

Source: NWS 2023

**Table 4-41. Historic Crests at the Marietta, Lancaster, and Mount Joy Gages**

Marietta		Lancaster		Mount Joy	
Feet	Date	Feet	Date	Feet	Date
64.54	06/23/1972	27.90	06/23/1972	14.40	07/25/2018
60.73	03/19/1936	21.30	09/08/2011	12.69	09/02/2021
58.30	06/02/1889	18.49	09/02/2021	10.10	10/29/2015
58.16	09/09/2011	18.14	01/25/1978		
56.80	01/21/1996	17.80	10/09/2005		
56.27	09/19/2004	17.52	08/24/1933		
55.73	09/27/1975	16.70	09/09/1987		
54.90	05/29/1946	16.39	09/17/1999		
54.03	03/12/1964	15.30	05/06/1989		

Source: NWS 2023



### Past Occurrence

#### FEMA Major Disasters and Emergency Declarations

Lancaster County has been specifically included in 12 federal major disaster (DR) or emergency (EM) declarations for flood-related events, as listed in Table 4-42 (FEMA 2024).

Table 4-42. Flood-Related FEMA Declarations for Lancaster County, 1954 to 2023

FEMA Declaration Number	Dates of Event	Declaration Date	Details
DR-340-PA	June 23, 1972	June 23, 1972	Pennsylvania Tropical Storm Agnes
DR-400-PA	July 17, 1973	July 17, 1973	Pennsylvania Severe Storms, Flooding
DR-485-PA	September 26, 1975	September 26, 1975	Pennsylvania Severe Storms, Heavy Rains, Flooding
DR-523-PA	October 20, 1976	October 20, 1976	Pennsylvania Severe Storms, Flooding
DR-1093-PA	January 19 – February 1, 1996	January 21, 1996	Pennsylvania Flooding
DR-1294-PA	September 16-29, 1999	September 18, 1999	Pennsylvania Hurricane Floyd
DR-1555-PA	September 8-9, 2004	September 19, 2004	Severe Storms and Flooding Associated With Tropical Depression Frances in Pennsylvania
DR-1557-PA	September 17 – October 1, 2004	September 19, 2004	Pennsylvania Tropical Depression Ivan
DR-1649-PA	June 23 – July 10, 2006	June 30, 2006	Severe Storms, Flooding, and Mudslides in Pennsylvania
EM-3340-PA	September 3 – October 15, 2011	September 8, 2011	Remnants of Tropical Storm Lee in Pennsylvania
DR-4030-PA	September 3 – October 15, 2011	September 12, 2011	Tropical Storm Lee in Pennsylvania
EM-3356-PA	October 26 – November 8, 2012	October 29, 2012	Hurricane Sandy in Pennsylvania

Source: FEMA 2024

#### Previous Events

Lancaster County has a history of flooding events that affected multiple communities over a large area. Of the types of flooding that occur in the county, flash flooding is the most common.

The most significant flooding in recent times occurred with Tropical Storm Lee in September 2011. A Susquehanna River flow of 665,000 cubic feet per second (cfs) was measured on September 9, 2011, at Marietta. The Conestoga River gage at Conestoga recorded a flow of 30,100 cfs, the highest ever since the gage establishment in 1985 (FEMA 2018).

A previous significant flooding event occurred in June 1972, the result of Tropical Storm Agnes. Heavy rainfall from Agnes created severe runoff conditions which, in turn, produced record flows on local streams and tributaries (FEMA 2018):

- The Susquehanna River measured a record 1,020,000 cfs upstream at Harrisburg. Previous major floods on the Susquehanna River were recorded at the Harrisburg gage in 1889 (654,000 cfs) and 1936 (740,000 cfs). The return period for these three floods was approximately 450, 75, and 140 years, respectively.
- Conestoga Creek measured a record 88,300 cfs at the Lancaster gage, almost four times the previous record of 22,800 cfs set in 1933. The return periods for these two floods at the Lancaster gage were approximately 1,300 and 30 years, respectively.
- The discharge of Conestoga Creek at the Township of East Earl was measured at 13,500 cfs.

According to the National Oceanic and Atmospheric Administration’s National Center for Environmental Information (NOAA NCEI) storm event database, Lancaster County experienced 52 flood events and 62 flash



flood events since 1950. These events resulted in \$7.5 million in property damage and resulted in five deaths (NOAA NCEI 2024). Based on all sources researched, known flooding events resulting in property damage that affected Lancaster County and its municipalities since 2013 are listed in Table 4-43.

An ice jam database, maintained by the Ice Engineering Group at the USACE Cold Regions Research and Engineering Laboratory (CRREL) maintains about 26,000 records of ice jam incidents across the United States. According to the database, Lancaster County was impacted by 31 ice jam incidents between 1784 and September 2024 (USACE 2024). In addition to these events, ice jams have the potential to impact the structural integrity of dams, with multiple ice jams have occurred at the Safe Harbor Dam. For more information on dams, refer to section 4.3.2 Dam Failure.

**Table 4-43. Flooding Events between 2013 and 2024 in Lancaster County**

Date of Event	Event Type	Location	FEMA Declaration Number	County Designated ?	Losses/Impacts
January 31, 2013	Flood	Churchtown	N/A	N/A	Rainfall between 2 and 3 inches combined with cold season hydrological effects produced widespread flooding across Adams, York and Lancaster counties. Numerous roads were closed and several water rescues were reported. Minor flood stages were exceed on the Swatara Creek at Harper Tavern and the Conestoga River at Lancaster.
August 13, 2013	Flood, Flash Flood	Churchtown	N/A	N/A	Runoff from heavy rain and flash flooding caused flooding problems and road closures. A water rescue was conducted in Warwick Township at Cocalico/Rothsville Road. Heavy thunderstorms produced areas of flash flooding. Several homes had flooded basements. A water rescue was conducted in Sadsbury Township at Noble/Lower Valley Road due to a vehicle stuck in standing water.
October 10, 2013	Flood	Churchtown	N/A	N/A	Rainfall of 5-10 inches over a 2-day period resulted in widespread significant flooding. Road closures included Franklin Drive/Blue Lane; Landis Mill bridge at Blue Jay Drive; North Plum and East Liberty Street underpass; Fruitville Pike near RT 72 in Penn Township and other rural roads across the County. Chiques Creek near Manheim came out of its banks and flooded nearby roads. Minor river flooding occurred on the Conestoga at Lancaster with a crest of 11.20 feet.
April 30, 2014	Flood	York Furnace	N/A	N/A	Heavy rains resulted in flooding and road closures across Lancaster County. Several small creeks and streams overflowed their banks and inundated surrounding areas. The Conestoga River crested just above flood stage (11.63 feet on May 1) and caused minor flooding in low-lying areas. In Sadsbury Township, fire fighters rescued a man from his car on Noble Road near Creek Road. Water was about 18 inches deep. Noble Road was closed from Creek Road to Lower Valley Road because of high water. Several cars were abandoned on nearby Brick Mill Road.
May 1, 2014	Flood	Rothsville	N/A	N/A	The Conestoga River at Lancaster reached minor flood stage and crested at 11.63 feet.
July 14, 2014	Flash Flood	Columbia	N/A	N/A	Heavy rain produced flash flooding in Eden Heights and Rossmere. Floodwaters impacted homes on Carlton Drive/Rockford Lane and closed a section of the Lititz Pike at Keller Avenue.
July 15, 2015	Flood, Flash Flood	Kissel Hill	N/A	N/A	Heavy rain produced flash flooding in Earl Township. Locations that experienced flooding included Bareville, Hinkletown and New Holland. Floodwaters closed several secondary roads in the affected areas.



**Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam**

Date of Event	Event Type	Location	FEMA Declaration Number	County Designated ?	Losses/Impacts
September 5, 2014	Flash Flood	Washington	N/A	N/A	Torrential thunderstorm rain and flash flooding closed SR 441 in Washington Borough.
September 6, 2014	Flash Flood	Vintage	N/A	N/A	Torrential thunderstorm rains caused flash flooding and prompted water rescues near Kinzers and Gap.
July 13, 2016	Flash Flood	Hollinger	N/A	N/A	Heavy rain resulted in flash flooding forcing the closure of a portion of Route 30, where three sinkholes were reported. Route 30 from the area of the Dutch Wonderland amusement park to the Pennsylvania State Police barracks near the Route 30/Route 462 split was closed due to flooding. There were multiple reports of people rescued from vehicles stranded in high water. Many small streams spilled out of their banks.
January 23, 2018	Ice Jam	Marietta	N/A	N/A	A break up ice jam occurred on the Susquehanna River in Marietta. The ice jam was able to release itself and flow down river. No damage was reported.
June 2, 2018	Flash Flood	Willow Street, Mountville, Millersville	N/A	N/A	Heavy rains lead to flash flooding, resulting in numerous impassable roads along and near Willow Street and along the West Branch of the Little Conestoga Creek over Charlestown Road. Heavy rainfall resulted in Little Conestoga Creek over its banks on Blue Rock Road. Three persons were trapped in their residence and required a water rescue. Heavy rainfall resulted in numerous roads becoming impassable throughout Millersville.
July 24-25, 2018	Flood	Klinesville	N/A	N/A	Significant flooding was reported across the area. A landslide closed PA-441 between Old Chickies Hill Road and Klinesville Road in West Hempfield Township.
August 3, 2018	Flash Flood	Reinholds	N/A	N/A	Flash flooding was reported. A water rescue occurred on Creamery Road in West Cocalico Township.
August 21-22, 2018	Flash Flood	Bowmansville, New Holland	N/A	N/A	Storms produced flash flooding in Lancaster County. A vehicle was swept into Muddy Creek north of Bowmansville. Several road closures from flash flooding were reported across eastern Lancaster County, including New Holland, Bowmansville and Adamstown.
August 31, 2018	Flash Flood	Florin	N/A	N/A	Significant flash flooding occurred due to a thunderstorm that brought over 10 inches of rain in several hours. This prompted numerous water rescues and one home that was evacuated. PA Route 283 was closed at PA 772.
July 11, 2019	Flood	New Holland	N/A	N/A	Thunderstorms caused flooding through the town of Lebanon. A trailer park in East Earl Township flooded.
August 4, 2020	Flash Flood	Manor Ridge	N/A	N/A	Heavy rain from Tropical Storm Isaias impacted the Susquehanna Valley, and there was one report of a tree down on a home in Lancaster County. Flash flooding was reported across the area. Flooding blocked one lane of traffic on Route 283. Flooding was reported 2 miles north of Ephrata. Flooding was reported on Route 897 in East Cocalico Township. Flooding was reported along Steel Way and across Route 283 in Manheim Township.
August 7, 2020	Flash Flood	Old Line	N/A	N/A	Scattered thunderstorms produced flash flooding across Lancaster County. A dozen water rescue calls were reported, and there were reports of high water on roads across Lancaster County, and some residential flooding. PPL's outage center showed 805 customers without power in Lancaster County.



Date of Event	Event Type	Location	FEMA Declaration Number	County Designated ?	Losses/Impacts
August 18, 2021	Flash Flood	Wilshire Hills	N/A	N/A	The remnants of Tropical Storm Fred brought heavy rain and strong thunderstorms to central Pennsylvania, along with a handful of tornadoes. Water rescues were reported in Lancaster city, along with numerous flooded roadways.
August 22, 2021	Flash Flood	Terre Hill	N/A	N/A	Tropical Storm Henri brought rain and thunderstorms to the area. One storm became stationary over the New Holland area, where up to 5 inches of rain in a short time produced flash flooding. Small streams overflowed their banks and flooded local roads. Many roads were closed. Flash flooding was reported on Gristmill Road.
September 1, 2021	Flash Flood	Churchtown	N/A	N/A	The remnants of Hurricane Ida produced widespread heavy rainfall across Pennsylvania. Thunderstorms were observed southeast of I-81 and the PA Turnpike. Widespread flash flooding and water rescues were reported across Lancaster County in and near Lancaster and Ephrata. The Conestoga River at Lancaster crested at 18.49 feet, which is in major flood stage.
December 18, 2023	Flood	Strasburg Township	N/A	N/A	A strong storm system produced 2 to 4 inches of rainfall, leading to localized flooding. Heavy rainfall and flooding led to several water rescues in Strasburg Township near the intersection of Lime Valley Road and Brenneman Road. Flooding along Cabin Drive near Ephrata. A direct fatality was reported when a 73-year old male drove into the floodwaters and drowned.
January 9-10, 2024	Flood	East Drumore Township, West Lampeter Township, Lancaster City	N/A	N/A	Heavy rain and snowmelt led to flooding near Conowingo Creek in East Drumore Township, with water rising up to the doors on a midsize sedan. Flooding occurred along Pequea Creek in West Lampeter Township. The Conestoga River flooded along a stretch of North Conestoga Drive to the east of the city of Lancaster.
April 3, 2024	Flood	Little Britain Township	N/A	N/A	An early spring storm brought a period of prolonged rain, leading to the flooding of creeks and rivers. A dam on Octoraro Creek in western Chester County was performing an emergency release of water, and there was concern of a bridge or multiple bridges below the dam becoming submerged. This prompted a flood warning for Octoraro Creek below the dam in eastern Lancaster County.

Source: FEMA 2024; NOAA NCEI 2024; USACE 2024

N/A Not applicable/not available

### Future Occurrence

For this HMP update, the most up-to-date data was used to calculate the probability of future occurrence of flooding events for Lancaster County. Information from NOAA NCEI storm events database, FEMA, and the CRREL ice jam database were used to identify the number of flood events that occurred between 1950 and 2024. Table 4-44 shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year.

**Table 4-44. Probability of Future Flooding Events**

Hazard Type	Number of Occurrences Between 1950 and 2024	Recurrence Interval (in Years) (# Years/Number of Events)	Percent Chance of Occurrence in Any Given Year
Flash Flood	62	1.19	83.78%
Flood	52	1.42	70.27%





Hazard Type	Number of Occurrences Between 1950 and 2024	Recurrence Interval (in Years) (# Years/Number of Events)	Percent Chance of Occurrence in Any Given Year
Ice Jam	21	3.52	28.38%

Source: FEMA 2024; NOAA NCEI 2024; USACE 2024

Based on historical flood events, Lancaster County has a high probability of flooding for the future. The fact that the elements required for flooding exist and that major flooding has occurred throughout the county in the past suggests that many people and properties are at risk from the flood hazard in the future. It is concluded that Lancaster County will continue to experience direct and indirect impacts of annual flooding events. Therefore, the future occurrence of floods in Lancaster County has been characterized as *likely*, when taking into consideration flash flooding.

### Vulnerability Assessment

Floodplains for the 1 and 0.2 percent annual chance flood events from FEMA’s 2016 mapping were used to estimate the vulnerability of county assets to the flood hazard (see Figure 4-12). To estimate potential losses, the 1 percent annual chance flood depth grid was imported into the Hazus model and a riverine analysis was run.

### Life, Health, and Safety

#### General Population

Everyone who lives in or spends time in a mapped floodplain is at risk from the flooding hazard. Based on the spatial analysis, 3,906 people live in the SFHA (or 1 percent annual chance event floodplain) and 8,234 people live in the 0.2 percent annual chance flood event floodplain (Table 4-45). Lancaster City has the greatest estimated number of individuals residing in the floodplain—approximately 542 people in the 1 percent and 1,201 people in the 0.2 percent chance flood boundaries, respectively. The Marietta Borough has the highest percentage of population within the 1 percent and 0.2 percent annual chance floodplains (16.3 percent and 31.3 percent, respectively, of its 2,623 total population).

**Table 4-45 Residents Living in the 1 Percent and 0.2 Percent Annual Chance Flood Hazard Areas**

Jurisdiction	Total Population (2020 Decennial Census)	1 Percent Annual Chance Flood Event Hazard Area		0.2 Percent Annual Chance Flood Event Hazard Area	
		Number of Residents	Percent of Total	Number of Residents	Percent of Total
Adamstown Borough	1,916	7	0.4%	7	0.4%
Akron Borough	4,152	24	0.6%	45	1.1%
Bart Township	3,181	0	0.0%	0	0.0%
Brecknock Township	7,557	3	<0.1%	10	0.1%
Caernarvon Township	4,609	14	0.3%	14	0.3%
Christiana Borough	1,112	24	2.2%	44	4.0%
Clay Township	6,857	62	0.9%	62	0.9%
Colerain Township	3,883	5	0.1%	5	0.1%
Columbia Borough	10,207	130	1.3%	208	2.0%
Conestoga Township	3,914	27	0.7%	71	1.8%
Conoy Township	3,361	71	2.1%	118	3.5%
Denver Borough	3,792	29	0.8%	125	3.3%
Drumore Township	2,561	56	2.2%	60	2.3%
Earl Township	7,144	5	0.1%	51	0.7%
East Cocalico Township	10,767	68	0.6%	161	1.5%
East Donegal Township	8,684	65	0.7%	114	1.3%



*Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam*

Jurisdiction	Total Population (2020 Decennial Census)	1 Percent Annual Chance Flood Event Hazard Area		0.2 Percent Annual Chance Flood Event Hazard Area	
		Number of Residents	Percent of Total	Number of Residents	Percent of Total
East Drumore Township	3,936	8	0.2%	8	0.2%
East Earl Township	6,699	51	0.8%	72	1.1%
East Hempfield Township	26,304	92	0.3%	177	0.7%
East Lampeter Township	17,776	134	0.8%	228	1.3%
East Petersburg Borough	4,573	0	0.0%	0	0.0%
Eden Township	2,239	5	0.2%	5	0.2%
Elizabeth Township	3,985	13	0.3%	13	0.3%
Elizabethtown Borough	11,639	34	0.3%	55	0.5%
Ephrata Borough	13,794	254	1.8%	621	4.5%
Ephrata Township	10,386	68	0.7%	283	2.7%
Fulton Township	3,214	4	0.1%	4	0.1%
Lancaster City	58,039	542	0.9%	1,201	2.1%
Lancaster Township	18,642	124	0.7%	392	2.1%
Leacock Township	5,652	22	0.4%	72	1.3%
Lititz Borough	9,381	130	1.4%	172	1.8%
Little Britain Township	4,118	13	0.3%	13	0.3%
Manheim Borough	5,046	256	5.1%	650	12.9%
Manheim Township	43,977	108	0.2%	255	0.6%
Manor Township	21,849	217	1.0%	269	1.2%
Marietta Borough	2,623	428	16.3%	820	31.3%
Martic Township	5,221	31	0.6%	48	0.9%
Millersville Borough	7,903	9	0.1%	9	0.1%
Mount Joy Borough	8,325	0	0.0%	0	0.0%
Mount Joy Township	10,721	34	0.3%	77	0.7%
Mountville Borough	3,017	0	0.0%	4	0.1%
New Holland Borough	5,743	0	0.0%	0	0.0%
Paradise Township	5,672	95	1.7%	147	2.6%
Penn Township	10,210	70	0.7%	97	1.0%
Pequea Township	5,474	11	0.2%	40	0.7%
Providence Township	6,995	13	0.2%	47	0.7%
Quarryville Borough	2,843	23	0.8%	42	1.5%
Rapho Township	12,024	42	0.3%	54	0.4%
Sadsbury Township	3,536	5	0.1%	5	0.1%
Salisbury Township	11,494	40	0.3%	40	0.3%
Strasburg Borough	3,117	0	0.0%	0	0.0%
Strasburg Township	4,457	30	0.7%	34	0.8%
Terre Hill Borough	1,357	0	0.0%	0	0.0%
Upper Leacock Township	8,921	47	0.5%	66	0.7%
Warwick Township	19,022	36	0.2%	52	0.3%
West Cocalico Township	7,456	51	0.7%	74	1.0%
West Donegal Township	8,944	8	0.1%	8	0.1%
West Earl Township	8,560	160	1.9%	629	7.3%
West Hempfield Township	17,020	34	0.2%	54	0.3%



Jurisdiction	Total Population (2020 Decennial Census)	1 Percent Annual Chance Flood Event Hazard Area		0.2 Percent Annual Chance Flood Event Hazard Area	
		Number of Residents	Percent of Total	Number of Residents	Percent of Total
West Lampeter Township	17,383	74	0.4%	302	1.7%
<b>Lancaster County</b>	<b>552,984</b>	<b>3,906</b>	<b>0.7%</b>	<b>8,234</b>	<b>1.5%</b>

Source: U.S. Census Bureau 2020; Lancaster County 2023, 2024; FEMA 2016

In the event of a flood, some floodplain residents could be displaced from their homes, requiring them to seek temporary shelter with friends, family, or emergency shelters. Hazus estimates the potential sheltering needs as a result of a 1 percent annual chance flood event. The estimated displaced population and number of persons seeking short-term sheltering differs from the total population in the floodplain because not all residents will be impacted enough by a flood event to be displaced or to require short-term sheltering.

Table 4-46 shows Hazus estimates for displacement and sheltering needs for the 1 percent annual chance flood event in Lancaster County. Hazus estimates that 3,047 people will be displaced and 1,904 people will seek short-term sheltering countywide. Marietta Borough would have the greatest displaced population (257 people) and Lancaster City would have the greatest number of persons seeking short-term shelter (196 people).

**Table 4-46 Population Displaced or Seeking Short-Term Shelter from the 1 Percent Annual Chance Flood Event**

Jurisdiction	Total Population (2020 Decennial Census)	Displaced Population	Persons Seeking Short-Term Sheltering
Adamstown Borough	1,916	8	4
Akron Borough	4,152	16	10
Bart Township	3,181	5	1
Brecknock Township	7,557	35	21
Caernarvon Township	4,609	8	2
Christiana Borough	1,112	35	19
Clay Township	6,857	33	16
Colerain Township	3,883	2	0
Columbia Borough	10,207	40	29
Conestoga Township	3,914	13	4
Conoy Township	3,361	56	36
Denver Borough	3,792	61	28
Drumore Township	2,561	1	0
Earl Township	7,144	18	5
East Cocalico Township	10,767	69	43
East Donegal Township	8,684	28	15
East Drumore Township	3,936	3	1
East Earl Township	6,699	29	9
East Hempfield Township	26,304	210	164
East Lampeter Township	17,776	100	60
East Petersburg Borough	4,573	8	6
Eden Township	2,239	10	9
Elizabeth Township	3,985	8	2
Elizabethtown Borough	11,639	61	41
Ephrata Borough	13,794	160	111
Ephrata Township	10,386	120	74
Fulton Township	3,214	1	0



Jurisdiction	Total Population (2020 Decennial Census)	Displaced Population	Persons Seeking Short-Term Sheltering
Lancaster City	58,039	239	196
Lancaster Township	18,642	151	115
Leacock Township	5,652	16	4
Lititz Borough	9,381	124	77
Little Britain Township	4,118	3	1
Manheim Borough	5,046	125	61
Manheim Township	43,977	203	153
Manor Township	21,849	146	96
Marietta Borough	2,623		161
Martic Township	5,221	13	5
Millersville Borough	7,903	3	2
Mount Joy Borough	8,325	23	16
Mount Joy Township	10,721	36	24
Mountville Borough	3,017	0	0
New Holland Borough	5,743	0	0
Paradise Township	5,672	51	22
Penn Township	10,210	39	15
Pequea Township	5,474	11	4
Providence Township	6,995	27	10
Quarryville Borough	2,843	18	6
Rapho Township	12,024	25	10
Sadsbury Township	3,536	4	3
Salisbury Township	11,494	23	5
Strasburg Borough	3,117	0	0
Strasburg Township	4,457	33	16
Terre Hill Borough	1,357	0	0
Upper Leacock Township	8,921	11	3
Warwick Township	19,022	51	35
West Cocalico Township	7,456	48	25
West Donegal Township	8,944	20	16
West Earl Township	8,560	100	48
West Hempfield Township	17,020	22	9
West Lampeter Township	17,383	87	56
<b>Lancaster County</b>	<b>552,984</b>	<b>3,047</b>	<b>1,904</b>

Source: Hazus v6.1, U.S. Census Bureau 2020; FEMA 2016

The number of injuries and deaths resulting from typical riverine flooding is generally limited because of advance weather forecasting, blockades, and warnings. Ongoing mitigation efforts should help to avoid the most likely cause of injury—persons trying to cross flooded roadways or channels. Mitigation action items addressing this issue are included in the mitigation strategy for this plan. Warning time for flash flooding is often limited due to the sudden nature of conditions that cause such flooding. Populations without adequate warning of the event are highly vulnerable to this hazard.

Common public health risks associated with flood events also include (FEMA 2022):

- Unsafe food
- Contaminated drinking and washing water and poor sanitation
- Mosquitos and animals



- Carbon monoxide poisoning
- Secondary hazards associated with re-entering/cleaning flooded structures
- Exposure to mold in flooded buildings
- Mental stress and fatigue

The best level of mitigation for these impacts is to be aware that they can occur, educate the public on prevention, and be prepared to deal with them in responding to flood events.

### Socially Vulnerable Populations

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over the age of 65. Economically disadvantaged populations are more vulnerable because they may lack financial resources to evacuate during a flood event. The population over 65 is more vulnerable because they are more likely to need medical attention that may not be available because of isolation during a flood event, and they may have more difficulty evacuating.

Table 4-47 summarizes socially vulnerable populations in the 1 percent and 0.2 percent annual chance flood event hazard areas. The jurisdictions with the greatest exposures are as follows:

- **1 percent annual chance flood event hazard area**—Marietta Borough has the highest population over 65 (115). Lancaster City has the highest population under the age of 5 (36), the largest population of non-English speaking persons (40), the largest disabled population (83), and the greatest population of individuals living in poverty (95).
- **0.2 percent annual chance flood event hazard area**—Marietta Borough has the highest population over 65 (220). Lancaster City has the highest population under the age of 5 (80), has the largest population of non-English speaking persons (89), the largest disabled population (184), and the greatest population of individuals living in poverty (210).

For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

### General Building Stock

Table 4-48 summarizes buildings in the mapped flood hazard areas. The 1 percent annual chance flood hazard area includes 3,808 structures, or 1.3 percent of the building stock. The 0.2 percent annual chance flood hazard area includes 6,260 structures, or 2.2 percent of the building stock. Table 4-49 lists buildings in the flood hazard areas by occupancy class. For both hazard areas, the commercial occupancy is the most exposed to the flood hazard: 2,690 structures in the 1 percent annual chance hazard area and 4,035 structures in the 0.2 percent annual chance hazard area.

The potential damage caused by flood events is the modeled loss that could occur to the exposed building stock based on damage to structures and contents. Hazus estimated potential damage to buildings in Lancaster County for the 1 percent annual chance flood event, as listed in Table 4-50. Hazus estimates \$773.9 million in potential building damage countywide. This includes \$48.8 million in residential building loss and \$426.4 million in commercial building loss.



### NFIP Statistics

According to September 2023 data (the most recent data available for this plan update), Lancaster County has 763 NFIP policies, totaling \$1,010,985 in coverage. Since 1978, there have been 1,799 claims for NFIP policies in the County, with a total of \$30.2 million in losses paid.

The September 2023 data also show that Lancaster County had 184 repetitive loss (RL) properties and 35 severe repetitive loss (SRL) properties at that time. Table 4-51 summarizes RL properties and Table 4-52 summarizes SRL properties by occupancy, by jurisdiction.

Table 4-53 summarizes NFIP data by jurisdiction.

### Definitions

**Repetitive loss property**—An NFIP-insured structure that incurred flood-related damage on two occasions for which the cost of repair equaled or exceeded 25 percent of the market value of the structure at the time of the damage.

**Severe repetitive loss property**—An NFIP-insured residential structure for which at least one of the following sets of claim payments has occurred:

- At least four NFIP claim payments over \$5,000 each (including building and contents), with the cumulative amount exceeding \$20,000
- At least two payments for claims with the cumulative amount of the building portion of the payments exceeding the market value of the building

For either of the above severe repetitive loss conditions, at least two of the claims must have occurred within any 10-year period and must have been submitted on dates more than 10 days apart.



Table 4-47. Estimated Number of Vulnerable Persons Within the Flood Hazard Areas

Jurisdiction	Number of Vulnerable Persons Living in the 1 Percent Annual Chance Flood Event Hazard Area					Number of Vulnerable Persons Living in the 0.2 Percent Annual Chance Flood Event Hazard Area				
	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	0	0	0	0	0	0	0	0	0	0
Akron Borough	4	2	0	2	2	8	4	0	4	3
Bart Township	0	0	0	0	0	0	0	0	0	0
Brecknock Township	0	0	0	0	0	1	0	0	0	0
Caernarvon Township	2	1	0	1	1	2	1	0	1	1
Christiana Borough	5	1	0	3	1	9	2	0	5	2
Clay Township	10	4	0	4	3	10	4	0	4	3
Colerain Township	0	0	0	0	0	0	0	0	0	0
Columbia Borough	27	4	3	24	20	43	6	4	39	32
Conestoga Township	4	0	0	3	1	11	1	0	8	3
Conoy Township	10	5	0	9	5	17	8	0	15	8
Denver Borough	4	1	0	2	1	19	6	2	10	7
Drumore Township	7	3	2	6	4	7	3	2	6	4
Earl Township	1	0	0	0	0	12	4	1	4	4
East Cocalico Township	12	2	1	7	3	29	5	3	16	7
East Donegal Township	9	4	0	5	2	16	7	0	9	3
East Drumore Township	2	0	0	1	0	2	0	0	1	0
East Earl Township	11	2	2	5	1	15	3	2	7	1
East Hempfield Township	24	3	1	9	2	46	5	2	17	4
East Lampeter Township	21	10	6	14	12	36	17	10	24	20
East Petersburg Borough	0	0	0	0	0	0	0	0	0	0
Eden Township	0	0	0	0	0	0	0	0	0	0
Elizabeth Township	2	0	0	0	0	2	0	0	0	0
Elizabethtown Borough	5	1	1	4	2	8	1	1	6	3
Ephrata Borough	44	17	21	42	23	107	41	51	104	56
Ephrata Township	13	2	2	7	3	55	11	10	30	14
Fulton Township	0	0	0	0	0	0	0	0	0	0
Lancaster City	50	36	40	83	95	111	80	89	184	210
Lancaster Township	27	9	6	12	10	86	28	19	38	33
Leacock Township	3	1	0	1	1	10	4	1	3	4
Lititz Borough	33	7	1	13	4	43	9	1	17	5



Jurisdiction	Number of Vulnerable Persons Living in the 1 Percent Annual Chance Flood Event Hazard Area					Number of Vulnerable Persons Living in the 0.2 Percent Annual Chance Flood Event Hazard Area				
	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Little Britain Township	2	1	0	1	1	2	1	0	1	1
Manheim Borough	29	26	1	33	28	73	66	3	85	71
Manheim Township	24	5	1	11	5	57	12	3	27	13
Manor Township	41	12	13	25	21	50	15	16	31	26
Marietta Borough	115	28	0	71	54	220	54	0	136	104
Martic Township	4	3	0	3	2	6	4	0	5	3
Millersville Borough	1	0	0	1	2	1	0	0	1	2
Mount Joy Borough	0	0	0	0	0	0	0	0	0	0
Mount Joy Township	5	2	0	3	1	11	4	0	6	2
Mountville Borough	0	0	0	0	0	1	0	0	0	0
New Holland Borough	0	0	0	0	0	0	0	0	0	0
Paradise Township	11	8	1	9	8	17	12	1	14	12
Penn Township	16	3	0	5	2	22	4	0	7	3
Pequea Township	2	0	0	1	0	7	1	0	3	1
Providence Township	2	0	0	1	1	9	1	0	5	4
Quarryville Borough	3	1	0	3	3	6	2	0	5	6
Rapho Township	9	2	0	4	1	11	2	0	5	1
Sadsbury Township	0	0	0	0	0	0	0	0	0	0
Salisbury Township	4	3	1	2	2	4	3	1	2	2
Strasburg Borough	0	0	0	0	0	0	0	0	0	0
Strasburg Township	5	3	0	1	2	5	3	0	1	2
Terre Hill Borough	0	0	0	0	0	0	0	0	0	0
Upper Leacock Township	7	3	3	4	3	9	4	4	5	4
Warwick Township	7	1	0	3	2	10	1	0	4	2
West Cocalico Township	7	5	0	3	4	10	7	0	4	5
West Donegal Township	3	0	0	1	0	3	0	0	1	0
West Earl Township	31	14	4	11	5	123	56	16	44	21
West Hempfield Township	6	1	1	4	0	9	2	1	6	0
West Lampeter Township	23	2	0	8	2	93	10	1	35	9
<b>Lancaster County</b>	<b>687</b>	<b>238</b>	<b>111</b>	<b>465</b>	<b>345</b>	<b>1,464</b>	<b>514</b>	<b>244</b>	<b>985</b>	<b>721</b>

Source: U.S. Census Bureau 2022; Lancaster County 2023, 2024; FEMA 2016





Table 4-48. General Building Stock Exposure to the 1 Percent and 0.2 Percent Annual Chance Flood Event—All Occupancies

Jurisdiction	Jurisdiction Total Buildings		Estimated Building Stock Located in the Flood Hazard Area			
	Number of Buildings	Replacement Cost Value	1 percent Annual Chance Flood Event Hazard Area Number of Buildings	Replacement Cost Value	0.2 percent Annual Chance Flood Event Hazard Area Number of Buildings	Replacement Cost Value
Adamstown Borough	1,061	\$567,784,670	15	\$14,583,024	16	\$15,400,198
Akron Borough	1,946	\$780,121,864	13	\$3,124,910	22	\$6,200,383
Bart Township	2,746	\$1,885,029,231	11	\$5,009,600	11	\$5,009,600
Brecknock Township	6,458	\$3,832,548,357	56	\$21,485,525	62	\$22,433,877
Caernarvon Township	3,617	\$2,383,292,372	13	\$6,332,682	13	\$6,332,682
Christiana Borough	584	\$307,647,839	27	\$23,809,371	34	\$26,878,718
Clay Township	4,929	\$3,411,423,294	73	\$45,421,323	74	\$45,797,962
Colerain Township	3,177	\$2,533,877,481	14	\$2,789,470	14	\$2,789,470
Columbia Borough	4,036	\$4,983,733,544	71	\$95,953,487	105	\$228,618,493
Conestoga Township	2,953	\$1,420,507,504	40	\$10,855,310	80	\$20,811,554
Conoy Township	2,599	\$1,789,579,577	67	\$53,222,996	95	\$63,300,074
Denver Borough	1,918	\$2,747,960,874	79	\$724,334,595	156	\$756,946,740
Drumore Township	2,426	\$1,886,590,595	48	\$159,618,629	49	\$160,217,027
Earl Township	5,290	\$10,279,323,543	61	\$36,895,971	106	\$61,289,664
East Cocalico Township	7,428	\$5,177,824,554	62	\$23,423,895	147	\$77,538,474
East Donegal Township	4,506	\$6,877,402,214	69	\$42,291,598	106	\$61,300,575
East Drumore Township	3,043	\$3,747,277,368	15	\$8,147,073	15	\$8,147,073
East Earl Township	5,648	\$6,797,710,925	136	\$167,579,679	195	\$211,704,826
East Hempfield Township	11,417	\$42,919,064,493	86	\$60,265,658	123	\$100,918,704
East Lampeter Township	8,359	\$16,552,653,977	125	\$103,586,862	247	\$275,096,772
East Petersburg Borough	2,033	\$1,076,855,572	1	\$500,362	4	\$2,880,732
Eden Township	1,797	\$1,268,005,230	4	\$908,075	4	\$908,075
Elizabeth Township	3,194	\$2,173,694,928	30	\$9,997,157	30	\$9,997,157
Elizabethtown Borough	4,454	\$6,918,177,890	31	\$69,018,422	40	\$76,124,084
Ephrata Borough	6,357	\$13,348,895,113	146	\$108,383,552	320	\$442,806,619
Ephrata Township	5,383	\$6,162,339,672	92	\$72,736,475	217	\$216,827,701
Fulton Township	3,035	\$2,732,951,621	43	\$14,765,440	43	\$14,765,440
Lancaster City	14,223	\$49,154,384,225	139	\$240,243,616	251	\$285,927,675
Lancaster Township	5,365	\$16,948,222,966	69	\$120,102,999	151	\$156,587,402
Leacock Township	4,771	\$5,521,489,045	61	\$48,824,855	78	\$138,541,467
Lititz Borough	4,389	\$10,053,673,662	142	\$1,331,660,985	171	\$1,386,482,196



Jurisdiction	Jurisdiction Total Buildings		Estimated Building Stock Located in the Flood Hazard Area			
	Number of Buildings	Replacement Cost Value	1 percent Annual Chance Flood Event Hazard Area		0.2 percent Annual Chance Flood Event Hazard Area	
			Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value
Little Britain Township	3,545	\$3,060,610,596	16	\$9,433,754	16	\$9,433,754
Manheim Borough	2,956	\$4,013,795,389	235	\$361,990,251	493	\$792,426,537
Manheim Township	16,101	\$25,203,355,402	117	\$236,925,301	215	\$297,177,753
Manor Township	10,400	\$20,927,614,237	193	\$97,546,549	223	\$113,527,328
Marietta Borough	1,402	\$754,834,832	272	\$231,627,106	480	\$367,553,773
Martic Township	4,469	\$2,359,595,108	43	\$16,995,847	71	\$162,784,730
Millersville Borough	2,611	\$4,408,036,349	5	\$1,258,904	5	\$1,258,904
Mount Joy Borough	3,925	\$4,719,474,554	9	\$4,594,925	9	\$4,594,925
Mount Joy Township	5,918	\$7,127,138,587	39	\$13,712,163	83	\$124,500,223
Mountville Borough	1,189	\$1,106,163,051	0	\$0	1	\$738,426
New Holland Borough	2,819	\$5,086,885,413	0	\$0	0	\$0
Paradise Township	4,470	\$4,125,868,997	79	\$30,696,179	110	\$46,598,500
Penn Township	6,163	\$6,256,819,382	104	\$154,021,257	136	\$200,668,229
Pequea Township	3,612	\$2,379,058,553	20	\$9,063,900	42	\$20,070,895
Providence Township	4,666	\$3,832,302,966	48	\$576,496,211	65	\$591,559,771
Quarryville Borough	1,451	\$1,138,506,005	62	\$163,846,940	77	\$175,449,267
Rapho Township	8,253	\$7,968,083,321	54	\$66,203,204	69	\$71,806,228
Sadsbury Township	2,765	\$2,150,137,506	7	\$2,607,661	8	\$2,704,690
Salisbury Township	8,204	\$7,541,703,016	90	\$55,461,152	90	\$55,461,152
Strasburg Borough	1,716	\$965,120,267	1	\$267,929	1	\$267,929
Strasburg Township	3,777	\$4,508,049,956	64	\$66,869,348	76	\$81,837,617
Terre Hill Borough	840	\$352,866,296	0	\$0	0	\$0
Upper Leacock Township	5,549	\$12,221,244,032	58	\$70,245,912	93	\$91,194,991
Warwick Township	8,483	\$13,241,309,844	81	\$86,655,089	105	\$102,328,192
West Cocalico Township	5,957	\$3,405,206,014	82	\$36,764,988	96	\$53,861,217
West Donegal Township	4,332	\$7,574,423,332	11	\$5,447,992	12	\$23,783,306
West Earl Township	5,356	\$5,324,536,861	175	\$111,876,913	494	\$419,069,186
West Hempfield Township	8,662	\$10,809,249,135	47	\$44,544,676	67	\$66,189,463
West Lampeter Township	7,031	\$18,752,932,700	57	\$40,728,356	144	\$76,824,023
<b>Lancaster County</b>	<b>285,764</b>	<b>\$427,554,965,900</b>	<b>3,808</b>	<b>\$6,121,756,102</b>	<b>6,260</b>	<b>\$8,842,252,425</b>

Source: Lancaster County 2023, 2024; RS Means 2024; FEMA 2016





Table 4-49. Buildings Located in the 1 Percent and 0.2 Percent Annual Chance Flood Event Hazard Areas by Occupancy Class

Jurisdiction	Buildings in the 1% Annual Chance Flood Event Hazard Area				Buildings in the 0.2% Annual Chance Flood Event Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>	Residential	Commercial	Industrial	Other <sup>a</sup>
Adamstown Borough	2	13	0	0	2	14	0	0
Akron Borough	7	6	0	0	13	9	0	0
Bart Township	0	10	0	1	0	10	0	1
Brecknock Township	1	54	0	1	3	58	0	1
Caernarvon Township	3	10	0	0	3	10	0	0
Christiana Borough	6	21	0	0	11	23	0	0
Clay Township	15	56	0	2	15	57	0	2
Colerain Township	1	13	0	0	1	13	0	0
Columbia Borough	28	38	4	1	45	53	5	2
Conestoga Township	8	31	0	1	21	58	0	1
Conoy Township	21	44	0	2	35	58	0	2
Denver Borough	8	61	8	2	34	110	10	2
Drumore Township	12	31	2	3	13	31	2	3
Earl Township	1	58	0	2	9	94	0	3
East Cocalico Township	19	41	1	1	45	96	3	3
East Donegal Township	16	49	2	2	28	72	2	4
East Drumore Township	2	13	0	0	2	13	0	0
East Earl Township	12	108	8	8	17	158	8	12
East Hempfield Township	25	53	0	8	48	67	0	8
East Lampeter Township	30	91	1	3	51	187	4	5
East Petersburg Borough	0	0	1	0	0	2	2	0
Eden Township	1	3	0	0	1	3	0	0
Elizabeth Township	4	24	0	2	4	24	0	2
Elizabethtown Borough	8	20	0	3	13	24	0	3
Ephrata Borough	63	75	3	5	154	152	7	7
Ephrata Township	15	74	1	2	62	140	1	14
Fulton Township	1	42	0	0	1	42	0	0
Lancaster City	65	74	0	0	144	107	0	0
Lancaster Township	25	44	0	0	79	70	0	2
Leacock Township	4	55	1	1	13	63	1	1
Lititz Borough	34	91	13	4	45	108	14	4
Little Britain Township	3	13	0	0	3	13	0	0



Jurisdiction	Buildings in the 1% Annual Chance Flood Event Hazard Area				Buildings in the 0.2% Annual Chance Flood Event Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>	Residential	Commercial	Industrial	Other <sup>a</sup>
Manheim Borough	76	144	7	8	193	278	12	10
Manheim Township	28	83	1	5	66	140	1	8
Manor Township	54	126	3	10	67	141	4	11
Marietta Borough	119	142	8	3	228	227	10	15
Martic Township	9	32	1	1	14	51	5	1
Millersville Borough	2	3	0	0	2	3	0	0
Mount Joy Borough	0	9	0	0	0	9	0	0
Mount Joy Township	8	29	1	1	18	59	1	5
Mountville Borough	0	0	0	0	1	0	0	0
New Holland Borough	0	0	0	0	0	0	0	0
Paradise Township	20	57	0	2	31	75	0	4
Penn Township	18	81	1	4	25	106	1	4
Pequea Township	3	16	1	0	11	29	1	1
Providence Township	3	44	0	1	11	53	0	1
Quarryville Borough	6	53	1	2	11	63	1	2
Rapho Township	10	40	0	4	13	51	0	5
Sadsbury Township	1	6	0	0	1	7	0	0
Salisbury Township	8	81	0	1	8	81	0	1
Strasburg Borough	0	1	0	0	0	1	0	0
Strasburg Township	7	53	1	3	8	64	1	3
Terre Hill Borough	0	0	0	0	0	0	0	0
Upper Leacock Township	10	39	3	6	14	68	3	8
Warwick Township	9	59	3	10	13	76	3	13
West Cocalico Township	13	69	0	0	19	77	0	0
West Donegal Township	2	7	0	2	2	8	0	2
West Earl Township	37	126	2	10	145	315	8	26
West Hempfield Township	10	37	0	0	16	50	0	1
West Lampeter Township	18	37	1	1	73	64	3	4
Lancaster County	911	2,690	79	128	1,905	4,035	113	207

Source: Lancaster County 2023, 2024; FEMA 2016

a. Other = Government, Religion, Agricultural, and Education



Table 4-50. Estimated General Building Stock Potential Loss from the 1 Percent Annual Chance Flood Event, by Occupancy Class

Jurisdiction	Total Replacement Cost Value (RCV)	Estimated Loss for All Occupancies	Estimated Loss for Residential Properties	Estimated Loss for Commercial Properties	Estimated Loss for All Other Occupancies
Adamstown Borough	\$567,784,670	\$130,488	\$0	\$130,488	\$0
Akron Borough	\$780,121,864	\$362,904	\$248,513	\$114,391	\$0
Bart Township	\$1,885,029,231	\$187,236	\$0	\$187,236	\$0
Brecknock Township	\$3,832,548,357	\$4,116,645	\$0	\$3,010,089	\$1,106,557
Caernarvon Township	\$2,383,292,372	\$192,258	\$0	\$192,258	\$0
Christiana Borough	\$307,647,839	\$6,749,167	\$56,462	\$6,692,705	\$0
Clay Township	\$3,411,423,294	\$2,367,068	\$286,193	\$1,830,902	\$249,973
Colerain Township	\$2,533,877,481	\$104,075	\$0	\$104,075	\$0
Columbia Borough	\$4,983,733,544	\$10,017,234	\$753,708	\$5,725,013	\$3,538,512
Conestoga Township	\$1,420,507,504	\$3,329,983	\$422,838	\$2,461,253	\$445,893
Conoy Township	\$1,789,579,577	\$8,382,823	\$769,489	\$6,593,265	\$1,020,070
Denver Borough	\$2,747,960,874	\$203,617,967	\$604,176	\$38,902,271	\$164,111,521
Drumore Township	\$1,886,590,595	\$27,651,319	\$198,592	\$1,872,613	\$25,580,115
Earl Township	\$10,279,323,543	\$21,573,084	\$0	\$17,011,145	\$4,561,940
East Cocalico Township	\$5,177,824,554	\$2,753,067	\$181,832	\$2,458,176	\$113,060
East Donegal Township	\$6,877,402,214	\$6,312,571	\$1,050,171	\$4,809,377	\$453,023
East Drumore Township	\$3,747,277,368	\$450,038	\$0	\$450,038	\$0
East Earl Township	\$6,797,710,925	\$14,693,909	\$203,367	\$7,984,591	\$6,505,951
East Hempfield Township	\$42,919,064,493	\$5,727,673	\$926,133	\$801,942	\$3,999,598
East Lampeter Township	\$16,552,653,977	\$24,590,065	\$2,255,669	\$21,615,385	\$719,011
East Petersburg Borough	\$1,076,855,572	\$70,770	\$0	\$0	\$70,770
Eden Township	\$1,268,005,230	\$50,503	\$0	\$50,503	\$0
Elizabeth Township	\$2,173,694,928	\$1,197,149	\$117,525	\$877,515	\$202,109
Elizabethtown Borough	\$6,918,177,890	\$16,499,812	\$194,562	\$4,655,058	\$11,650,192
Ephrata Borough	\$13,348,895,113	\$23,185,129	\$2,533,675	\$14,467,567	\$6,183,887
Ephrata Township	\$6,162,339,672	\$18,754,398	\$487,836	\$17,611,838	\$654,723
Fulton Township	\$2,732,951,621	\$452,159	\$0	\$452,159	\$0
Lancaster City	\$49,154,384,225	\$24,222,661	\$13,583,667	\$10,638,994	\$0
Lancaster Township	\$16,948,222,966	\$45,327,688	\$3,562,422	\$41,765,266	\$0
Leacock Township	\$5,521,489,045	\$2,364,440	\$2,026	\$2,314,691	\$47,723
Lititz Borough	\$10,053,673,662	\$24,789,699	\$537,213	\$17,719,846	\$6,532,639
Little Britain Township	\$3,060,610,596	\$696,092	\$215,623	\$480,469	\$0



Jurisdiction	Total Replacement Cost Value (RCV)	Estimated Loss for All Occupancies	Estimated Loss for Residential Properties	Estimated Loss for Commercial Properties	Estimated Loss for All Other Occupancies
Manheim Borough	\$4,013,795,389	\$31,919,470	\$1,678,709	\$21,820,402	\$8,420,359
Manheim Township	\$25,203,355,402	\$30,385,458	\$1,453,280	\$23,571,153	\$5,361,024
Manor Township	\$20,927,614,237	\$18,344,343	\$1,267,359	\$11,930,832	\$5,146,152
Marietta Borough	\$754,834,832	\$37,220,013	\$4,830,647	\$26,366,079	\$6,023,287
Martic Township	\$2,359,595,108	\$6,191,414	\$380,146	\$5,619,747	\$191,520
Millersville Borough	\$4,408,036,349	\$439,824	\$186,063	\$253,761	\$0
Mount Joy Borough	\$4,719,474,554	\$2,123,532	\$0	\$2,123,532	\$0
Mount Joy Township	\$7,127,138,587	\$2,581,772	\$156,493	\$2,105,432	\$319,847
Mountville Borough	\$1,106,163,051	\$8	\$8	\$0	\$0
New Holland Borough	\$5,086,885,413	\$4	\$4	\$0	\$0
Paradise Township	\$4,125,868,997	\$6,793,394	\$1,052,632	\$5,535,824	\$204,938
Penn Township	\$6,256,819,382	\$12,073,460	\$244,337	\$9,809,752	\$2,019,370
Pequea Township	\$2,379,058,553	\$837,800	\$0	\$833,551	\$4,249
Providence Township	\$3,832,302,966	\$2,949,339	\$73,131	\$2,771,781	\$104,427
Quarryville Borough	\$1,138,506,005	\$25,715,016	\$83,630	\$13,250,652	\$12,380,733
Rapho Township	\$7,968,083,321	\$8,230,864	\$1,529,424	\$5,785,941	\$915,499
Sadsbury Township	\$2,150,137,506	\$90,611	\$0	\$90,611	\$0
Salisbury Township	\$7,541,703,016	\$6,098,934	\$1,021	\$6,097,913	\$0
Strasburg Borough	\$965,120,267	\$2,760	\$0	\$2,760	\$0
Strasburg Township	\$4,508,049,956	\$10,593,993	\$476,176	\$9,384,458	\$733,359
Terre Hill Borough	\$352,866,296	\$0	\$0	\$0	\$0
Upper Leacock Township	\$12,221,244,032	\$13,929,091	\$590,392	\$7,490,795	\$5,847,905
Warwick Township	\$13,241,309,844	\$8,294,472	\$386,954	\$6,261,833	\$1,645,685
West Cocalico Township	\$3,405,206,014	\$1,470,589	\$230,091	\$1,240,498	\$0
West Donegal Township	\$7,574,423,332	\$53,907	\$39,353	\$14,555	\$0
West Earl Township	\$5,324,536,861	\$29,169,637	\$2,780,046	\$16,815,291	\$9,574,300
West Hempfield Township	\$10,809,249,135	\$2,246,192	\$436,752	\$1,809,440	\$0
West Lampeter Township	\$18,752,932,700	\$15,261,818	\$1,811,003	\$11,484,557	\$1,966,258
Lancaster County	\$427,554,965,900	\$773,937,789	\$48,879,345	\$426,452,266	\$298,606,178

Source: Hazus v6.1, Lancaster County 2023, 2024; RS Means 2024; FEMA 2016



Table 4-51. Total and Mitigated Repetitive Loss Properties in Lancaster County by Occupancy Type

Jurisdiction	Single Family		2-4 Family		Business Non-Residential		Other Residential		Non-Residential		Total	
	T	M	T	M	T	M	T	M	T	M	T	M
Adamstown Borough	0	0	0	0	0	0	0	0	0	0	0	0
Akron Borough	1	0	0	0	0	0	0	0	0	0	1	0
Bart Township	0	0	0	0	0	0	0	0	0	0	0	0
Brecknock Township	0	0	0	0	1	0	0	0	1	0	2	0
Caernarvon Township	1	0	0	0	0	0	0	0	0	0	1	0
Christiana Borough	0	0	0	0	0	0	0	0	1	0	1	0
Clay Township	1	0	0	0	0	0	0	0	0	0	1	0
Colerain Township	1	0	0	0	0	0	0	0	0	0	1	0
Columbia Borough	2	0	0	0	0	0	0	0	0	0	2	0
Conestoga Township	3	0	0	0	0	0	0	0	2	1	5	1
Conoy Township	3	0	0	0	0	0	0	0	0	0	3	0
Denver Borough	0	0	0	0	0	0	0	0	0	0	0	0
Drumore Township	2	0	0	0	0	0	0	0	0	0	2	0
Earl Township	1	1	0	0	0	0	0	0	1	0	2	1
East Cocalico Township	2	0	0	0	0	0	0	0	0	0	2	0
East Donegal Township	3	0	0	0	0	0	0	0	0	0	3	0
East Drumore Township	0	0	0	0	0	0	0	0	0	0	0	0
East Earl Township	0	0	0	0	0	0	0	0	0	0	0	0
East Hempfield Township	3	0	0	0	0	0	1	0	0	0	4	0
East Lampeter Township	2	0	0	0	2	0	1	0	3	0	8	0
East Petersburg Borough	0	0	0	0	0	0	0	0	0	0	0	0
Eden Township	0	0	0	0	0	0	0	0	0	0	0	0
Elizabeth Township	2	0	0	0	0	0	0	0	0	0	2	0
Elizabethtown Borough	0	0	0	0	1	0	0	0	0	0	1	0
Ephrata Borough	5	0	0	0	1	0	0	0	1	0	7	0
Ephrata Township	4	0	0	0	0	0	0	0	1	0	5	0
Fulton Township	0	0	0	0	1	0	0	0	0	0	1	0
Lancaster City	0	0	0	0	0	0	0	0	2	1	2	1
Lancaster Township	8	0	1	0	0	0	0	0	3	0	12	0
Leacock Township	1	1	0	0	0	0	0	0	1	1	2	2
Lititz Borough	0	0	2	0	1	0	0	0	1	0	4	0
Little Britain Township	0	0	0	0	0	0	0	0	0	0	0	0
Manheim Borough	13	2	0	0	1	0	0	0	1	0	15	2
Manheim Township	3	0	2	0	0	0	0	0	0	0	5	0
Manor Township	8	1	0	0	0	0	0	0	2	0	10	1
Marietta Borough	15	0	1	0	1	0	0	0	1	0	18	0
Martic Township	5	0	0	0	1	0	0	0	4	0	10	0
Millersville Borough	2	0	0	0	0	0	0	0	0	0	2	0
Mount Joy Borough	0	0	0	0	0	0	0	0	0	0	0	0
Mount Joy Township	0	0	0	0	0	0	0	0	1	0	1	0
Mountville Borough	0	0	0	0	0	0	0	0	0	0	0	0
New Holland Borough	0	0	0	0	0	0	0	0	0	0	0	0



Jurisdiction	Single Family		2-4 Family		Business Non-Residential		Other Residential		Non-Residential		Total	
	T	M	T	M	T	M	T	M	T	M	T	M
Paradise Township	5	0	0	0	0	0	0	0	1	0	6	0
Penn Township	1	0	0	0	0	0	0	0	2	0	3	0
Pequea Township	2	0	0	0	0	0	0	0	0	0	2	0
Providence Township	0	0	0	0	0	0	0	0	0	0	0	0
Quarryville Borough	0	0	0	0	0	0	0	0	0	0	0	0
Rapho Township	3	0	0	0	0	0	0	0	0	0	3	0
Sadsbury Township	0	0	0	0	0	0	0	0	0	0	0	0
Salisbury Township	0	0	0	0	0	0	0	0	0	0	0	0
Strasburg Borough	0	0	0	0	0	0	0	0	0	0	0	0
Strasburg Township	1	0	0	0	0	0	0	0	11	0	12	0
Terre Hill Borough	0	0	0	0	0	0	0	0	0	0	0	0
Upper Leacock Township	4	0	0	0	0	0	0	0	1	0	5	0
Warwick Township	1	0	0	0	0	0	0	0	0	0	1	0
West Cocalico Township	1	0	0	0	0	0	0	0	0	0	1	0
West Donegal Township	0	0	0	0	0	0	0	0	0	0	0	0
West Earl Township	2	0	0	0	0	0	0	0	1	1	3	1
West Hempfield Township	3	0	0	0	0	0	0	0	0	0	3	0
West Lampeter Township	7	1	2	0	0	0	0	0	1	0	10	1
<b>Lancaster County</b>	<b>121</b>	<b>6</b>	<b>8</b>	<b>0</b>	<b>10</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>43</b>	<b>3</b>	<b>184</b>	<b>10</b>

Source: FEMA 2023

Note: (T) = Total; (M) = Mitigated

**Table 4-52. Total and Mitigated Severe Repetitive Loss Properties in Lancaster County by Occupancy Type**

Jurisdiction	Single Family		2-4 Family		Business Non-Residential		Other Residential		Non-Residential		Total	
	T	M	T	M	T	M	T	M	T	M	T	M
Adamstown Borough	0	0	0	0	0	0	0	0	0	0	0	0
Akron Borough	0	0	0	0	0	0	0	0	0	0	0	0
Bart Township	0	0	0	0	0	0	0	0	0	0	0	0
Brecknock Township	0	0	0	0	0	0	0	0	0	0	0	0
Caernarvon Township	1	0	0	0	0	0	0	0	0	0	1	0
Christiana Borough	0	0	0	0	0	0	0	0	1	0	1	0
Clay Township	0	0	0	0	0	0	0	0	0	0	0	0
Colerain Township	0	0	0	0	0	0	0	0	0	0	0	0
Columbia Borough	0	0	0	0	0	0	0	0	0	0	0	0
Conestoga Township	2	0	0	0	0	0	0	0	1	0	3	0
Conoy Township	0	0	0	0	0	0	0	0	0	0	0	0
Denver Borough	0	0	0	0	0	0	0	0	0	0	0	0
Drumore Township	0	0	0	0	0	0	0	0	0	0	0	0
Earl Township	0	0	0	0	0	0	0	0	0	0	0	0
East Cocalico Township	0	0	0	0	0	0	0	0	0	0	0	0
East Donegal Township	0	0	0	0	0	0	0	0	0	0	0	0



Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

Jurisdiction	Single Family		2-4 Family		Business Non-Residential		Other Residential		Non-Residential		Total	
	T	M	T	M	T	M	T	M	T	M	T	M
East Drumore Township	0	0	0	0	0	0	0	0	0	0	0	0
East Earl Township	0	0	0	0	0	0	0	0	0	0	0	0
East Hempfield Township	0	0	0	0	0	0	0	0	0	0	0	0
East Lampeter Township	0	0	0	0	2	0	1	0	1	0	4	0
East Petersburg Borough	0	0	0	0	0	0	0	0	0	0	0	0
Eden Township	0	0	0	0	0	0	0	0	0	0	0	0
Elizabeth Township	0	0	0	0	0	0	0	0	0	0	0	0
Elizabethtown Borough	0	0	0	0	0	0	0	0	0	0	0	0
Ephrata Borough	1	0	0	0	0	0	0	0	0	0	1	0
Ephrata Township	0	0	0	0	0	0	0	0	1	0	1	0
Fulton Township	0	0	0	0	0	0	0	0	0	0	0	0
Lancaster City	0	0	0	0	0	0	0	0	1	0	1	0
Lancaster Township	6	0	0	0	0	0	0	0	0	0	6	0
Leacock Township	1	1	0	0	0	0	0	0	1	1	2	2
Lititz Borough	0	0	0	0	0	0	0	0	0	0	0	0
Little Britain Township	0	0	0	0	0	0	0	0	0	0	0	0
Manheim Borough	0	0	0	0	0	0	0	0	0	0	0	0
Manheim Township	1	0	0	0	0	0	0	0	0	0	1	0
Manor Township	1	0	0	0	0	0	0	0	0	0	1	0
Marietta Borough	0	0	0	0	0	0	0	0	0	0	0	0
Martic Township	0	0	0	0	0	0	0	0	0	0	0	0
Millersville Borough	0	0	0	0	0	0	0	0	0	0	0	0
Mount Joy Borough	0	0	0	0	0	0	0	0	0	0	0	0
Mount Joy Township	0	0	0	0	0	0	0	0	0	0	0	0
Mountville Borough	0	0	0	0	0	0	0	0	0	0	0	0
New Holland Borough	0	0	0	0	0	0	0	0	0	0	0	0
Paradise Township	1	0	0	0	0	0	0	0	0	0	1	0
Penn Township	0	0	0	0	0	0	0	0	0	0	0	0
Pequea Township	1	0	0	0	0	0	0	0	0	0	1	0
Providence Township	0	0	0	0	0	0	0	0	0	0	0	0
Quarryville Borough	0	0	0	0	0	0	0	0	0	0	0	0
Rapho Township	0	0	0	0	0	0	0	0	0	0	0	0
Sadsbury Township	0	0	0	0	0	0	0	0	0	0	0	0
Salisbury Township	0	0	0	0	0	0	0	0	0	0	0	0
Strasburg Borough	0	0	0	0	0	0	0	0	0	0	0	0
Strasburg Township	1	0	0	0	0	0	0	0	4	0	5	0
Terre Hill Borough	0	0	0	0	0	0	0	0	0	0	0	0
Upper Leacock Township	0	0	0	0	0	0	0	0	1	0	1	0
Warwick Township	0	0	0	0	0	0	0	0	0	0	0	0
West Cocalico Township	0	0	0	0	0	0	0	0	0	0	0	0
West Donegal Township	0	0	0	0	0	0	0	0	0	0	0	0
West Earl Township	1	0	0	0	0	0	0	0	0	0	1	0
West Hempfield Township	0	0	0	0	0	0	0	0	0	0	0	0
West Lampeter Township	2	1	2	0	0	0	0	0	0	0	4	1





Jurisdiction	Single Family		2-4 Family		Business Non-Residential		Other Residential		Non-Residential		Total	
	T	M	T	M	T	M	T	M	T	M	T	M
Lancaster County	19	2	2	0	2	0	1	0	11	1	35	3

Source: FEMA 2023

Note: (T) = Total; (M) = Mitigated

Table 4-53. Repetitive and Severe Loss Properties and NFIP Data in Lancaster County

Jurisdiction	Total Number of Policies	Total Premium	Total Claims	Total Payments	Number of RL Properties	Number of SRL Properties
Adamstown Borough	2	\$1,099	1	\$1,274	0	0
Akron Borough	2	\$4,181	8	\$170,759	1	0
Bart Township	0	\$0	1	\$390	0	0
Brecknock Township	5	\$10,028	13	\$125,569	2	0
Caernarvon Township	1	\$526	5	\$40,456	1	1
Christiana Borough	3	\$11,419	14	\$468,021	1	1
Clay Township	11	\$11,298	4	\$25,190	1	0
Colerain Township	3	\$1,770	3	\$9,337	1	0
Columbia Borough	8	\$11,349	31	\$329,997	2	0
Conestoga Township	7	\$10,381	52	\$343,436	5	3
Conoy Township	11	\$8,481	17	\$258,038	3	0
Denver Borough	17	\$20,601	13	\$246,066	0	0
Drumore Township	2	\$5,204	12	\$94,401	2	0
Earl Township	4	\$2,849	8	\$34,813	2	0
East Cocalico Township	17	\$13,782	27	\$481,378	2	0
East Donegal Township	9	\$10,142	23	\$683,215	3	0
East Drumore Township	2	\$2,324	0	\$0	0	0
East Earl Township	5	\$3,251	0	\$0	0	0
East Hempfield Township	38	\$48,096	77	\$909,199	4	0
East Lampeter Township	32	\$56,960	66	\$2,233,555	8	4
East Petersburg Borough	2	\$862	3	\$47,339	0	0
Eden Township	1	\$946	3	\$12,477	0	0
Elizabeth Township	4	\$3,809	8	\$407,818	2	0
Elizabethtown Borough	14	\$18,196	21	\$329,638	1	0
Ephrata Borough	45	\$56,849	90	\$2,636,195	7	1
Ephrata Township	16	\$26,514	34	\$1,033,447	5	1
Fulton Township	4	\$2,359	4	\$57,645	1	0
Lancaster City	84	\$91,955	97	\$1,304,743	2	1
Lancaster Township	26	\$61,533	95	\$1,478,394	12	6
Leacock Township	2	\$8,091	26	\$202,668	2	2
Lititz Borough	32	\$83,792	58	\$1,379,647	4	0
Little Britain Township	5	\$6,373	3	\$509	0	0
Manheim Borough	46	\$64,749	145	\$3,304,504	15	0
Manheim Township	59	\$63,145	58	\$664,666	3	1
Manor Township	29	\$29,761	103	\$1,481,023	12	1



Jurisdiction	Total Number of Policies	Total Premium	Total Claims	Total Payments	Number of RL Properties	Number of SRL Properties
Marietta Borough	47	\$70,682	154	\$2,911,140	18	0
Martic Township	4	\$2,738	36	\$431,027	10	0
Millersville Borough	3	\$1,518	0	\$0	0	0
Mount Joy Borough	10	\$6,103	16	\$453,640	2	0
Mount Joy Township	8	\$4,477	9	\$274,873	1	0
Mountville Borough	0	\$0	0	\$0	0	0
New Holland Borough	0	\$0	0	\$0	0	0
Paradise Township	5	\$15,888	39	\$253,255	6	1
Penn Township	13	\$29,852	19	\$1,171,681	1	0
Pequea Township	4	\$2,684	16	\$186,027	4	1
Providence Township	7	\$5,623	4	\$2,733	0	0
Quarryville Borough	3	\$2,100	3	\$3,418	0	0
Rapho Township	16	\$17,857	22	\$368,936	3	0
Sadsbury Township	1	\$683	2	\$5,185	0	0
Salisbury Township	0	\$0	0	\$0	0	0
Strasburg Borough	0	\$0	0	\$0	0	0
Strasburg Township	4	\$8,436	157	\$1,607,876	12	5
Terre Hill Borough	0	\$0	0	\$0	0	0
Upper Leacock Township	10	\$8,447	16	\$156,623	5	1
Warwick Township	14	\$9,459	18	\$189,339	1	0
West Cocalico Township	12	\$15,717	15	\$187,930	1	0
West Donegal Township	7	\$5,299	3	\$49,090	0	0
West Earl Township	16	\$19,736	30	\$392,413	3	1
West Hempfield Township	14	\$19,355	25	\$230,540	3	0
West Lampeter Township	17	\$11,656	92	\$559,621	10	4
<b>Lancaster County</b>	<b>763</b>	<b>\$1,010,985</b>	<b>1,799</b>	<b>\$30,231,153.57</b>	<b>184</b>	<b>35</b>

Source: FEMA 2023

### Community Lifelines and Other Critical Facilities

Critical services during and after a flood event may not be available if community lifelines and other critical facilities are directly impacted. Flood impacts can lead to isolation caused by roads and bridges being washed out or blocked by water or debris, health problems caused by water and sewer systems that are flooded or backed up, drinking water contamination caused by floodwaters carrying pollutants to water supplies, and localized urban flooding caused by culverts blocked with debris.

Oversaturated soils from periods of heavy rain and flooding may cause utility poles to tip over or fall completely, interrupting the power grid for a large area, especially if a transformer is impacted. Flooded buildings may have their utilities disrupted if the service panel, generator, meter, etc. are not elevated above the flood protection level. Floods can have harmful effects on the water supply (Andrew 2021):

- **Water Supply Contamination**—Floodwater can contaminate private drinking water sources, such as wells and springs. Floodwater picks up debris, increasing the number of bacteria, sewage, and other industrial waste and chemicals into the water source. Excess water also makes it more difficult for water treatment plants to treat the water effectively. Contamination at any step of the water flow process puts consumers at risk of toxins that could result in serious harm, such as wound infections, skin rashes, gastrointestinal illnesses, and tetanus. In extreme cases, death may occur.



- Disruption to Clean Drinking and Cooking Water—In the event of only having access to contaminated water, consumers are unable to cook or clean in their home until the water is certified as safe. Depending on the severity of the flood and the storm, this could take days, weeks, months and in some cases even years. Without access to clean drinking and cooking water, consumers ultimately become reliant on bottled water. In impoverished communities, those affected may not have the economic means to stock up on bottled water. Moreover, in a flood, retail locations are often inaccessible and/or low on water supply.

Table 4-54 summarizes community lifelines and other critical facilities located within the flood hazard areas: 311 within the 1 percent annual chance flood hazard area and 422 within the 0.2 percent annual chance flood hazard area.

**Table 4-54. Lifeline Facility Exposure to the Flood Hazard**

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located in the 1 percent Annual Chance Flood Event Hazard Area	Number of Lifelines Located in the 0.2 percent Annual Chance Flood Event Hazard Area
Communications	149	5	5
Energy	70	2	6
Food, Hydration, Shelter	12	0	0
Hazardous Materials	731	39	56
Health and Medical	1,147	8	26
Safety and Security	1,340	40	49
Transportation	44	30	30
Water Systems	449	55	69
Other Critical Facilities	2,534	132	181
<b>Total</b>	<b>6,476</b>	<b>311</b>	<b>422</b>

Source: Lancaster County 2008, 2019, 2023; HIFLD 2022, 2023; National Park Service; National Register of Historic Places; FEMA 2016

### Economy

Economic impacts of flooding include general building stock damage, agricultural losses, business interruption, and impacts on tourism and tax base. In areas that are directly flooded, renovations of commercial and industrial buildings may be necessary, disrupting associated services. Damage to general building stock can be quantified by use of Hazus as discussed above. Other economic components such as loss of facility use, functional downtime, and social economic factors are less able to be measured with a high degree of certainty.

The 2022 USDA Agricultural Census showed that Lancaster County had 19 percent of Pennsylvania’s agricultural sales—\$1.8 million including livestock, poultry, and products. Roughly \$270,000 was spent in Lancaster County on repairs, supplies, and maintenance costs for farm production expenses, a 27 percent increase from 2017. It can be anticipated that following a flood event, the cost for supplies to repair and maintain equipment will increase (USDA 2022).

Debris management may also be a large expense after a flood event. Hazus estimates the amount of debris generated from a 1 percent annual chance flood event. The model breaks down debris into three categories because of the different types of equipment needed to handle debris:

- Finishes (dry wall, insulation, etc.)
- Structural (wood, brick, etc.)
- Foundations (concrete slab and block, rebar, etc.).



Table 4-55 summarizes the debris Hazus estimates from a 1 percent annual chance flood event. This table only estimates structural debris generated by flooding and does not include non-structural debris or additional potential damage and debris possibly generated by wind that may be associated with a flood event or storm that causes flooding. Overall, Hazus estimates about 58,000 tons of debris.

**Table 4-55. Estimated Debris Generated from the 1 Percent Annual Chance Flood Event**

Jurisdiction	1 percent Annual Chance Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Adamstown Borough	9.5	7.7	1.1	0.7
Akron Borough	8.3	5.8	1.5	1.0
Bart Township	15.7	13.8	1.1	0.9
Brecknock Township	31.6	27.2	2.6	1.8
Caernarvon Township	11.8	11.6	<0.1	0.1
Christiana Borough	71.1	69.1	1.2	0.8
Clay Township	22.4	21.0	0.7	0.7
Colerain Township	6.0	5.4	0.3	0.3
Columbia Borough	308.9	178.5	71.9	58.5
Conestoga Township	115.9	43.7	39.2	33.1
Conoy Township	91.9	41.1	28.3	22.5
Denver Borough	137.5	134.4	1.9	1.2
Drumore Township	11.7	3.7	4.1	3.9
Earl Township	25.4	23.5	1.1	0.8
East Cocalico Township	106.4	72.3	20.2	13.9
East Donegal Township	75.9	39.9	21.0	15.0
East Drumore Township	1.9	1.8	<0.1	0.1
East Earl Township	124.1	118.6	2.5	3.0
East Hempfield Township	434.9	233.5	138.7	62.7
East Lampeter Township	44,892.4	1,910.3	24,540.9	18,441.2
East Petersburg Borough	1.7	1.7	0.0	0.0
Eden Township	2.2	1.8	0.3	0.2
Elizabeth Township	2.8	1.9	0.2	0.6
Elizabethtown Borough	131.8	131.6	0.1	0.1
Ephrata Borough	938.0	860.7	42.8	34.6
Ephrata Township	169.0	122.9	26.9	19.2
Fulton Township	2.0	1.9	<0.1	0.1
Lancaster City	1,866.4	675.2	655.8	535.4
Lancaster Township	969.5	381.5	330.9	257.2
Leacock Township	74.0	64.7	5.3	3.9
Lititz Borough	272.5	272.4	<0.1	<0.1
Little Britain Township	28.7	5.7	13.1	9.9
Manheim Borough	725.2	680.2	19.8	25.3
Manheim Township	820.4	283.9	286.9	249.6
Manor Township	592.6	268.4	187.6	136.5
Marietta Borough	1,480.7	1,025.9	239.8	215.0
Martic Township	113.3	37.4	44.1	31.9
Millersville Borough	2.6	2.6	0.0	0.0
Mount Joy Borough	91.1	68.4	13.0	9.8



Jurisdiction	1 percent Annual Chance Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Mount Joy Township	13.0	11.8	0.5	0.7
Mountville Borough	1.3	1.3	0.0	0.0
New Holland Borough	0.0	0.0	0.0	0.0
Paradise Township	214.2	148.8	38.0	27.4
Penn Township	52.4	46.8	2.8	2.8
Pequea Township	55.8	29.2	15.3	11.3
Providence Township	65.3	27.1	22.2	16.1
Quarryville Borough	124.0	70.0	32.1	21.9
Rapho Township	281.6	78.2	119.2	84.2
Sadsbury Township	0.5	0.5	0.0	0.0
Salisbury Township	11.8	11.5	0.1	0.2
Strasburg Borough	0.1	0.1	0.0	0.0
Strasburg Township	122.9	59.2	36.2	27.5
Terre Hill Borough	0.0	0.0	0.0	0.0
Upper Leacock Township	404.9	61.2	196.7	147.0
Warwick Township	173.3	31.5	80.8	61.0
West Cocalico Township	26.4	25.8	0.2	0.4
West Donegal Township	12.9	12.7	0.1	0.1
West Earl Township	911.0	256.6	377.8	276.6
West Hempfield Township	90.4	29.5	35.1	25.8
West Lampeter Township	418.7	142.8	162.1	113.7
<b>Lancaster County</b>	<b>57,768.1</b>	<b>8,896.2</b>	<b>27,863.9</b>	<b>21,007.9</b>

Source: Hazus v6.1, Lancaster County 2023, 2024; FEMA 2016

### Environment

The environmental impacts of a flood can include significant water quality and debris disposal issues. Floodwaters can back up sanitary sewer systems and inundate wastewater treatment plants, causing raw sewage to contaminate the flooded waterway. The contents of unsecured containers of oil, fertilizers, pesticides, and other chemicals get added to floodwaters. Hazardous materials may be released and distributed widely across the floodplain. After floodwaters subside, contaminated and flood-damaged building materials and contents must be properly disposed of. Contaminated sediment must be removed from buildings, yards, and properties. In addition, severe erosion is likely; such erosion can negatively impact local ecosystems. Severe flooding will affect natural areas and can ultimately be disruptive to species that reside in them.

### Future Changes That May Impact Vulnerability

#### Projected Development

Flood events may increase in frequency or severity as land use changes, more structures are built, and impervious surfaces expand. As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by a flood event if the structures are located within the flood hazard area and mitigation measures are not considered. Therefore, it is the intention of the county and all participating municipalities to discourage development in flood hazard areas or to encourage higher regulatory standards at the local level.

In accordance with the 1978 Pennsylvania Stormwater Management Act (Act 167), counties are required to prepare stormwater management plans on a watershed-by-watershed basis that provide for improved



management of stormwater impacts associated with development of land. In 2013, Lancaster County developed and implemented “Blueprints—An Integrated Water Resources Plan for Lancaster County,” which is the water resource element to the County’s Comprehensive Plan that promotes watershed-based planning and management. The plan also serves as the County’s stormwater management plan in accordance with Act 167. The main five goals of the plan are as follows:

- Provide water, sewer, and stormwater infrastructure to accommodate 85 percent of future growth in urban growth areas
- Deliver essential infrastructure services to both urban and rural settlements in a cost-effective manner.
- Reduce the number of miles of impaired streams.
- Institutionalize integrated water resources management in Lancaster County.
- Increase the use of green infrastructure in water resources management.

The Lancaster County Planning Department, in collaboration with the Lancaster Clean Water Partners, Lancaster County Conservation District, and consultants HRG and LandStudies, is working on updating their plan, Lancaster County Act 167 Stormwater Management Plan, phase two of the initial planning process is taking place January 2025. The Lancaster County Planning Department,

### Projected Changes in Population

As more people move into flood zones, an increased amount of the population will be vulnerable to flood hazards. Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

Flood extents for the 1 percent and 0.2 percent annual chance flood event will continue to evolve alongside natural occurrences such as climate change. The May 2021 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures and precipitation in the 21st century. An increase in variability of temperature and precipitation may lead to increased frequency and/or severity of storm events. Summer floods and general stream flow variability are projected to increase because of increased variability in precipitation.

Even with the anticipated increase in winter precipitation as rain rather than snow, increased winter temperatures and a reduced snowpack may decrease rain-on-snow events and thus major flooding events in Pennsylvania. This conclusion, however, remains speculative until further studies can validate it. Future improvements in modeling smaller-scale climatic processes are expected and will lead to improved understanding of how the changing climate will alter temperature, precipitation, storms, and flood events in Pennsylvania (Commonwealth of Pennsylvania 2021).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

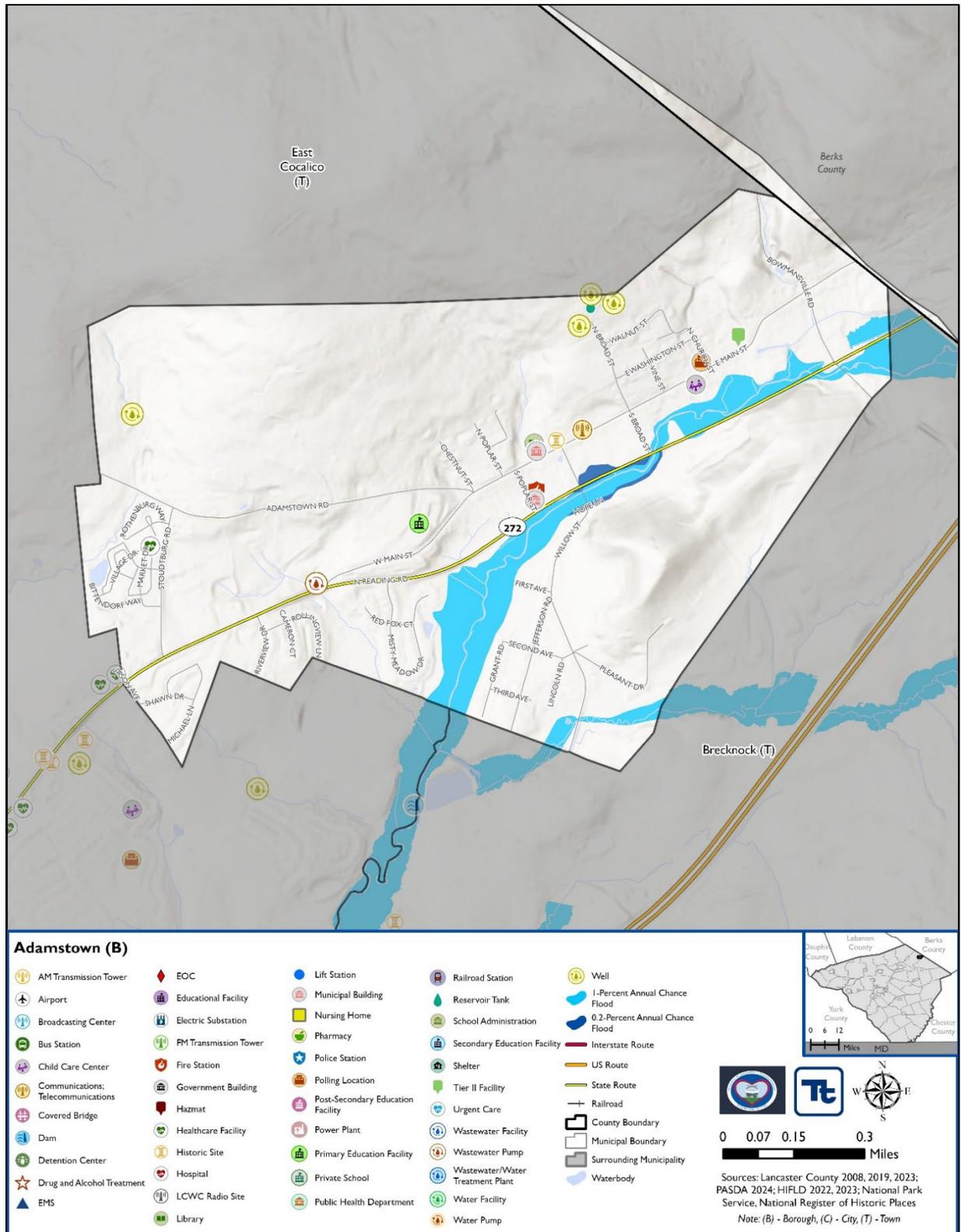
Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county.

Lancaster County will work to update building and critical facility inventories to develop more precise modeling of flood impacts in future updates.



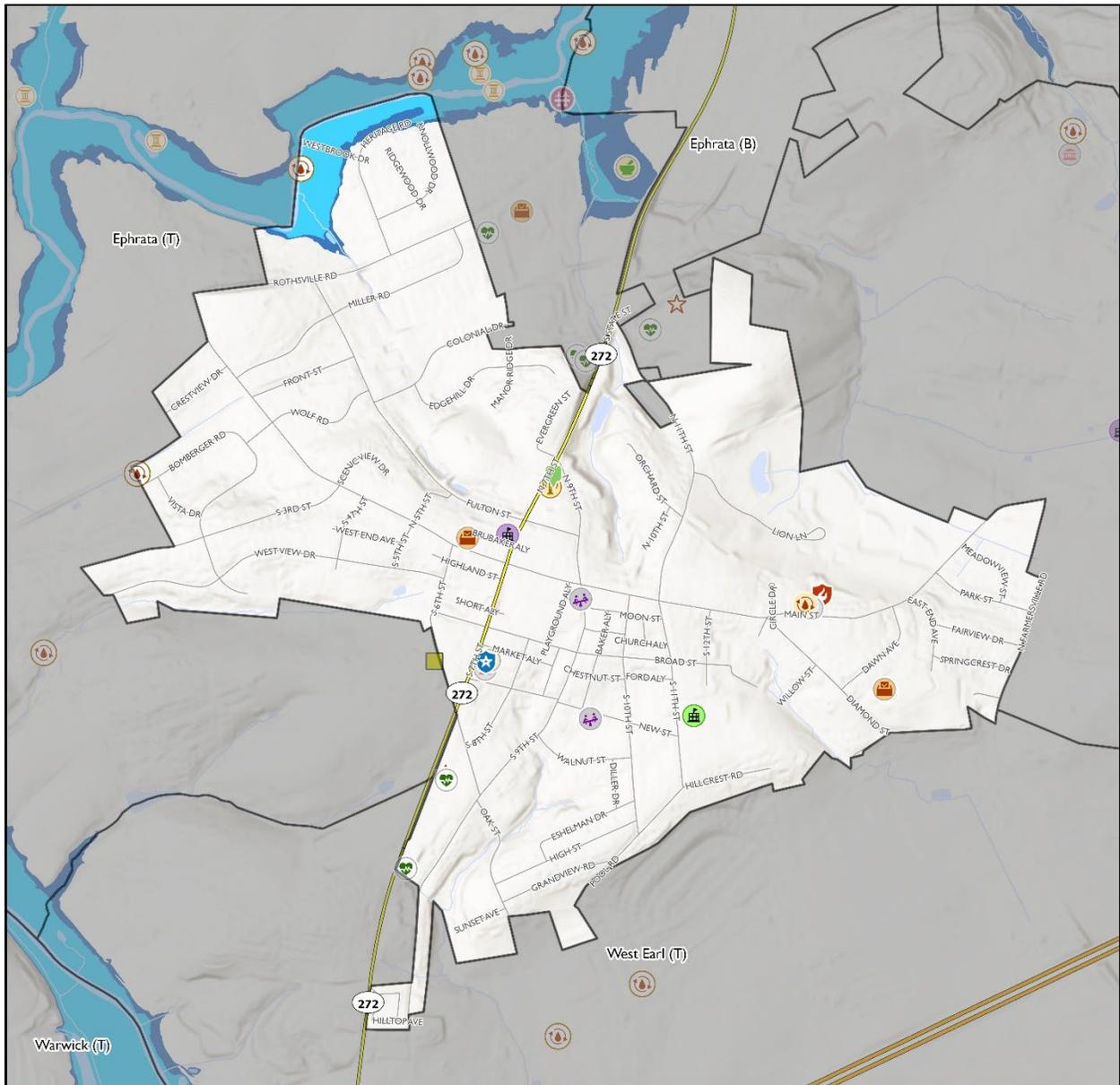
### Jurisdictional Flood Hazard Maps

#### Adamstown Borough



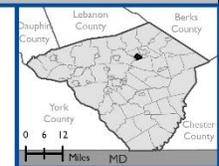


Akron Borough



Akron (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| EMS                                | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
|                                    | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |

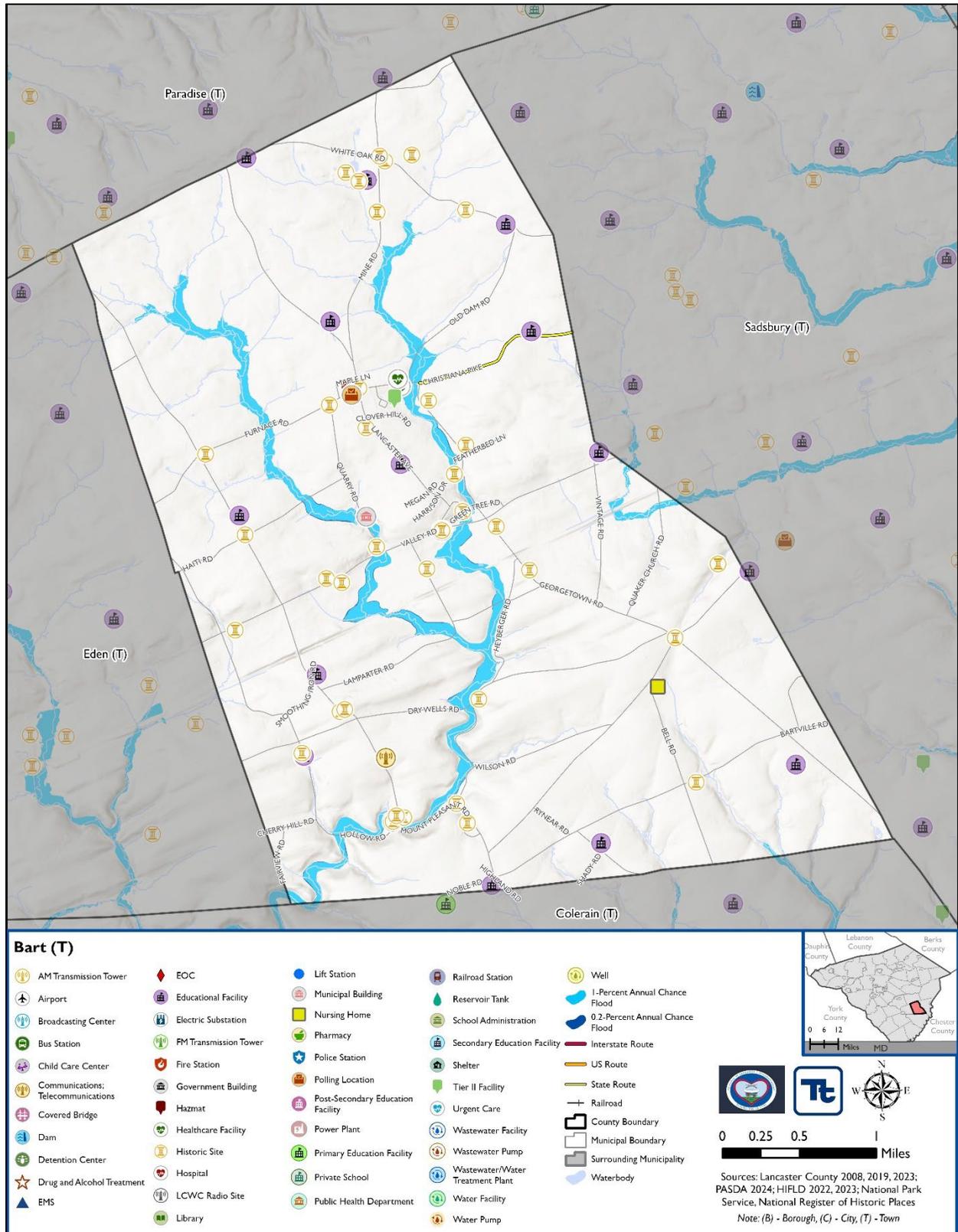


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



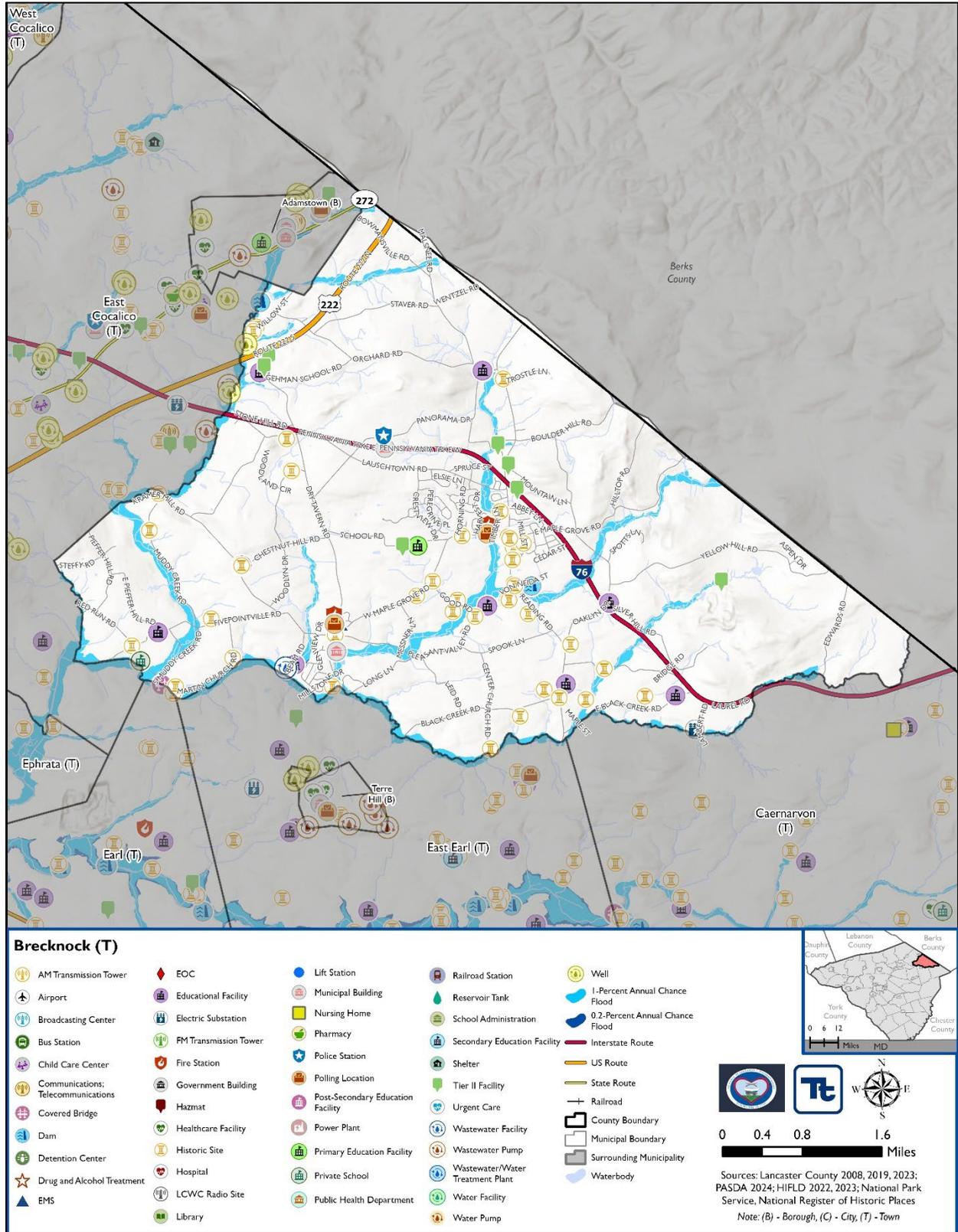


Bart Township



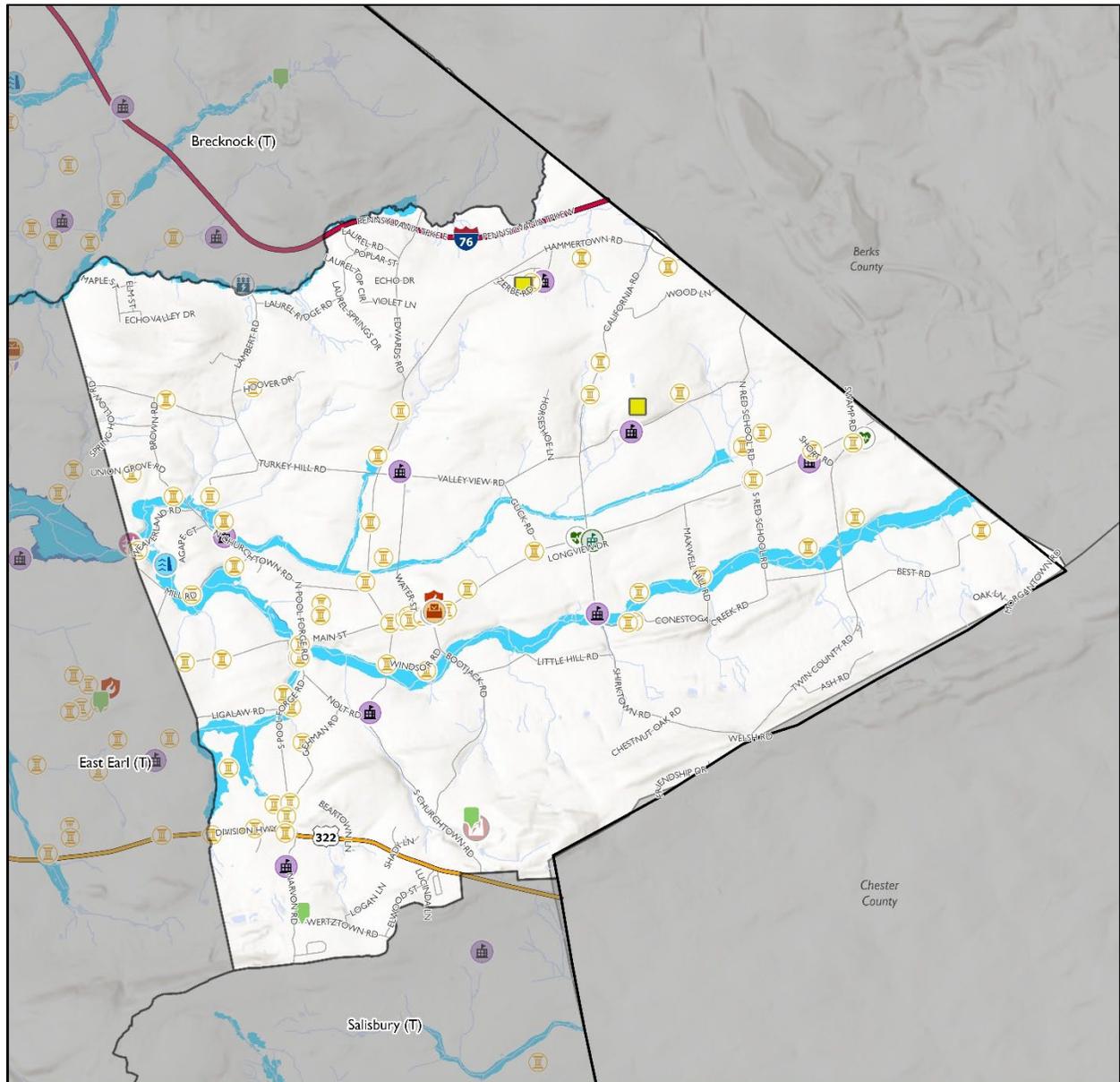


Brecknock Township





### Caernarvon Township



**Caernarvon (T)**

AM Transmission Tower	EOC	Lift Station	Railroad Station	Well
Airport	Educational Facility	Municipal Building	Reservoir Tank	1-Percent Annual Chance Flood
Broadcasting Center	Electric Substation	Nursing Home	School Administration	0.2-Percent Annual Chance Flood
Bus Station	FM Transmission Tower	Pharmacy	Secondary Education Facility	Interstate Route
Child Care Center	Fire Station	Police Station	Shelter	US Route
Communications; Telecommunications	Government Building	Polling Location	Tier II Facility	State Route
Covered Bridge	Hazard	Post-Secondary Education Facility	Urgent Care	Railroad
Dam	Healthcare Facility	Power Plant	Wastewater Facility	County Boundary
Detention Center	Historic Site	Primary Education Facility	Wastewater Pump	Municipal Boundary
Drug and Alcohol Treatment	Hospital	Private School	Wastewater/Water Treatment Plant	Surrounding Municipality
EMS	LCWC Radio Site	Public Health Department	Water Facility	Waterbody
Library	Water Pump			

0 0.33 0.65 1.3 Miles

Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places

Note: (B) - Borough, (C) - City, (T) - Town

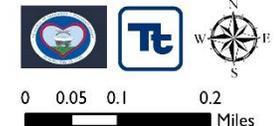
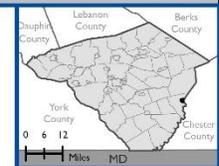


Christiana Borough



Christiana (B)

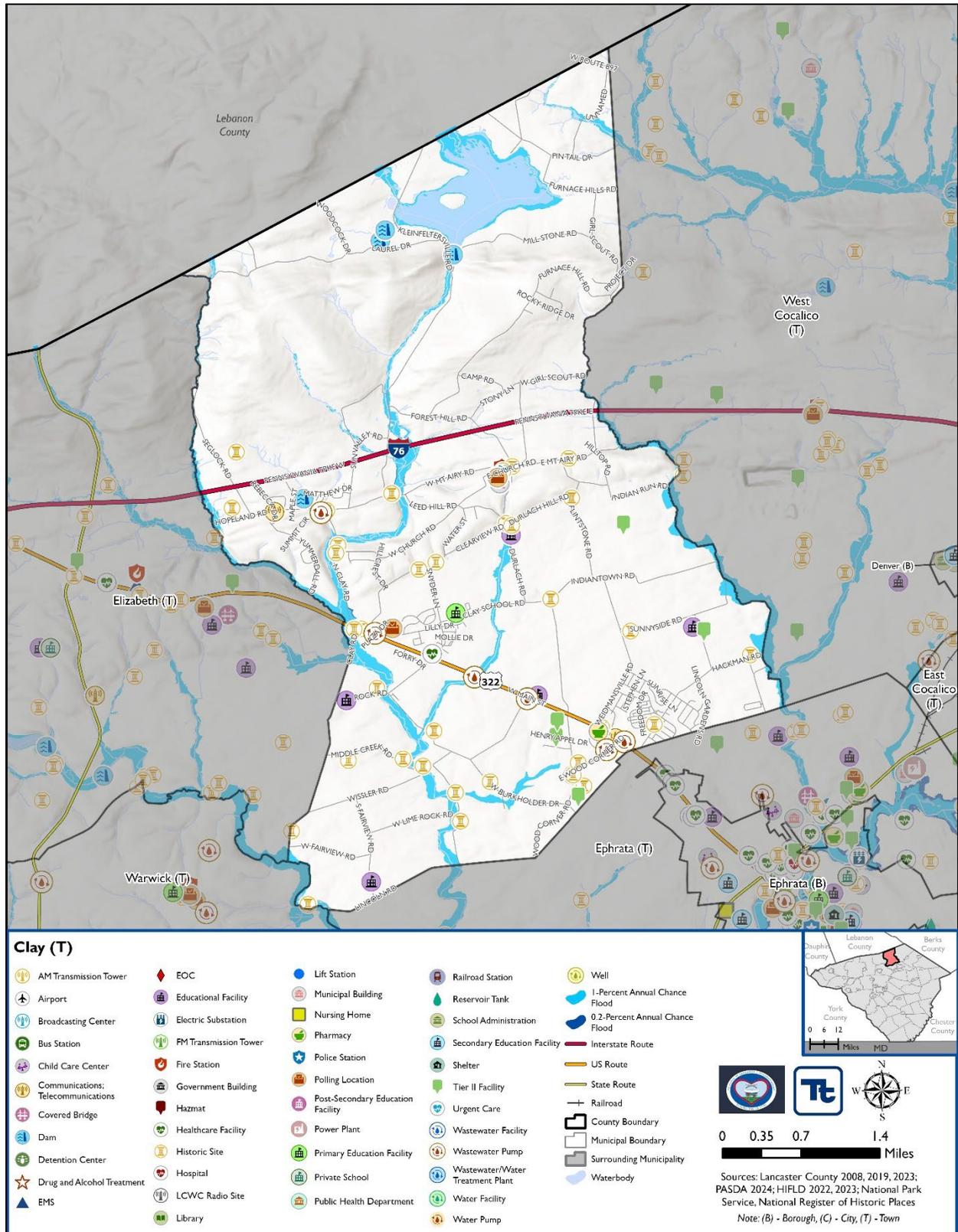
- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |



Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town

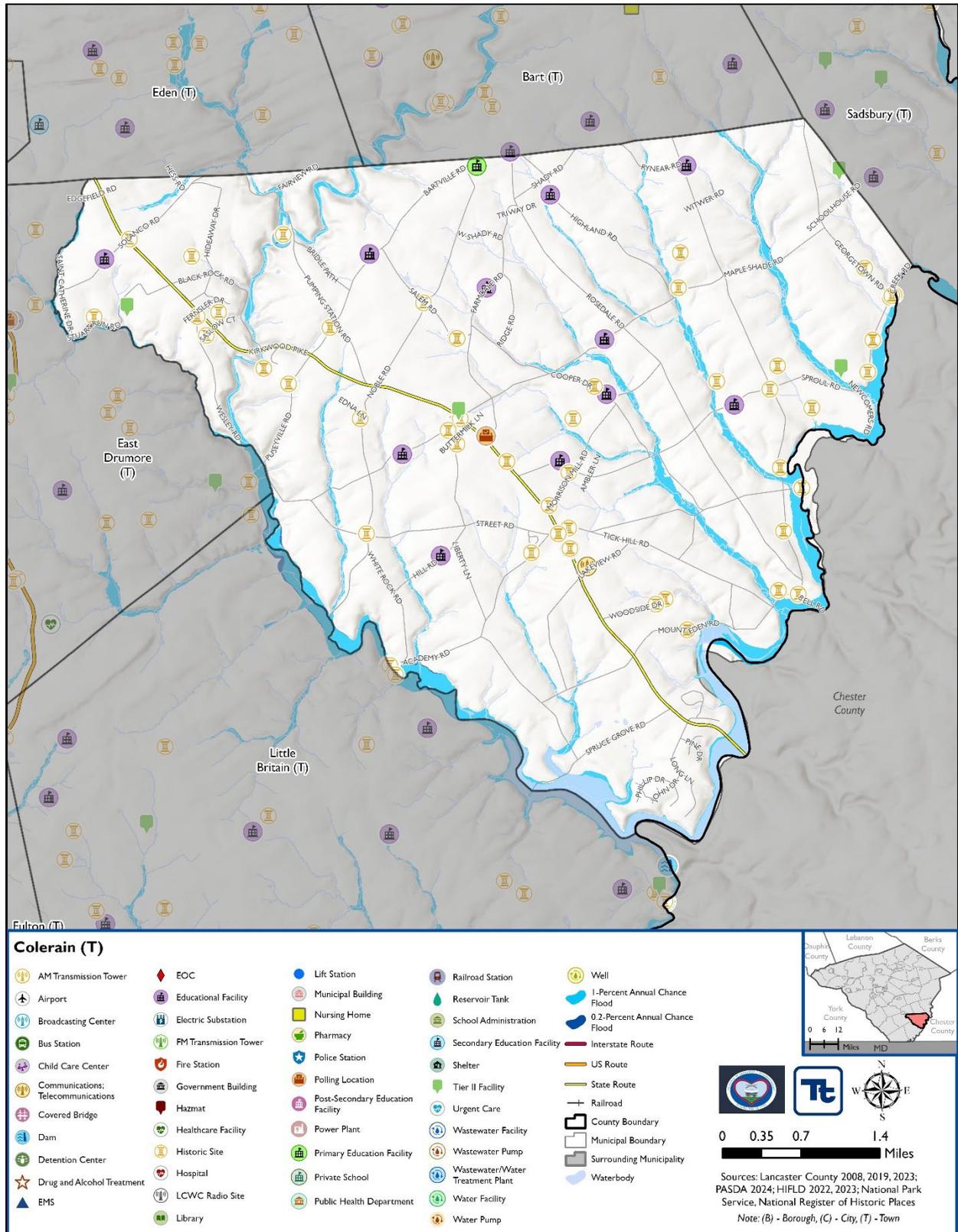


Clay Township





Colerain Township



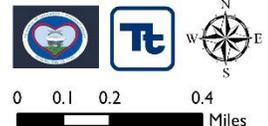
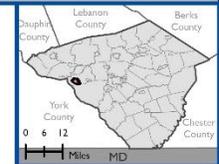


Columbia Borough



Columbia (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |



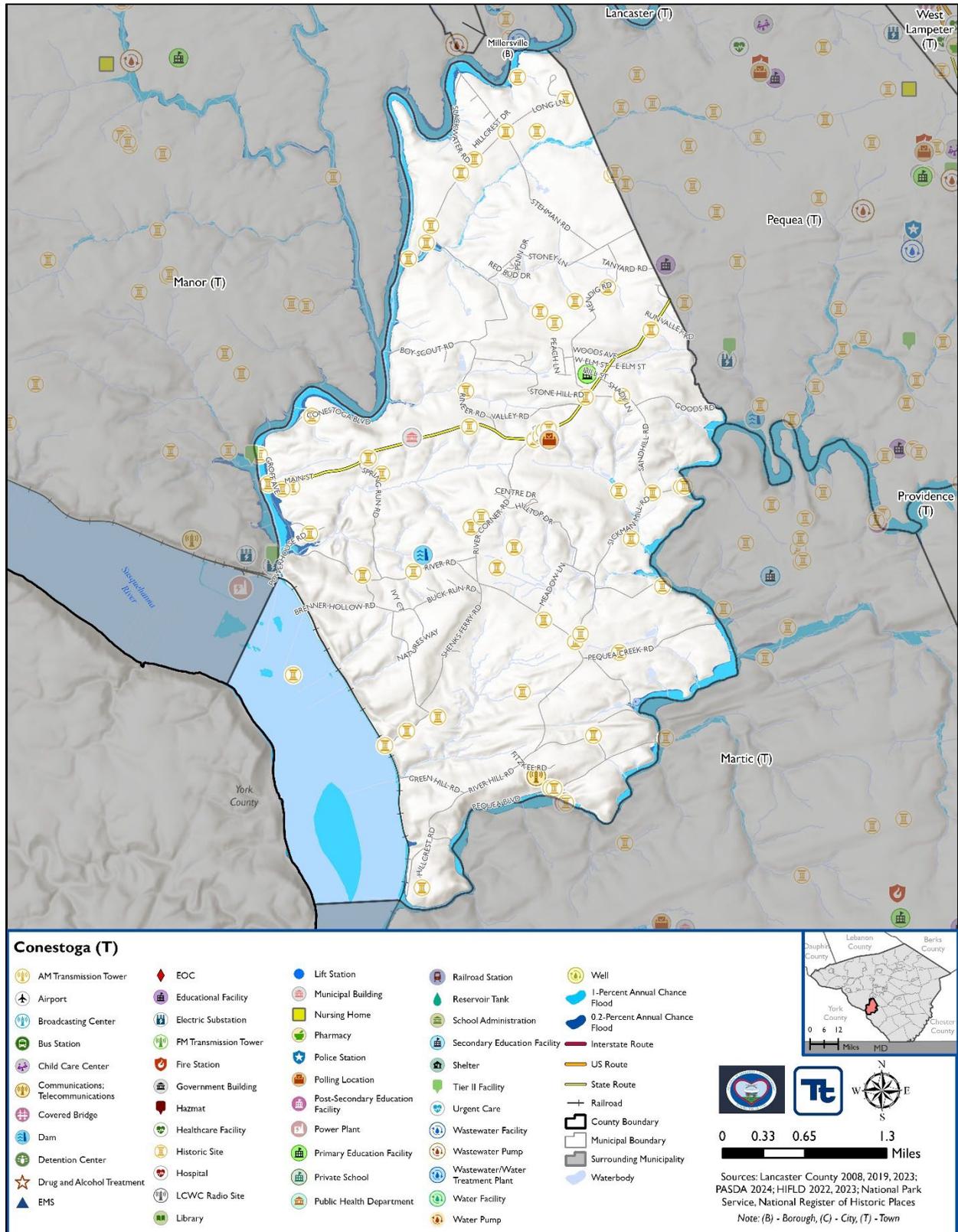
Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town





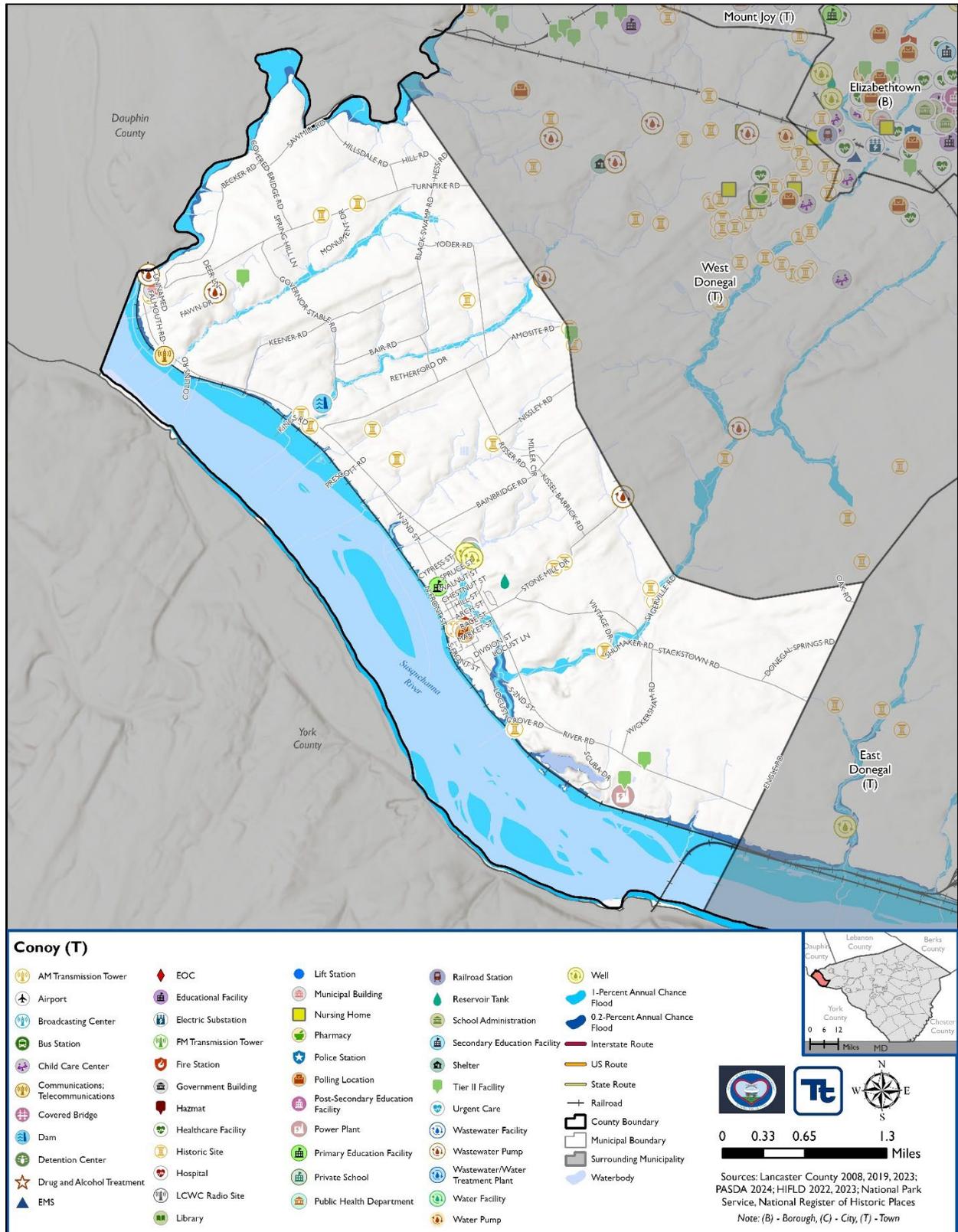
Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

Conestoga Township



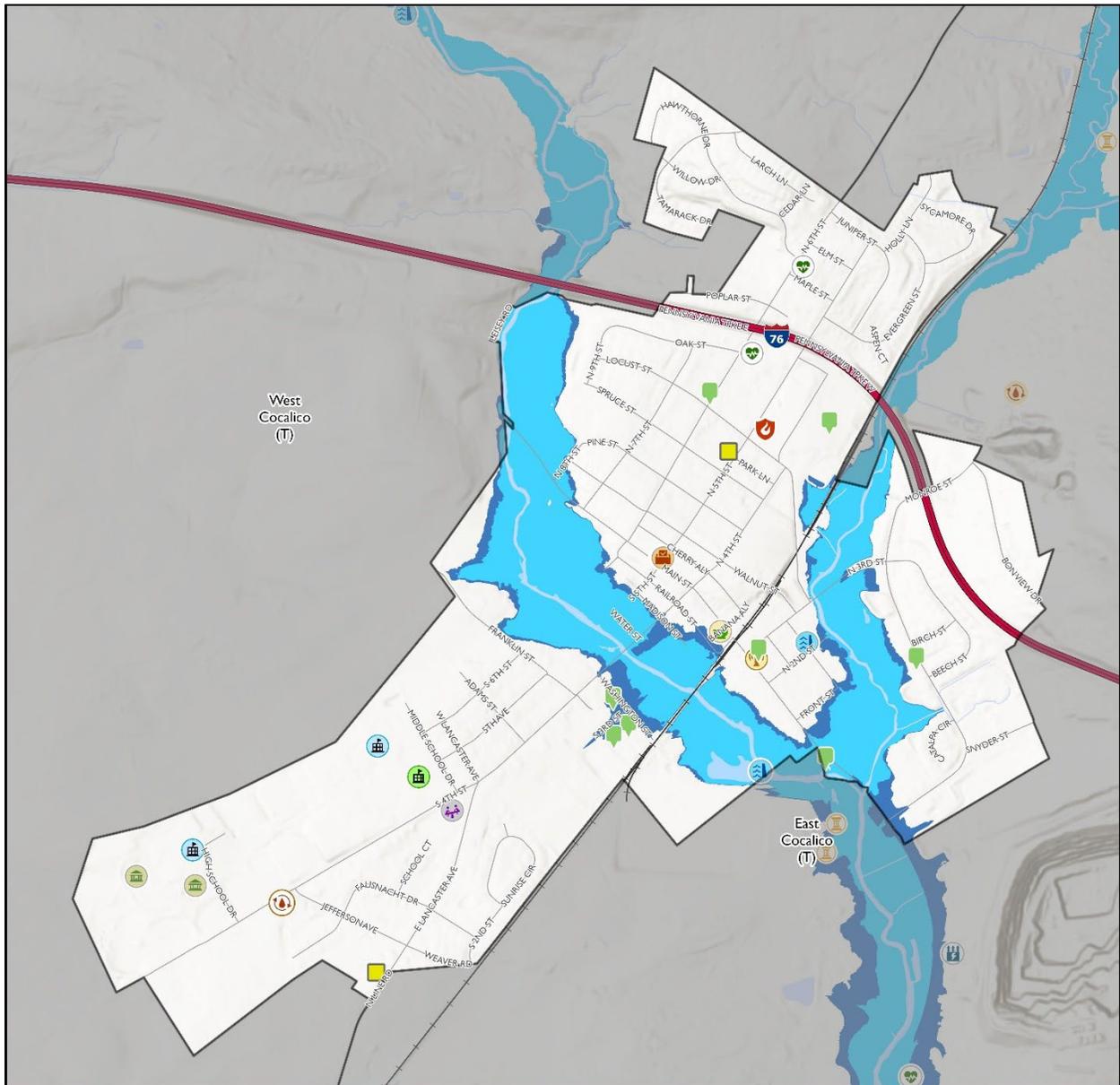


Conoy Township



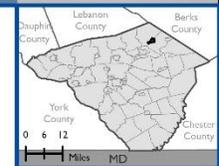


Denver Borough



Denver (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Private School                    | Wastewater/Water Treatment Plant | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Public Health Department          | Water Facility                   | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Water Pump                        | Waterbody                        |                                 |
| Library                            |                       |                                   |                                  |                                 |

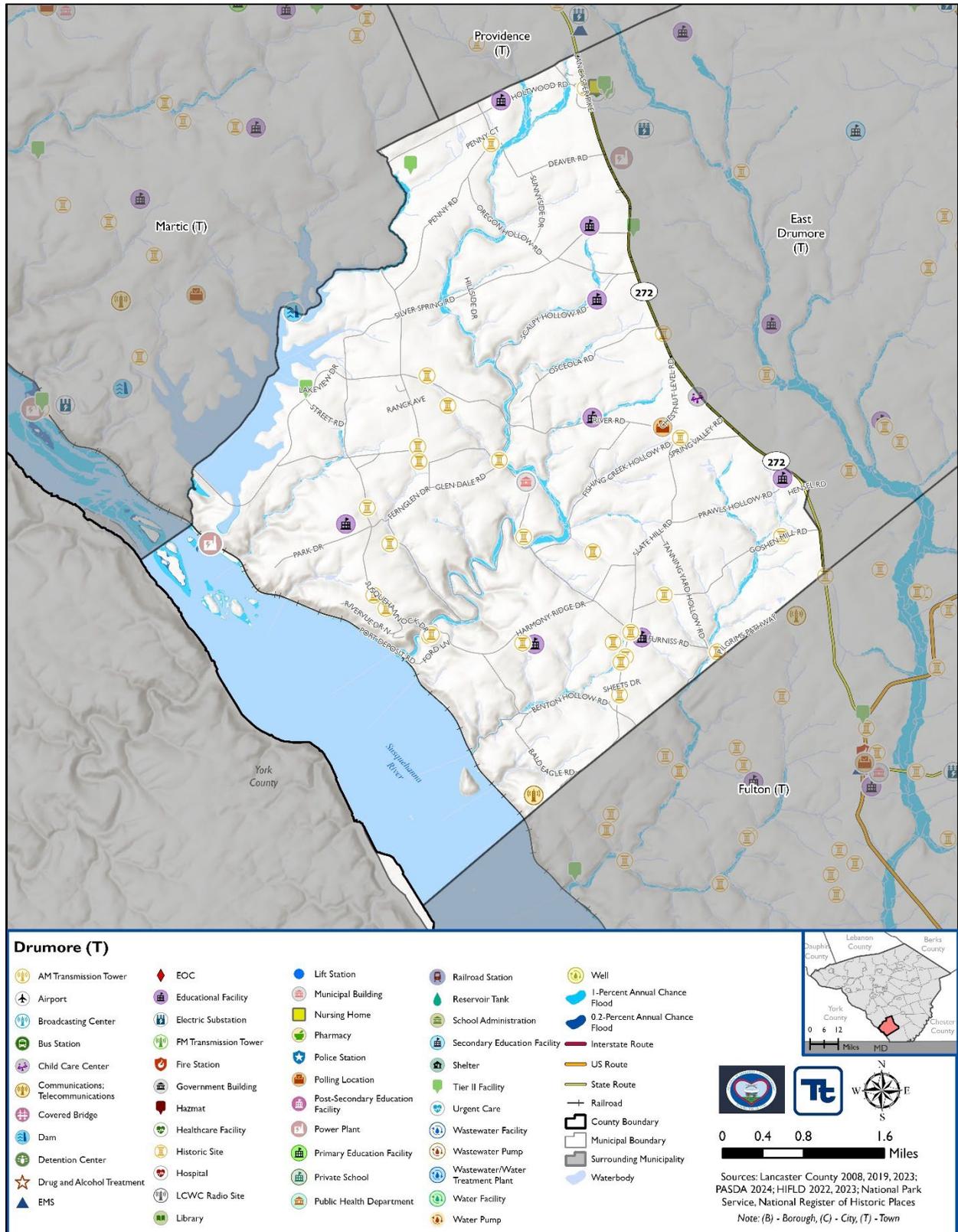


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
 Note: (B) - Borough, (C) - City, (T) - Town



Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

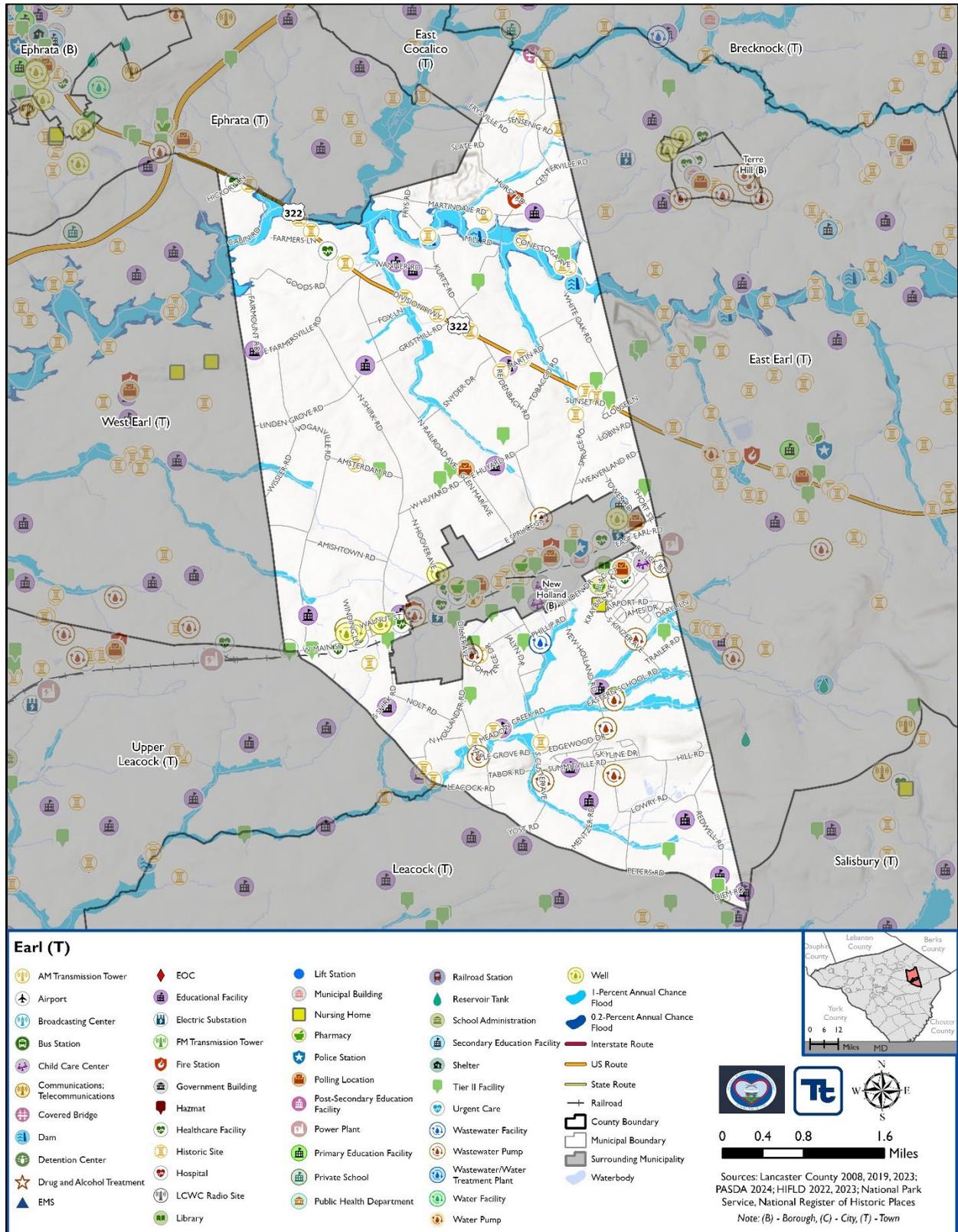
Drumore Township





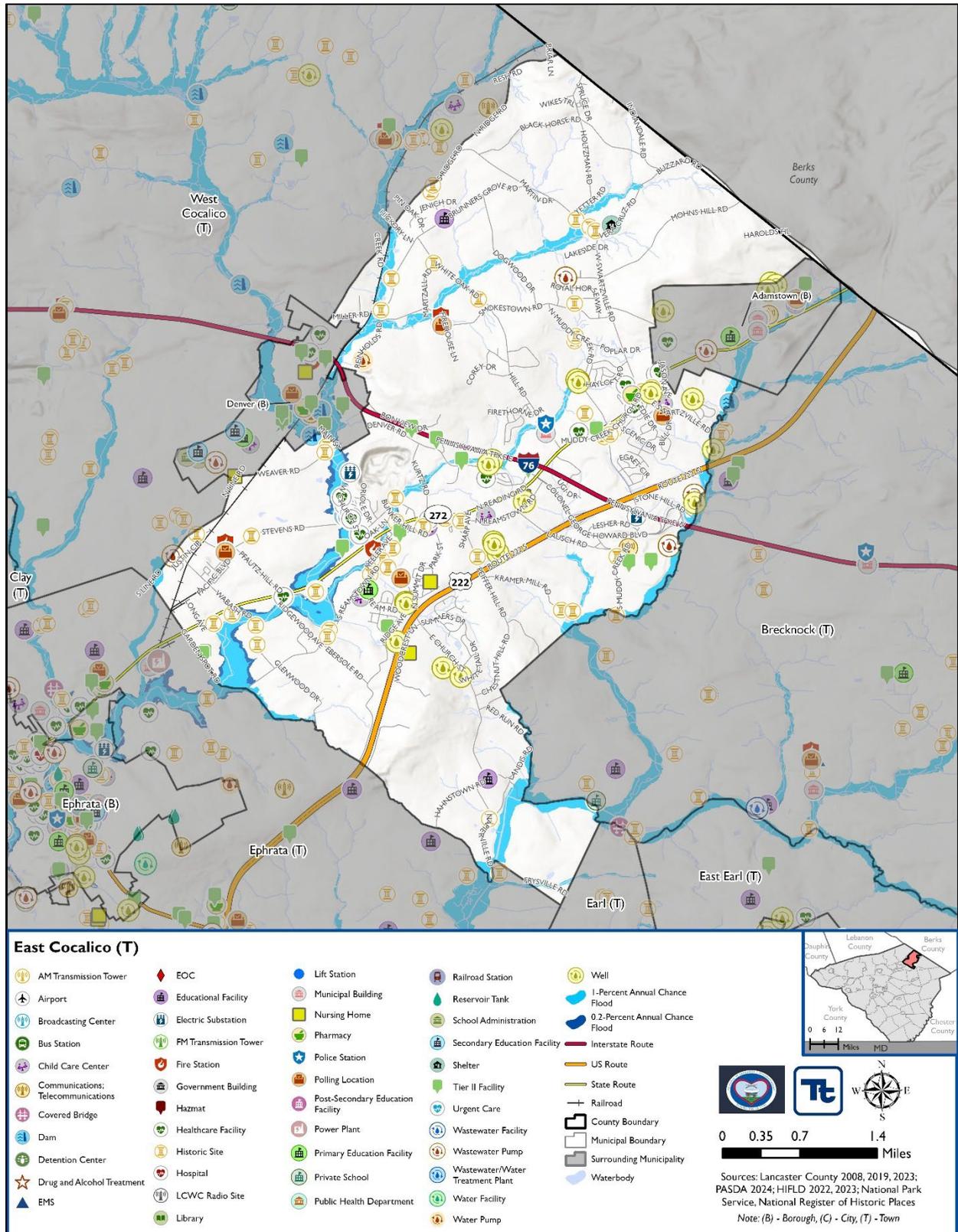
Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

Earl Township



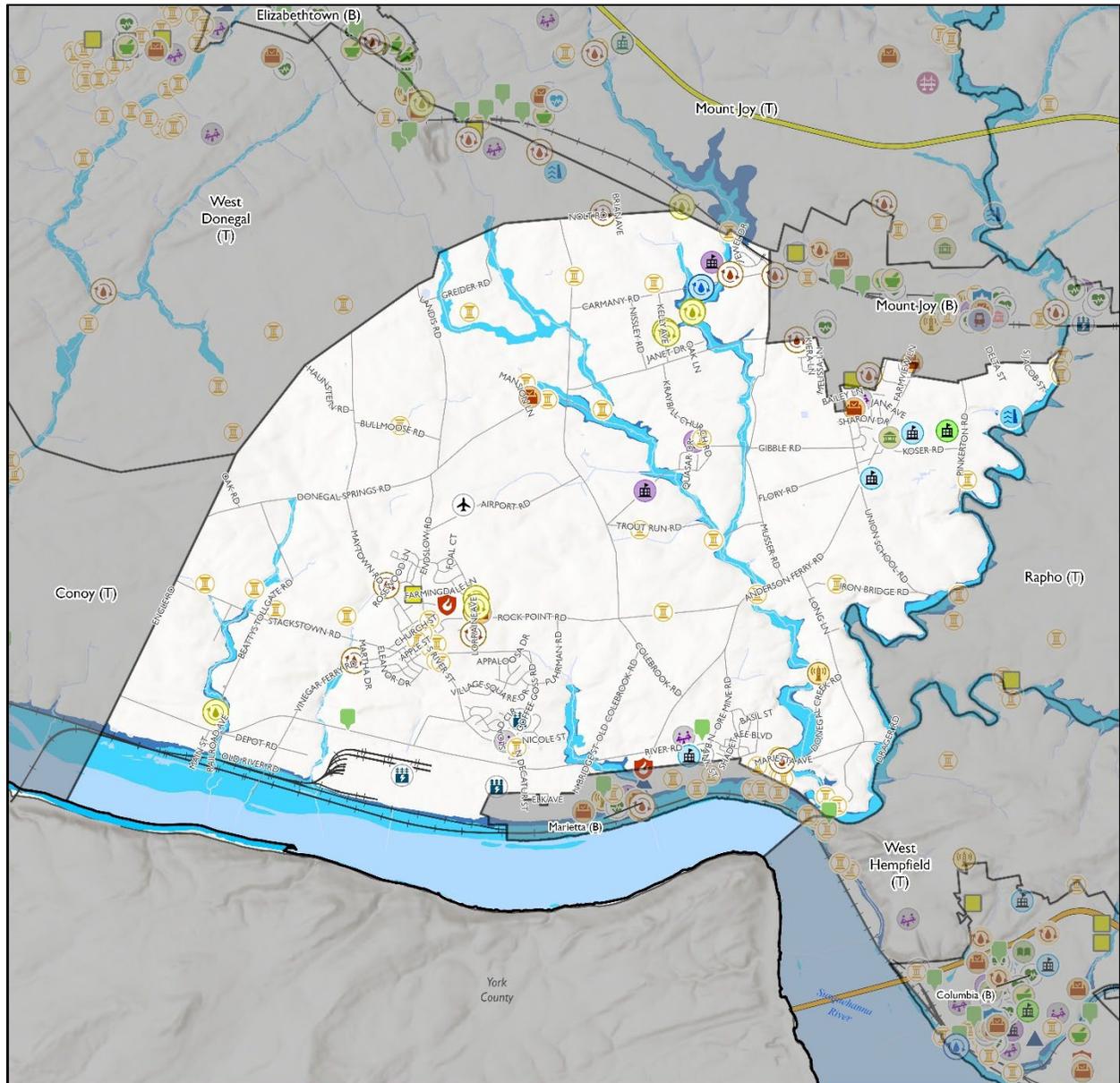


East Cocalico Township



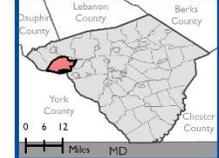


East Donegal Township



East Donegal (T)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
| Library                            | Water Pump            |                                   |                                  |                                 |

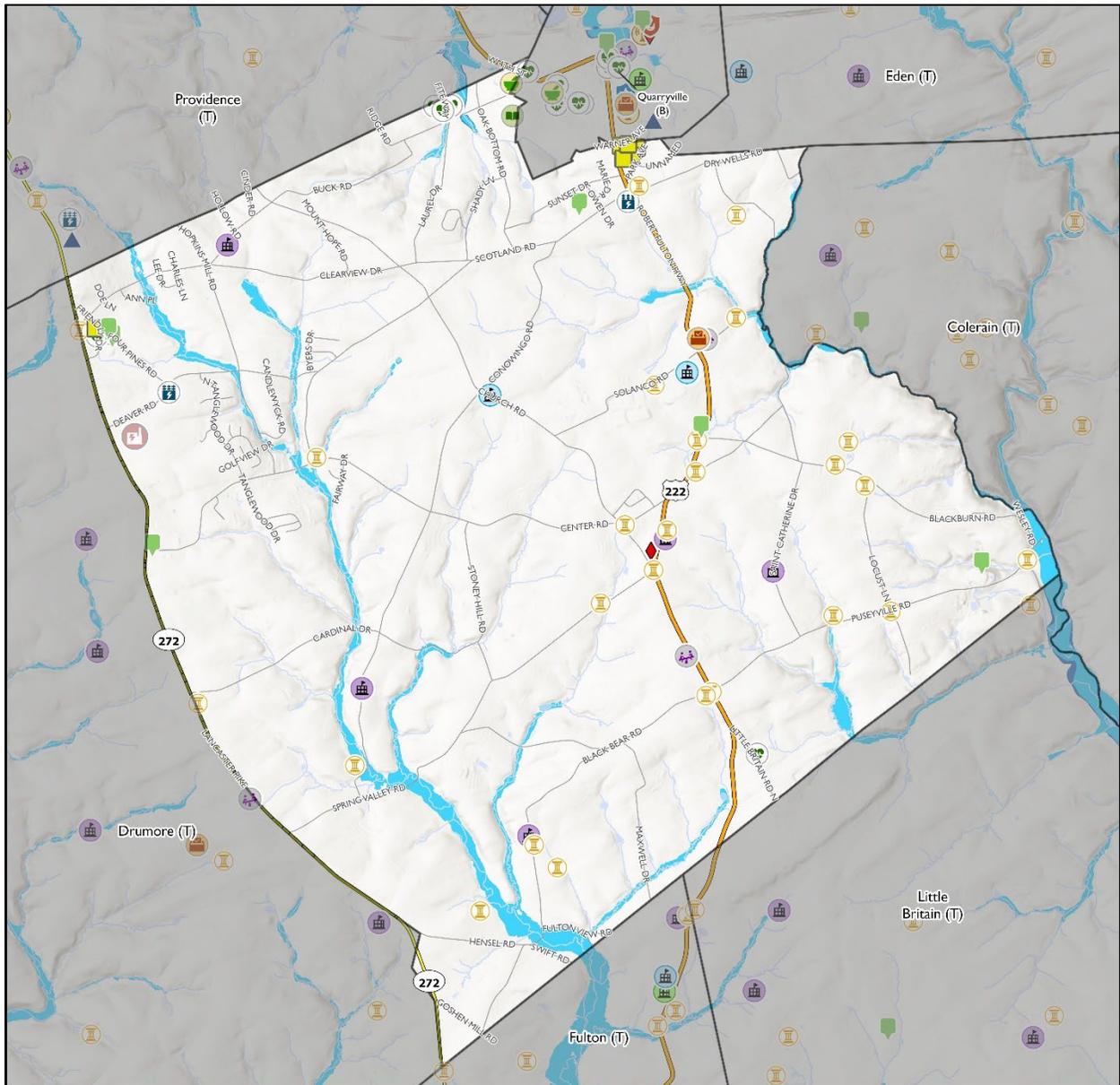


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



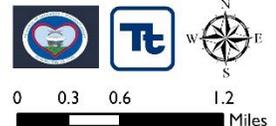
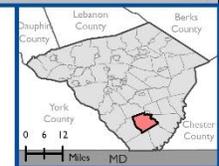


East Drumore Township



East Drumore (T)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
| Library                            | Water Pump            |                                   |                                  |                                 |

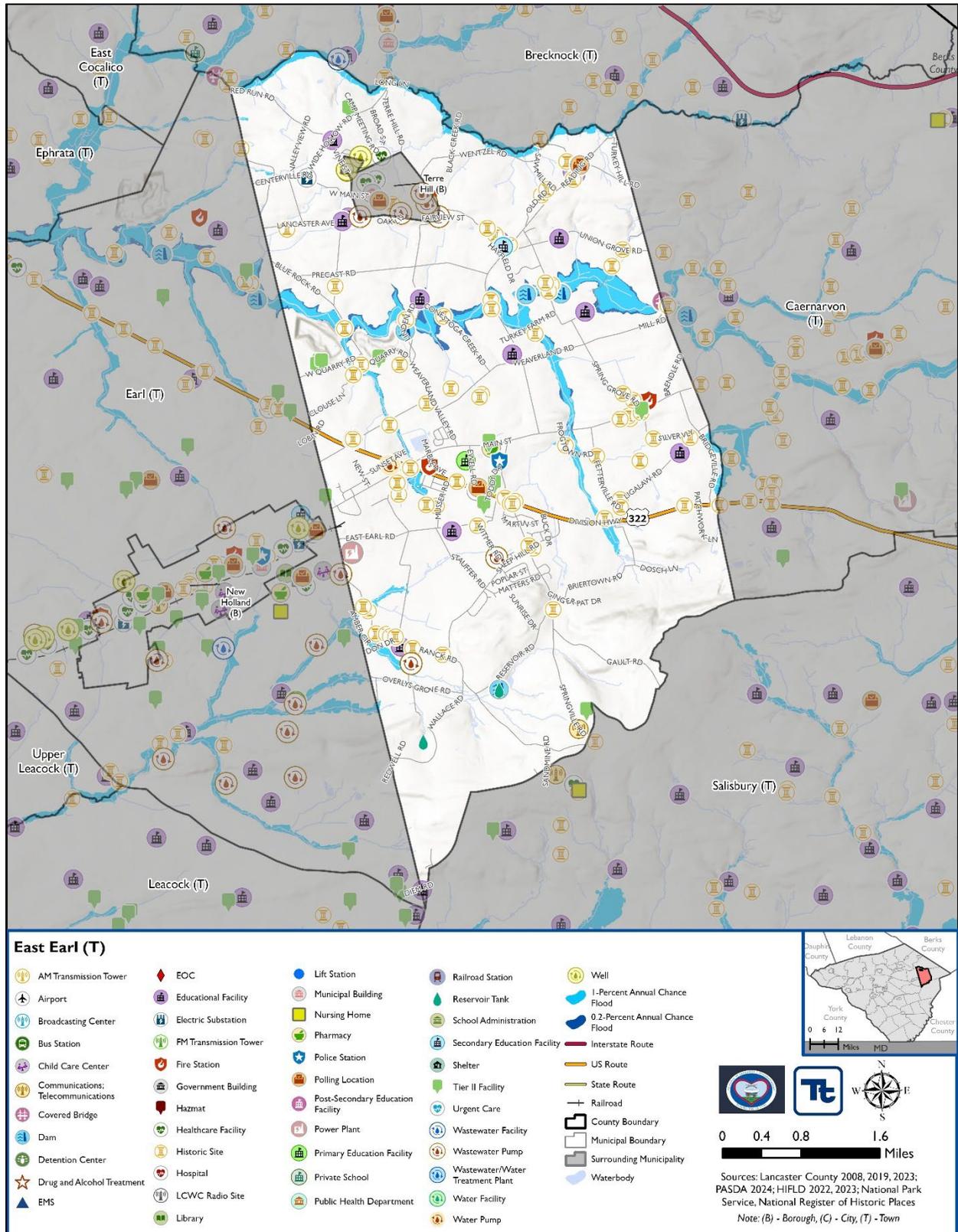


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



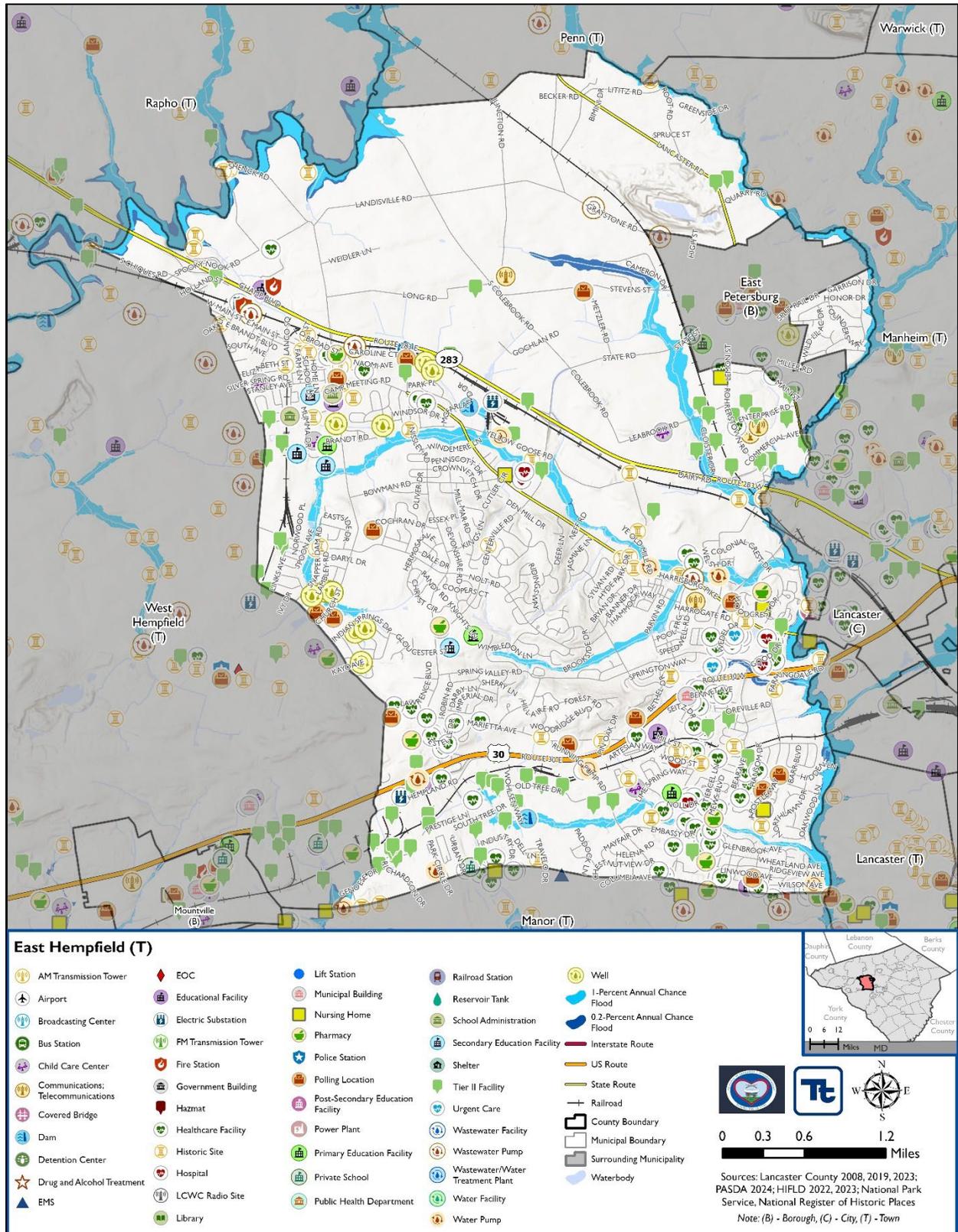


East Earl Township



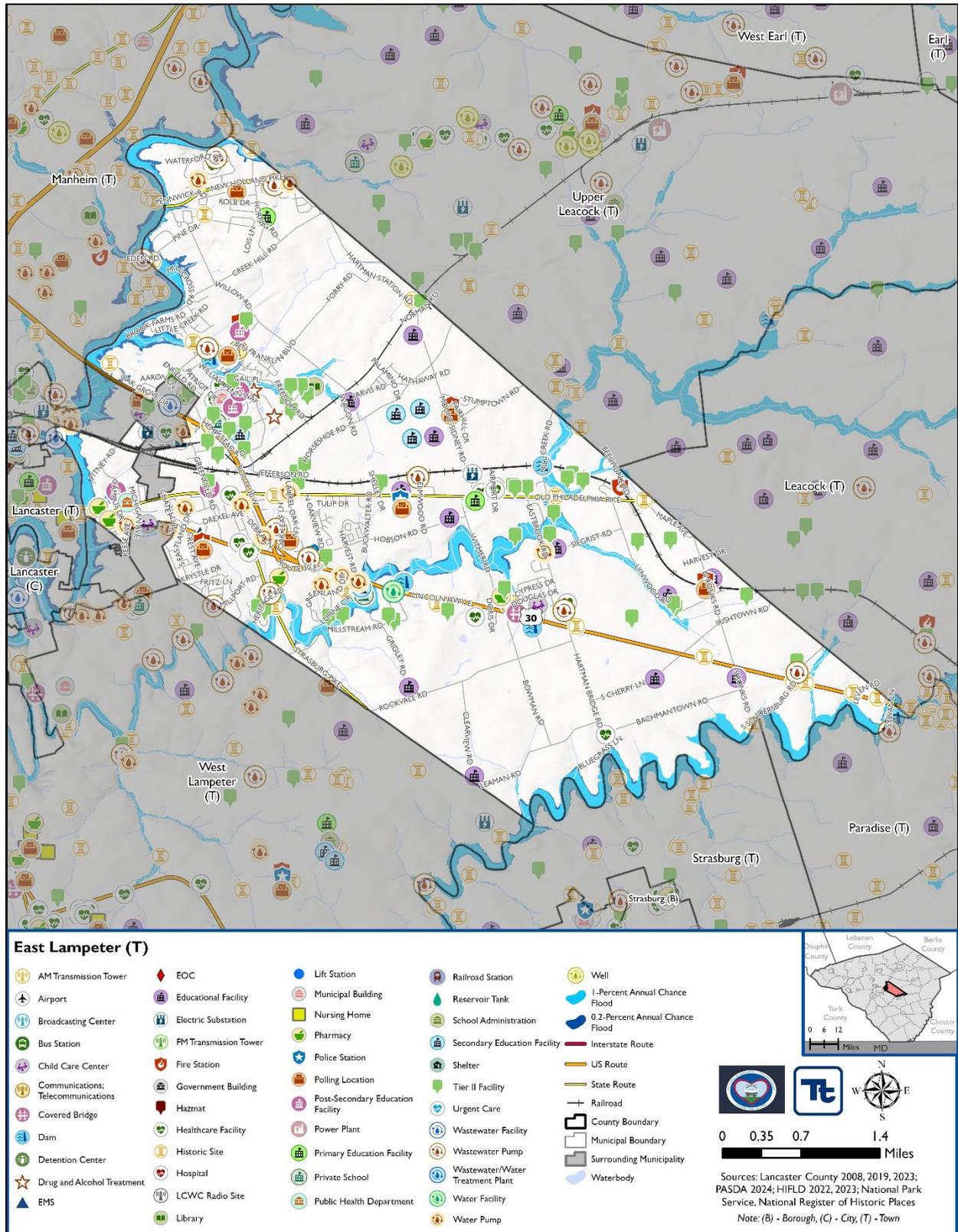


East Hempfield Township



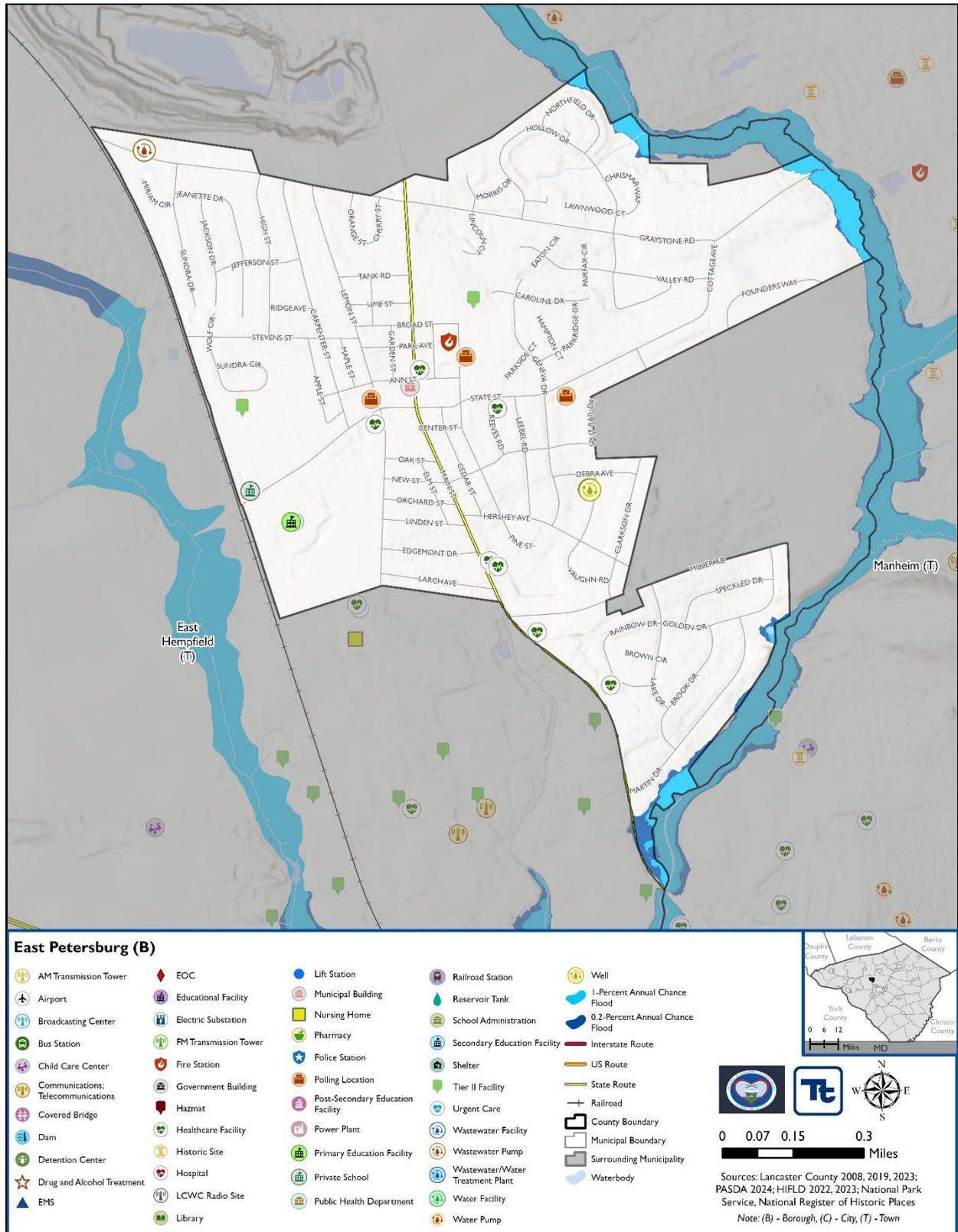


### East Lampeter Township





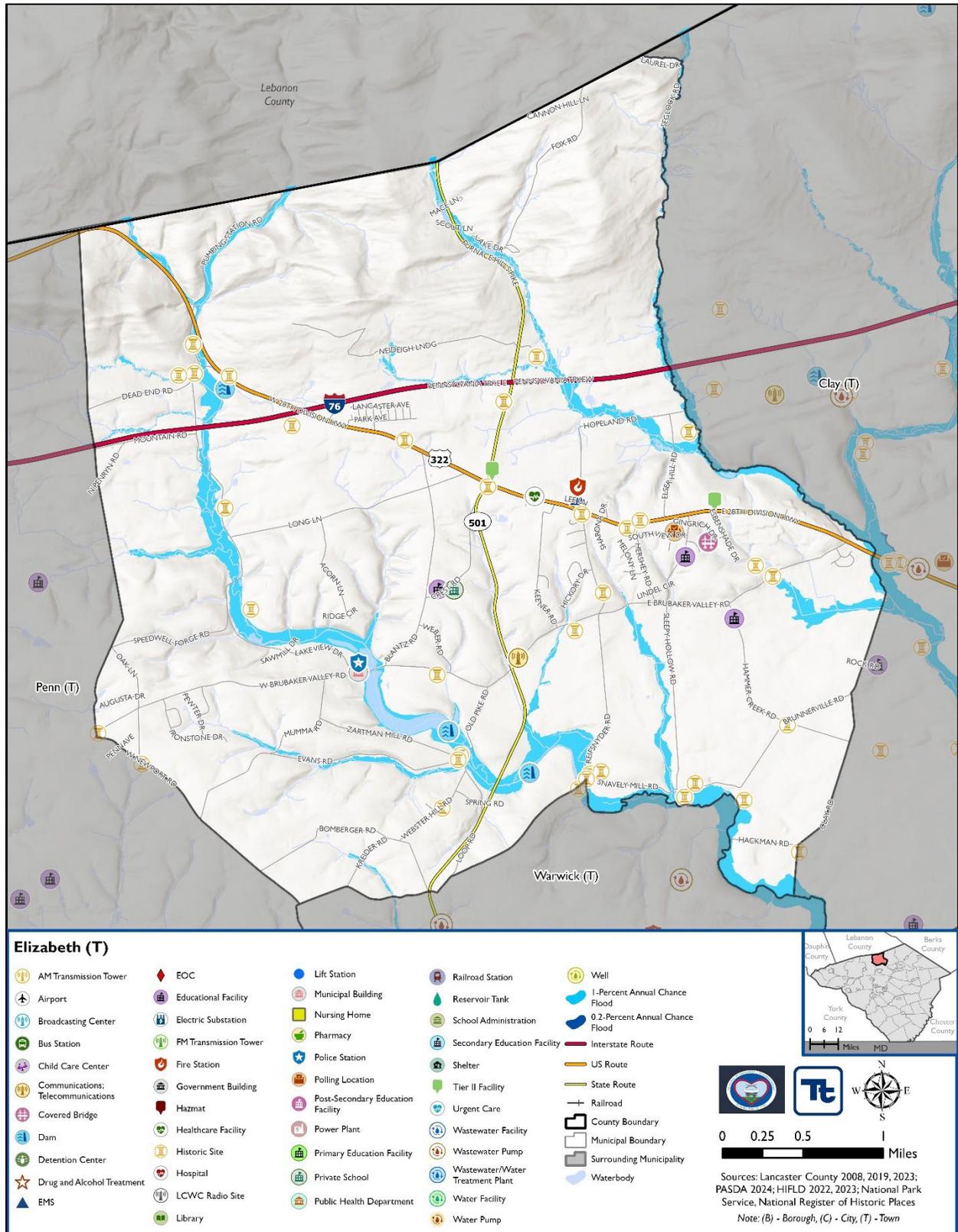
East Petersburg Borough





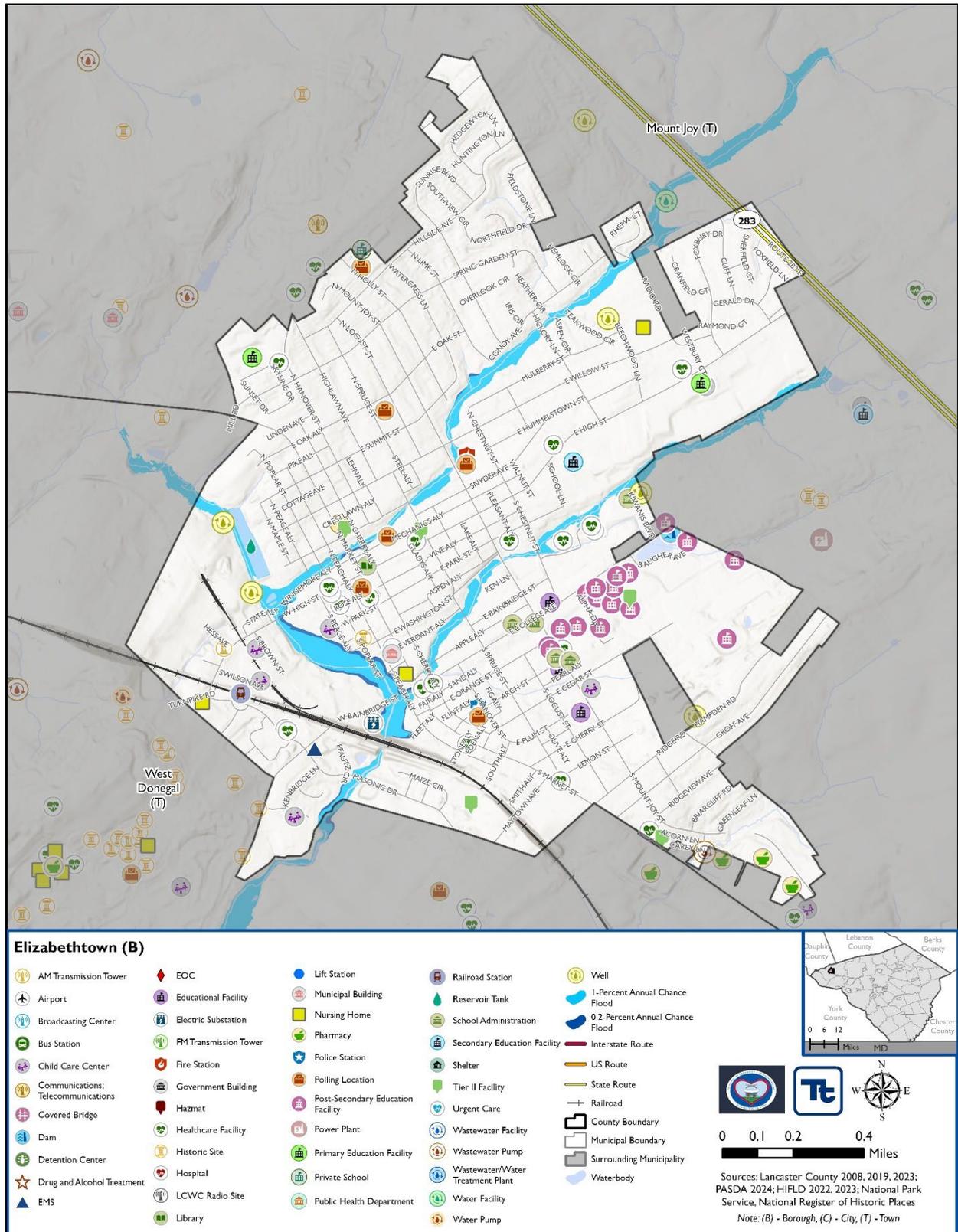


Elizabeth Township



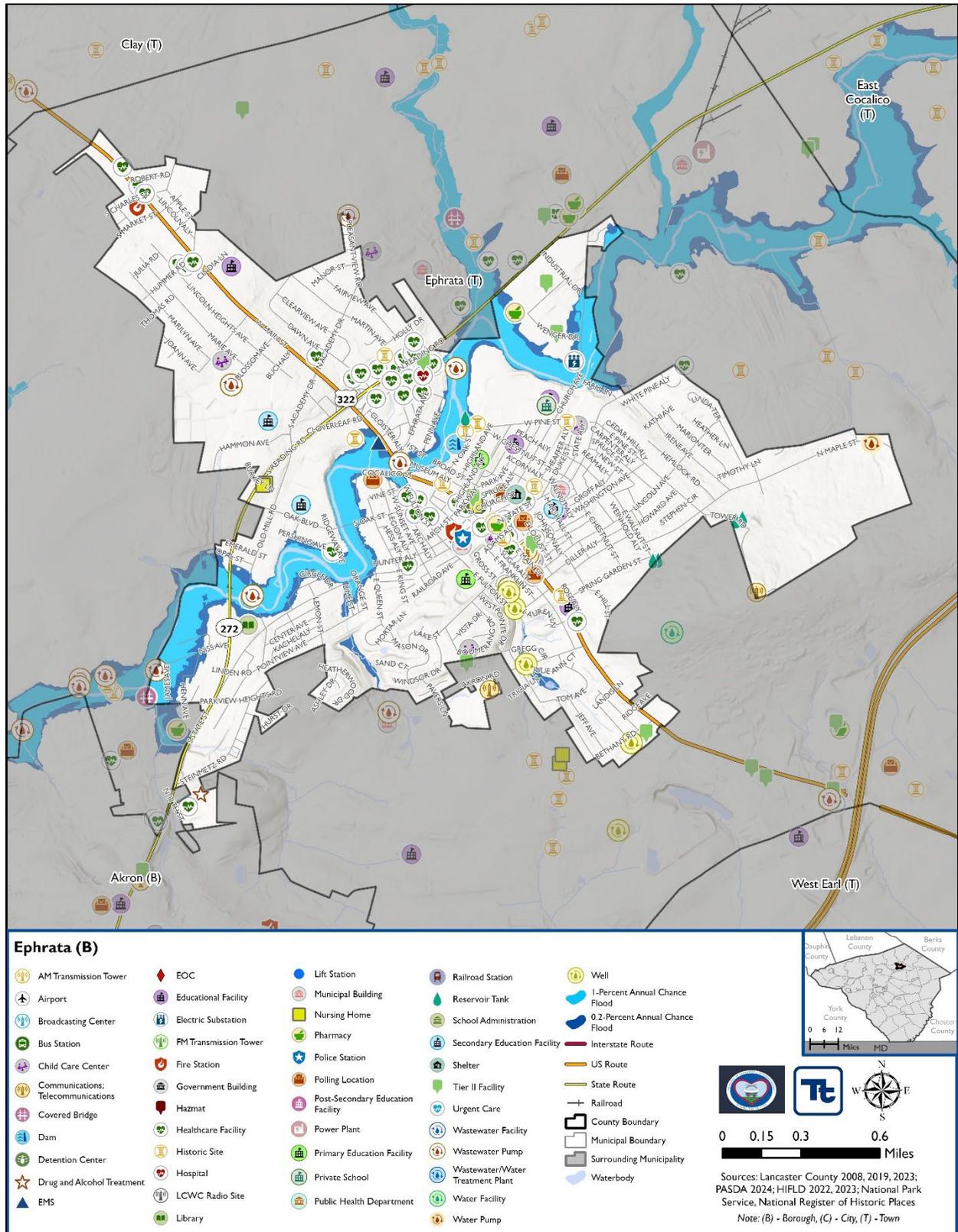


Elizabethtown Borough



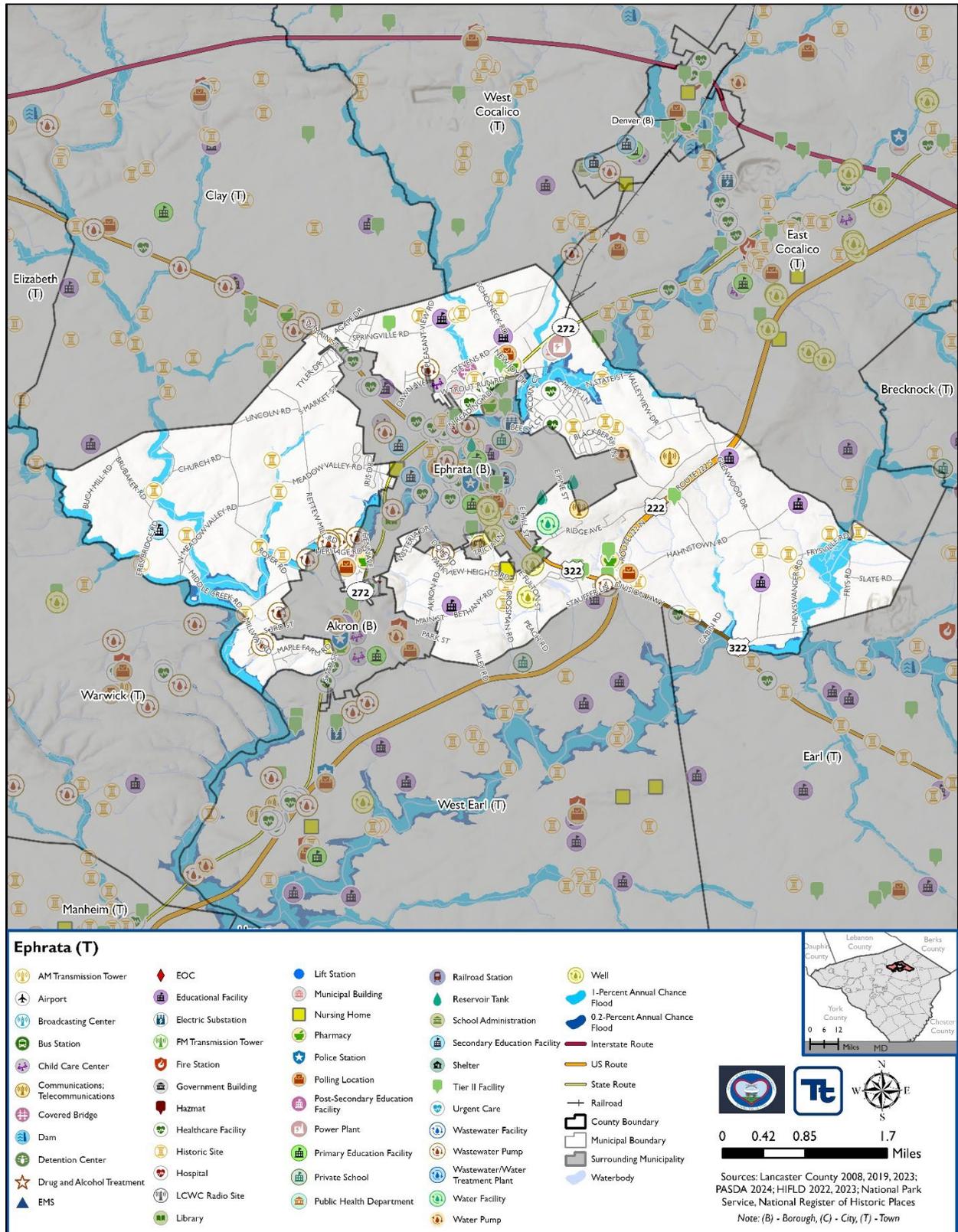


Ephrata Borough



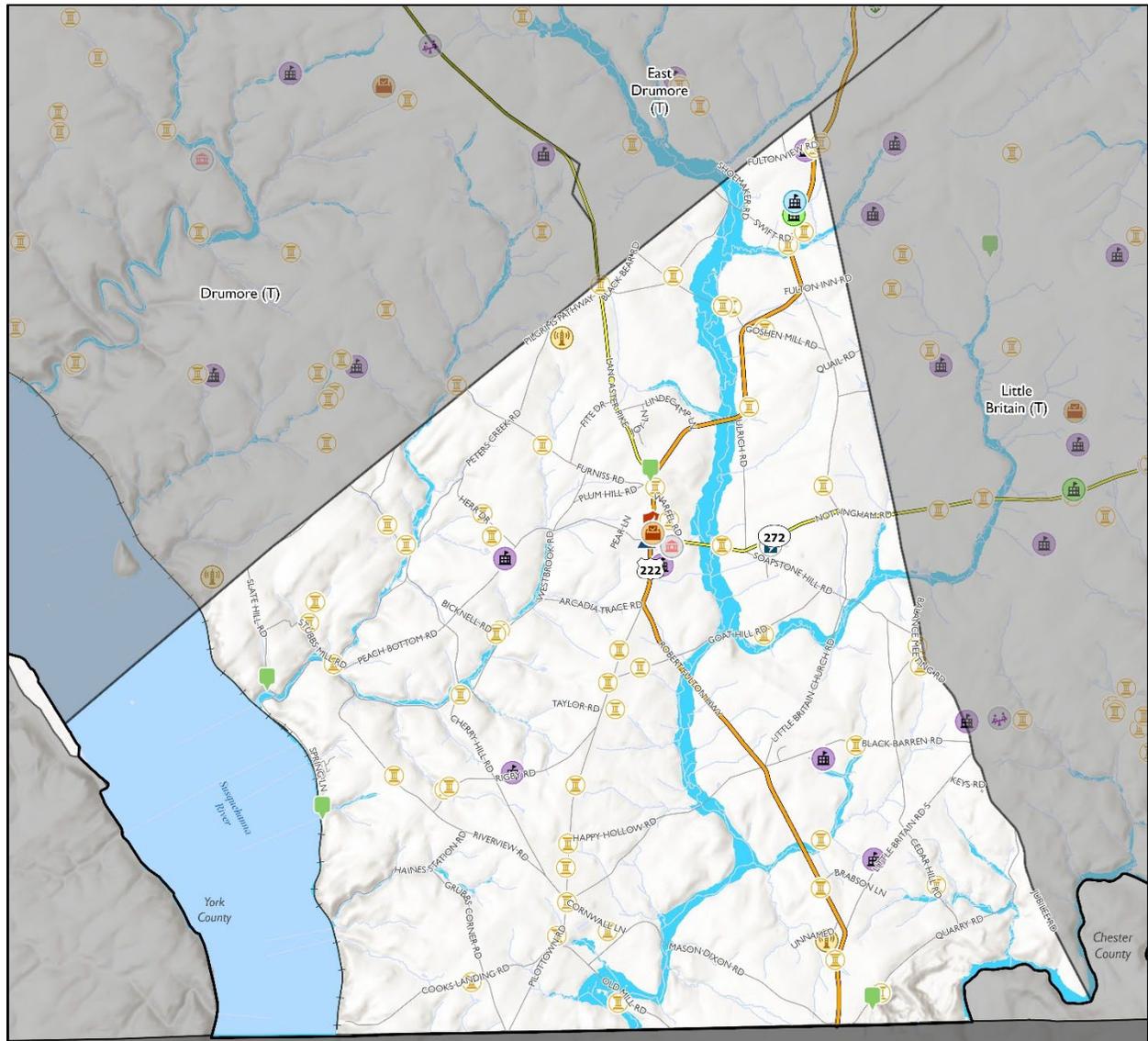


Ephrata Township



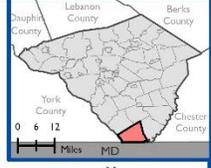


### Fulton Township



**Fulton (T)**

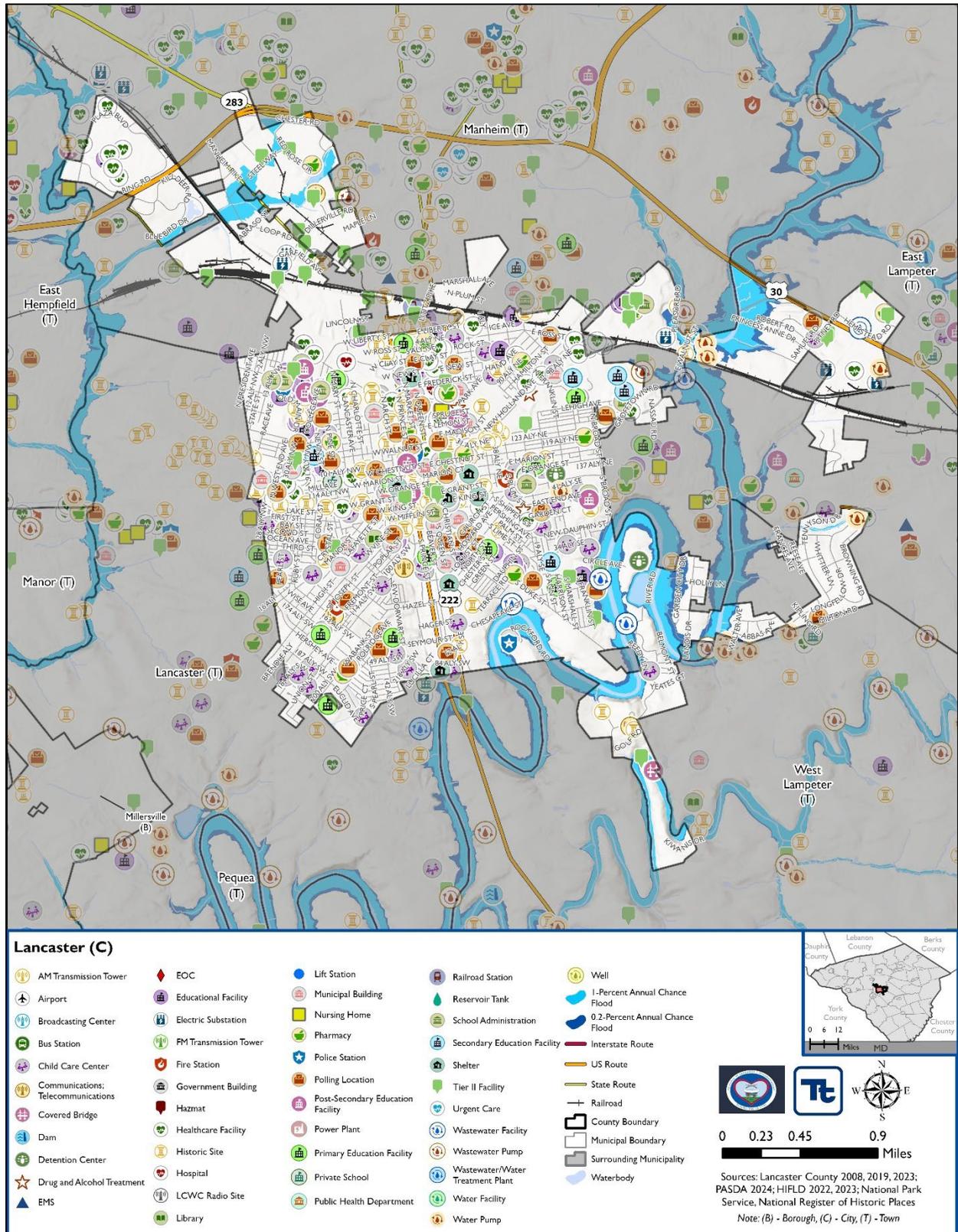
AM Transmission Tower	EOC	Lift Station	Railroad Station	Well
Airport	Educational Facility	Municipal Building	Reservoir Tank	1-Percent Annual Chance Flood
Broadcasting Center	Electric Substation	Nursing Home	School Administration	0.2-Percent Annual Chance Flood
Bus Station	FM Transmission Tower	Pharmacy	Secondary Education Facility	Interstate Route
Child Care Center	Fire Station	Police Station	Shelter	US Route
Communications; Telecommunications	Government Building	Polling Location	Tier II Facility	State Route
Covered Bridge	Hazard	Post-Secondary Education Facility	Urgent Care	Railroad
Dam	Healthcare Facility	Power Plant	Wastewater Facility	County Boundary
Detention Center	Historic Site	Primary Education Facility	Wastewater Pump	Municipal Boundary
Drug and Alcohol Treatment	Hospital	Private School	Wastewater/Water Treatment Plant	Surrounding Municipality
EMS	LCWC Radio Site	Public Health Department	Water Facility	Waterbody
Library	Water Pump			




Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town

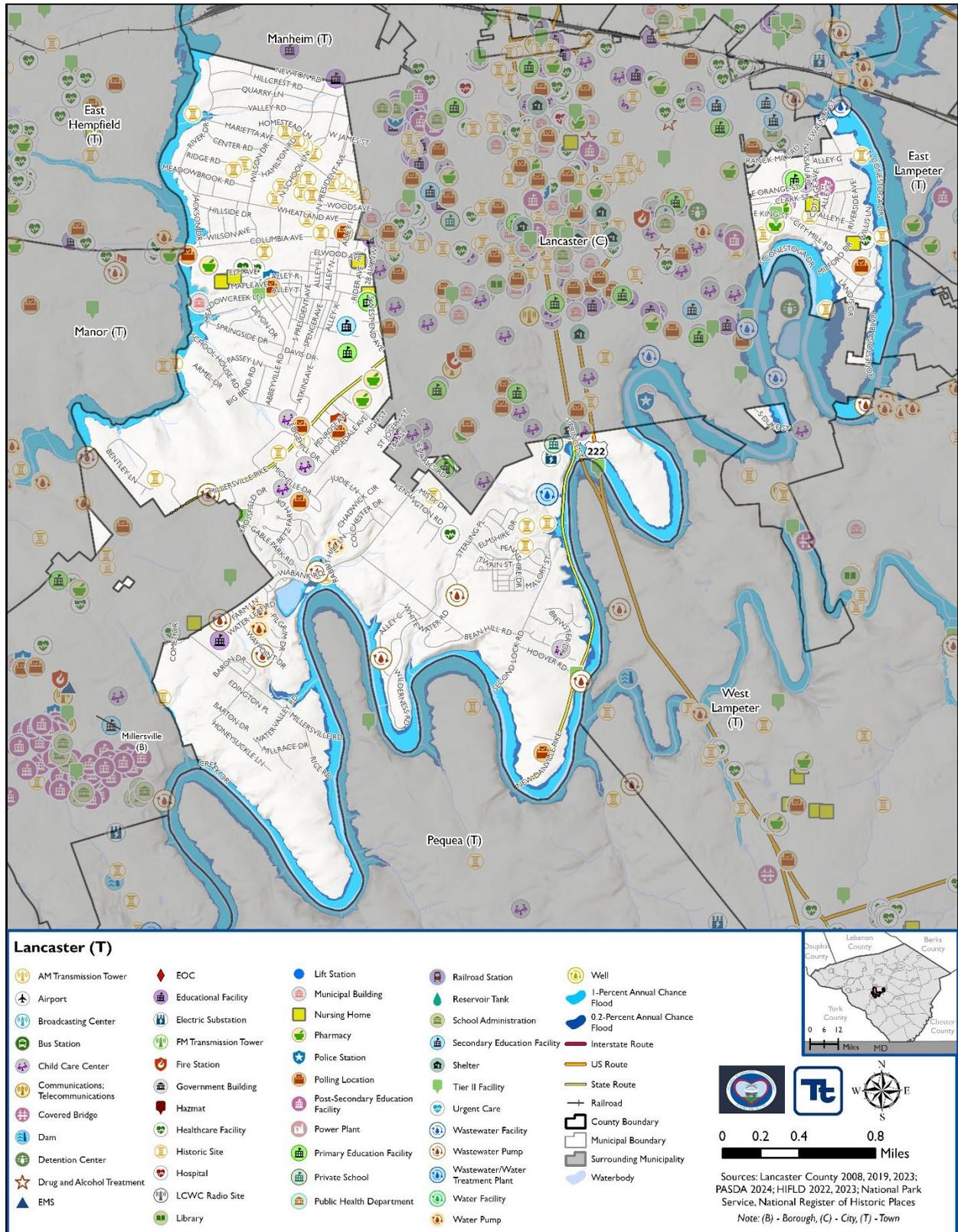


Lancaster City



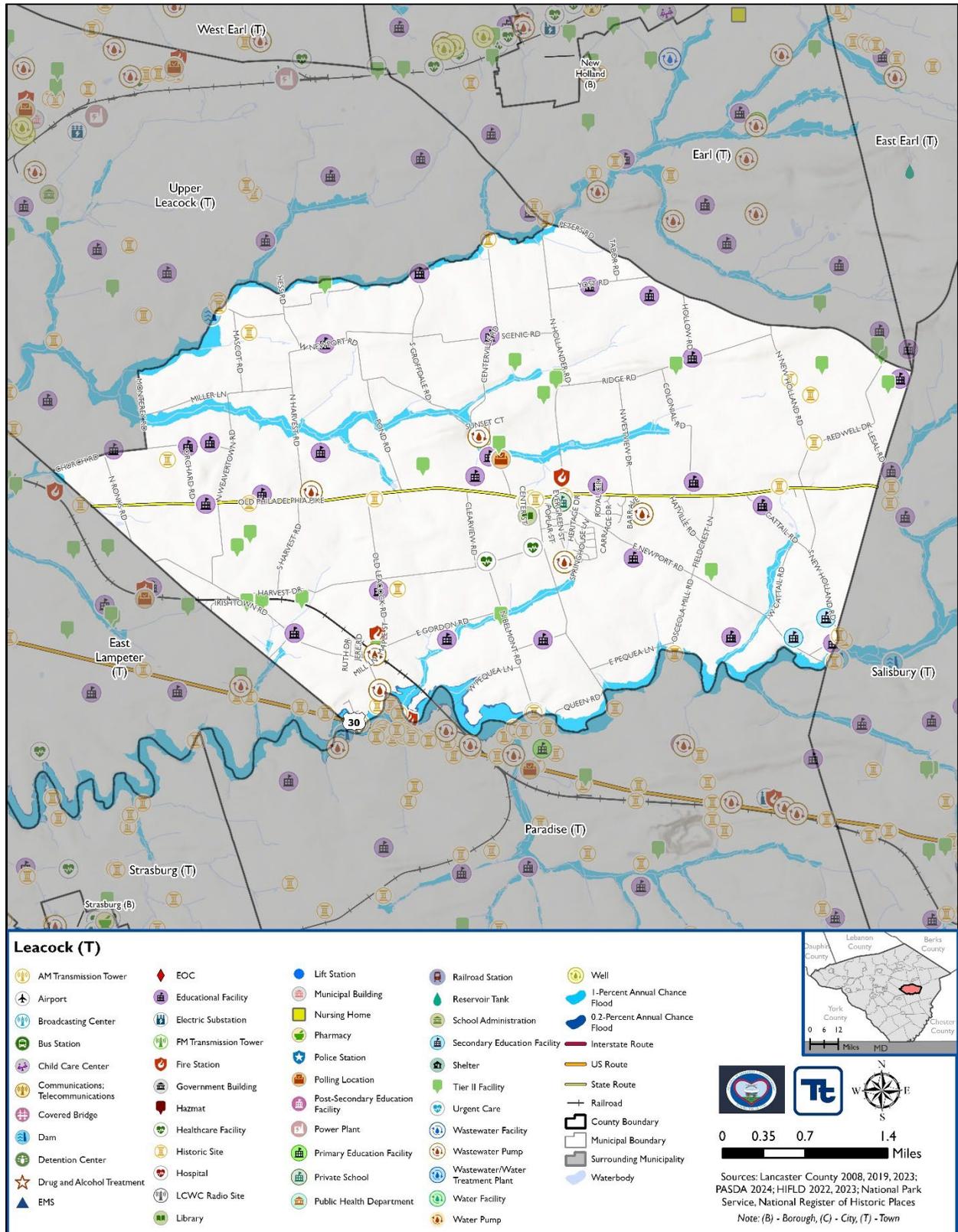


Lancaster Township



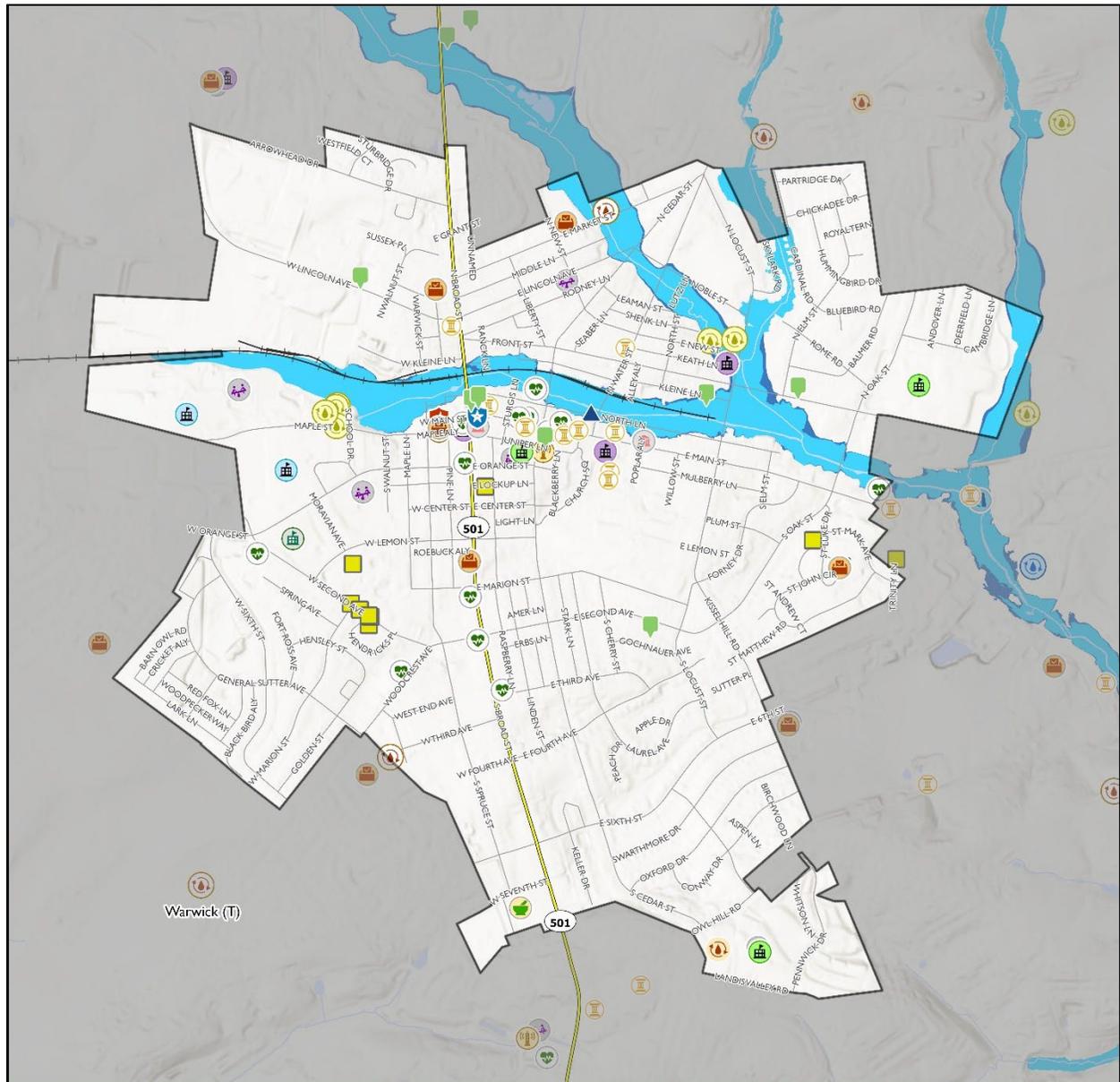


Leacock Township





### Lititz Borough



**Lititz (B)**

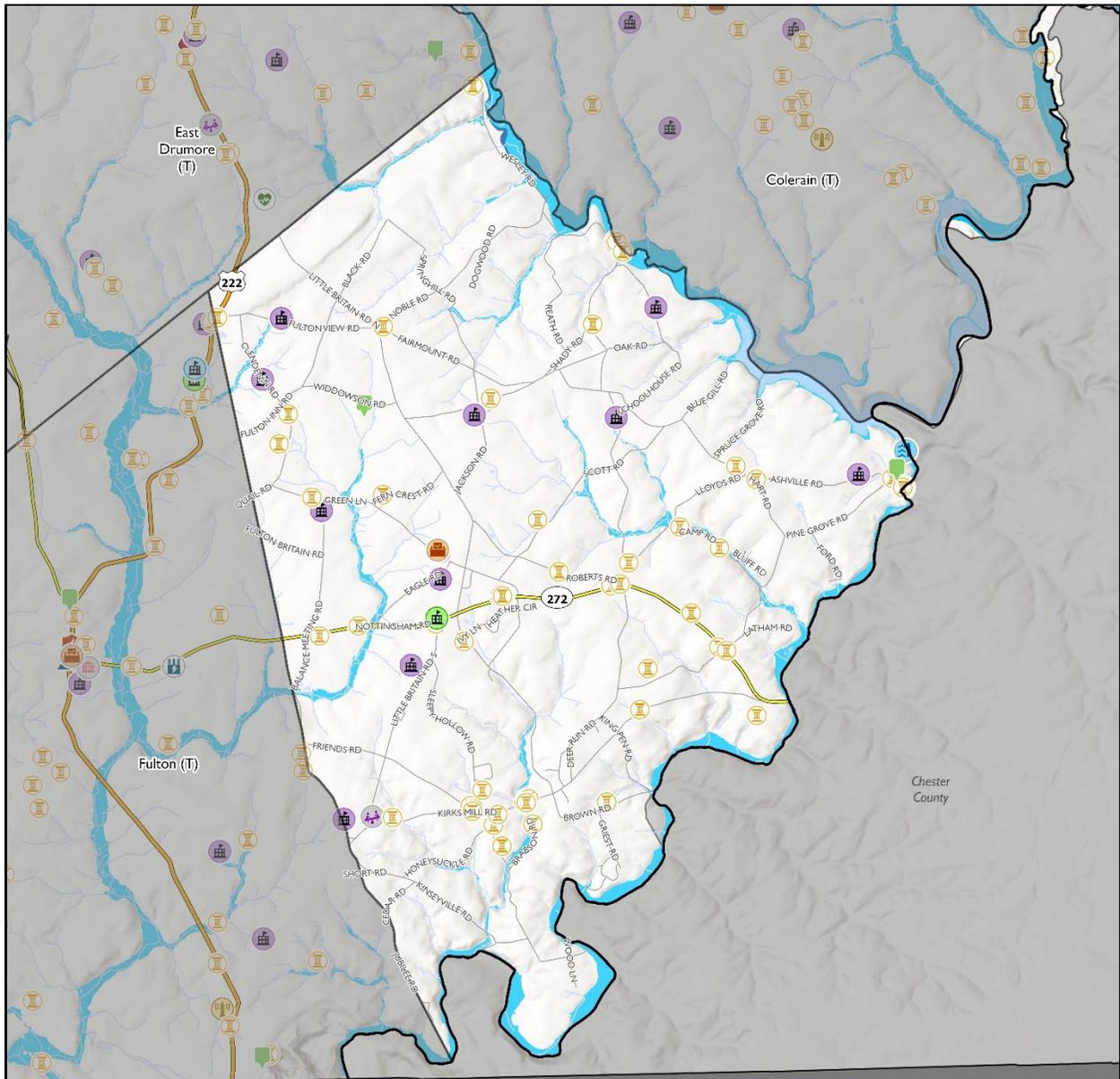
AM Transmission Tower	EOC	Lift Station	Railroad Station	Well
Airport	Educational Facility	Municipal Building	Reservoir Tank	1-Percent Annual Chance Flood
Broadcasting Center	Electric Substation	Nursing Home	School Administration	0.2-Percent Annual Chance Flood
Bus Station	FM Transmission Tower	Pharmacy	Secondary Education Facility	Interstate Route
Child Care Center	Fire Station	Police Station	Shelter	US Route
Communications; Telecommunications	Government Building	Polling Location	Tier II Facility	State Route
Covered Bridge	Hazmat	Post-Secondary Education Facility	Urgent Care	Railroad
Dam	Healthcare Facility	Power Plant	Wastewater Facility	County Boundary
Detention Center	Historic Site	Primary Education Facility	Wastewater Pump	Municipal Boundary
Drug and Alcohol Treatment	Hospital	Private School	Wastewater/Water Treatment Plant	Surrounding Municipality
EMS	LCWC Radio Site	Public Health Department	Water Facility	Waterbody
Library	Water Pump			

Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
 Note: (B) - Borough, (C) - City, (T) - Town



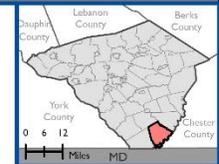


Little Britain Township



Little Britain (T)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
| Library                            | Water Pump            |                                   |                                  |                                 |

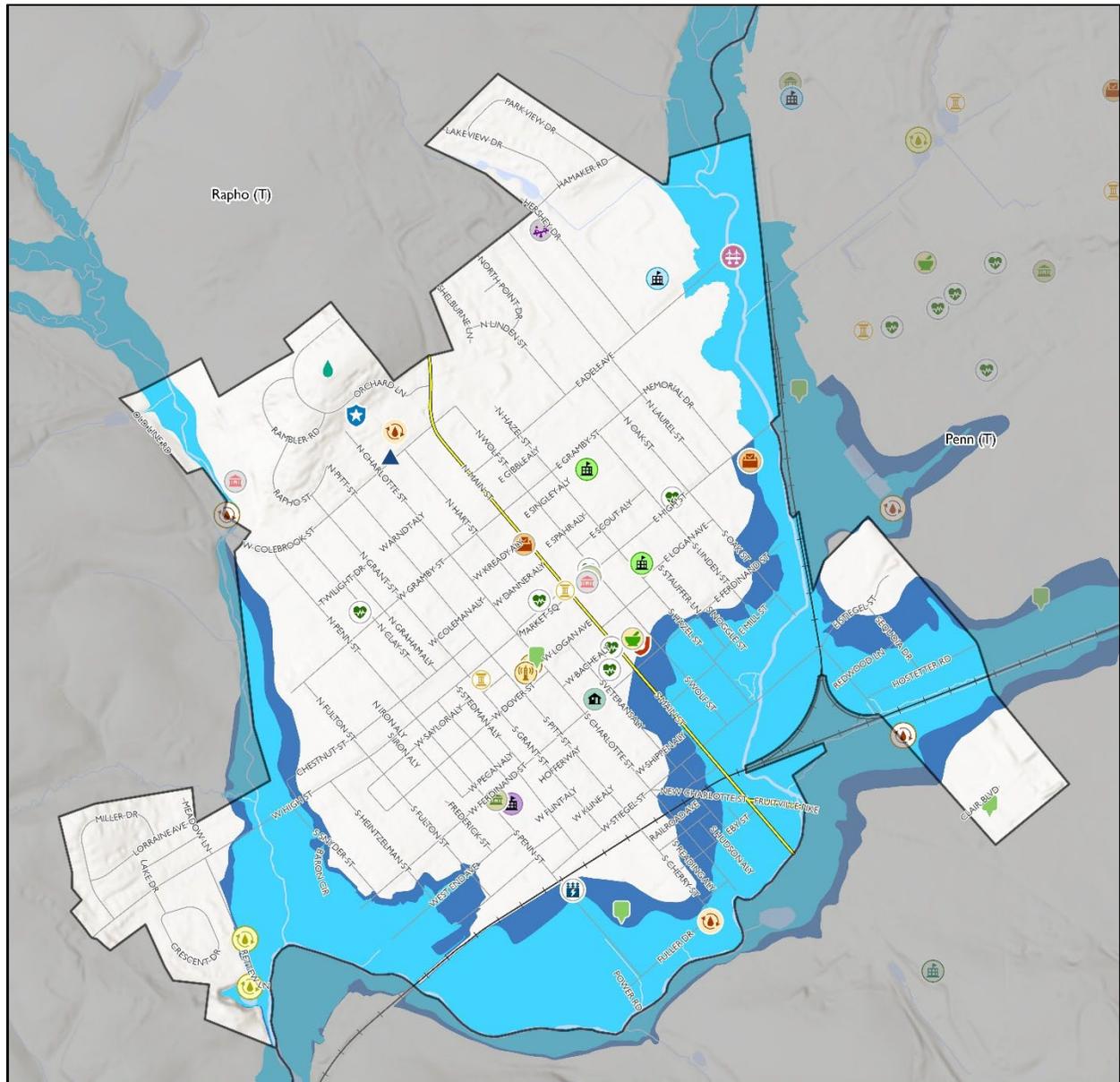


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



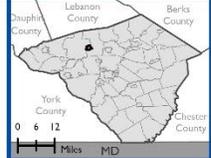


Manheim Borough



Manheim (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |

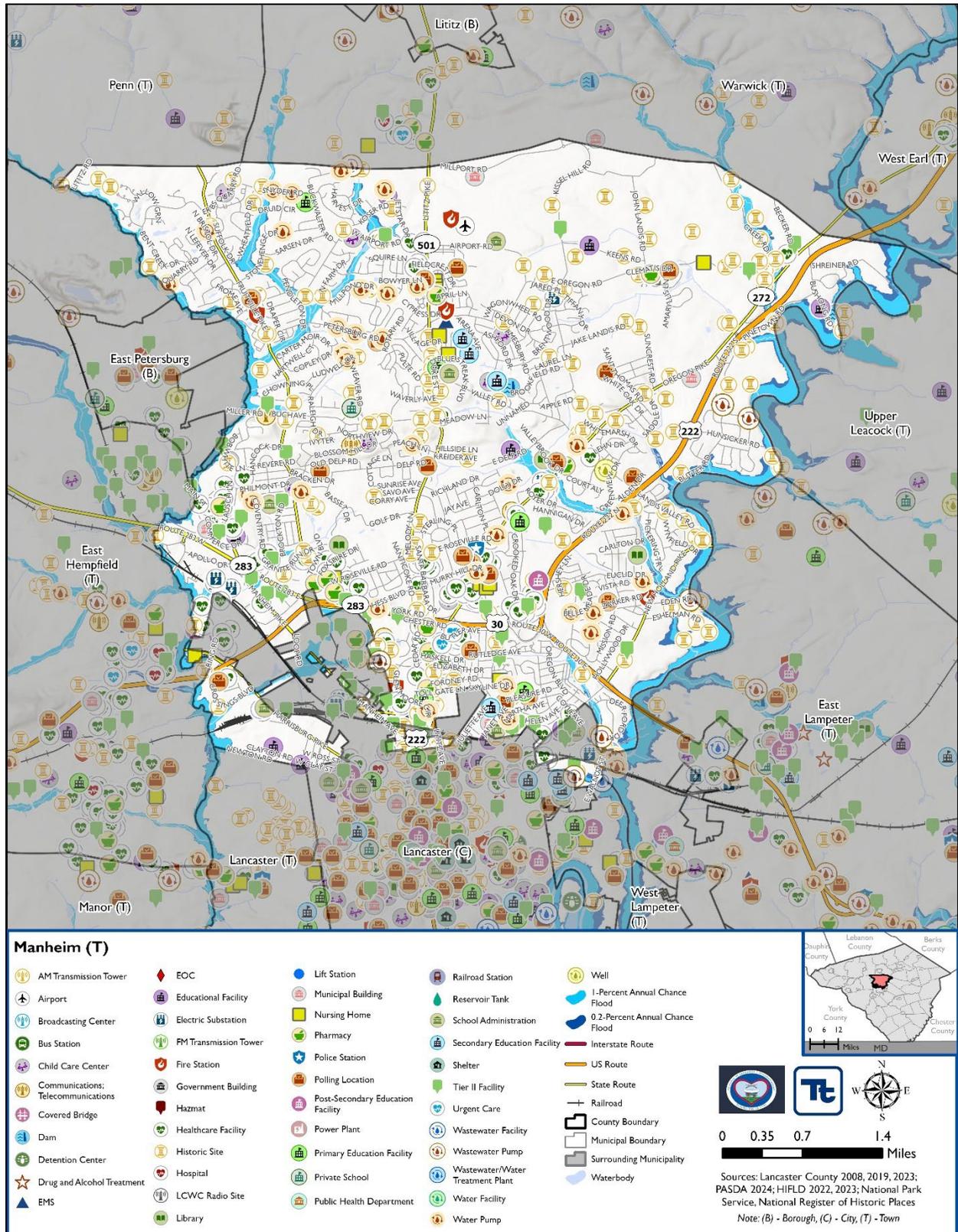


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town





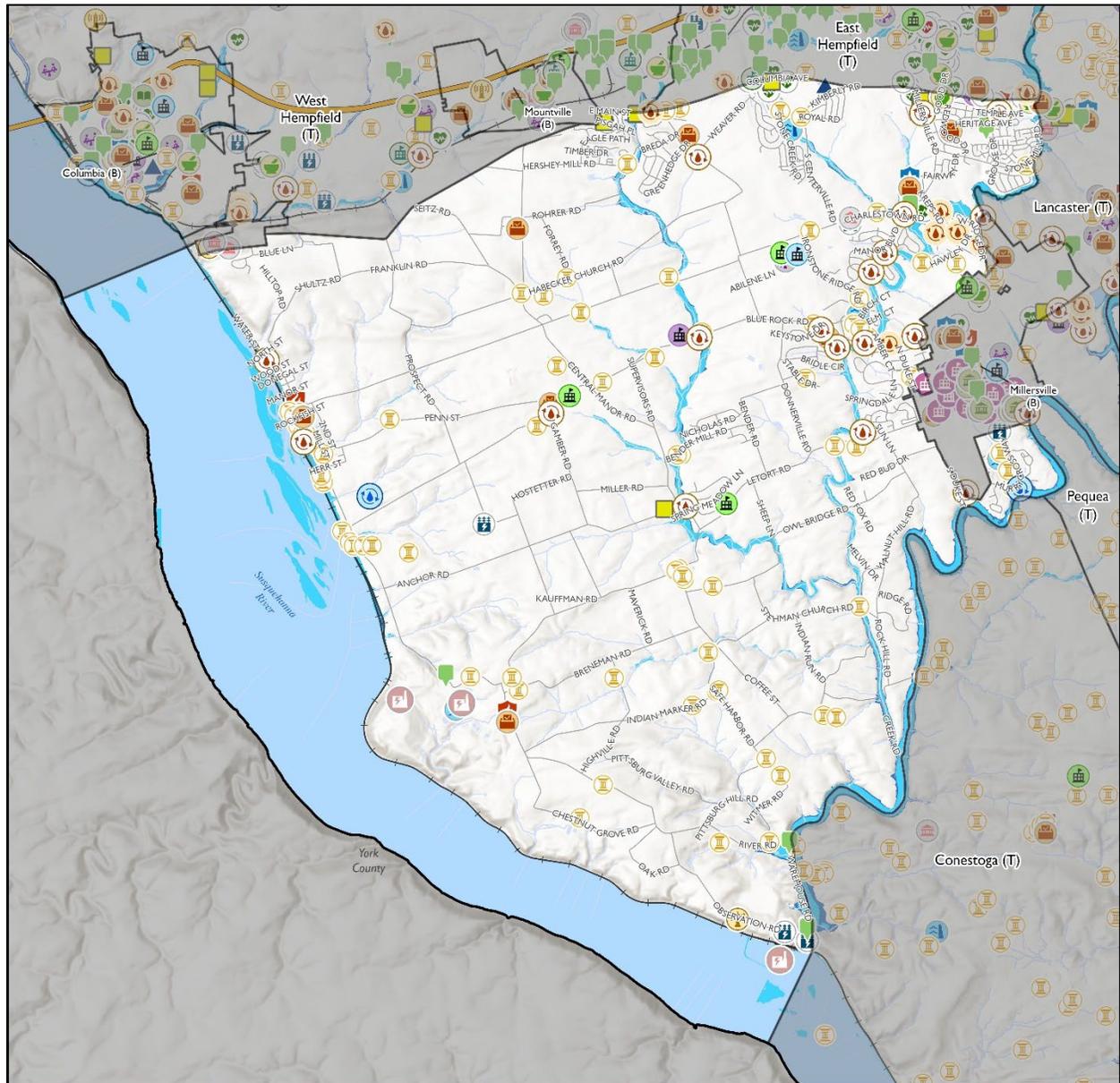
Manheim Township





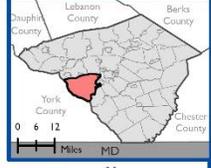
Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

Manor Township



Manor (T)

- AM Transmission Tower
- Airport
- Broadcasting Center
- Bus Station
- Child Care Center
- Communications; Telecommunications
- Covered Bridge
- Dam
- Detention Center
- Drug and Alcohol Treatment
- EMS
- EOC
- Educational Facility
- Electric Substation
- FM Transmission Tower
- Fire Station
- Government Building
- Hazmat
- Healthcare Facility
- Historic Site
- Hospital
- LCWC Radio Site
- Library
- Lift Station
- Municipal Building
- Nursing Home
- Pharmacy
- Police Station
- Polling Location
- Post-Secondary Education Facility
- Power Plant
- Primary Education Facility
- Private School
- Public Health Department
- Railroad Station
- Reservoir Tank
- School Administration
- Secondary Education Facility
- Shelter
- Tier II Facility
- Urgent Care
- Wastewater Facility
- Wastewater Pump
- Wastewater/Water Treatment Plant
- Water Facility
- Water Pump
- Well
- 1-Percent Annual Chance Flood
- 0.2-Percent Annual Chance Flood
- Interstate Route
- US Route
- State Route
- Railroad
- County Boundary
- Municipal Boundary
- Surrounding Municipality
- Waterbody

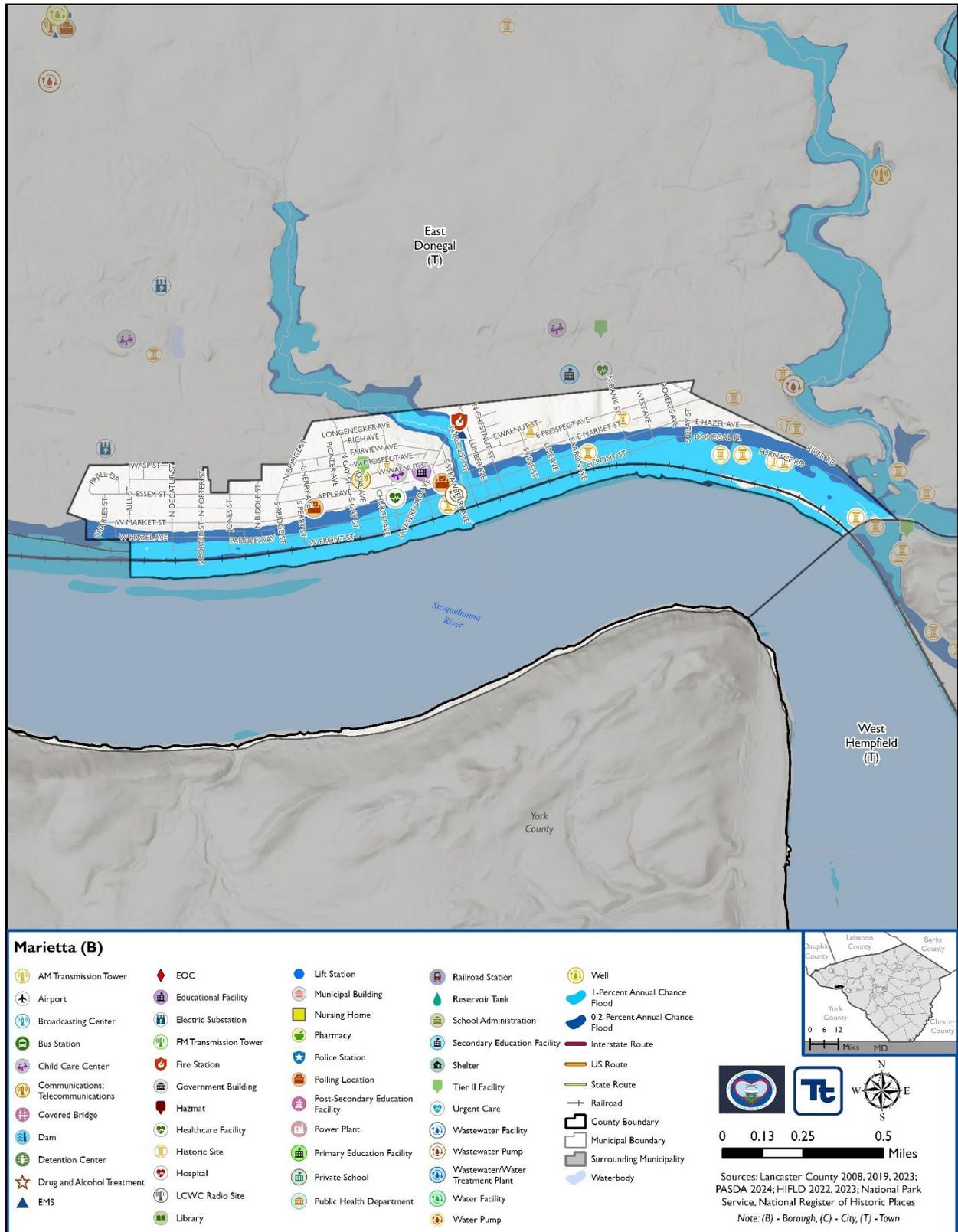


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



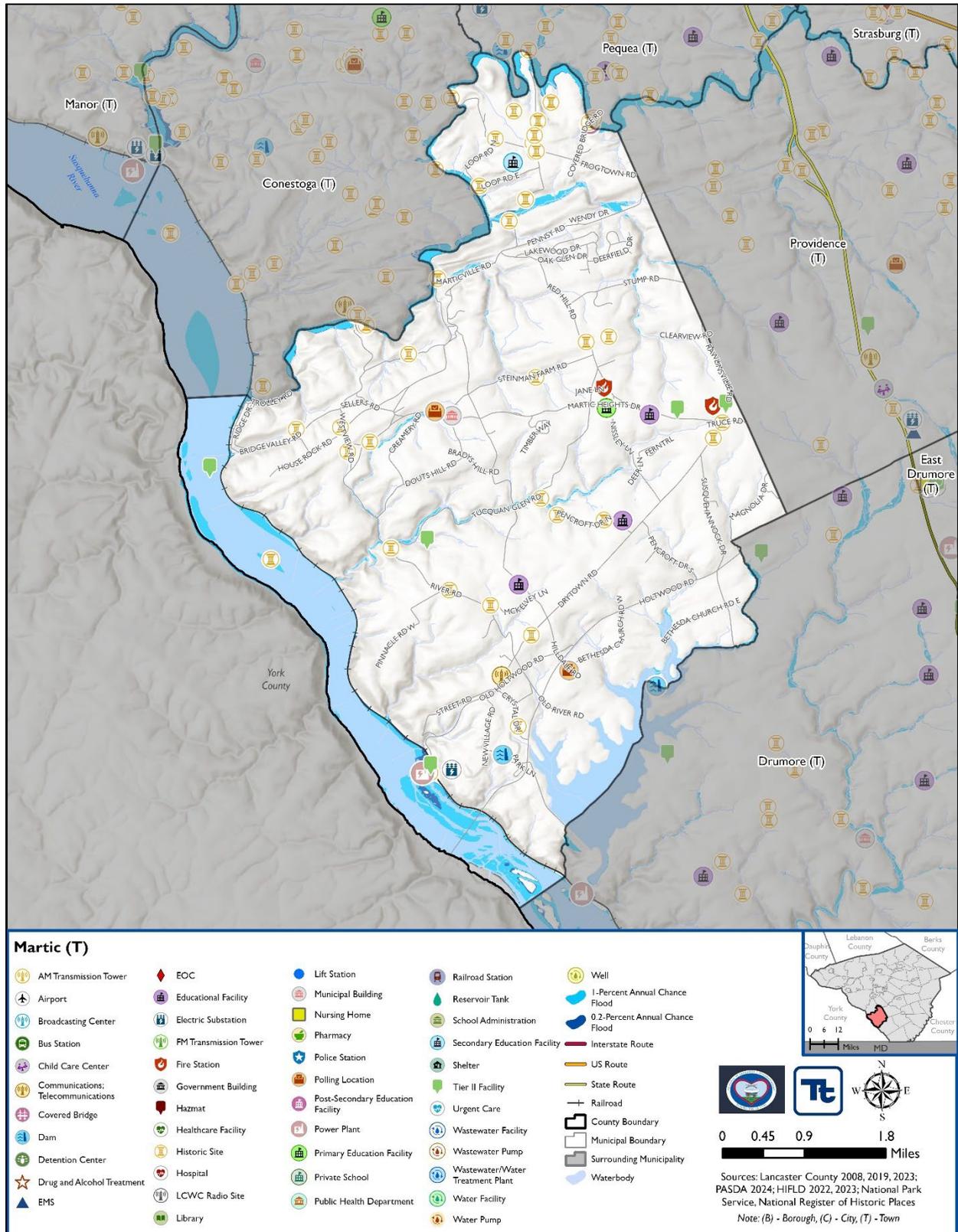


Marietta Borough





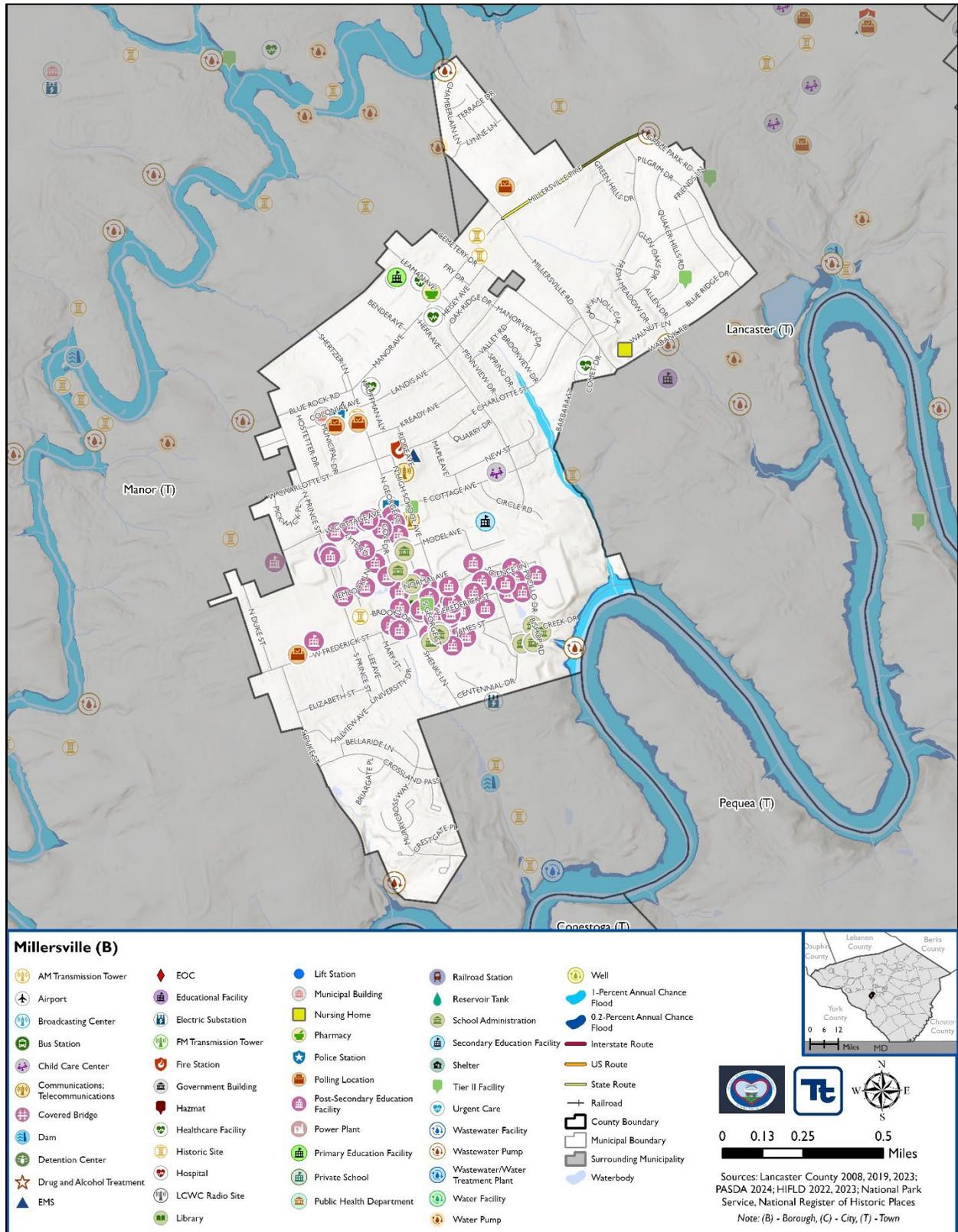
### Martic Township





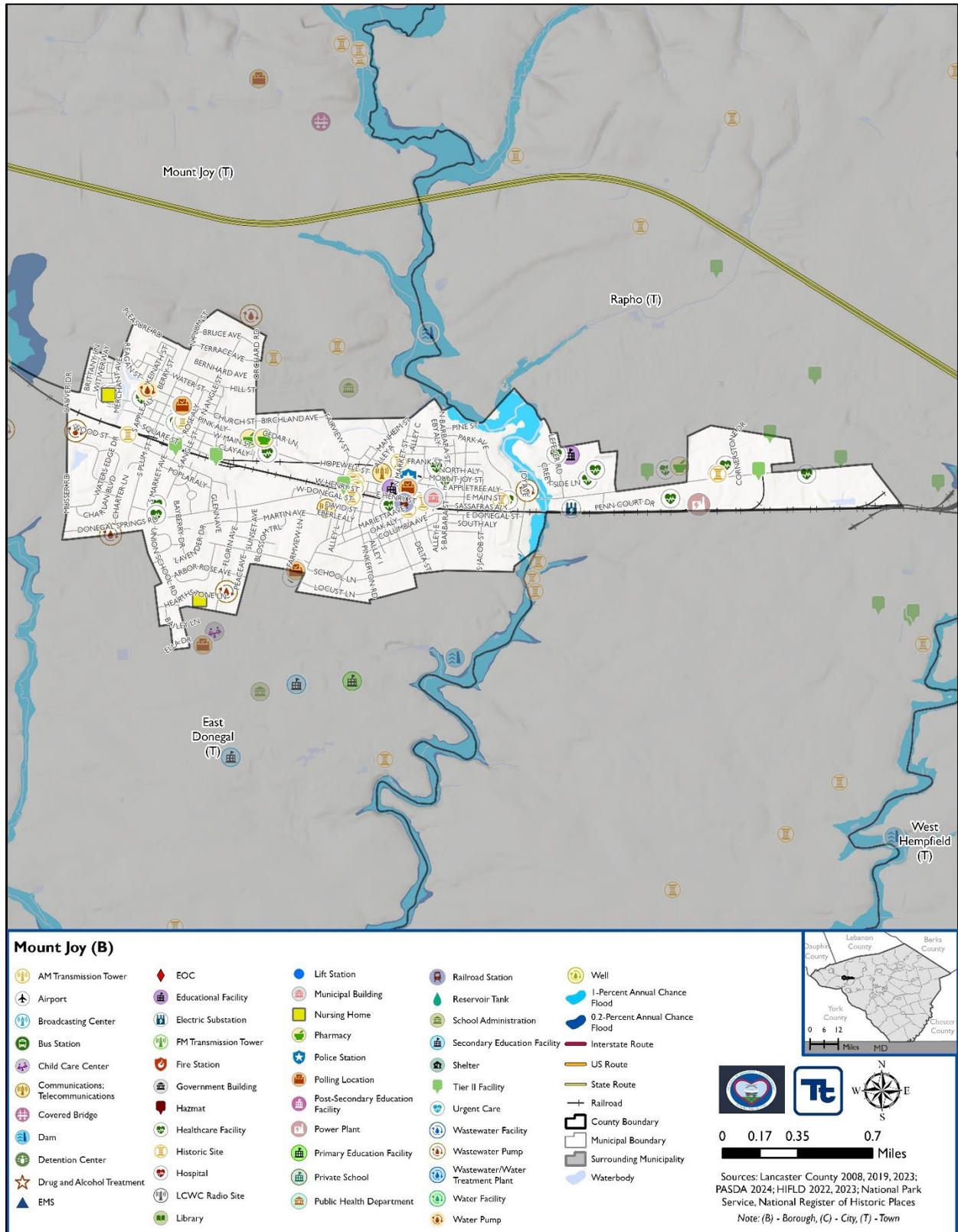
### Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

## Millersville Borough



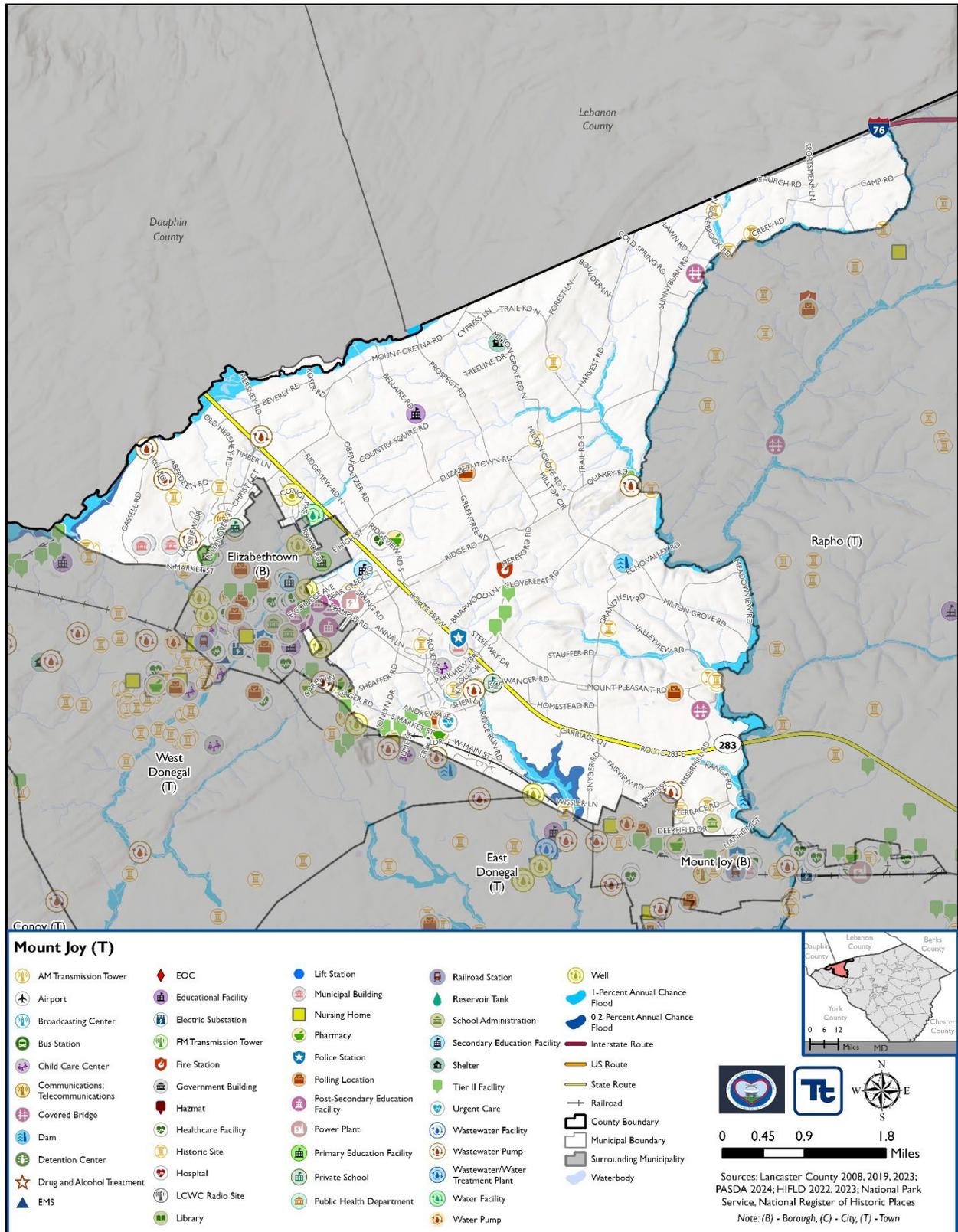


### Mount Joy Borough



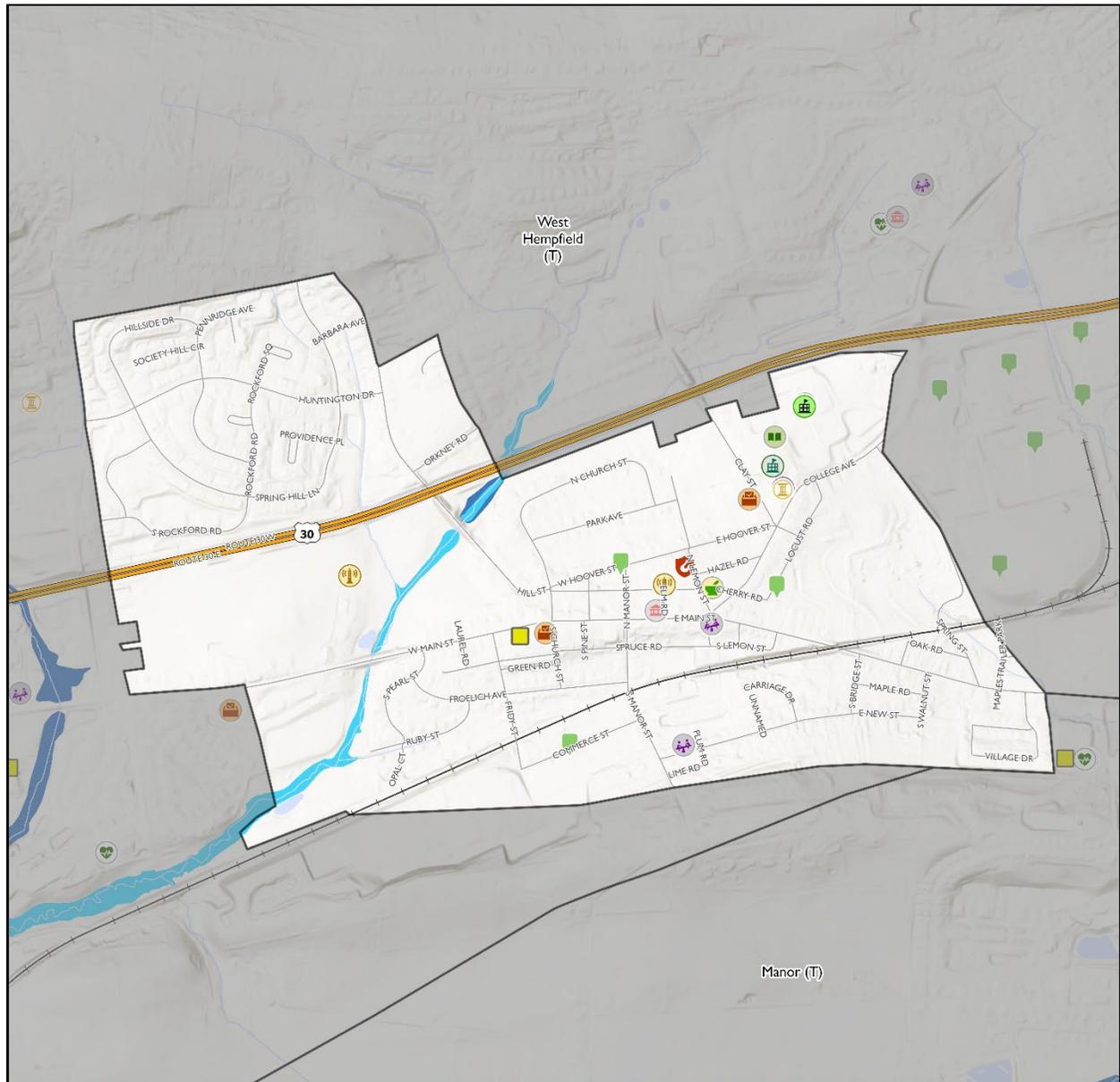


Mount Joy Township



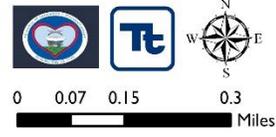
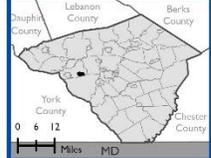


Mountville Borough



Mountville (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |

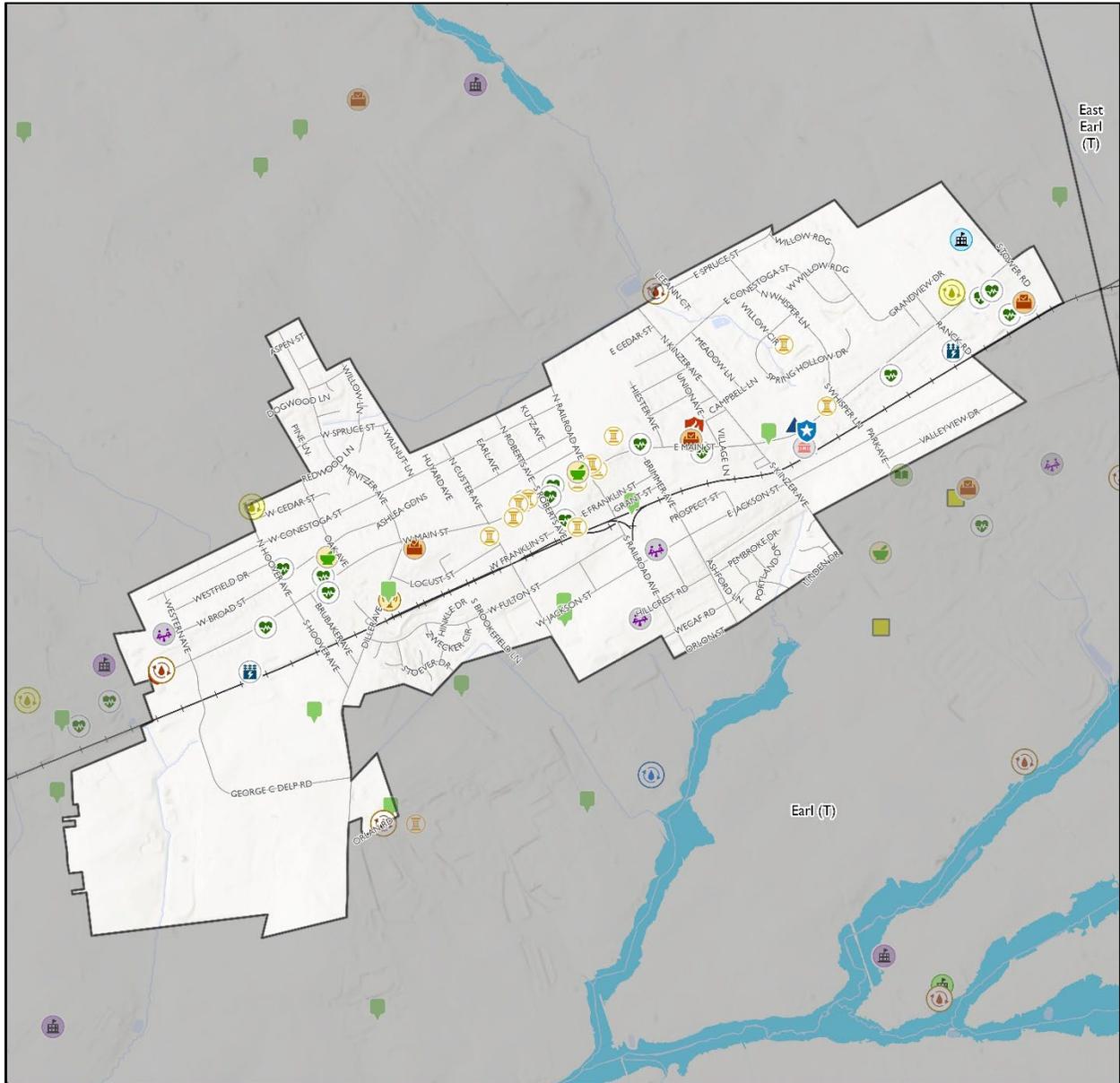


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



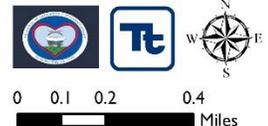
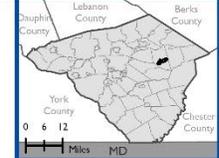


New Holland Borough



New Holland (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Urgent Care                      | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Wastewater Facility              | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater/Water Treatment Plant | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Water Facility                   | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Water Pump                       | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          |                                  | Waterbody                       |
| Library                            |                       |                                   |                                  |                                 |

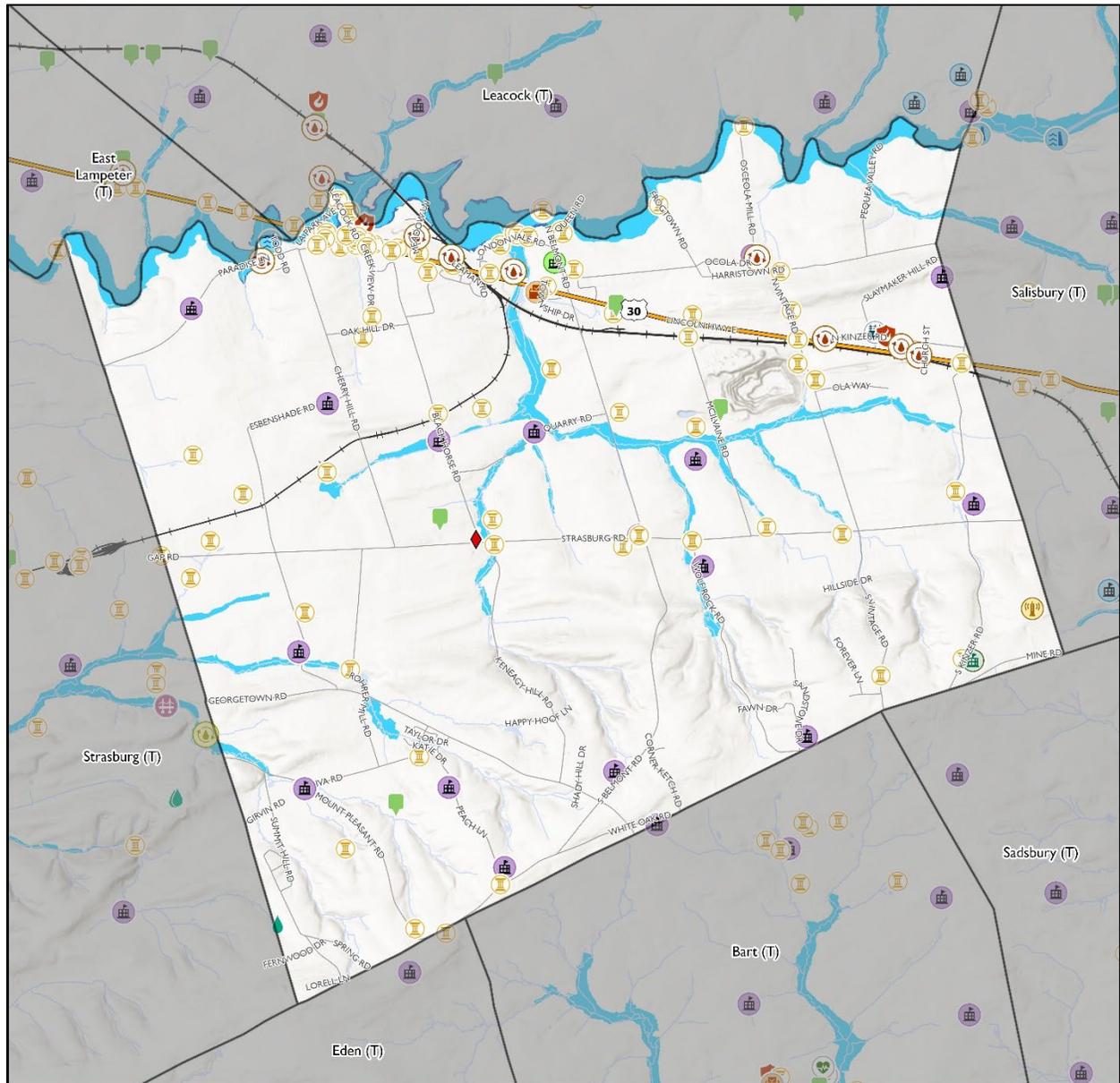


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



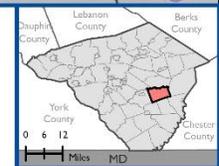


Paradise Township



Paradise (T)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
| Library                            | Water Pump            |                                   |                                  |                                 |



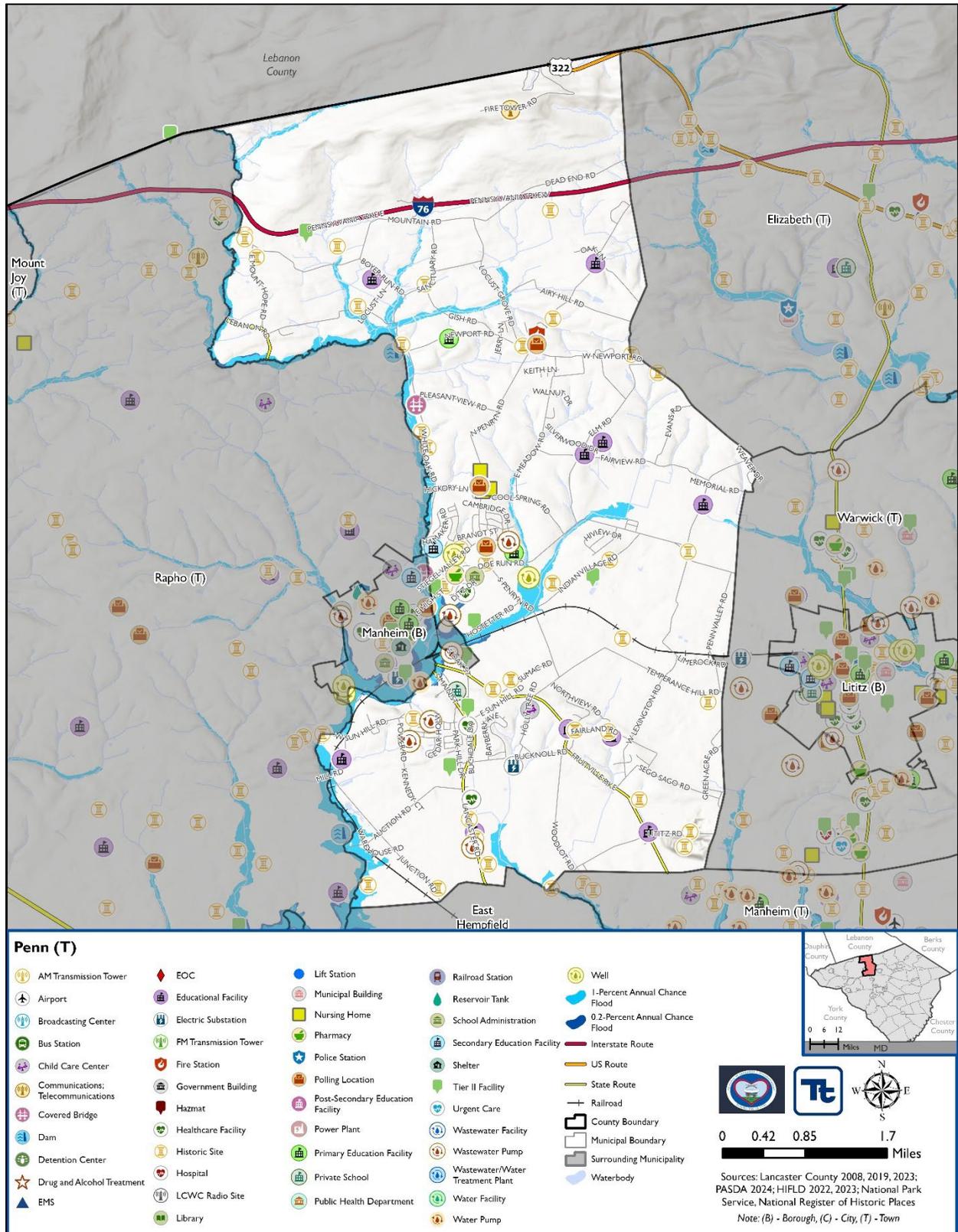
Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town





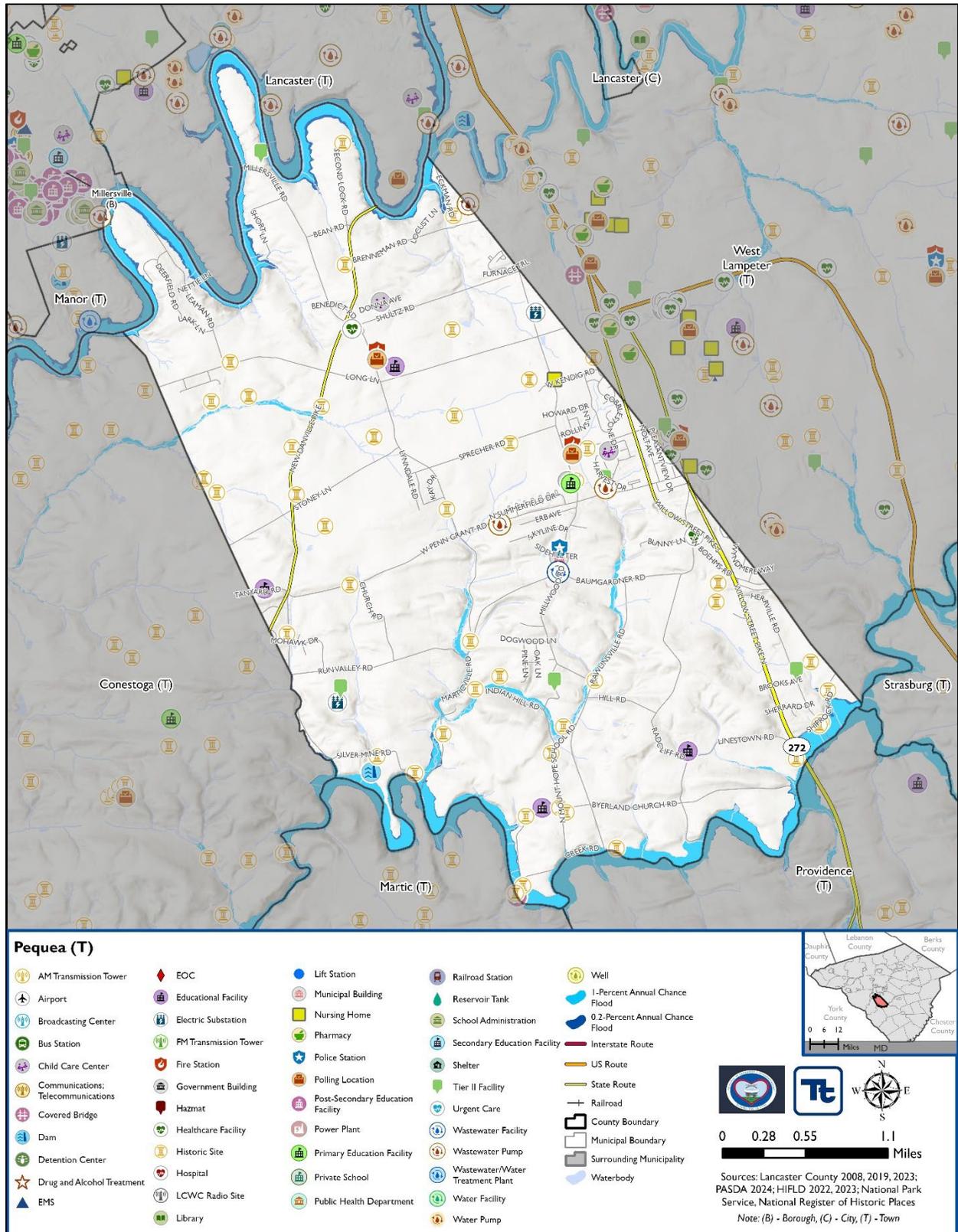
Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

Penn Township



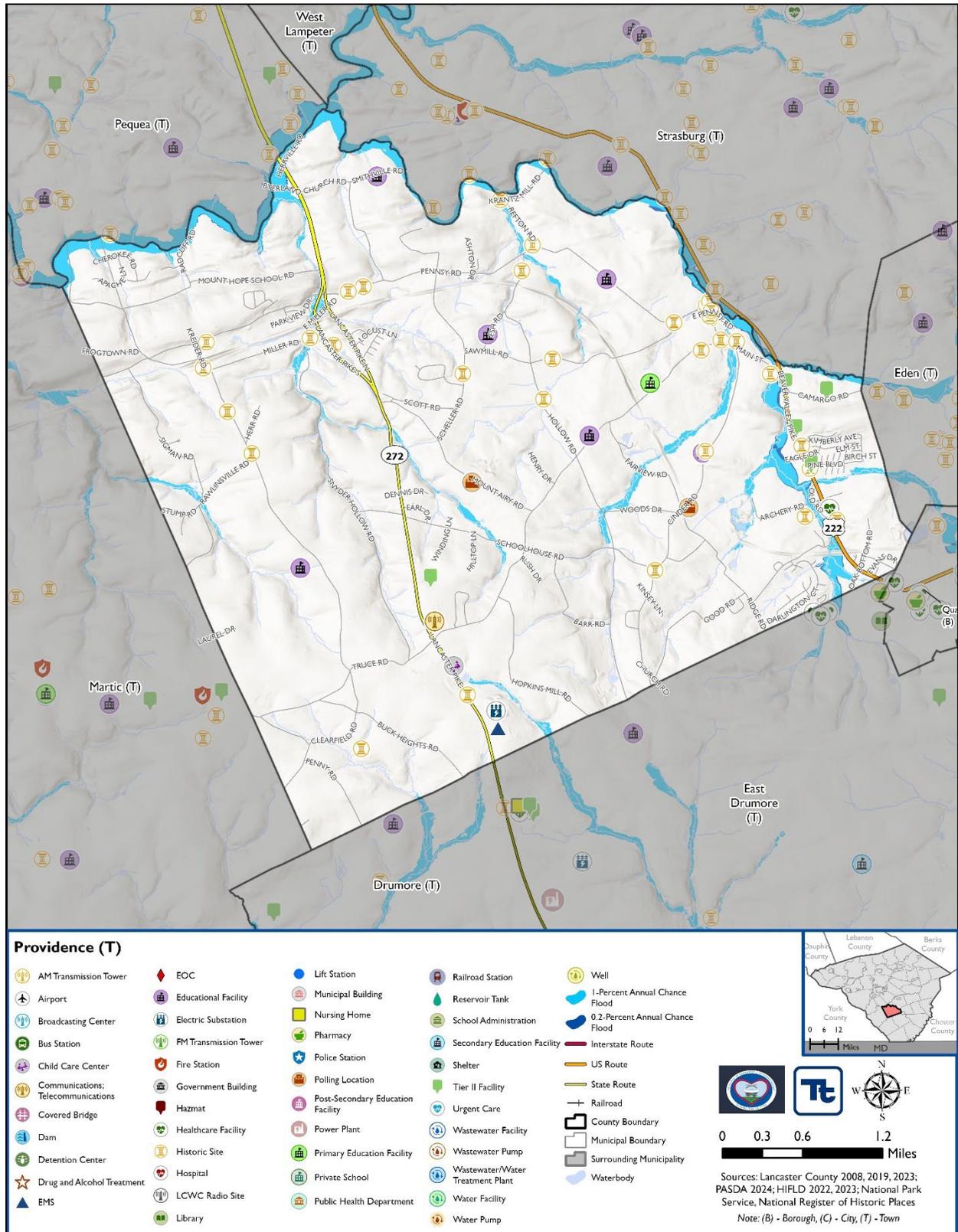


Pequea Township



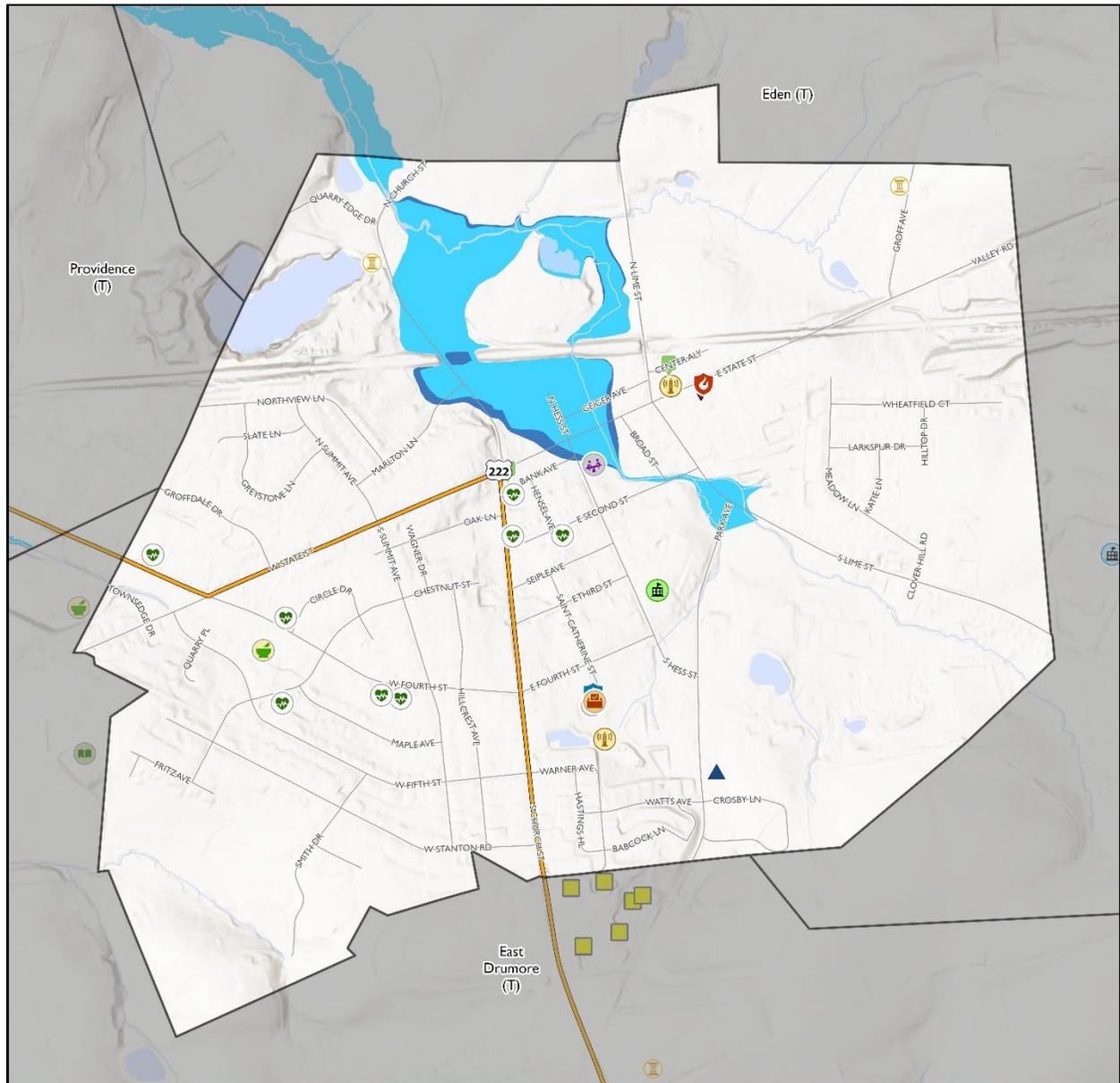


Providence Township





Quarryville Borough



**Quarryville (B)**

AM Transmission Tower	EOC	Lift Station	Railroad Station	Well
Airport	Educational Facility	Municipal Building	Reservoir Tank	1-Percent Annual Chance Flood
Broadcasting Center	Electric Substation	Nursing Home	School Administration	0.2-Percent Annual Chance Flood
Bus Station	FM Transmission Tower	Pharmacy	Secondary Education Facility	Interstate Route
Child Care Center	Fire Station	Police Station	Shelter	US Route
Communications; Telecommunications	Government Building	Polling Location	Tier II Facility	State Route
Covered Bridge	Hazard	Post-Secondary Education Facility	Urgent Care	Railroad
Dam	Healthcare Facility	Power Plant	Wastewater Facility	County Boundary
Detention Center	Historic Site	Wastewater Pump	Wastewater/Water Treatment Plant	Municipal Boundary
Drug and Alcohol Treatment	Hospital	Water Facility	Water Pump	Surrounding Municipality
EMS	LCWC Radio Site	Waterbody		
Library	Public Health Department			

0 0.05 0.1 0.2 Miles

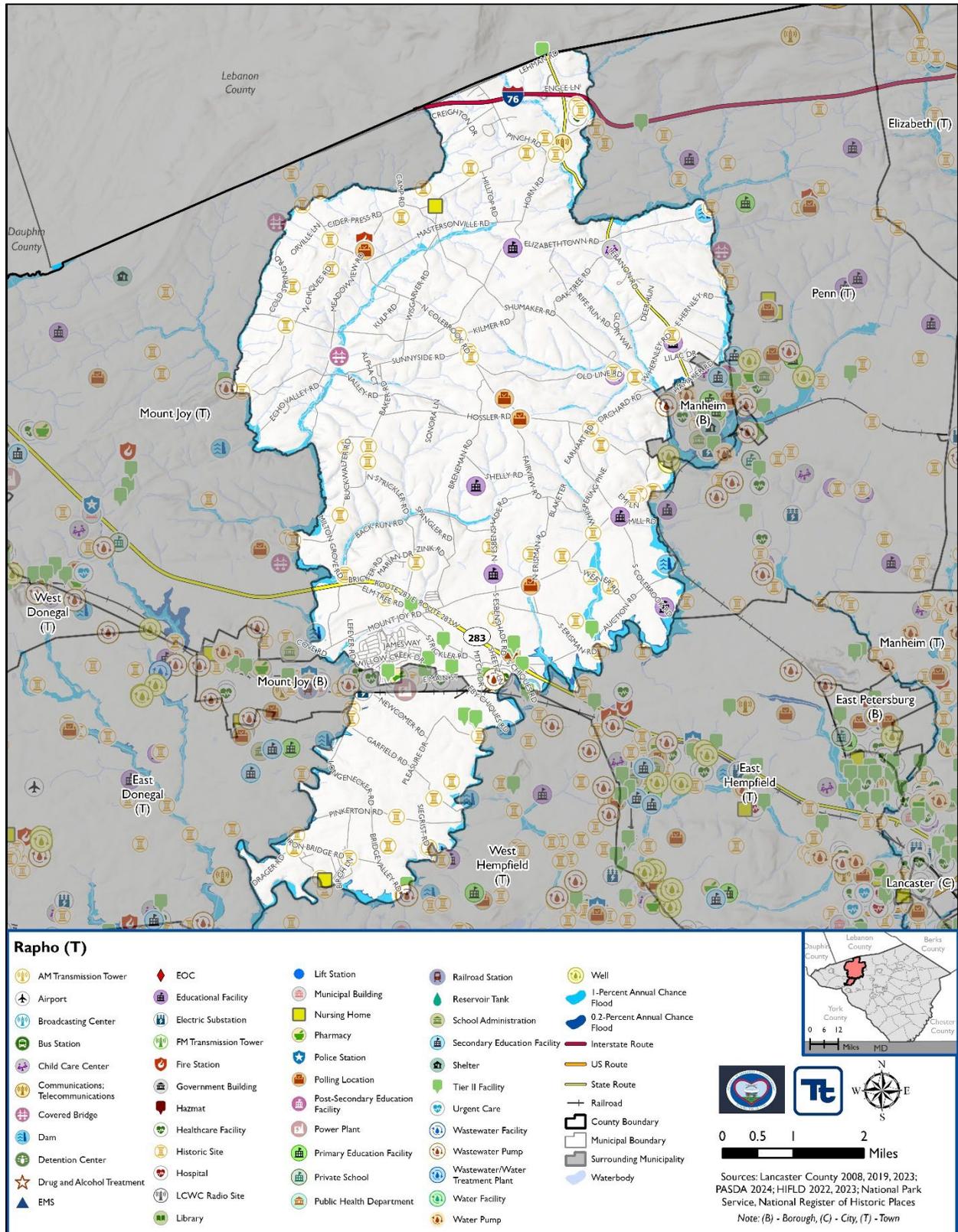
Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places

Note: (B) - Borough, (C) - City, (T) - Town



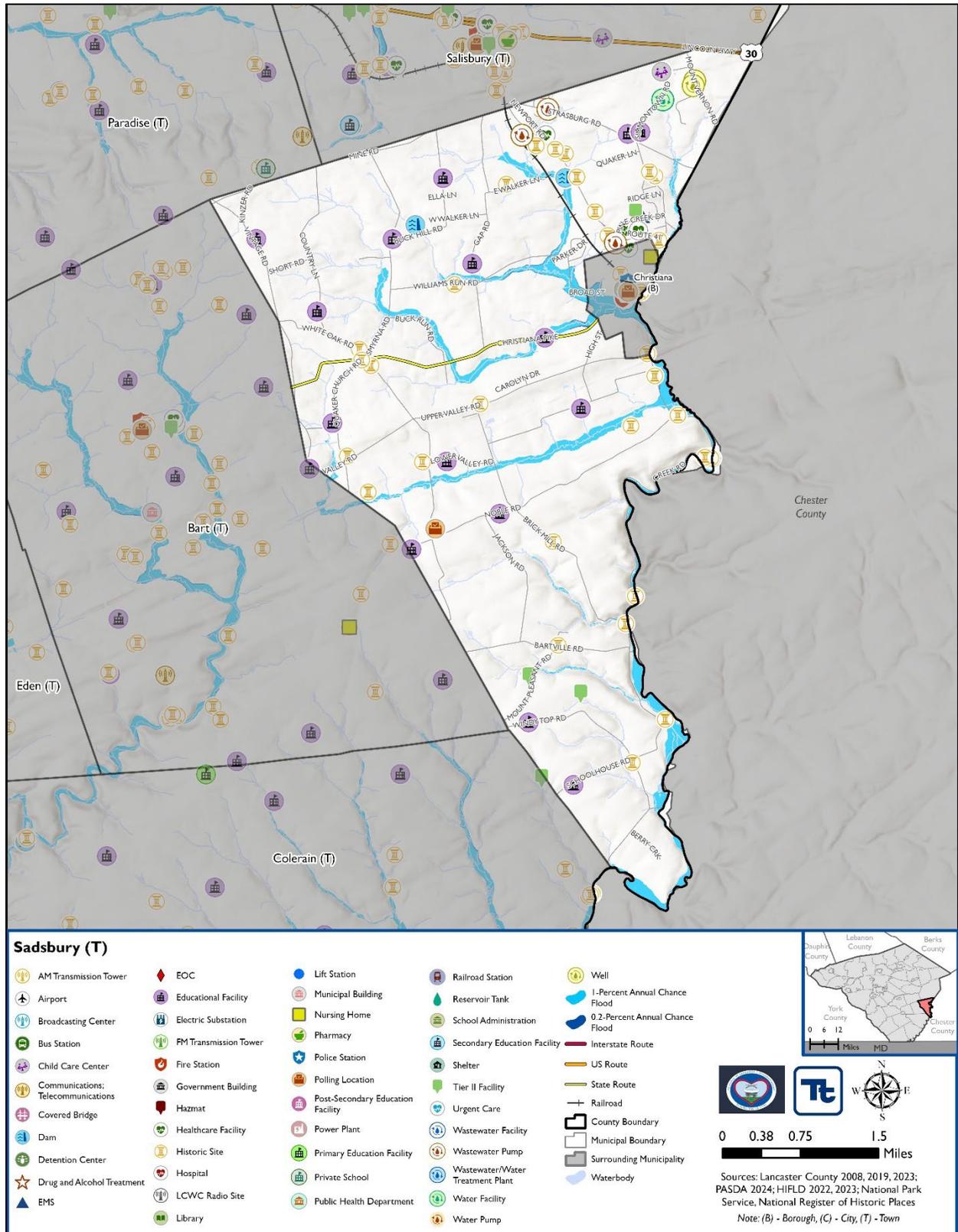
### Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

## Rapho Township



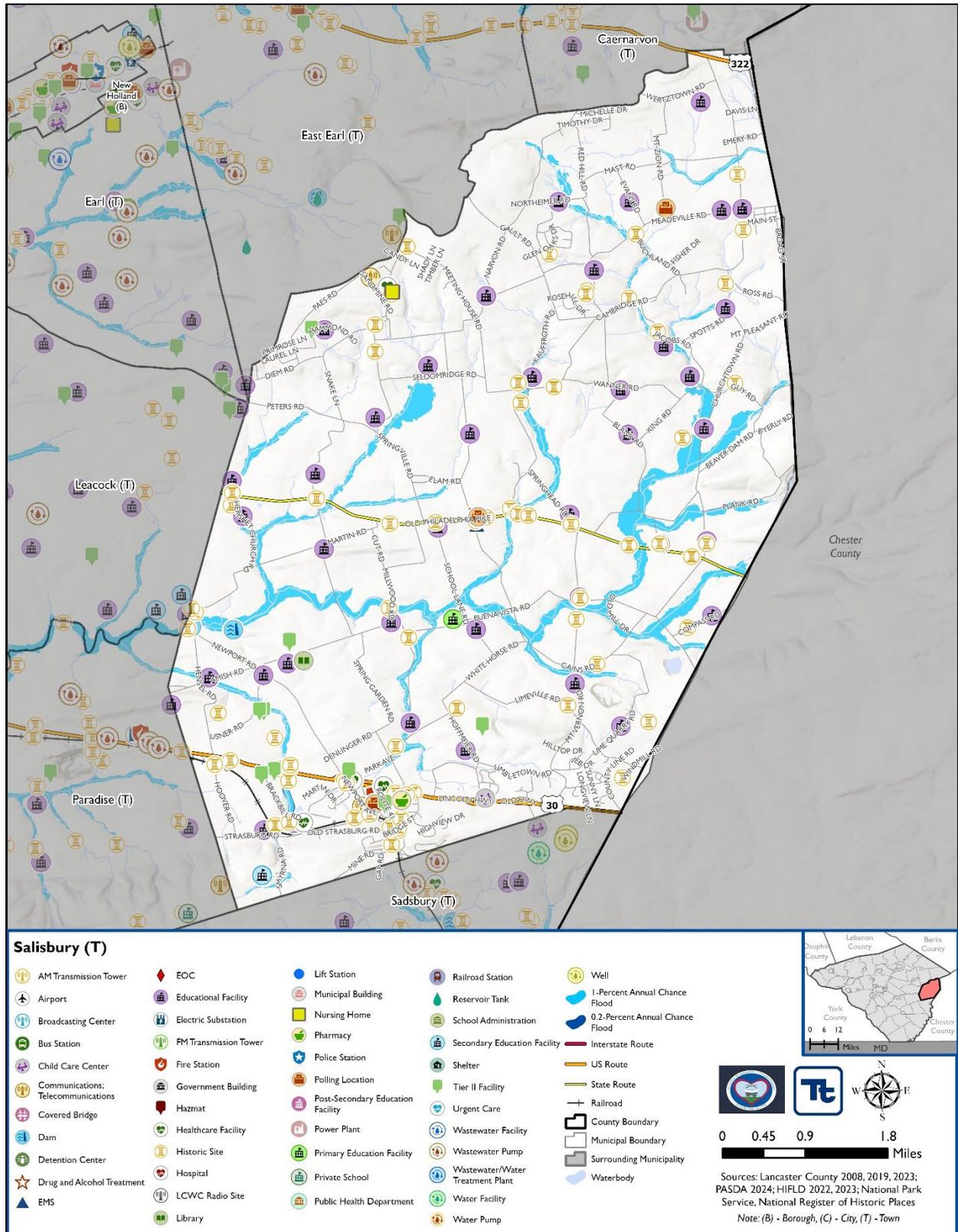


Sadsbury Township



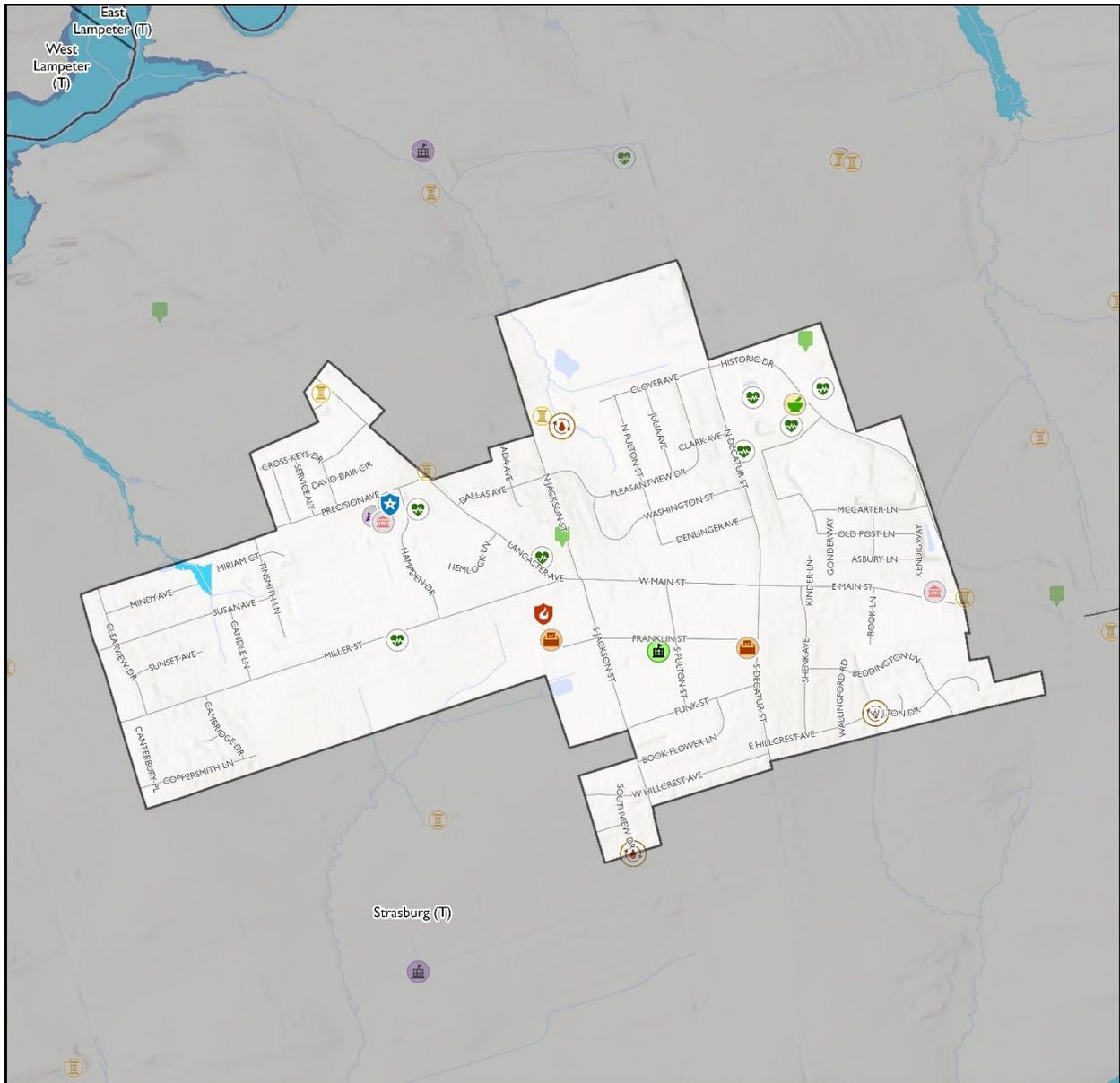


Salisbury Township



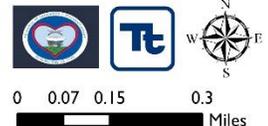
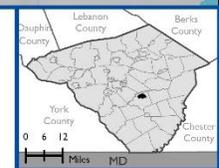


### Strasburg Borough



#### Strasburg (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Wastewater Facility              | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater/Water Treatment Plant | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Water Facility                   | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Pump                       | Waterbody                       |
| Library                            |                       |                                   |                                  |                                 |

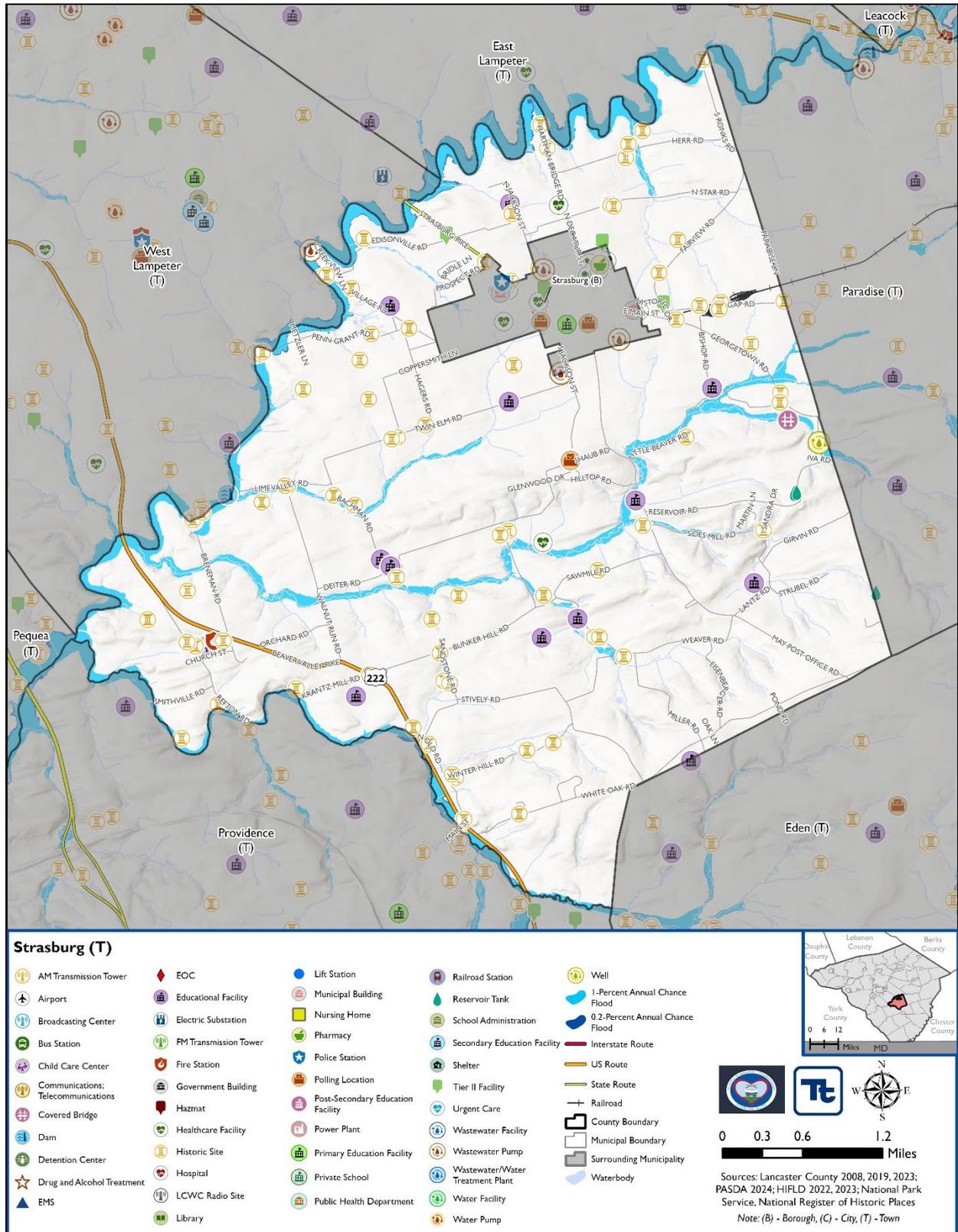


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
 Note: (B) - Borough, (C) - City, (T) - Town



### Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

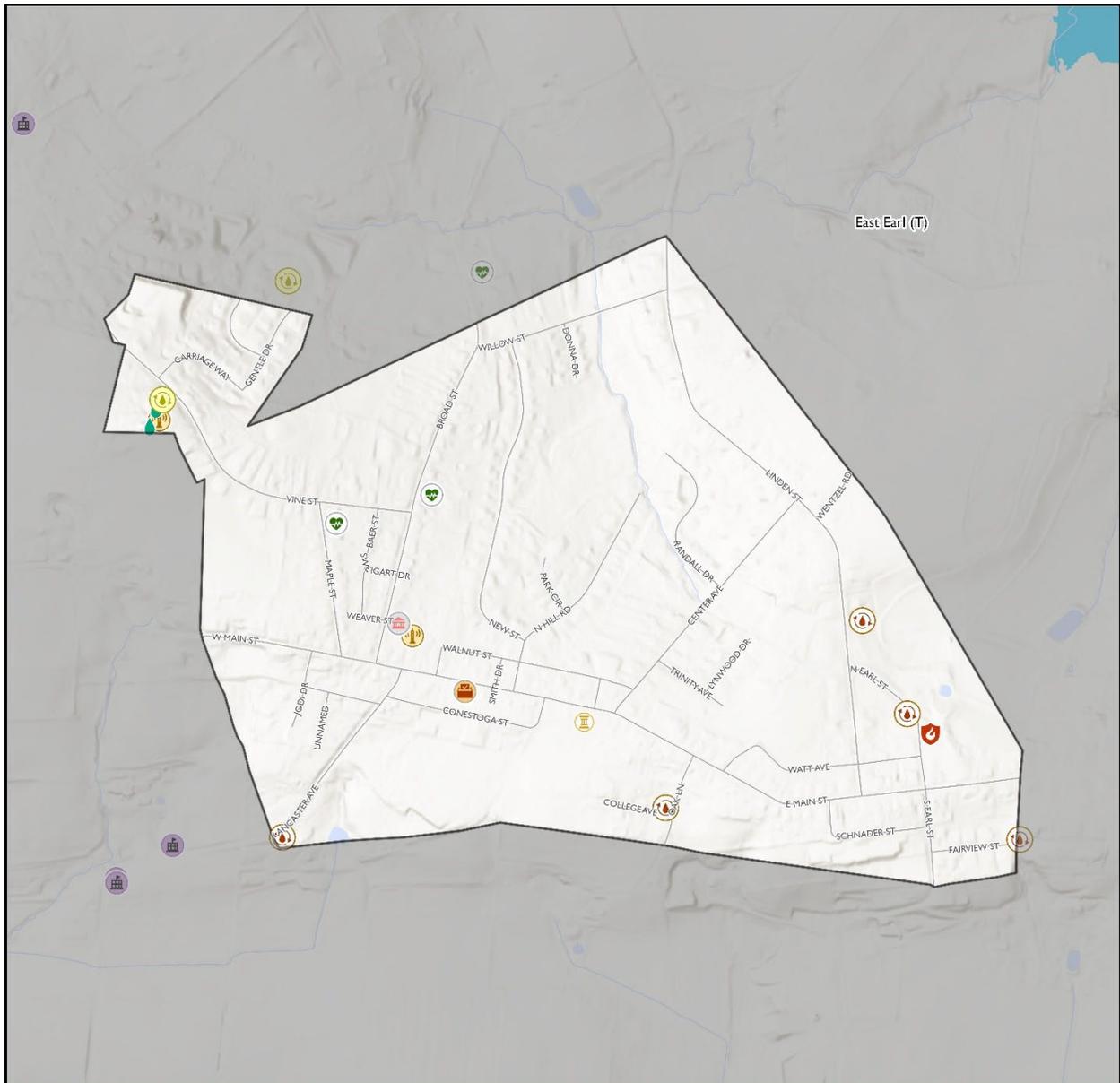
## Strasburg Township





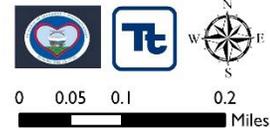
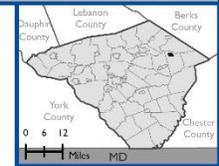
Section 4.3.7. Risk Assessment: Flood, Flash Flood, Ice Jam

Terre Hill Borough



Terre Hill (B)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazard                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |

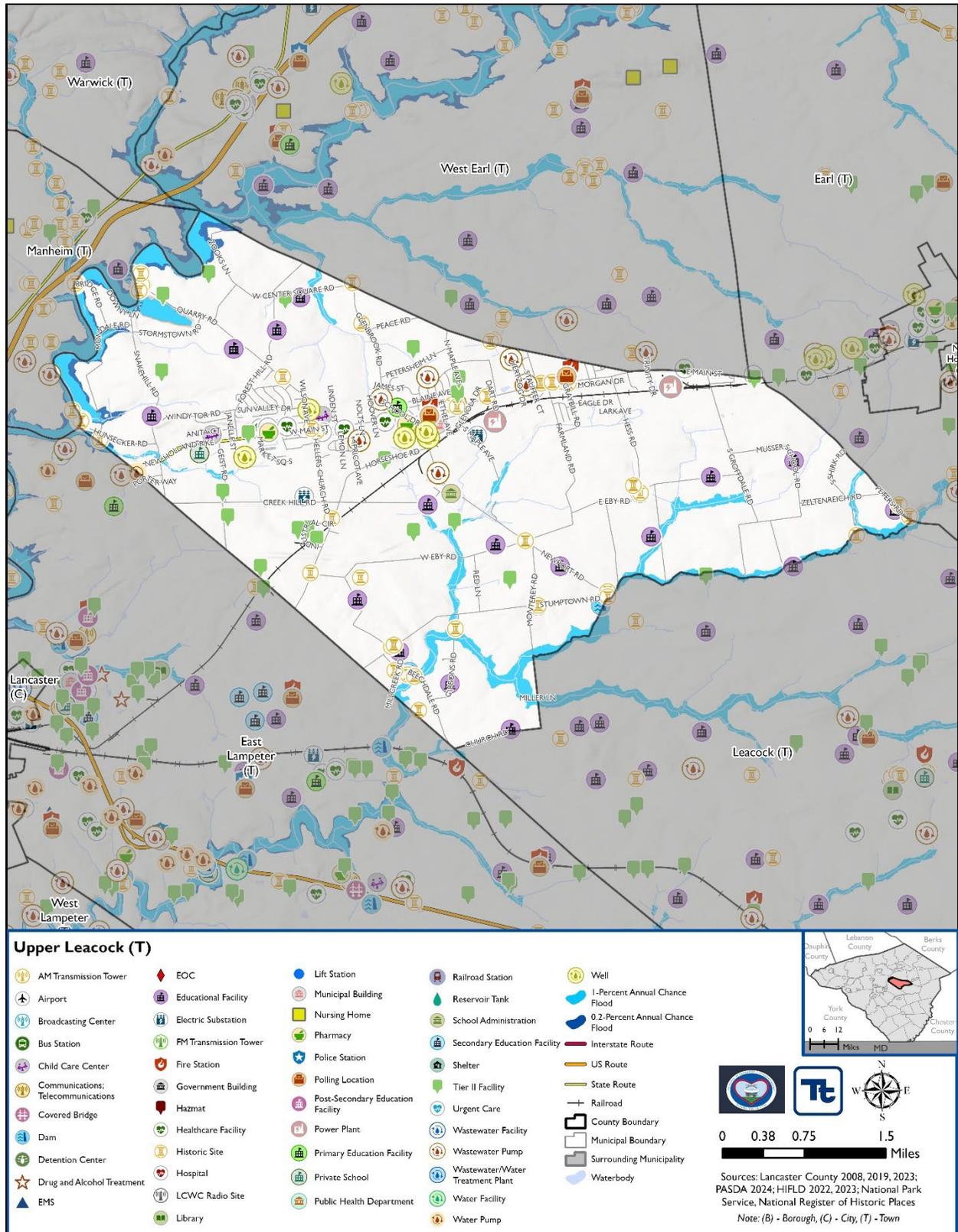


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



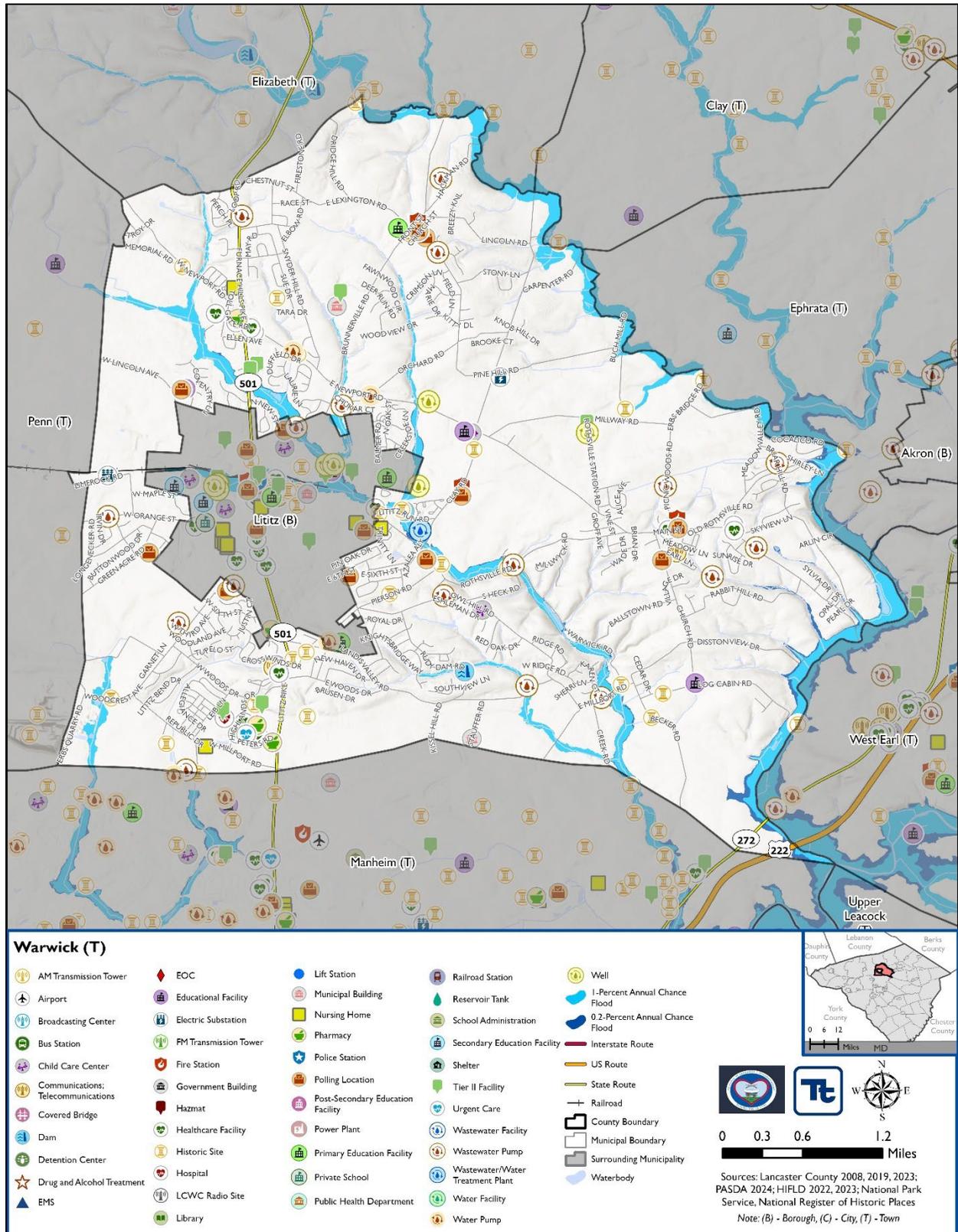


### Upper Leacock Township



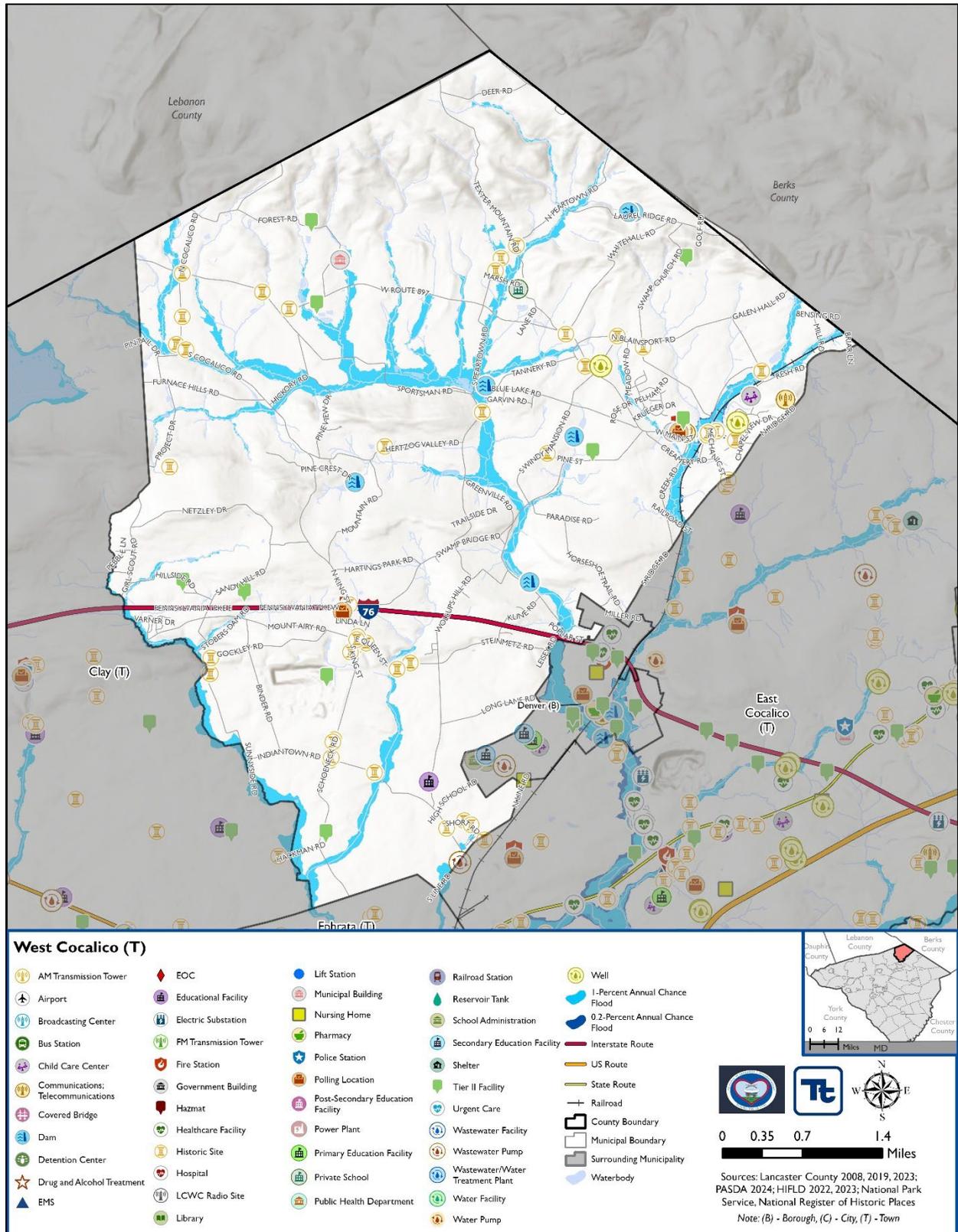


Warwick Township



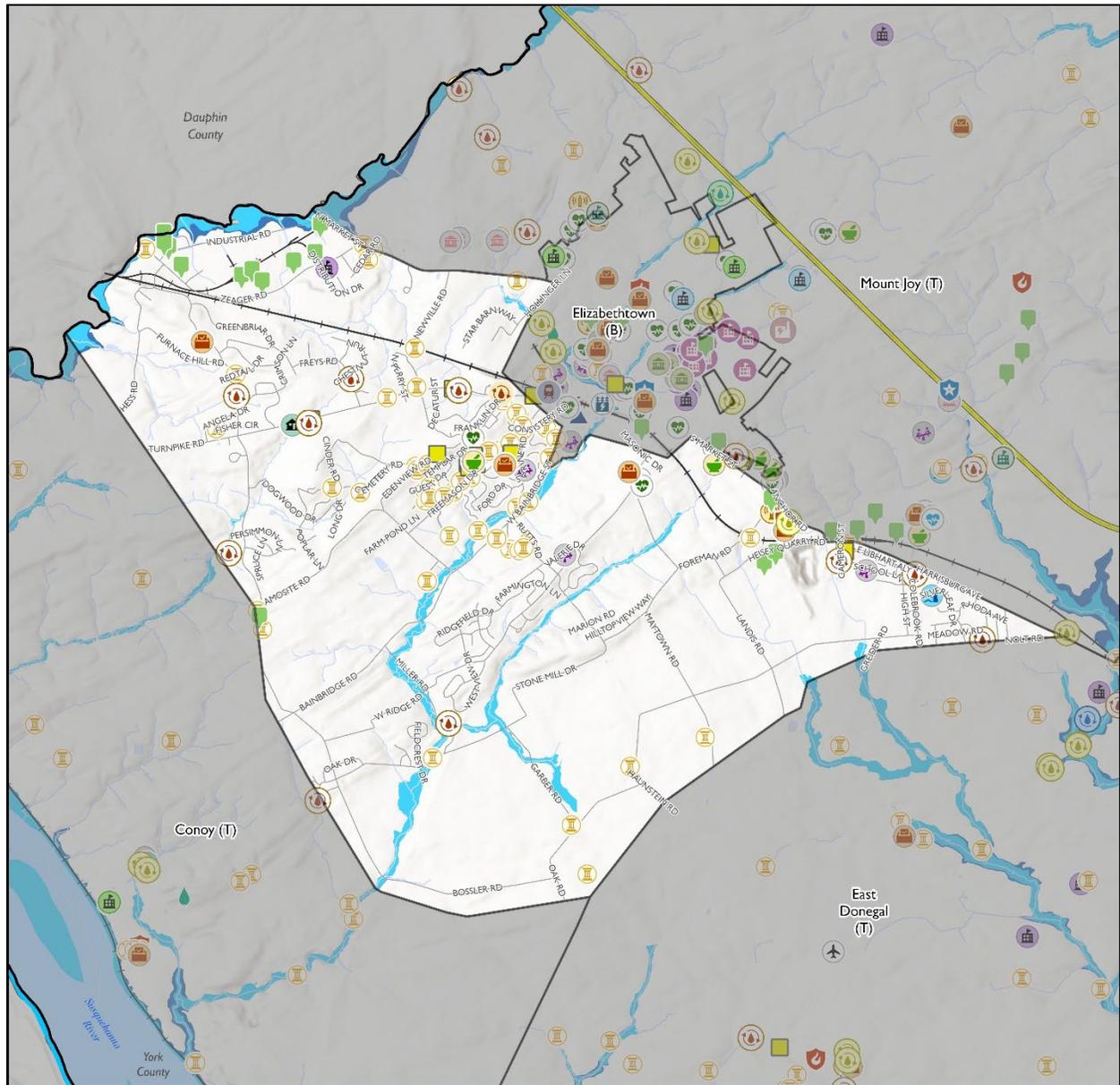


West Cocalico Township





### West Donegal Township



**West Donegal (T)**

AM Transmission Tower	EOC	Lift Station	Railroad Station	Well
Airport	Educational Facility	Municipal Building	Reservoir Tank	1-Percent Annual Chance Flood
Broadcasting Center	Electric Substation	Nursing Home	School Administration	0.2-Percent Annual Chance Flood
Bus Station	FM Transmission Tower	Pharmacy	Secondary Education Facility	Interstate Route
Child Care Center	Fire Station	Police Station	Shelter	US Route
Communications; Telecommunications	Government Building	Polling Location	Tier II Facility	State Route
Covered Bridge	Hazmat	Post-Secondary Education Facility	Urgent Care	Railroad
Dam	Healthcare Facility	Power Plant	Wastewater Facility	County Boundary
Detention Center	Historic Site	Primary Education Facility	Wastewater Pump	Municipal Boundary
Drug and Alcohol Treatment	Hospital	Private School	Wastewater/Water Treatment Plant	Surrounding Municipality
EMS	LCWC Radio Site	Public Health Department	Water Facility	Waterbody
Library	Water Pump			

0 0.33 0.65 1.3 Miles

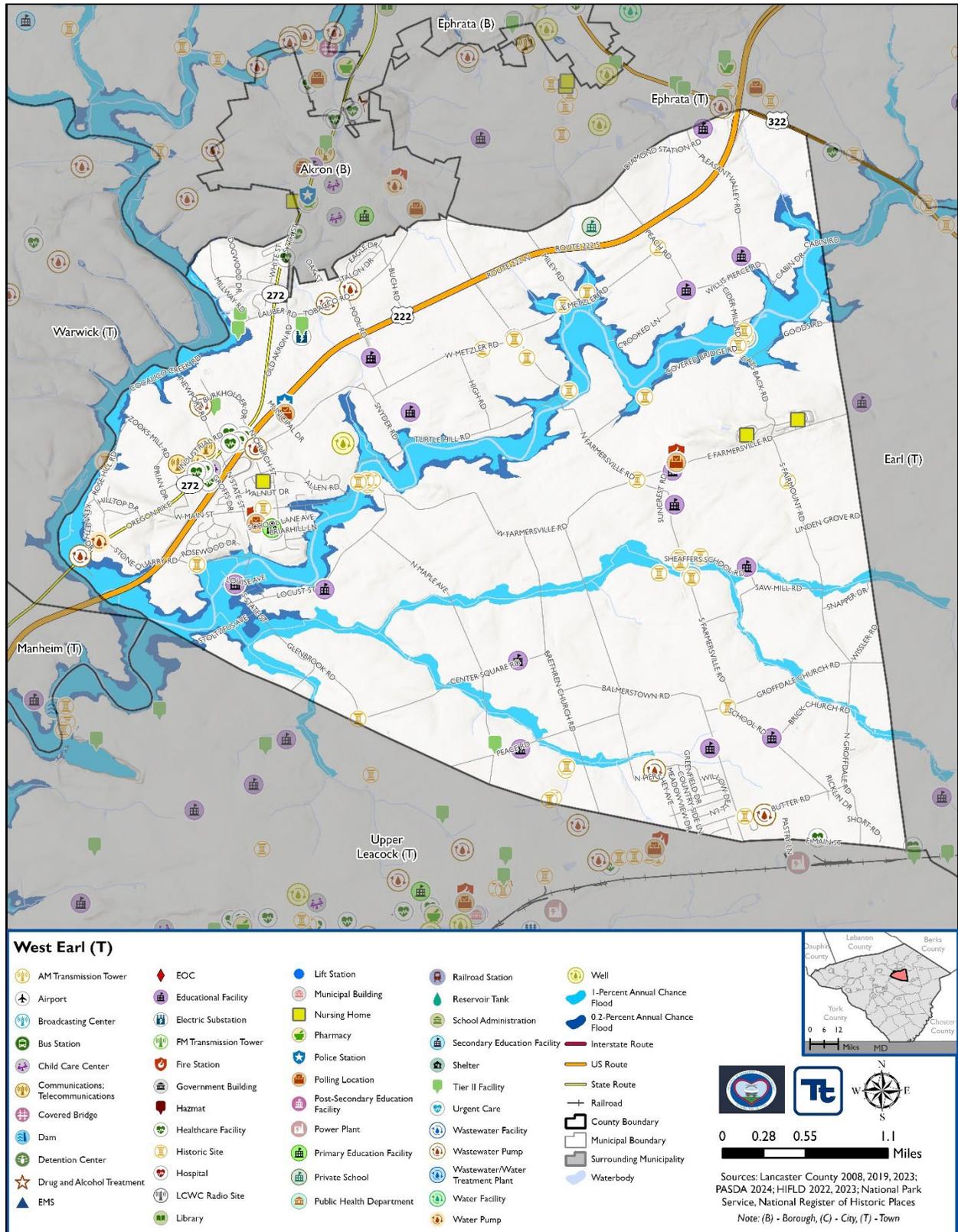
0 0.33 0.65 1.3 Miles

Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places

Note: (B) - Borough, (C) - City, (T) - Town

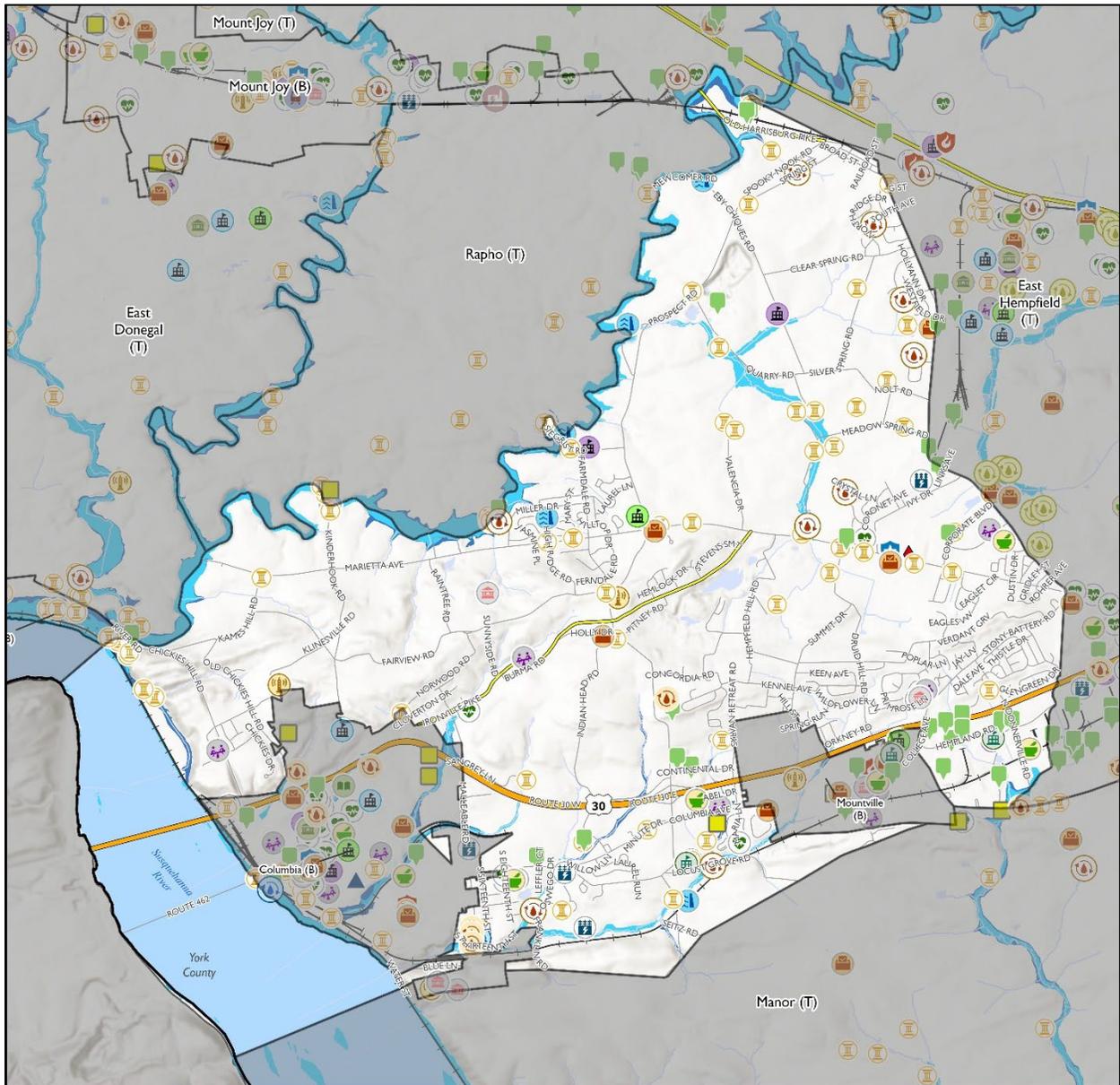


West Earl Township



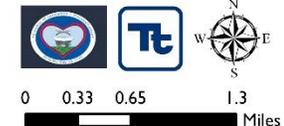
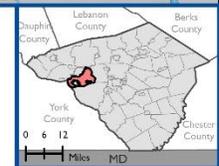


West Hempfield Township



West Hempfield (T)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazmat                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
|                                    | Library               | Water Pump                        |                                  |                                 |

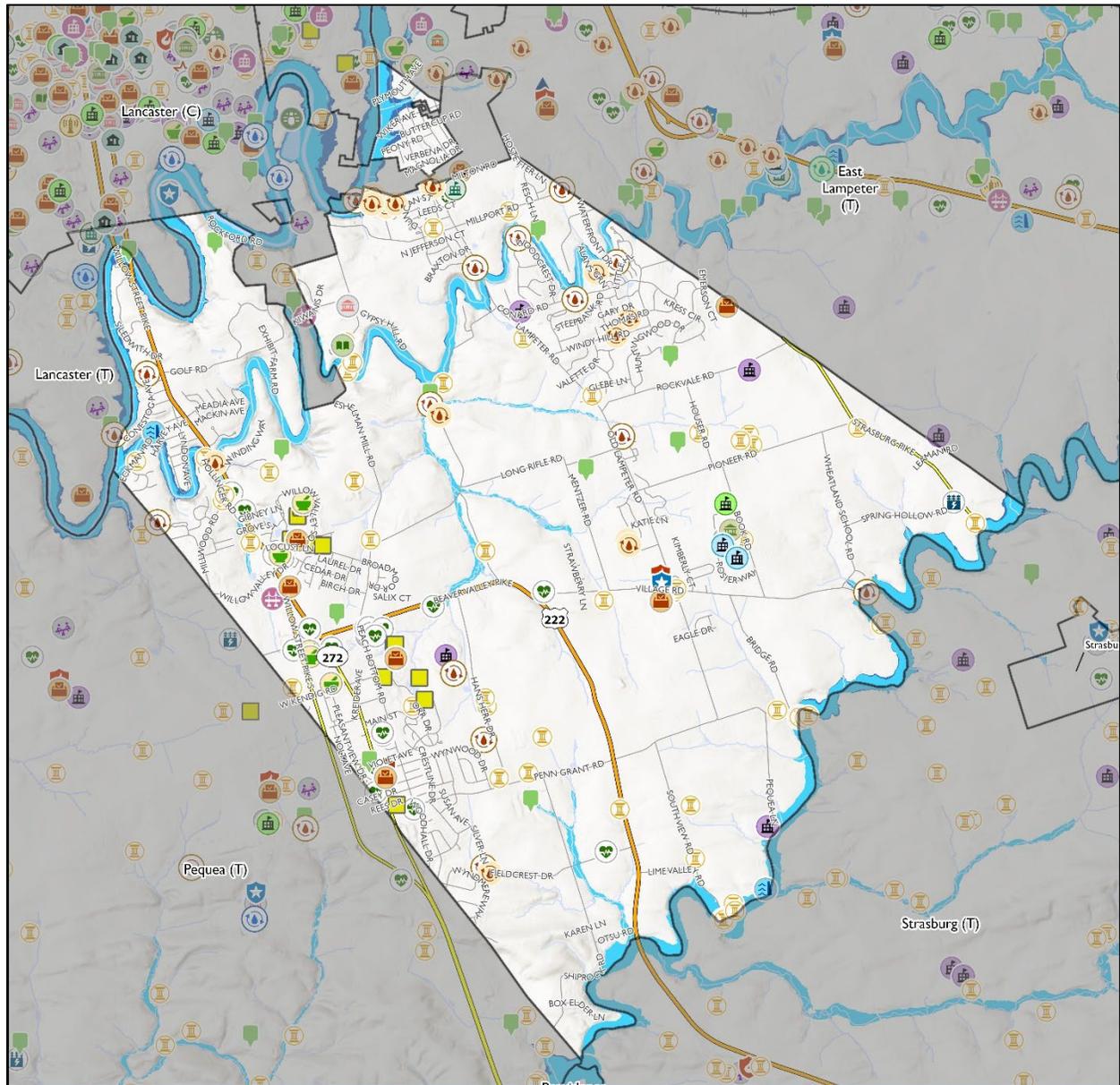


Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



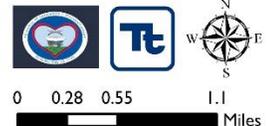
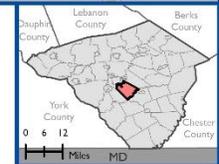


### West Lampeter Township



#### West Lampeter (T)

- |                                    |                       |                                   |                                  |                                 |
|------------------------------------|-----------------------|-----------------------------------|----------------------------------|---------------------------------|
| AM Transmission Tower              | EOC                   | Lift Station                      | Railroad Station                 | Well                            |
| Airport                            | Educational Facility  | Municipal Building                | Reservoir Tank                   | 1-Percent Annual Chance Flood   |
| Broadcasting Center                | Electric Substation   | Nursing Home                      | School Administration            | 0.2-Percent Annual Chance Flood |
| Bus Station                        | FM Transmission Tower | Pharmacy                          | Secondary Education Facility     | Interstate Route                |
| Child Care Center                  | Fire Station          | Police Station                    | Shelter                          | US Route                        |
| Communications; Telecommunications | Government Building   | Polling Location                  | Tier II Facility                 | State Route                     |
| Covered Bridge                     | Hazmat                | Post-Secondary Education Facility | Urgent Care                      | Railroad                        |
| Dam                                | Healthcare Facility   | Power Plant                       | Wastewater Facility              | County Boundary                 |
| Detention Center                   | Historic Site         | Primary Education Facility        | Wastewater Pump                  | Municipal Boundary              |
| Drug and Alcohol Treatment         | Hospital              | Private School                    | Wastewater/Water Treatment Plant | Surrounding Municipality        |
| EMS                                | LCWC Radio Site       | Public Health Department          | Water Facility                   | Waterbody                       |
| Library                            | Water Pump            |                                   |                                  |                                 |



Sources: Lancaster County 2008, 2019, 2023; PASDA 2024; HIFLD 2022, 2023; National Park Service, National Register of Historic Places  
Note: (B) - Borough, (C) - City, (T) - Town



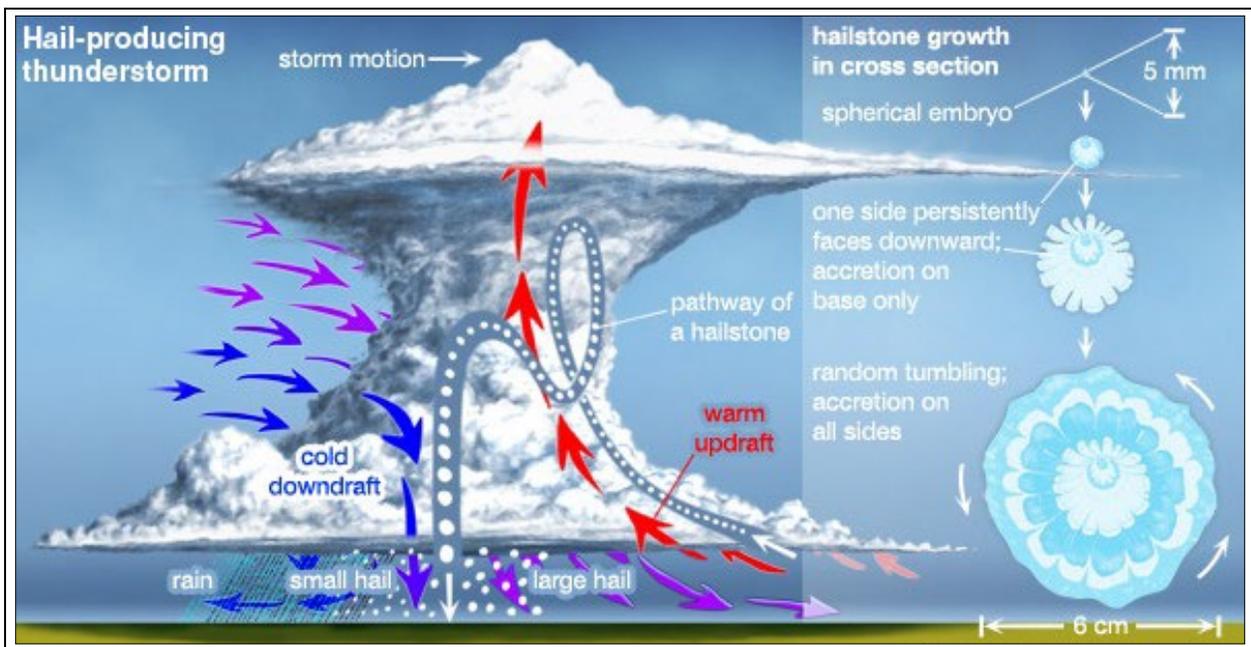


### 4.3.8 Hailstorm

#### Hazard Description

Hail precipitation is often produced at the front of a severe thunderstorm system or in conjunction with a tornado event when ice crystals form within a low-pressure front as warm air rises into the upper atmosphere and is cooled (NOAA NSSL, 2022a). Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation in the form of balls or irregularly shaped masses of ice. Figure 4-13 illustrates the process of hail formulation. Hailstorms can cause significant damage to crops, livestock and property, depending on the size, duration, and intensity of hail precipitation.

Figure 4-13. Hail Formation



Source: Encyclopedia Britannica 2011

Hail can be produced during many different types of storms. Typically, hail occurs with thunderstorms. The higher the temperatures at the earth's surface, the greater the strength of the updrafts, and the greater the amount of time the hailstones are suspended, giving them more time to increase in size. A hailstorm event is defined as a storm with hail that is 0.75 inch or greater in diameter.

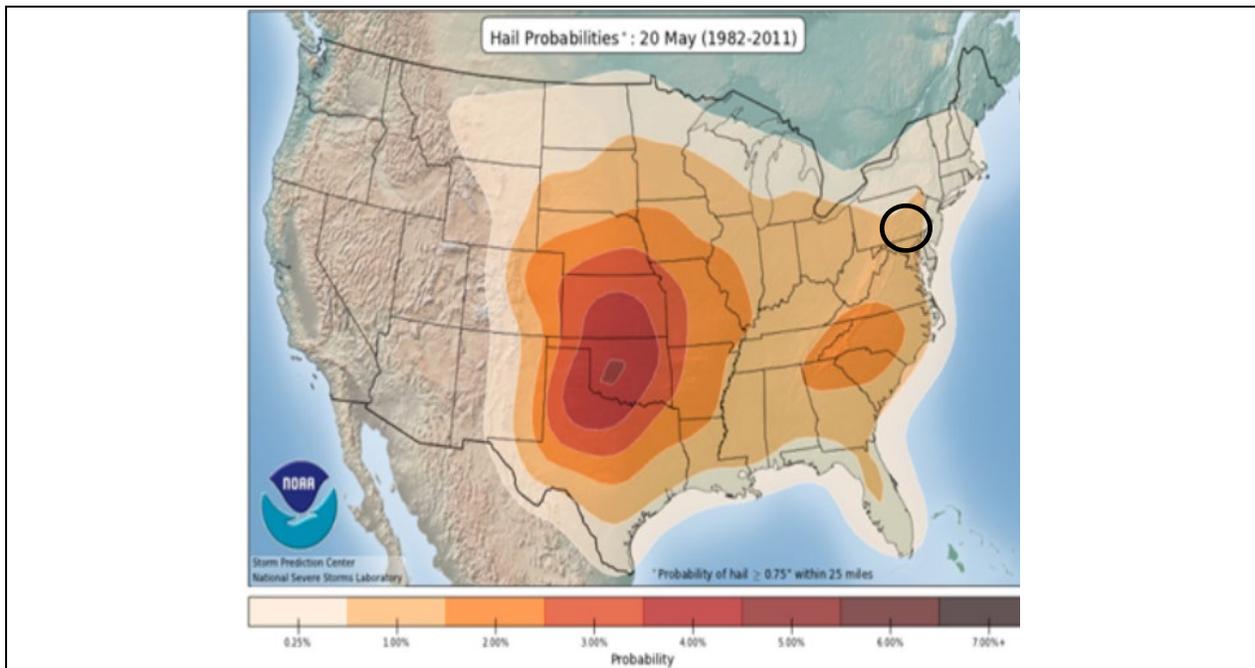
Damage to crops and vehicles is typically the most significant impact of hailstorms. Hail causes over \$1 billion in crop and property damage, on average, each year in the United States (Associated Press 2024). Damage depends on the size, duration, and intensity of hail precipitation. Only the very largest hail stones pose serious risk to people who are exposed. Automobiles and aircraft are particularly susceptible to damage. Individuals who do not seek shelter could face serious injury.

#### Location and Extent

Hail most often occurs in the United States, where the topography and geography are suitable for strong thunderstorm events (Purdue MRCC n.d.). Figure 4-14 shows the annual probability of hailstorms in the United States. There is no meaningful variation in hailstorm probability across Lancaster County.



Figure 4-14. Annual Probability of Hailstorms in the United States



Source: NOAA Storm Prediction Center 2011

Note: The black oval indicates the approximate location of Lancaster County.

### Range of Magnitude

Hail can vary from less than an inch to several inches in diameter. During most hailstorms, hail is produced in a variety of sizes. The size of hail is estimated by comparing it with familiar objects. Table 4-56 shows various sizes of hail compared to real-world objects.

Table 4-56. Hail Size

Size	Inches in Diameter	Updraft Speed (mph)
BB	<0.25	< 24
Pea	0.25	24
Marble	0.50	35
Dime	0.70	38
Penny	0.75	40
Nickel	0.88	46
Quarter	1.0	49
Half-dollar	1.25	54
Walnut	1.5	60
Golf Ball	1.75	64
Hen Egg	2.0	69
Tennis Ball	2.5	77
Baseball	2.75	81
Teacup	3.0	84
Grapefruit	4.0	98
Softball	4.5	103

Source: NWS n.d.



Lancaster County has experienced hail ranging from 0.75 to 2.75 inches in diameter. No deaths or injuries due to hail have been recorded in the County. Lancaster County’s worst hailstorm occurred on April 9, 1980, when thunderstorms produced golf-ball- to baseball-sized hail across Central and Eastern Pennsylvania. According to the Pennsylvania HMP, Lancaster County is not significantly impacted by hailstorm hazards (PEMA 2023).

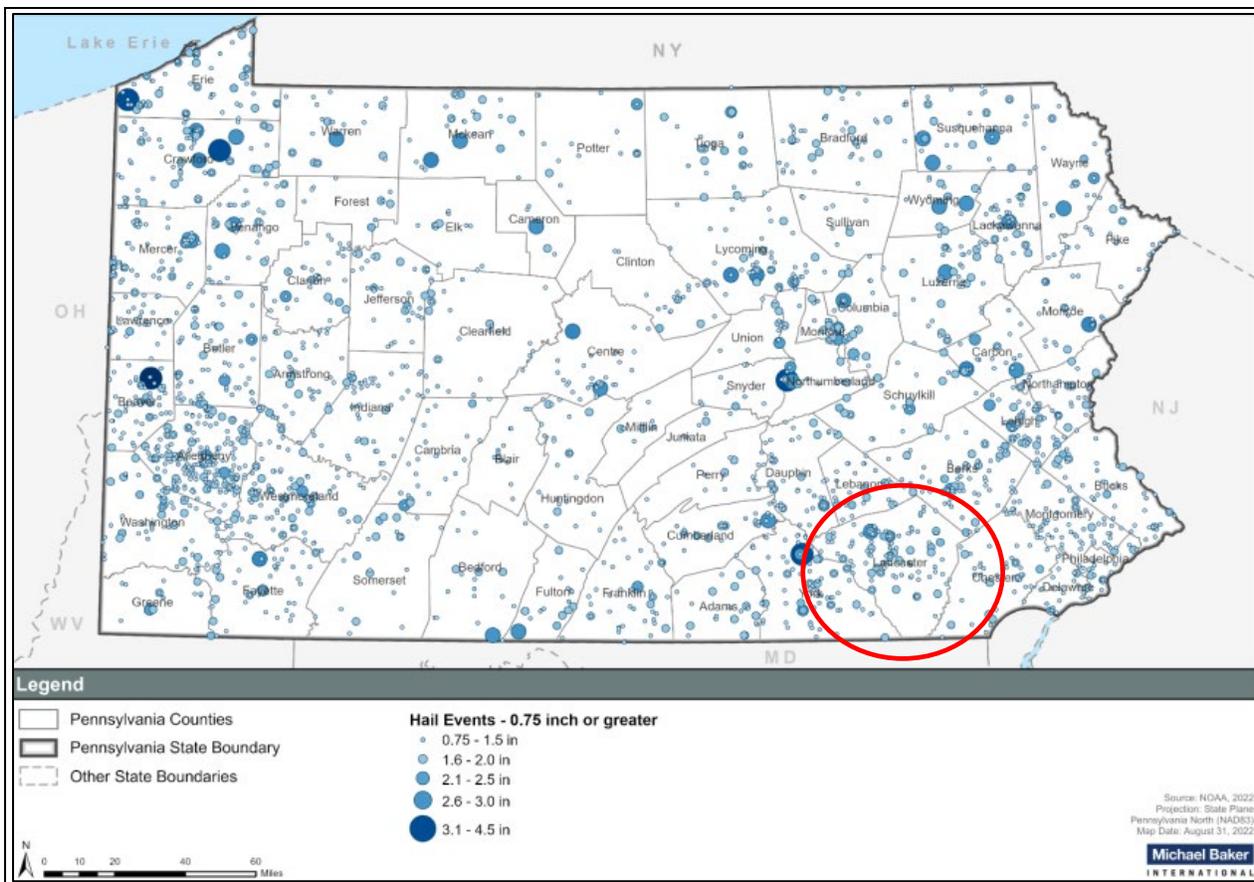
Based on reports from the National Center for Environmental Information and Lancaster County residents, the worst-case scenario for a hailstorm would be a storm that dropped baseball-sized hail (the largest observed in the County) throughout the County. This would cause widespread damage to property and crops.

**Past Occurrence**

Hailstorms occur as a routine part of severe weather in Lancaster County, with a few minor incidents each year. About 96 percent of hailstorm events in Pennsylvania have occurred from April through September, and 87 percent occurred between noon and 9:00 p.m. (PEMA 2023). These times are consistent with historical hailstorm reports from Lancaster County.

The NOAA-NCEI Storm Events database indicates that 188 hailstorm events were recorded in Lancaster County from 1950 to 2024. Figure 4-15 displays the number of recorded hailstorm events by location and magnitude between 1955 and 2022. Table 4-57 includes the 19 hail events in Lancaster County since the last plan (from 2018 to 2024).

**Figure 4-15. Hail Events in Pennsylvania (1950-2016)**



Source: PEMA 2023

Note: The red oval indicates the location of Lancaster County.



Table 4-57. Recorded Hail Events from 2018 to 2024 in Lancaster County

Date	Location	Maximum Hail Size (inches)	Deaths	Injuries	Property Damage	Crop Damage
May 19, 2019	County-Wide	1	0	0	0	0
May 19, 2019	County-Wide	1.25	0	0	0	0
May 19, 2019	County-Wide	1	0	0	0	0
May 28, 2019	County-Wide	0.88	0	0	0	0
May 28, 2019	County-Wide	1.5	0	0	0	0
May 28, 2019	County-Wide	1	0	0	0	0
June 2, 2019	County-Wide	1	0	0	0	0
June 29, 2019	County-Wide	0.75	0	0	0	0
July 6, 2020	County-Wide	1.5	0	0	0	0
July 6, 2020	County-Wide	0.75	0	0	0	0
May 26, 2021	County-Wide	0.88	0	0	0	0
July 17, 2021	County-Wide	1	0	0	0	0
May 20, 2022	County-Wide	1	0	0	0	0
June 16, 2022	County-Wide	1	0	0	0	0
July 1, 2022	County-Wide	1	0	0	0	0
July 2, 2022	County-Wide	1.5	0	0	0	0
July 2, 2022	County-Wide	1	0	0	0	0
July 2, 2022	County-Wide	1	0	0	0	0
June 26, 2023	County-Wide	1	0	0	0	0

Source: NOAA NCEI 2024

Of the 40 public survey responses received for this HMP update, 29 (72 percent) indicated that they are concerned, very concerned, or extremely concerned about severe storms, including hail events. Specific comments include the following:

- I have had hail and wind damage to my roof and siding. I have had flooding in my home as well. Typically, these have occurred during the warmer months.
- Basement flooding due to high ground water levels. Hail damage to roof.
- Hail damage about 10 years ago.

Neither Lancaster County nor the Commonwealth of Pennsylvania has ever been included in a federal disaster declaration because of a hail event.

### Future Occurrence

The past occurrences described above indicate that hailstorm events in Lancaster County have a 100 percent chance of occurring in any given year, as shown in Table 4-58. The future occurrence of hailstorms in the County is considered *likely* due to past historical events recorded.

Table 4-58. Lancaster County Hailstorm Future Occurrence

Hazard Type	Number of Occurrences Between 1950 and 2024	Percent Chance of Occurrence in Any Given Year
Hailstorm	188	100%

Source: NOAA NCEI 2024



### Vulnerability Assessment

The entire county has been identified as the hazard area for hailstorms. Therefore, all assets in Lancaster County (population, structures, critical facilities, and lifelines) are vulnerable.

#### Life, Health, and Safety

##### General Population

The entire population of the County is considered exposed to the hail hazard, as the storm cells that produce this hazard can develop over any part of the region. The area of damage caused by these storms is relatively small because a single storm does not cause widespread devastation but may cause damage within a focused area.

People outdoors (for example, pursuing recreational activities and farming) are considered most vulnerable to the hazard because they ordinarily receive little to no warning, and shelter may not be available to them. Moving to a lower-risk location decreases a person’s vulnerability.

##### Socially Vulnerable Populations

Some populations may experience exacerbated impacts from a hailstorm and prolonged recovery if/when impacted. This is due to many factors, including their physical and financial ability to react or respond during a hazard. Of the population exposed, the most vulnerable include the economically disadvantaged and the population over 65, of which there are 104,082 persons over the age of 65 in Lancaster County. Economically disadvantaged populations may be more vulnerable because they lack financial resources to recover from harm or damage caused by a hailstorm. The population over 65 is more vulnerable because they are more likely to need medical attention that may not be available due to isolation during an extreme storm with hail. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

**Table 4-59. Socially Vulnerable Lancaster County Populations**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>



Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

All buildings in the county are equally exposed to the hailstorm hazard, but hailstorms primarily affect agricultural products. The facilities most vulnerable to hailstorm threats are food- and agriculture-related producers and manufacturers. These facilities are present within both urban and rural areas and would be directly or indirectly affected by a hailstorm event.

### Community Lifelines and Other Critical Facilities

Full functionality of community lifelines and other critical facilities, such as police, fire, and medical services, is essential for any emergency response during and after a hailstorm event. These critical facilities are largely constructed of concrete and masonry; therefore, these should undergo only minimal structural damage from a hailstorm event. Because power interruption can occur, backup power is recommended for community lifelines and other critical facilities.

### Economy

Lancaster County has not experienced historical hailstorm property damage or significant crop damage (\$0 in property damage claims per NOAA-NCEI records). However, given the unpredictability of hailstorms, significant property and crop damage is possible during any hailstorm event. Hail can cause serious damage to automobiles, aircraft, skylights, livestock, and crops. Areas of the County with large amounts of farmland and high agricultural yields are more likely to be affected by hailstorm hazards.

Jurisdictional loss estimation is based on the potential for lost agricultural revenues throughout the county. The USDA Census of Agriculture enumerates farmland acreage by county, as well as the annual market value of all agricultural products sold by county. If the county were to lose its agricultural yield because of hail, total losses could amount to nearly \$1.9 billion in sales of crops. Livestock, poultry, and associated products have a potential loss value of nearly \$1.5 billion (USDA 2022). Table 4-60 displays the agricultural lands in the county, by jurisdiction.

Table 4-60. Agricultural Land Area (Acres) in Lancaster County, by Jurisdiction

Jurisdiction	Total Agricultural Lands (acres)	% of County Total Agricultural Lands
Adamstown Borough	70.4	<0.1%
Akron Borough	57.4	<0.1%
Bart Township	8,127.8	2.4%
Brecknock Township	6,527.2	1.9%
Caernarvon Township	7,839.5	2.3%
Christiana Borough	62.1	<0.1%
Clay Township	7,085.6	2.1%
Colerain Township	12,567.6	3.7%
Columbia Borough	111.5	<0.1%
Conestoga Township	3,472.6	1.0%
Conoy Township	5,400.6	1.6%
Denver Borough	100.0	<0.1%
Drumore Township	9,265.4	2.7%
Earl Township	10,380.0	3.0%
East Cocalico Township	4,529.0	1.3%
East Donegal Township	10,162.6	3.0%
East Drumore Township	10,938.7	3.2%



Jurisdiction	Total Agricultural Lands (acres)	% of County Total Agricultural Lands
East Earl Township	9,085.1	2.7%
East Hempfield Township	4,944.7	1.4%
East Lampeter Township	6,712.0	2.0%
East Petersburg Borough	83.7	<0.1%
Eden Township	5,379.1	1.6%
Elizabeth Township	4,572.1	1.3%
Elizabethtown Borough	86.3	<0.1%
Ephrata Borough	110.7	<0.1%
Ephrata Township	6,372.2	1.9%
Fulton Township	10,775.4	3.2%
Lancaster City	47.8	<0.1%
Lancaster Township	453.8	0.1%
Leacock Township	11,107.7	3.3%
Lititz Borough	78.3	<0.1%
Little Britain Township	11,953.7	3.5%
Manheim Borough	82.3	<0.1%
Manheim Township	4,262.7	1.2%
Manor Township	15,315.5	4.5%
Marietta Borough	24.6	<0.1%
Martic Township	6,627.8	1.9%
Millersville Borough	109.3	<0.1%
Mount Joy Borough	164.9	<0.1%
Mount Joy Township	10,640.5	3.1%
Mountville Borough	80.4	<0.1%
New Holland Borough	144.3	<0.1%
Paradise Township	7,371.2	2.2%
Penn Township	11,017.6	3.2%
Pequea Township	4,926.9	1.4%
Providence Township	6,438.6	1.9%
Quarryville Borough	188.9	0.1%
Rapho Township	21,966.7	6.4%
Sadsbury Township	8,634.2	2.5%
Salisbury Township	18,039.4	5.3%
Strasburg Borough	115.8	<0.1%
Strasburg Township	9,019.5	2.6%
Terre Hill Borough	53.4	<0.1%
Upper Leacock Township	8,536.4	2.5%
Warwick Township	6,995.5	2.0%
West Cocalico Township	7,954.6	2.3%
West Donegal Township	5,169.7	1.5%
West Earl Township	8,222.1	2.4%
West Hempfield Township	5,438.3	1.6%
West Lampeter Township	5,545.1	1.6%
<b>Lancaster County</b>	<b>341,546.7</b>	<b>100.0%</b>

Source: USGS/NLCD 2021



### Environment

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Damage to trees, shrubbery, and other vegetation may occur during hailstorm events through defoliation. Unless there are compounding stresses, natural vegetation can typically recover over time following the event (PEMA 2023).

### Future Changes That May Impact Vulnerability

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#### Projected Development

Areas targeted for potential future growth and development within the next 5 to 10 years have been identified across Lancaster County and are further. All new developments will be exposed to the hailstorm hazard.

#### Projected Changes in Population

The risk that hailstorms pose to people will increase with any increase in the county's population. Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

#### Climate Change

Climate change could alter the prevalence and severity of extreme weather events such as hailstorms. The June 2009 Pennsylvania Climate Impact Assessment indicates the likelihood that Pennsylvania will undergo increased temperatures in the 21st century. An increase in variability of temperature and precipitation may well lead to increased frequency and severity of hailstorm events. Future improvements in modeling smaller-scale climatic processes such as thunderstorms and associated hailstorms can be expected and will lead to improved understanding of the ways in which the changing climate will alter storms, such as hailstorm events, in Pennsylvania (PEMA 2021).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county. Collection of additional information and actual loss data specific to the plan participants will further enhance the vulnerability assessment for this hazard.



### 4.3.9 Invasive Species

#### Hazard Description

An invasive species is a species that is not indigenous to the ecosystem under consideration and whose introduction causes or is likely to cause economic, environmental, or human harm. These species can be any type of organism: amphibian, plant, fish, invertebrate, mammal, bird, disease, or pathogen. The magnitude of an invasive species threat is generally amplified when the ecosystem or host species is already stressed, such as in times of drought or after a wildfire, as the already weakened state of the native ecosystem causes it to succumb to an infestation more easily (PEMA 2023).

The Pennsylvania Governor’s Invasive Species Council has identified over 300 species that could significantly threaten the natural environment in Pennsylvania (PDA n.d.) These species are largely introduced by the actions of humans. Common pathways for invasive species include unintentional release, the movement of goods and equipment that may unknowingly harbor species, smuggling, emptying ship ballast water, hull fouling, and escape from cultivation (PDA n.d.). Invasive species threats are generally categorized as follows:

- Aquatic invasive species are non-native viruses, invertebrates, fish, and aquatic plants that threaten the diversity or abundance of native species; the ecological stability of infested waters; human health and safety; or commercial, agriculture, aquaculture, or recreational activities dependent on such waters (FWS 2021).
- Terrestrial invasive species are non-native arthropods, vascular plants, higher vertebrates, or pathogens that complete their life cycle on land instead of water and whose introduction causes or is likely to cause economic or environmental harm or harm to human health (USDA n.d.).

Lancaster County officials and municipal leaders have identified plants, insects, and diseases that have caused, or have potential to cause, significant damage to the county’s natural landscape and agricultural economy through defoliation and mortality, or out-competition for vital resources. The sections below describe species of local concern that are considered for this risk assessment.

#### Emerald Ash Borer

The emerald ash borer was detected in 2007 in Butler and Allegheny Counties. It is an invasive pest from Southeast Asia that kills all types of ash trees (genus *Fraxinus*) in North America. It has caused massive devastation and prompted the USDA to form a national program for surveying, outreach, and management (USDA n.d.). As a result of federal and state mitigation efforts, Pennsylvania lifted all quarantines in the commonwealth in 2011, and the USDA has rescinded its federal quarantine. Although the commonwealth’s quarantine is no longer in effect, it is still possible for the emerald ash borer to impact Pennsylvania.

#### Spotted Lanternfly

The spotted lanternfly was first observed in Berks County in 2014. Since then, the pests have been found in about 38 Pennsylvania counties, including Lancaster County, with an additional six counties being added in 2023 (PDA n.d.). The spotted lanternfly (adult and juvenile) sucks sap from stems and branches from under the bark. When it is done feeding, the sap continues to ooze from the tree and attract other insects. This liquid then promotes mold. All these factors will damage a tree (USDA n.d.). A recent economic impact study estimates Pennsylvania could lose more than \$324 million annually and 2,800 jobs (PDA 2019). Because of the detrimental effects this insect has on Pennsylvania’s ecosystem and economy, the Department of Agriculture has set up a hotline to report spotted lanternfly sightings.

#### Invasive Plants

Many invasive plants pose a significant threat to ecosystem biodiversity and agricultural productivity because of their ability to out-compete native species. The Pennsylvania Department of Agriculture (PDA) defines Class A noxious weeds as invasive plants that are established in the state, are geographically limited, and are



intended to be fully eradicated (PDA n.d.). Pennsylvania’s Controlled Plant and Noxious Weed Act identifies 22 Class A noxious weeds (PDA n.d.). Some species (e.g., Palmer amaranth and waterhemp) are prolific seed producers and have developed a potential resistance to traditional herbicides, making them challenging to manage. Others, such as kudzu, grow rapidly and prevent slower-growing native plants from establishing.

### Location and Extent

The location of invasive threats in Lancaster County depends on the preferred habitat of the species as well as the species’ ease of movement and establishment. The University of Arizona and the National Invasive Species Information Center have identified the following characteristics of areas that are more likely to be impacted by invasive species:

- Lack of natural predators or diseases that kept the species under control in its native environment
- Present vacant ecological niches that can be exploited by non-native species
- Lack of species diversity
- Lack of a multi-tiered canopy (in the case of invasive plants)
- Disturbed by fire, construction, or agriculture prior to invasion.

No mapping of such areas in Lancaster County has been prepared, so the entire county is assumed to be at risk from this hazard.

### Range of Magnitude

The magnitude of invasive species threats ranges from nuisance to widespread killer. Some invasive species are not considered agricultural pests and do not harm humans. Others can cause widespread illness or death in humans or significant changes in the composition of local ecosystems.

Forest or crop-impacting invasive species could have a significant economic impact in Lancaster County because the county hosts both forest-based recreational land and agricultural land. Forests prevent soil degradation and erosion, protect watersheds, stabilize slopes, and absorb carbon dioxide emissions. If forest land is wiped out, the effects of erosion and flooding will be amplified. Invasive species negatively impact the county’s agricultural economy by increasing the cost of pest control measures and decreasing harvest yields. Invasive species reduce the productivity and profitability of agricultural land.

Invasive species that affect the health of hardwood trees can have damaging impacts in urban and suburban areas. As the damage progresses, branches become less stable and are more susceptible to winds. Significant building and auto damage can result from falling trees.

The magnitude of an invasive species threat is generally amplified when the ecosystem or host species is already stressed, such as in times of drought. The already-weakened state of the native ecosystem causes it to succumb to an infestation more easily. An example of a possible worst-case invasive species scenario would be if the spotted lanternfly were to continue to spread across Lancaster County and significantly destroy the county’s crops. Crops, including grapes and apples, would be devastated. Farms, orchards, wineries, and lumber companies could experience a \$324 billion loss in Pennsylvania (PDA 2019). Such significant crop loss could cause farms and vineyards to fail, resulting in the loss of jobs and valuable income to the county.

### Past Occurrence

Invasive species have been entering Pennsylvania since the arrival of early European settlers. The presence of the emerald ash borer in Lancaster County was first confirmed in a 2015 (LNPLancasterOnline 2015). Lancaster County is part of the emerald ash borer infestation zone, along with 61 other Pennsylvania counties (USDA 2017c). Additionally, the hemlock woolly adelgid has been present in Pennsylvania since 1973 and was first detected in Lancaster County between 1967 and 2010. The Pennsylvania Governor’s Invasive Species Council continues to monitor the progression of invasive species.



Of the 40 responses received to the public survey distributed for this HMP, 18 (46 percent) identified invasive species as a hazard experienced in the last five years.

### Future Occurrence

According to the Pennsylvania Governor’s Invasive Species Council, the probability of future occurrence for invasive species threats is on the rise because of the growing volume of transported goods; increasing technology, efficiency, and speed of transportation; and expanding international trade agreements. Expanded global trade has created opportunities for many organisms to be transported to and establish themselves in new countries and regions.

Climate change also contributes to the introduction of new invasive species. As maximum and minimum seasonal temperatures change, pests are able to establish themselves in previously inhospitable climates. This gives introduced species an earlier start and increases the magnitude of their growth, which may shift the dominance of ecosystems in favor of non-native species.

To combat the increase in future occurrences, the Invasive Species Council released the Invasive Species Management Plan in May 2009 and revised it in 2016. This plan outlines the Commonwealth’s goals for the management of the spread of non-native invasive species (PDA 2019). The plan creates a framework for responding to threats through research, action, and public outreach. The PDA Entomology Programs regularly conduct surveys to monitor, control, and mitigate invasive species (PDA n.d.). Lancaster County is currently surveyed for the spotted lanternfly in order to prevent future occurrences (Pennsylvania Department of Agriculture 2021).

It is reasonable to assume that current threats will continue to directly impact or threaten Lancaster County. For this HMP, future occurrences of invasive species are considered *likely*.

### Vulnerability Assessment

#### Life, Health, and Safety

##### General Population

The entire population of Lancaster County is vulnerable to invasive species to some extent, but direct impacts on life, health, and safety are minor. Indirect impacts such as spread of disease by invasive species are possible.

##### Socially Vulnerable Populations

People with limited English abilities may have difficulty understanding the risks associated with invasive species if education and outreach are not provided in preferred languages. Often, outreach materials are generated only in English. For people living below poverty levels, the costs associated with removing or treating impacted vegetation may not be feasible. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

Table 4-61. Socially Vulnerable Lancaster County Populations

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
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Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

No structures are anticipated to be directly affected by infestation of invasive species; however, some species could lead to the death of vegetation and trees throughout the county, which could result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly causing foundation issues for nearby structures. Additionally, with an increased number of dead trees, there is an increased risk of trees falling on roadways, power lines, and buildings.

Some invasive plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other invasive plant species have been known to clog culverts and streams, increasing flood risk.

### Community Lifelines and Other Critical Facilities

Impacts on critical facilities and lifelines are specific to the type of facility and the species impacting it. Water treatment plants could be impacted by invasive species because of the same issues that threaten the general building stock. Water that becomes polluted due to increased sedimentation and erosion will require additional treatment. If the system becomes clogged with these pollutants, the ability of water treatment plants to operate may become impaired. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities built on or around these soils.

### Economy

Lancaster County recognizes the importance of preserving natural resources, promoting native species, and maintaining agricultural productivity for the county’s cultural heritage and economic stability. Invasive species have the potential to impact over 378,574 acres of agricultural land in Lancaster County, which has a market value of \$1,854,419,000 (USDA 2022). Costs associated with activities and programs implemented to conduct surveillance and address a variety of infestations within Lancaster County have not been quantified in available documentation.

### Environment

Invasive species contribute to a broad range of environmental impacts. Many invasive species can cause significant reductions in biodiversity by crowding out native species. This can affect the health of individual host organisms as well as the overall well-being of the affected ecosystem.



Lancaster County’s parks, forests and neighborhood trees are vulnerable to invasive species. Species that cause eventual destabilization of soil, such as invasive insects that destroy plants or invasive plants that outcompete native vegetation but have less effective root systems, can increase runoff into water bodies. This can lead to negative impacts on drinking water supplies. Soil destabilization can also increase the likelihood of mudslides in areas with a steep slope.

### **Future Changes That May Impact Vulnerability**

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#### **Projected Development**

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Changes in land use have the potential to render some habitats more susceptible to invasive species, such as clearing the land and providing opportunities for invasive species to inhabit the area. Clearing the land may also reduce the habitat for predator species that could manage the spread of infestations naturally.

#### **Projected Changes in Population**

Invasive species in croplands and nurseries can have an impact on persons outside of Lancaster County if the farmers within the County supply resources to neighboring communities. Being aware of trends occurring around the County may reveal that infestations within agricultural commodities provided by the County impacts a greater number of persons.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

#### **Climate Change**

Changing weather patterns could create a change in the migration patterns for when invasive species move into and out of Lancaster County. If the species have a more prolonged existence in the County, there may be a greater number of infestation events, or a higher value of loss tied to infestation (United States Environmental Protection Agency 2022).

### **Change of Vulnerability Since 2019 Hazard Mitigation Plan**

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Overall, the County remains vulnerable to the invasive species hazard. Any changes or perceived increase in vulnerability may be attributed to changes in population numbers and density, use of recreational water bodies, and changes to the climate. Any additional information regarding localized concerns and past impacts will be collected and analyzed. Such data will be developed to support future revisions to the HMP. Future mitigation efforts could include partnering and collaborating with existing Pennsylvania organizations and through local efforts.



## 4.3.10 Nuclear Incident

### Hazard Description

Nuclear explosions can cause significant damage and casualties from blast, heat, and radiation. The primary concern following a nuclear accident or nuclear attack is the extent of radiation, inhalation, and ingestion of radioactive isotopes which can cause acute health effects (e.g. death, burns, severe impairment), chronic health effects (e.g. cancer), and psychological effects (PEMA 2023).

The nuclear industry has adopted pre-determined, site-specific emergency action levels. The emergency action levels provide the framework and guidance for observing, addressing, and classifying the severity of site-specific incidents and conditions that are communicated to off-site emergency response organizations (USNRC 2022). Emergency action levels address issues of security, such as threats of airborne attack, hostile action within the facility, or attack on the facility. They ensure appropriate notifications of a security threat in a timely manner.

The Nuclear Regulatory Commission (NRC) encourages the use of probabilistic risk assessments to estimate quantitatively the potential risk to public health and safety considering the design, operations, and maintenance practices at nuclear power plants. Probabilistic risk assessments typically focus on accidents that can severely damage the core and that may challenge containment.

Nuclear power is an important source of energy in the Commonwealth, and there are four nuclear power stations in Pennsylvania, one less than there were in the 2018 plan due to Three Mile Island (TMI) shutting down in 2019. However, TMI is anticipated to be reopened under a new name, Crane Clean Energy Center (CCEC), in 2025 by the Constellation Energy Corporation (WGAL 2024).

### Location and Extent

FEMA, PEMA, and county governments have formulated Radiological Emergency Response Plans to prepare for radiological emergencies at active nuclear power-generating facilities in the Commonwealth of Pennsylvania (PA DEP 2023). These plans include a plume exposure pathway emergency planning zone (EPZ) (an area with a radius of 10 miles from each nuclear power facility), and an ingestion exposure pathway EPZ (an area with a radius of 50 miles from each facility). Figure 4-16 shows the location of Lancaster County relative to all EPZs.

There are two active nuclear power generation stations whose 50-mile radius reaches Lancaster County: the Peach Bottom Atomic Power Station located to the southeast in Peach Bottom Township, York County; and the Limerick Generating Station in Limerick Township, Montgomery County. With the anticipated reopening of CCEC in 2027 in Londonderry Township, Dauphin County, it should be known that Lancaster County is entirely located in the anticipated 50-mile radius for the plant as well. The county is not within the 50-mile radius of Pennsylvania's other active stations—the Beaver Valley Power Station in Shippingport Borough, Beaver County, and the Susquehanna Steam Electric Station in Salem Township, Luzerne County (PEMA 2023, PEMA 2018).

Table 4-62 lists the jurisdictions in Lancaster County that are located within the 10-mile EPZ for Peach Bottom and anticipated CCEC and the 50-mile EPZ of Peach Bottom, Limerick Station, and anticipated CCEC. Although the Peach Bottom 10-mile plume exposure EPZ includes only portions of Lancaster County (refer to Figure 4-16 and Table 4-62), impacts are anticipated across the entire county via the 50-mile ingestion exposure pathway EPZs; for Peach Bottom and Limerick.

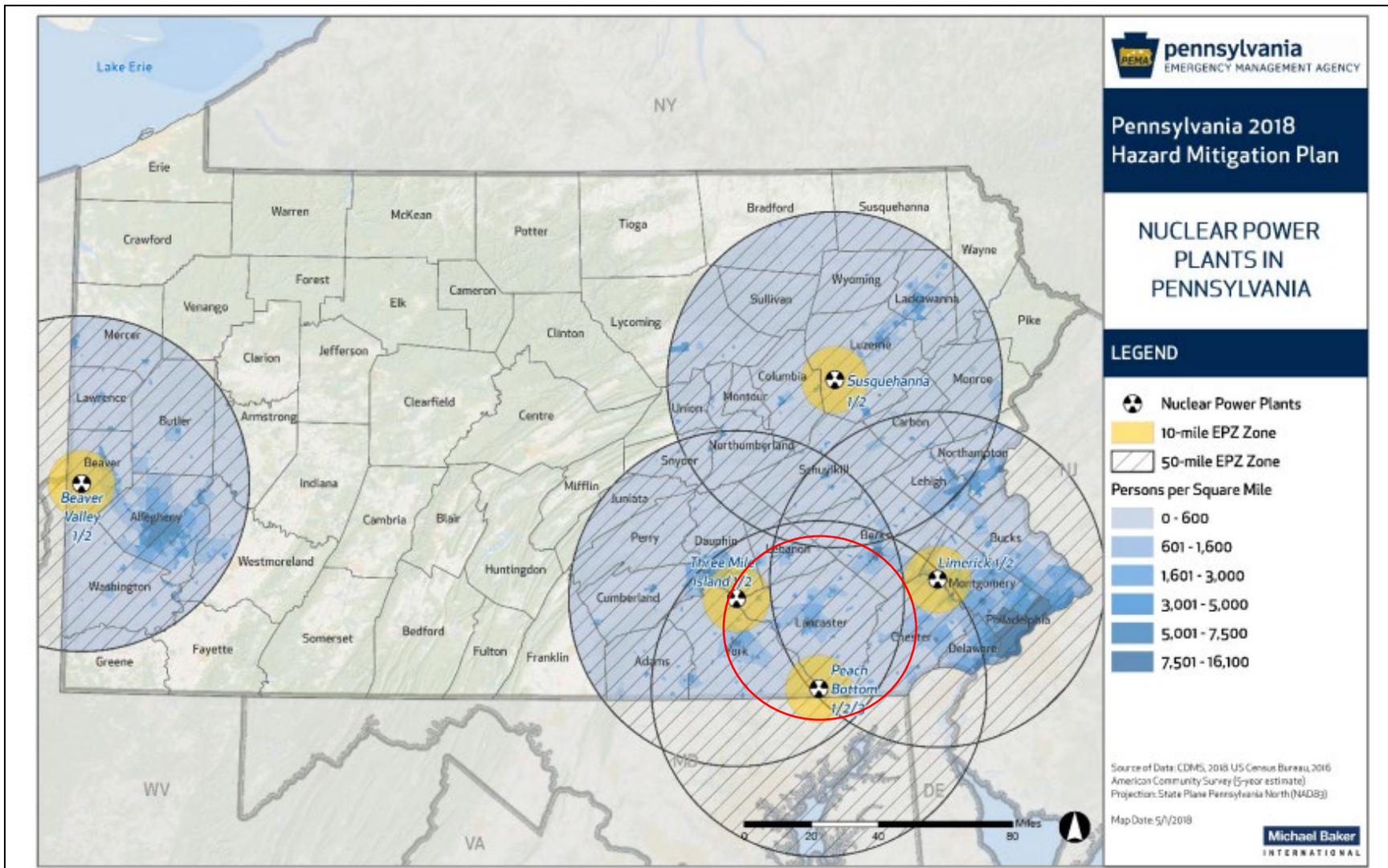
It is worth noting that although the County does not have any jurisdictions located within the 50-mile EPZ for the Susquehanna Steam Electric Station, the EPZ is only out of range by approximately half a mile. Portions of Lancaster County are located in the 50-mile EPZ for the Salem Nuclear Generating Station, Units 1 and 2, and Hope Creek Generating Station located in Salem County, New Jersey. However, due to the unavailability of mapped EPZ zones for these stations, the municipalities potentially impacted were not able to be identified.



The U.S. Department of Energy transports used nuclear fuel to the repository by rail and road inside sealed containers. However, no nuclear fuel is transported through Lancaster County.



Figure 4-16. Location of Pennsylvania Nuclear Power Stations, EPZs, and the Population Density of Affected Municipalities



Source: PEMA 2018

Note: Lancaster County is located within the red circle. As shown, all of Lancaster County is encompassed by the Peach Bottom EPZ, Three Mile Island EPZ, and most of the County is covered by the Limerick EPZ; the Three Mile Island EPZ is identified in anticipation of the opening of the CCEC at the same location.





Table 4-62. Lancaster County Jurisdictions in EPZs

Jurisdiction	Anticipated 10-Mile Plume Exposure Pathway EPZ—CCEC	10-Mile Plume Exposure Pathway EPZ—Peach Bottom	Anticipated 50-Mile Ingestion Exposure Pathway EPZ—CCEC	50-Mile Ingestion Exposure Pathway EPZ—Peach Bottom	50-Mile Ingestion Exposure Pathway EPZ—Limerick
Adamstown Borough	No	No	Yes	Yes	Yes
Akron Borough	No	No	Yes	Yes	Yes
Bart Township	No	No	Yes	Yes	Yes
Brecknock Township	No	No	Yes	Yes	Yes
Caernarvon Township	No	No	Yes	Yes	Yes
Christiana Borough	No	No	Yes	Yes	Yes
Clay Township	No	No	Yes	Yes	Yes
Colerain Township	No	No	Yes	Yes	Yes
Columbia Borough	No	No	Yes	Yes	Yes
Conestoga Township	No	No	Yes	Yes	Yes
Conoy Township	Yes	No	Yes	Yes	No
Denver Borough	No	No	Yes	Yes	Yes
Drumore Township	No	Yes	Yes	Yes	Yes
Earl Township	No	No	Yes	Yes	Yes
East Cocalico Township	No	No	Yes	Yes	Yes
East Donegal Township	Yes	No	Yes	Yes	No
East Drumore Township	No	Yes	Yes	Yes	Yes
East Earl Township	No	No	Yes	Yes	Yes
East Hempfield Township	No	No	Yes	Yes	Yes
East Lampeter Township	No	No	Yes	Yes	Yes
East Petersburg Borough	No	No	Yes	Yes	Yes
Eden Township	No	No	Yes	Yes	Yes
Elizabeth Township	No	No	Yes	Yes	Yes
Elizabethtown Borough	Yes	No	Yes	Yes	No
Ephrata Borough	No	No	Yes	Yes	Yes
Ephrata Township	No	No	Yes	Yes	Yes
Fulton Township	No	Yes	Yes	Yes	Yes
Lancaster City	No	No	Yes	Yes	Yes
Lancaster Township	No	No	Yes	Yes	Yes
Leacock Township	No	No	Yes	Yes	Yes
Lititz Borough	No	No	Yes	Yes	Yes
Little Britain Township	No	Yes	Yes	Yes	Yes
Manheim Borough	No	No	Yes	Yes	Yes
Manheim Township	No	No	Yes	Yes	Yes
Manor Township	No	No	Yes	Yes	Yes
Marietta Borough	No	No	Yes	Yes	No
Martic Township	No	Yes	Yes	Yes	Yes
Millersville Borough	No	No	Yes	Yes	Yes
Mount Joy Borough	No	No	Yes	Yes	No
Mount Joy Township	Yes	No	Yes	Yes	Yes
Mountville Borough	No	No	Yes	Yes	Yes



Jurisdiction	Anticipated 10-Mile Plume Exposure Pathway EPZ—CCEC	10-Mile Plume Exposure Pathway EPZ—Peach Bottom	Anticipated 50-Mile Ingestion Exposure Pathway EPZ—CCEC	50-Mile Ingestion Exposure Pathway EPZ—Peach Bottom	50-Mile Ingestion Exposure Pathway EPZ—Limerick
New Holland Borough	No	No	Yes	Yes	Yes
Paradise Township	No	No	Yes	Yes	Yes
Penn Township	No	No	Yes	Yes	Yes
Pequea Township	No	No	Yes	Yes	Yes
Providence Township	No	Yes	Yes	Yes	Yes
Quarryville Borough	No	Yes	Yes	Yes	Yes
Rapho Township	No	No	Yes	Yes	Yes
Sadsbury Township	No	No	Yes	Yes	Yes
Salisbury Township	No	No	Yes	Yes	Yes
Strasburg Borough	No	No	Yes	Yes	Yes
Strasburg Township	No	No	Yes	Yes	Yes
Terre Hill Borough	No	No	Yes	Yes	Yes
Upper Leacock Township	No	No	Yes	Yes	Yes
Warwick Township	No	No	Yes	Yes	Yes
West Cocalico Township	No	No	Yes	Yes	Yes
West Donegal Township	Yes	No	Yes	Yes	No
West Earl Township	No	No	Yes	Yes	Yes
West Hempfield Township	No	No	Yes	Yes	Yes
West Lampeter Township	No	No	Yes	Yes	Yes

Source: PEMA 2023; PEMA 2018

### Range of Magnitude

Plume exposure pathway EPZ refers to whole-body external exposure to radiation from a radioactive plume and from deposited materials and inhalation exposure from the passing radioactive plume. The duration of primary exposures could range in length from hours to days.

The 50-mile ingestion exposure pathway EPZ refers to exposure primarily from ingestion of water or foods such as milk and fresh vegetables that have been contaminated with radiation. This kind of exposure can stem from any of the three categories of nuclear accident:

- **Criticality accidents**—Involves loss of control of nuclear assemblies or power reactors.
- **Loss-of-coolant accidents**—Occurs whenever a reactor coolant system experiences a break or opening large enough that the coolant inventory in the system cannot be maintained by the normally operating make-up system.
- **Loss-of-containment accidents**—Involves the release of radioactivity from materials such as tritium, fission products, plutonium, and natural, depleted, or enriched uranium. Points of release have been containment vessels at fixed facilities or damaged packages during transportation accidents.

In accordance with FEMA and NRC regulations, each facility is required to notify jurisdictional agencies of an incident or occurrence within that facility. PEMA and facility owners with whom PEMA coordinates use the following NRC classification levels for nuclear incidents based on an internal trigger (NRC 2021):



- **Unusual Event**—Incidents that indicate potential degradation in the level of safety of the plant. No release of radioactive material requiring off-site response or monitoring is expected unless further degradation occurs.
- **Alert**—Incidents that involve actual or potential substantial degradation in the level of safety of the plant. Any releases of radioactive material from the plant are expected to be limited to a small fraction of the U.S. Environmental Protection Agency (EPA) Protective Action Guides (PAG).
- **Site Area Emergency**—Incidents that resulted in actual or likely major failures of plant functions needed for protection of the public. Any releases of radioactive material are not expected to exceed EPA PAGs except near the site boundary.
- **General Emergency**—Incidents that have caused actual or imminent substantial core damage or melting of reactor fuel with potential for loss of containment integrity. Radioactive releases during a general emergency can reasonably be expected to exceed the EPA PAGs over more than the immediate site area.

Potential environmental impacts specific to the 50-mile ingestion exposure pathway EPZ include the long-term effects of radioactive contamination in the environment and in agricultural products. This is not a significant concern in terms of external exposure and immediate health risks, but even a small amount of radiation will require the protection of the food chain, particularly milk supplies. Small amounts of radiation ingested over time could lead to future health issues. As a result, in the case of a nuclear incident, foodstuffs, crops, milk, livestock feed and forage, and farm water supplies will need to be protected from and tested for contamination, in accordance with Commonwealth and local radiological emergency response procedures. Additionally, spills and releases of radiologically active materials from accidents can result in the contamination of soil and public water supplies (PEMA 2023).

The worst-case scenario nuclear incidents for Lancaster County would be if a General Emergency occurred at Peach Bottom or Limerick that leaked sufficient radiation to create injuries and fatalities as well as longer-term damage in the form of contaminated water, soil, and food supplies in the County.

### Past Occurrence

There have been no significant nuclear incidents in Pennsylvania since the 2019 HMP. The sections below describe earlier incidents of significance for the commonwealth and for Lancaster County.

#### 1979 TMI Incident

The accident at the TMI Generating Station in 1979 remains the nation’s only nuclear incident at the General Emergency level and remains the worst nuclear incident on record in the Commonwealth and the nation. During this incident, equipment malfunctions, design-related problems, and worker errors led to a partial meltdown of the TMI Unit 2 reactor core (PEMA 2023). The resulting contamination and state of the reactor core led to the development of a 14-year cleanup and scientific effort. The President’s Commission on the Accident at TMI concluded that the accident “generated considerable economic disturbance. Some of the impacts were short-term, occurring during the first days of the accident. Many of the impacts were experienced by the local community; others will be felt at the regional and national levels.”

The report concluded: “It appears clear that the major costs of the TMI Unit 2 accident are associated with the emergency management replacement power and the plant refurbishment or replacement. The minimum cost estimate of nearly \$1 billion supports the argument that considerable additional resources can be cost-effective if spent to guard against future accidents.”

Despite the severity of the damage, no injuries due to radiation exposure occurred. However, numerous studies were conducted to determine the measurable health effects related to radiation and/or stress. More than a dozen epidemiological and stress-related studies conducted to date have found no discernible direct health effects on the population in the vicinity of the plant.



The issue of radiation effects resulting from the accident at TMI will continue to be debated. Radiation science does accept thresholds of expected mortality and morbidity resulting from the exposure to radiation. Administrative standards have been incorporated into plans used by public health officials and emergency planners for the purpose of making protective action decisions pertaining to sheltering and evacuation.

The accident at TMI had a profound effect on the residents, emergency management community, government officials, and nuclear industry, not only in Pennsylvania but nationwide. There were minimal requirements for off-site emergency planning for nuclear power stations prior to this accident. Afterward, comprehensive, coordinated, and exercised plans were developed for the state, counties, school districts, special facilities (hospitals, nursing homes, and detention facilities), and municipalities to ensure the safety of the population. Costs associated with an incident at one of the commonwealth's nuclear facilities, whether real or perceived, are significant.

The mitigation efforts put in place immediately following the 1979 accident continue until today. The commonwealth's nuclear/radiological plan is a result of the commonwealth's efforts to address the many components of mitigation planning. The comprehensive planning involved with nuclear facilities is an ongoing effort. Plans are reviewed and amended on an annual basis. Recent amendments to various planning documents and station procedures include the efforts to enhance station security measures and the means to bolster communications and response in the incident of terrorist activities.

#### 1993 and 2015 TMI Incidents

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Another incident occurred at TMI on February 7, 1993, when an individual drove his car through a chain-link fence and then slammed into a roll-up garage door leading into the facility's turbine building. Plant officials, fearing the worst, immediately declared a site area emergency. The person who crashed the gate was apprehended. Other than property damage caused by the forcible entry through physical structures, there was no lasting damage to the facility, according to the Lancaster County Emergency Management Division.

There was also an alert declared at TMI on October 5, 2015. There was a small electrical fire at the power plant, which was extinguished quickly and with no threat of the release of radiation.

#### 1992 Peach Bottom Incident

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There has been one alert-level incident at Peach Bottom. On July 4, 1992, a fire occurred around an off-site transformer, causing a loss of electrical power to the facility. Other than the power outage, there were no other consequences.

#### 2011 Incident in Japan

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The most recent nuclear incident to occur worldwide was that which involved the Fukushima Daiichi nuclear reactor in Okuma, Fukushima, Japan. This incident occurred on March 11, 2011, when an earthquake and tsunami in the area resulted in a series of equipment failures, nuclear meltdowns and releases of radioactive materials. The World Health Organization completed a report that indicated small increases in the occurrence of certain cancers following the radiation exposure from the plant.

#### Future Occurrence

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Since the TMI incident, nuclear power has become significantly safer and is one of the most heavily regulated industries in the nation. Still, there is potential for a similar accident at any nuclear-generating facility in the commonwealth. Studies estimate the chance of failure of protective barriers in a modern nuclear facility at less than 1 in 100,000 years. Nuclear incidents may also occur as a result of intentional actions (PEMA 2023).

Across the United States, a number of unusual events and alert level events that warrant notification of local emergency managers occur at nuclear facilities each year. Of these, alert emergencies occur less frequently. In 1997, for example, there were 40 notifications of unusual events and three alert events nationwide.



The NRC developed a set of recommendations based on the lessons learned from the Fukushima incident. These recommendations are meant to enhance reactor safety for U.S. nuclear reactors against a variety of factors. Recommendations include the categories of regulatory framework, ensuring protection (of the facilities and equipment), enhancing mitigation, strengthening emergency preparedness, and improving the efficiency of NRC programs. One recommendation involves the re-evaluation and upgrade of seismic and flooding protection of structures, systems and components for each reactor. As more information comes out, and more lessons learned are developed, it should reinforce the protections against any type of incident involving nuclear power stations.

Based on historical events, site area emergency and general emergency incidents are very rare. Based on available historical data and the lack of nuclear incident events impacting Lancaster County, the future occurrence of nuclear incidents is considered *unlikely*.

### Vulnerability Assessment

Effects from a radiological incident at a fixed facility would vary depending on the product released (type of radiation), amount of radiation released, current weather conditions, and time of day. A qualitative assessment was performed to evaluate local assets' vulnerability to and potential impacts from a nuclear incident at the Peach Bottom and Limerick Stations.

The priority following an incident at any of the facilities in Pennsylvania is the life and safety of all individuals within the area impacted. Secondary to health and safety would be effects on critical infrastructure, environment, property, and the economy.

### Life, Health, and Safety

#### General Population

The entire county is located within a 50-mile ingestion exposure pathway EPZ, from Limerick, Peach Bottom, or both. Therefore, the entire population is vulnerable to this hazard. First responders on scene are also at risk.

#### Socially Vulnerable Populations

The younger population is considered particularly vulnerable to the radioactive isotopes that would be released in a nuclear incident (National Cancer Institute 2022). According to the 2022 American Community Survey, 34,709 persons under 5 years old reside in the county. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

Table 4-63. Socially Vulnerable Lancaster County Populations

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

A nuclear explosion can have similar effects to those produced by conventional explosives. The resulting shock from a nuclear explosion can collapse structures and generate flying debris. Additionally, thermal radiation resulting from a nuclear explosion could ignite fires or coalesce into a firestorm (US NRC 2020). Other potential damage to the general building stock from a nuclear plant incident can be difficult to quantify, as potential losses may include inaccessibility and/or potential structural and content losses.

### Community Lifelines and Other Critical Facilities

A significant nuclear plant incident causing contamination within an urban area may force businesses, public services, and utility services to close for an extended period. First responders potentially might not have access to incidents due to damaged infrastructure. Electrical/utility fires may increase with disruptions to lines as well, so first responders would have additional tasks during nuclear incidents. Water contamination is also a concern in nuclear incidents. Public water suppliers that operate in or provide water to the county, coupled with the county’s 2,382 domestic drinking water wells, are all vulnerable to the effects of a nuclear incident.

### Economy

The entire county may be impacted based on the flow of goods and services and where residents get their food supply. Contamination of agriculture, livestock, and production can lead to loss of commerce with other regions of the state, country, and even the world. Some countries halted imports of products from Japan for fear of contamination following the 2011 nuclear incident at the Fukushima Power Plant. This loss in revenue compounded losses that Japan and the region around the power plant were already encountering following the initial disaster.

The county’s primary vulnerability to nuclear incidents comes in the form of food, soil, and water contamination. There are 378,574 acres of farmland vulnerable to radiological contamination in a nuclear incident. According to the USDA 2022 Census of Agriculture, the market value of all agricultural products of these farms totaled approximately \$1.9 billion (USDA 2022). While it is unlikely that all agricultural products would be lost in the event of a nuclear incident, the county can expect some portion to be lost. Time of year also impacts the vulnerability and losses estimated for a nuclear incident; an incident that occurs during the prime growing and harvesting season will have a larger impact on the county.

### Environment

The release of radioactive materials has a profound impact on animals. Radiation causes genetic anomalies, leading to decreased reproduction, deformities, and death. High levels of contamination can also appear in plants and last for decades. For instance, Cesium-137, a radioactive fission product of nuclear plants, still appears around the 1986 Chernobyl incident site (EPA 2024).



## Future Changes That May Impact Vulnerability

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### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. An increase in development can increase vulnerability in the event of a nuclear incident. Future development can also increase the individuals exposed to the nuclear incident hazard. Residential development can increase the number of residents exposed, while commercial or industrial development may increase the persons exposed by introducing visitors and workers to the area. TMI is anticipated to be reopened under a new name, Crane Clean Energy Center (CCEC), in 2025 by the Constellation Energy Corporation (WGAL 2024).

### Projected Changes in Population

All county residents are at risk from the nuclear incident hazard, so increased population would increase total risk. Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

Nuclear power plants do not produce greenhouse gas emissions, and therefore no immediate climate change impacts are associated with the hazard. However, as the climate warms, additional water may be required to cool the reactors.

## Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, population statistics have been updated using the 2022 American Community Survey Population Estimates. Overall, the County continues to remain vulnerable to the nuclear incident hazard.



### 4.3.11 Pandemic and Infectious Disease

#### Hazard Description

Pandemic is defined as a disease outbreak affecting or attacking a large number of people across an extensive region, including several countries, and/or continent(s). It is further described as extensively epidemic. Generally, pandemic diseases cause sudden, pervasive illness in all age groups on a global scale. Infectious diseases are also highly virulent and can be spread from person-to-person (PEMA 2023). The worldwide COVID-19 outbreak is the most recent and best-known example of a pandemic.

Pandemics typically result from infectious diseases. An infectious disease, as defined by the World Health Organization (WHO), is caused by pathogenic organisms (e.g., bacteria, viruses, fungus, or parasites) that spread from one person to another, whether through direct or indirect contact. Flu, for example, generally spreads through the air or by touch; when an infected person coughs, infected droplets go into the air or onto their hands, facilitating transmission of the disease to other people (WHO n.d.) Zoonotic disease is a type of infectious disease that occurs when animals transmit a disease to humans (WHO n.d.). Any infectious disease can reach pandemic levels.

When a pandemic or other infectious disease outbreak occurs, WHO and other public health institutions begin tracking the outbreak, treatment, and more. The Centers for Disease Control and Prevention (CDC) and the National Institutes of Health are actively involved in managing the outbreak and treatment of COVID-19.

#### Location and Extent

Locations with higher-density populations are more susceptible to pandemic outbreaks, as the disease can be transmitted more easily.

#### Range of Magnitude

Pandemic events cover a wide geographic area and can affect large populations, which can include multiple countries or continents. Size and extent of an infected population depends on the aggressiveness of the disease, ease of transmission, and factors associated with the impacted community (e.g., access to medical care, demographic data, and population density).

The United States has been working with the WHO and other countries to strengthen the detection of disease and response to outbreaks and pandemics. Preparedness efforts are ongoing via PA DOH and local health departments through community preparedness programs. These programs empower local health departments and their community partners to promote local readiness, foster community resilience, and to ensure comprehensive, coordinated, and effective responses. They can help to reduce the magnitude of pandemic and infectious disease events in the future.

LCEMD has updated its Point of Dispensing (POD) plan in 2024, and has helped establish POD plans for the following entities:

- Brickerville Fire Company (Elizabeth Township)
- Clipper Magazine Stadium (Lancaster City)
- Field of Screams (Mountville Borough)
- Lancaster County Public Safety Training Center (Hempfield Township)
- Pleasant View Retirement Community (Penn Township)
- Solanco Fairgrounds (Quarryville Borough)

The Health and Medical Preparedness Coordinator at LCEMD directly supports the County Health Advisory Committee (CHAC) and provides planning updates to the CHAC for review and recommendations. The Lancaster County Health Advisory Council advises County Commissioners on matters of health emergency



planning, and provide information, data analysis and recommendations on matters of community-wide health in Lancaster County. Specifically, the Advisory Council provides evidence-based advice on the detection, prevention and response to medical illnesses that may or do pose an emergent threat to health of Lancaster County residents.

COVID-19

COVID-19 is currently the biggest pandemic threat to the county. Symptoms include fever or chills, cough, shortness of breath or difficulty breathing, fatigue, muscle or body aches, headache, new loss of taste or smell, sore throat, congestion or runny nose, nausea or vomiting, and diarrhea. Anyone can have mild to severe symptoms but older adults and people who have severe underlying medical conditions are at higher risk for developing more serious complications. COVID-19 caused a major impact on the general public, such as widespread travel restrictions and school and business closings, with the potential for severe impact on domestic and world economy (CDC 2020).

Ways to prevent the spread of COVID-19 include social distancing, staying home whenever possible and avoiding crowds, taking care of personal health (by resting and staying hydrated), staying in touch with a family doctor or healthcare professional, and avoiding public transportation. FDA-approved vaccines have been developed.

Pandemic Influenza

Influenza is a disease with high potential to reach pandemic scale in Pennsylvania. Influenza viruses with the potential to reach pandemic levels include the avian influenza A (H5N1) and avian influenza H7N9 (CDC 2023). From April 2009 to April 2010, 12,470 Americans died from H1N1 influenza (CDC 2010). Advancements in medical technologies have greatly reduced the number of deaths caused by influenza. Consequently, global effects of various influenza outbreaks have declined over the past century.

The CDC’s Pandemic Intervals Framework describes the progression of an influenza pandemic using six intervals. The framework is used to guide planning for an influenza pandemic and provides recommendations for risk assessment, decision-making, and action in the United States. Descriptions of the CDC pandemic intervals are presented in Table 4-64. Conclusion of Interval 6 leads to the post-peak period, where the pandemic is declared “ended” because enough data show that the influenza virus worldwide has become similar to a seasonal influenza virus. Despite a decrease in activity, countries still must be prepared for additional waves of the pandemic. Pandemic waves can be separated by a period of months leading to a long recovery time, to guarantee entry of the pandemic into the post-pandemic interval (CDC 2016). Figure 4-17 illustrates the six intervals of pandemic influenza described by CDC.

Seasonal Flu

Seasonal flu is a less severe concern than pandemic flu because of its regularity of occurrence and predictability. Table 4-65 lists key differences between pandemic and seasonal flu. An epidemic occurs when the incidence rate exceeds the expected rate of 6.6 percent but is not at the magnitude of a pandemic (CDC n.d.). In the past ten flu seasons, the seasonal severity classification, assessed by the CDC, included just two occurrences of a ‘High’ flu season, one occurrence of a ‘Low’ flu season, and seven occurrences of a ‘Moderate’ flu season. For this flu season (2024-2025), the CDC has a ‘Low’ severity classification (CDC 2024, CDC 2024).

Table 4-64. CDC Pandemic Intervals Framework

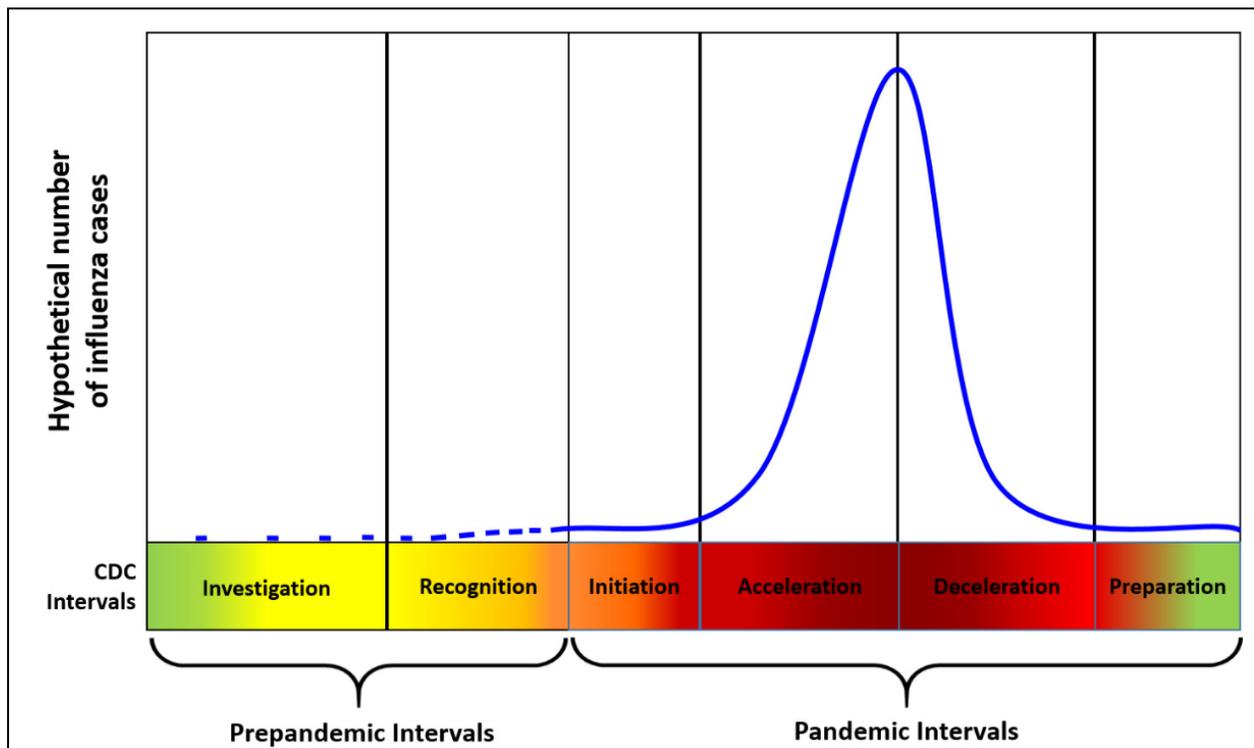
Interval	Description
Interval 1: Investigation of cases of novel influenza A virus infection in humans	Novel influenza A virus is identified in people; public health actions focus on targeted monitoring and investigation. This can trigger a risk assessment of that virus with the Influenza Risk Assessment Tool, which is used to evaluate whether the virus has the potential to cause a pandemic.



Interval	Description
Interval 2: Recognition of increased potential for ongoing transmission of a novel influenza A virus	Increasing numbers of human cases of novel influenza A illness are identified and the virus has the potential to spread from person to person, public health actions focus on control of the outbreak, including treatment of sick persons.
Interval 3: Initiation of a pandemic wave	People are easily infected with a novel influenza A virus that has the ability to spread in a sustained manner from person to person.
Interval 4: Acceleration of a pandemic wave	The new virus infects susceptible people at an increasing rate. Public health actions at this time may focus on the use of appropriate non-pharmaceutical interventions in the community (e.g., school and child-care facility closures, social distancing), as well the use of medications (e.g., antivirals) and vaccines, if available. These actions combined can reduce the spread of the disease and prevent illness or death.
Interval 5: Deceleration of a pandemic wave	The number of reported pandemic influenza cases consistently decreases in the United States. Public health actions include continued vaccination, monitoring of pandemic influenza A virus circulation and illness, and reducing the use of non-pharmaceutical interventions in the community (e.g., school closures).
Interval 6: Preparation for future pandemic waves	Public health actions include continued monitoring of pandemic influenza A virus activity and preparing for potential additional waves of infection. It is possible that a second pandemic wave could have higher severity than the initial wave. An influenza pandemic is declared “ended” when enough data show that the reported cases of influenza virus worldwide are similar to cases of seasonal influenza virus in the way they spread and the severity of the illness they can cause.

Source: CDC 2014

Figure 4-17. Preparedness and Response Framework for Novel Influenza A Virus Pandemics



Source: CDC 2014

Table 4-65. Seasonal Flu vs. Pandemic Flu

Pandemic Flu	Seasonal Flu
Rarely happens (three times in 20th century).	Happens annually and usually peaks in January or February.



Pandemic Flu	Seasonal Flu
People have little or no immunity because they have no previous exposure to the virus.	Sufferers usually have some immunity built up from previous exposure.
Healthy people may be at increased risk for serious complications.	Usually only people in vulnerable populations, not healthy adults, are at risk of serious complications.
Healthcare providers and hospitals may be overwhelmed.	Healthcare providers and hospitals can usually meet public and patient needs.
Vaccine probably would not be available in the early stages of a pandemic.	Vaccine is available for annual flu season.
Effective antivirals may be in limited supply	Adequate supplies of antivirals are usually available.
Number of deaths could be high (U.S. death toll during the 1918 pandemic was approximately 675,000).	Seasonal flu-associated deaths in the United States over 30 years ending in 2007 have ranged from about 3,000 per season to about 49,000 per season.
Symptoms may be more severe.	Symptoms include fever, cough, runny nose, and muscle pain.
May cause major impact on the general public, such as widespread travel restrictions and school or business closings.	Usually causes minor impact on the general public; some schools may close, and sick people are encouraged to stay home.
Potential for severe impact on domestic and world economy.	Manageable impact on domestic and world economy.

Source: Flu.gov 2015

### Past Occurrence

Table 4-66 lists worldwide pandemics over the past 100 years.

Table 4-66. Previous Pandemic Outbreaks

Date	Pandemic/Subtype	Worldwide Deaths (Approx.)
1918-1920	Spanish Flu/H1N1	50 million
1957-1958	Asian Flu/H2N2	1.5-2 million
1968-1969	Hong Kong Flu/H3N2	1 million
2009-2010	Swine Flu/H1N1	> 18,000
2019- ongoing	COVID-19	776.9 million as of 11/23/2024

Source: CDC 2010; WHO 2024

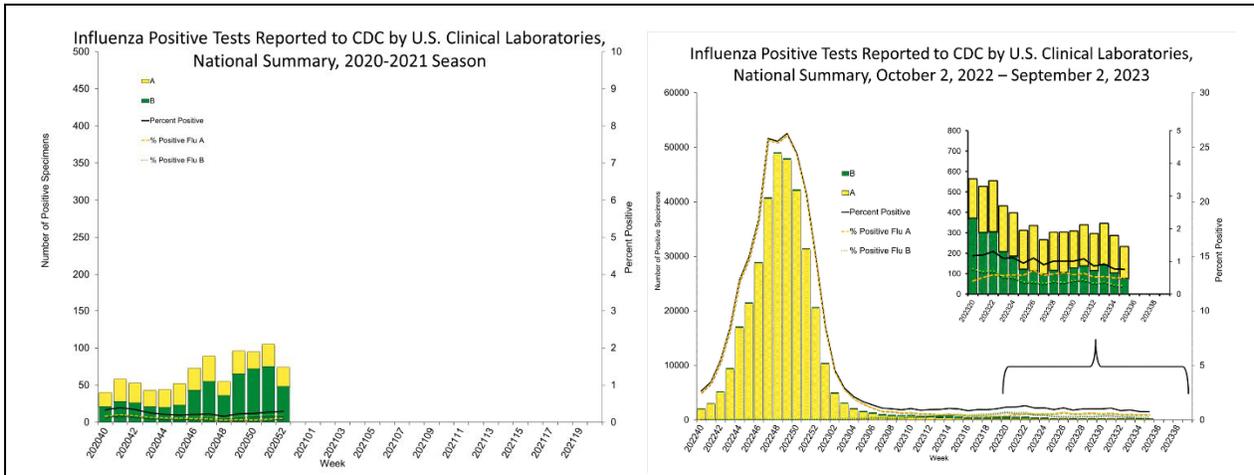
Significant numbers of deaths have occurred in the United States as a result of the following flu outbreaks:

- In the United States, about 675,000 people died while 22 million caught the Spanish Flu (1918-1920). Pennsylvania, one of the states that was hit the hardest, saw over 60,000 deaths (Shetty 2018).
- Most deaths resulting from Asian flu occurred between September 1957 and March 1958; within the United States, approximately 70,000 people died, and approximately 15 percent of the population of Pennsylvania was affected.
- The first cases of Hong Kong Flu in the United States were detected in September 1968, with deaths peaking between December 1968 and January 1969 (CDC n.d.).
- On June 11, 2009, WHO signaled that a pandemic of 2009 H1N1 swine flu was underway (CDC 2009). H1N1 was first detected in people in the United States in April 2009.

Epidemiologists and public health officials consistently track the rate of influenza or influenza-like illnesses (ILI) to monitor potential pandemic threats. This also allows them to provide annual data on ILI seasonal outbreaks. Figure 4-18 shows the national number of cases of ILI during the 2019-2021 and 2022-2023 seasons, distinguishing each type of ILI (Influenza A and Influenza B) with a unique color. Figure 4-19 shows the number of cases over the 2017-2018 and 2018-2019 seasons.

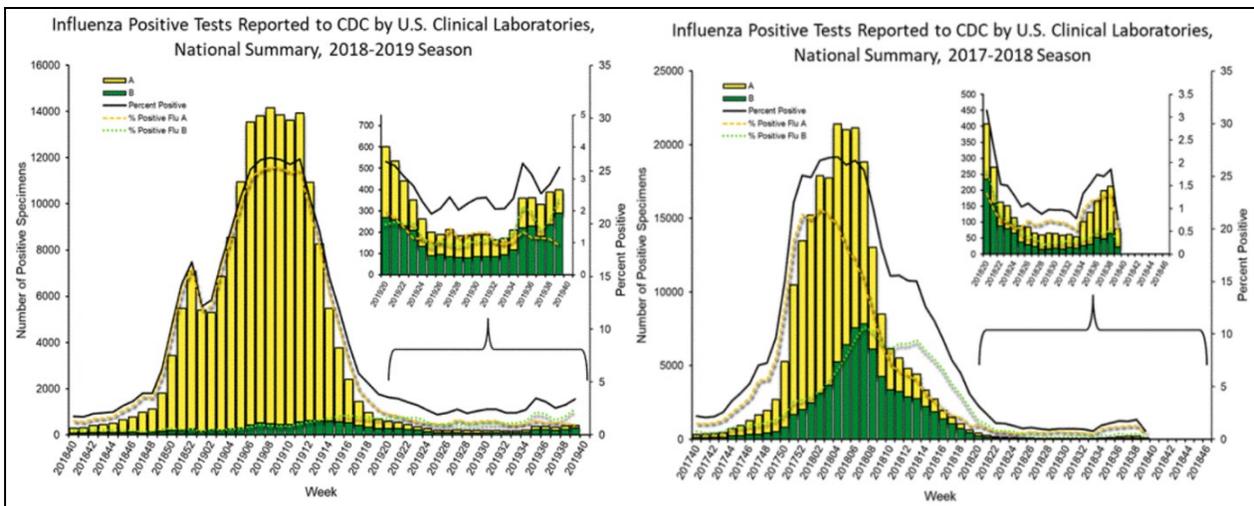


Figure 4-18. ILI Cases in the United States, 2020- 2021 and 2019-2020 Season



Source: CDC Weekly Flu 2020, 2021, 2022, 2023

Figure 4-19. ILI Cases in the United States, 2018-2019 and 2017- 2018 Season



Source: CDC Weekly Flu 2017, 2018, 2019

The first human cases of COVID-19 were reported in Wuhan City, China, in December 2019. In the United States, community transmission of COVID-19 was first detected in February 2020. By mid-March, all 50 states and four U.S. territories had reported cases of COVID-19. As of November 30, 2024, 1.2 million deaths related to COVID-19 had been reported in the United States (CDC 2024). Lancaster County has had a total of 152,460 cases of COVID-19 as and 2,222 deaths as of May 8, 2024 (PA DOH 2024, PA DOH 2024). As of publication of this HMP update, COVID-19 continues to be a significant pandemic concern for public health officials around the world.

### Future Occurrence

In Lancaster County, the probability of a future pandemic or infectious disease event depends on several factors. One factor that influences the spread of disease is population density. Populations that live close to one another are more likely to spread diseases. As population density increases in the County, so will the probability of a pandemic or infectious disease outbreak. When there is a significant change in a circulating strain of a virus, more of the population is susceptible and the strain could rapidly spread from person to person.



For this HMP, future occurrences of pandemic or infectious disease events are considered possible.

### Vulnerability Assessment

A qualitative assessment was performed to evaluate local assets' vulnerability to and potential impacts from the pandemic and infectious disease hazard.

#### Life, Health, and Safety

##### General Population

The entire population of Lancaster County is vulnerable to the pandemic or infectious disease hazard. Healthcare providers and first responders have an increased risk of exposure due to their frequent contact with infected populations. Areas with a higher population density also have an increased risk of exposure or transmission of disease due to the proximity to infected people.

##### Socially Vulnerable Populations

Vulnerable populations—especially the young, the elderly, and anyone else with weaker immune systems—are at greater risk for contracting a disease and suffering fatal or severe consequences. About 60 percent of hospitalizations related to seasonal flu and 90 percent of flu-related deaths occur among people 65 and older. People with underlying health conditions face a much higher probability of contracting many infectious diseases. Schools, convalescent centers, and other institutions are highly conducive to faster transmission of pandemic diseases (CDC 2010). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

Table 4-67. Socially Vulnerable Lancaster County Populations

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234



Section 4.3.11. Risk Assessment: Pandemic and Infectious Disease

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals



### General Building Stock

No structures are anticipated to be directly impacted by a pandemic or infectious disease. However, structures could be damaged due to the lack of maintenance if maintenance personnel are out sick. This is especially true of businesses with processes (e.g., chemical reactions) that occur continuously.

### Community Lifelines and Other Critical Facilities

While the actual structures of county and municipal buildings, critical facilities, and infrastructure will not be impacted by a pandemic or infectious disease, the effect of absenteeism on workers will impact local government services. Maintaining key functions is important to preserve life and decrease societal disruption during disease outbreaks. Heat, clean water, waste disposal, and corpse management all contribute to public health. Ensuring functional transportation systems also protects health by making it possible for people to access medical care and by transporting food and other essential goods. Critical infrastructure groups have a responsibility to maintain public health, provide public safety, transport medical supplies and food, implement a pandemic response, and maintaining societal functions. If workers are absent due to an infectious disease outbreak, these systems can fail (Cybersecurity and Infrastructure Security Agency n.d.).

The most significant impact of pandemic or infectious disease on critical facilities would be the increase in hospitalization and emergency room visits that would take place. This would create a greater demand on these critical facilities, their staff, and resources. The healthcare system will be severely taxed, if not overwhelmed, from the large number of illnesses and complications from infectious disease requiring hospitalization and critical care. Ventilators may be the most critical shortage if an outbreak occurs (Homeland Security Council 2006).

Mortuary services could be substantially impacted due to increased numbers of deaths. The timely, safe, and respectful disposition of the deceased is an essential component of an effective response (Homeland Security Council 2006).

### Economy

The COVID-19 outbreak in 2020-2022 resulted in significant negative impacts on economic activity in the county, commonwealth, and country due to the enforcement of social distancing and quarantine conditions until the disease spread was lessened. During the height of the pandemic, all non-essential businesses were forced to close. The virus outbreak also had a deleterious impact on government finances due to tax delinquency and user fee losses. Decreased revenues can lead to service cuts and prevent the county and community from procuring necessary supplies to weather the outbreak. Though costs associated with the activities and programs implemented to conduct surveillance and address pandemic have not been quantified in available documentation, the economic impact from the pandemic was clearly felt in Lancaster County. Smaller-scale infectious disease outbreaks can also cause negative economic impacts, though the extent of impact is variable.

### Environment

A pandemic or other infectious disease outbreak has no direct impact on the environment. However, pandemics and infectious disease can have the following cascading impacts on the environment:

- Pollution of land and waterways/water bodies due to prophylactic supplies (e.g., masks) being improperly disposed of (e.g., littered).
- Environmental contamination due to waste being improperly disposed of or treated, due to lack of personnel to carry out proper disposal procedures.
- Environmental contamination due to runaway chemical reactions causing releases of hazardous materials from facilities.
- A lack of environmental regulators due to them being sick, which can reduce the effectiveness of environmental programs or requirements, having a detrimental impact on the environment.



## Future Changes That May Impact Vulnerability

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### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Since buildings are not generally vulnerable to the pandemic and infectious disease hazard, new development will affect vulnerability to this hazard only so far as it causes changes in population density, as described below.

### Projected Changes in Population

Changes in population density may influence the number of persons exposed to pandemics or infectious disease outbreaks. Higher density jurisdictions can facilitate the spread of pandemic or infectious disease, and density may reduce available basic services provided by critical facilities such as hospitals and emergency facilities for persons that are not affected by a disease. Further, as the population ages there may be increased risk to this demographic. Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes are at higher risk for developing more serious complications from certain diseases.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

As discussed earlier in this section, the relationship between climate change and increase in infectious diseases is difficult to predict with certainty, however there may be linkages between the two. Changes in the environment may create a more livable habitat for vectors carrying disease as suggested by the Centers for Disease Control and Prevention (CDC 2021). Localized changes in climate and human interaction may also be a factor in the spread of disease.

The relationship between climate change and infectious diseases is somewhat controversial. The notion that rising temperatures will increase the number of mosquitoes that can transmit malaria among humans (rather than just shift their range) has been the subject of debate over the past decade. Some believe that climate change may affect the spread of disease, while others are not convinced. However, many researchers point out that climate is not the only force at work in increasing the spread of infectious diseases into the future. Other factors, such as expanded rapid travel and evolution of resistance to medical treatments, are already changing the ways pathogens infect people, plants, and animals (Baker, et al. 2021).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Overall, the County continues to remain vulnerable to the pandemic and infectious disease hazard. Any changes or perceived increase in vulnerability may be attributed to changes in population numbers and density or the emergence of new diseases. For future updates, Lancaster County will work with stakeholders to identify the long-term impacts of pandemics and infectious disease outbreaks, and the long-term solutions that can be implemented to reduce vulnerability to these events. Lancaster County will work with health sector stakeholders to increase their participation in future updates.



### 4.3.12 Radon Exposure

#### Hazard Description

Radon is a radioactive gas produced by the breakdown of uranium in soil and rock that can lead to lung cancer in people exposed over a long period of time. Approximately 40% of homes in Pennsylvania have radon levels above this guideline level. Three sources of radon in houses are now recognized (PEMA 2023):

- Radon in soil air that flows into the house;
- Radon dissolved in water from private wells and exsolved during water usage; this is rarely a problem in Pennsylvania; and
- Radon emanating from uranium-rich building materials (e.g., concrete blocks or gypsum wallboard); this is not known to be a problem in Pennsylvania.

Uranium decays to become radium, which decays to radon. Most exposure comes from breathing in radon gas that enters homes and buildings through foundation cracks and other openings. According to the Pennsylvania Department of Environmental Protection (PA DEP), approximately 40 percent of Pennsylvania homes have elevated radon levels (PA DEP n.d.-c).

#### Radon Health Risks

Radon exposure is responsible for more than 20,000 lung cancer deaths every year and is the number one cause of lung cancer among non-smokers. Lung cancer is the only known effect on human health from exposure to radon in air and, thus far, no evidence indicates that children are at greater risk of lung cancer than adults (EPA 2022). The main hazard is from radon-daughter products (polonium-218, lead-214, bismuth-214), which may become attached to lung tissue and induce lung cancer by their radioactive decay (EPA 2022). Table 4-68 lists cancer risks from exposure to radon at various levels for smokers and non-smokers. The table also compares lung cancer risks from radon exposure to other death risks and identifies action thresholds.

Table 4-68. Radon Risk for Smokers and Non-Smokers

Radon Level (pCi/L)	Lung Cancer Rate per 1,000 People with Lifetime Exposure <sup>a</sup>		Comparative Death Risk of Radon Exposure <sup>b</sup>		Action
	Smokers	Non-Smokers	Smokers	Non-Smokers	
20	260 people	36 people	250 times the risk of drowning	35 times the risk of drowning	Fix structure
10	150 people	18 people	200 times the risk of dying in a home fire	20 times the risk of dying in a home fire	
8	120 people	15 people	30 times the risk of dying in a fall	Four times the risk of dying in a fall	
4	62 people	Seven people	Five times the risk of dying in a car crash	The risk of dying in a car crash	
2	32 people	Four people	Six times the risk of dying from poison	The risk of dying from poison	Consider fixing structure
1.3 (average indoor radon level)	20 people	Two people			Reducing radon levels below 2 pCi/L is difficult; no action
0.4 (average outdoor radon level)	3 people	Two people or less			

Source: EPA 2023

Note: Risk may be lower for former smokers. pCi/L = picocuries per liter

a. Lifetime risk of lung cancer deaths from U.S. Environmental Protection Agency (EPA) Assessment of Risks from Radon in Homes (EPA 402-R-03-003).

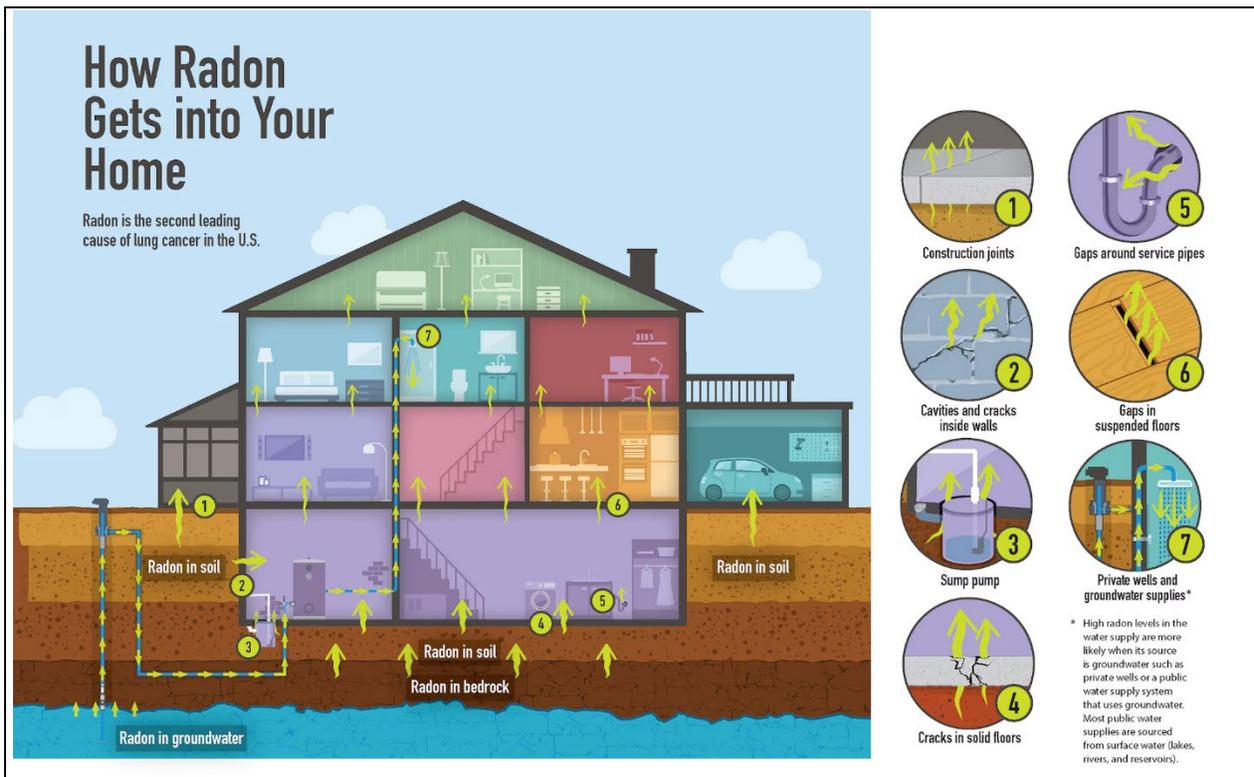


b. Comparison data calculated using the Centers for Disease Control and Prevention's 1999-2001 National Center for Injury Prevention and Control Reports

### Radon Sources

In Pennsylvania, the most common source of radon in houses is gas from the soil below the house. Rates of air flow into and out of houses, plus the location of air inflow and the radon content of air in the surrounding soil, are key factors affecting radon concentrations. Air must be drawn into a house to compensate for outflows of air caused by a furnace, fan, thermal chimney effect, or wind effects. If the upper part of the house is tight enough to impede influx of outdoor air, then an appreciable fraction of the air may be drawn in from the soil or fractured bedrock through the foundation and slab beneath the house, or through cracks and openings for pipes, sumps, and similar features. Figure 4-20 illustrates radon entry points into a home.

Figure 4-20 Radon Entry Points into a House



Source: CDC 2024

Soil gas typically contains between a few hundred and a few thousand picocuries per liter (pCi/L) of radon; therefore, even a small rate of soil gas inflow can lead to elevated radon concentrations in a house (PEMA 2023). Radon concentration in soil gas depends on a number of soil properties. In general, 10 to 50 percent of newly formed radon atoms escape the host mineral and gain access to the air-filled pore space. The radon content of soil gas is higher in soils containing higher levels of radium and uranium, especially if the radium occupies a site on or near the surface of a grain from which the radon can easily escape. The amount of space between soil particles and soil permeability for air flow, including cracks and channels, are important factors determining radon concentration in soil gas. Fractured areas in bedrock may supply air with radon concentrations similar to those in deep soil for houses built on bedrock (PEMA 2023).

It was not until the 1980s that the wide geographic distribution of elevated radon levels in houses and the possibility of extremely high radon concentrations in houses were recognized. In 1984, routine monitoring of employees leaving the Limerick nuclear power plant near Reading showed that readings from one employee frequently exceeded expected radiation levels, yet only natural, non-fission-product radioactivity was detected



on him. Radon levels in his home were detected around 2,500 pCi/L, much higher than the 4 pCi/L guideline set by EPA or even the 67 pCi/L limit for uranium miners. As a result of this event, the area of Pennsylvania where the employee lived became the focus of the first large-scale radon scare in the world (PEMA 2023).

Elsewhere in the United States, radon in well water or in building materials have been found to be sources of radon in homes, but these sources are not common in Pennsylvania (PEMA 2023).

### Radon Mitigation

The EPA's 2014 "Test, Fix, Save a Life" radon action campaign highlighted radon testing and mitigation as a simple and affordable step to significantly reduce the risk of lung cancer. This initiative specifies the following activities and facts for the public regarding radon poisoning (EPA 2022):

- **Test**—All homes with or without basements should be tested for radon. Affordable, do-it-yourself radon test kits are available online and at home improvement and hardware stores, or homeowners can hire a qualified radon tester.
- **Fix**—EPA recommends taking corrective action to fix radon levels at or above 4 pCi/L by contacting a qualified radon-reduction contractor. In most cases, a system with a vent pipe and fan is used to reduce radon. Addressing high radon levels often costs the same as other minor home repairs. EPA also recommends that Americans consider fixing their home if radon levels are between 2 and 4 pCi/L because there is no known safe level of exposure to radon.
- **Save a Life**—More than 20,000 Americans die from radon-related lung cancer each year. By decreasing elevated levels in the home, residents can help prevent lung cancer while creating a healthier home.

### Location and Extent

Radon is a widespread hazard. The distribution of radon correlates with the distribution of radium and uranium. While radium has a half-life (the time it takes to decay) of 1,600 years, radon has a half-life of 3.8 days. Because of the short half-life of radon, the distance that radon atoms can travel before they decay is generally limited to extents of feet or tens of feet (PEMA 2023). Areas where houses have high levels of radon can be divided into the following three groups in terms of uranium content in rock and soil (PEMA 2023):

- **Areas of very elevated uranium content (above 50 parts per million [ppm]) around uranium deposits and prospects**—Although very high levels of radon can occur in these areas, the hazard normally is restricted to within a few hundred feet of the deposit. In Pennsylvania, these localities occupy an insignificant area.
- **Areas of common rocks having higher than average uranium content (5 to 50 ppm)**—In Pennsylvania, these rock types include granitic and felsic alkali igneous rocks and black shales. High uranium values in rock or soil and high radon levels in houses in the Reading Prong are associated with Precambrian granitic gneisses commonly containing 10 to 20 ppm uranium, but locally containing more than 500 ppm uranium. Elevated uranium occurs in black shales of the Devonian Marcellus Formation and possibly the Ordovician Martinsburg Formation in Pennsylvania. High radon values are locally present in areas underlain by these formations.
- **Areas of soil or bedrock that have normal uranium content but properties that promote high radon levels in houses**—This group is not completely understood at present. Relatively high soil permeability can lead to high radon concentrations; the clearest examples of this scenario are houses built on glacial eskers. Limestone-dolomite soils also appear to be predisposed for high radon levels in houses, perhaps because of the presence of deep clay-rich residuum where radium is concentrated by weathering on iron oxide or clay surfaces, coupled with moderate porosity and permeability. The importance of carbonate soils is indicated by exceedance of 4 pCi/L in 93 percent of a sample of houses built on limestone-dolomite soils near State College, Centre County, and exceedance of 20 pCi/L in 21 percent of that sample of houses, even though uranium levels in the underlying bedrock are all within the normal radon range of 0.5 to 5 ppm.



The 2023 PA HMP indicates that current data on abundance and distribution of radon in Pennsylvania homes are incomplete and biased, but the plan identifies general patterns (PEMA 2023). One approximate measure of radon risk across Lancaster County is the available data on radon test results.

The PA DEP Bureau of Radiation Protection provides homeowners with information on how to test for radon in their houses. If results of a test exceed 4 pCi/L, the Bureau helps the homeowner repair the house to mitigate high radon levels. The Bureau’s website reports the total number of tests since 1990 and test results by zip code for zip codes where more than 30 tests were reported (PA DEP 2022). That includes four out of eight zip codes in Lancaster County, as shown in Table 4-69. The website only publishes the average and maximum results for a zip code; it does not offer a range of results for a zip code, municipality, or region. The PA DEP Radon Division recommends that all homeowners test for radon, regardless of test results within their zip codes. Despite a low average test result within a zip code, many homes in that zip code may have elevated radon levels.

Table 4-69. Radon Level Tests and Results by Zip Codes in Lancaster County

ZIP Code	Location	Area in Home	Number of Tests	Maximum Result (pCi/L)	Average Result (pCi/L)
17573	Lancaster	Basement	Insufficient Data	Insufficient Data	Insufficient Data
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
17601	Lancaster	Basement	13736	403.0	8.8
		First Floor	1595	256.1	5.6
17602	Lancaster	Basement	4983	97.1	6.3
		First Floor	976	52.2	3.9
17603	Lancaster	Basement	7549	173.2	6.2
		First Floor	946	99.9	3.7
17604	Lancaster	Basement	44	59.1	10.7
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
17605	Lancaster	Basement	Insufficient Data	Insufficient Data	Insufficient Data
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
17606	Lancaster	Basement	Insufficient Data	Insufficient Data	Insufficient Data
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
17607	Lancaster	Basement	Insufficient Data	Insufficient Data	Insufficient Data
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data

Source: PA DEP 2021

Range of Magnitude

The EPA has estimated that the national average indoor radon concentration is 1.3 pCi/L and the level for action is 4 pCi/L. The EPA-estimated average indoor concentration in Pennsylvania is 7.1 pCi/L in basements and 3.6 pCi/L on the first floor (PA DEP n.d.-c). Each county in Pennsylvania is classified as having a low, moderate, or high radon hazard potential. Lancaster County is classified as having a high hazard, meaning there is a predicted indoor radon level of 4 pCi/L or more (see Figure 4-21).

The worst-case scenario for radon exposure is a large area of tightly sealed homes causing high levels of exposure over a prolonged period of time without the residents being aware. This worst-case scenario exposure could lead to a large number of people with cancer caused by radon exposure. The most likely scenario is a single household exposed to a very low concentration of radon, with no adverse health effects.

Past Occurrence

As shown in Table 4-69, at least 30,000 homeowners in four Lancaster County zip codes have tested their homes for radon since 1990, with an overall average reading of more than 7 pCi/L. This suggests that radon exposure is a common occurrence in the County.

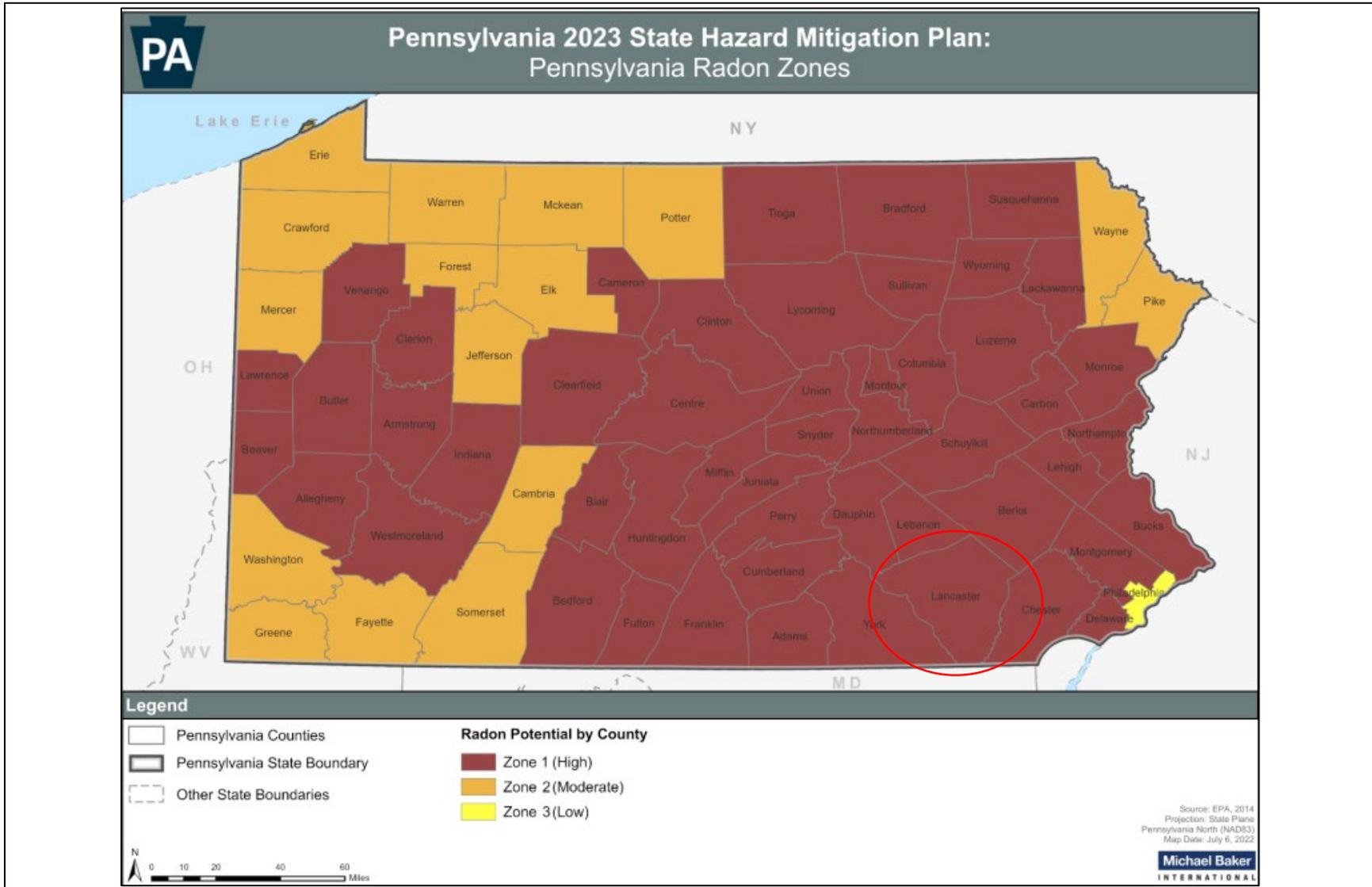




Of the 40 responses received for the public survey distributed for this HMP, one respondent (2.5 percent of the total) experienced radon hazards in the last five years.



Figure 4-21. Radon Hazard Zones in Pennsylvania



Source: PEMA 2023

Note: Lancaster County is identified by the red circle.





### Future Occurrence

Radon exposure is inevitable given present soil, geologic, and geomorphic factors across Pennsylvania. Residents who live in housing developments where radon levels previously have been found to be significantly high will continue to be more susceptible to exposure. However, new incidents of concentrated exposure may occur with future development or deterioration of older structures. Exposure can be limited by conducting proper testing in existing and future developments and implementing appropriate mitigation measures (PEMA 2023).

For this HMP, future occurrences of radon exposure are considered *highly likely*.

### Vulnerability Assessment

#### Life, Health, and Safety

For the purposes of this plan, the entire population of the county is assumed to be at risk of radon exposure. Radon is responsible for more than 20,000 of lung cancer deaths every year. Lung cancer is the only known effect on human health from exposure to radon in air, and thus far, no evidence indicates that children are at greater risk of lung cancer than adults (EPA 2022). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-69, houses in a number of Lancaster County municipalities or cities could be susceptible to high levels of radon. The average pCi/L testing result in the four zip codes reported by PA DEP was over 4 pCi/L, the highest one being 17604 zip code with a 10.7 pCi/L. Excess human cancer risk posed by radon exposure at this elevated level is identified in Table 4-68. The local jurisdictions included in zip code 17604 are:

- Lancaster City
- Manheim Township

#### General Building Stock and Community Lifelines and Other Critical Facilities

While the entire general building stock and critical facility inventory in Lancaster County is exposed to radon, radon does not result in direct damage to structures and facilities.

#### Economy

EPA has concluded that an average radon mitigation system costs \$1,200 and that one home in five has elevated radon levels. The cost of radon mitigation is estimated by assuming that 20 percent of residential buildings in High Potential (Level 1) counties have elevated radon levels, and each would require a radon mitigation system installed at the EPA estimated average of \$1,200 (PEMA 2013). This could exceed \$41 million in Lancaster County. However, 70 percent of households in the County have measured basement level average radon levels exceeding 4 pCi/L, indicating that the cost of radon mitigation may be higher than the estimate based on the above-cited information from EPA.

#### Environment

Radon exposure exerts minimal environmental impacts. Because of the relatively short half-life of radon, it tends to affect only living and breathing organisms such as humans or pets that are routinely within contained areas (basement or house) near the source from which the gas is released (PEMA 2023).

#### Future Changes That May Impact Vulnerability

##### Projected Development

Because the entirety of Lancaster County has been determined to be at risk for the radon exposure hazard, any new construction development will be exposed to this risk. Measures to reduce human exposure to radon in structures are readily available and can be incorporated during new construction at significantly lower cost and greater effectiveness than retrofitting existing structures to implement these measures.



### Projected Changes in Population

An increase in population will result in an increase in the number of persons exposed to the radon hazard. Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

According to the EPA’s *Climate Change and Indoor Air Quality* report, the primary factors that influence radon entry into a home include radon content of the soil; pressure differential between the interior of the home and the soil; the air exchange rate for the home; the moisture content surrounding the home; and the presence and size of entry pathways. The report notes that the relative concentration of radon to its decay products, and the ability to deliver dose, is impacted by factors including building ventilation rate, decay product attachment to aerosols, and particle deposition rate on surface. All these factors could be impacted by housing as well as behavioral changes driven directly or indirectly by climate change. For example, the increased use of ceiling fans could increase deposition of radon decay products and reduce the delivered radon-related doses to the lungs (CDC 2022).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

The risk for radon exposure in the County has increased since the 2019 plan, as the County’s population has increased. Because specific structural conditions affect human exposure to radon, direct radon measurements within facilities are necessary to properly assess the level of health risk and indicate the need for mitigation measures. Furthermore, EPA recommends that new construction projects consider radon exposure risk and installation of mitigation measures as appropriate.



### 4.3.13 Subsidence and Sinkholes

#### Hazard Description

Land subsidence is a gradual settling or sudden sinking of the Earth’s surface due to removal or displacement of subsurface earth materials. Sinkholes are subsidence features resulting from the downward movement of surficial material into a pre-existing subsurface void. There are two common causes of subsidence in Pennsylvania: 1) dissolution of carbonate rock such as limestone or dolomite and 2) mining activity. Collapse sometimes occurs only after a large amount of activity, or when a heavy burden is placed on the overlying material (PEMA 2023).

Sinkholes are generally found in areas underlain by carbonate bedrock (such as limestone and dolomite), found in large areas of central and eastern Pennsylvania. They occur naturally due to the physical and chemical weathering of the bedrock. Water passing through naturally occurring fractures dissolves the bedrock, leaving voids below the surface. Eventually, the earth on top of the voids collapses, leaving surface depressions. Sinkholes, linear depressions, and caves are characteristic structures associated with karst topography, which is landscape underlain by limestone that has been eroded. Sub-surface solution of limestone does not always result in the immediate formation of karst features (USGS 2018).

Mine subsidence is the movement of the ground surface as a result of the collapse of the roof, floor, or pillars of underground mines, especially where the cover of a mine is thin. This is a concern in Pennsylvania due to the number of underground coal and clay mines (DCNR n.d.). Underground extraction of materials such as oil, gas, coal, metal ores (i.e., copper, iron, and zinc), clay, shale, limestone, or water may result in slow-moving or abrupt shifts in the ground surface (Whittaker and Reddish 1989).

Human activity can be the cause of a subsidence area or sinkhole. Leaking water pipes or structures that convey stormwater runoff may result in areas of subsidence as the water dissolves layers of rock over time. Land grading or earth-moving activities that cause changes in stormwater flow can trigger subsidence events.

#### Location and Extent

According to Pennsylvania Department of Conservation and Natural Resources (DCNR), much of the land in Lancaster County has the carbonate geology that results in sinkholes; this is displayed in Figure 4-22. Figure 4-23 displays the subsidence hazard areas for Lancaster County, which indicates areas with limestone bedrock. Almost 30 percent of Lancaster County (277.98 square miles) is underlain by carbonate bedrock. The following municipalities have identified carbonate geology:

- Akron Borough
- Bart Township
- Caernarvon Township
- Christiana Borough
- Clay Township
- Columbia Borough
- Conestoga Township
- Conoy Township
- Denver Borough
- Earl Township
- East Cocalico Township
- East Donegal Township
- East Drumore Township
- East Earl Township
- East Hempfield Township
- East Lampeter Township
- East Petersburg Borough
- Elizabeth Township
- Ephrata Borough
- Ephrata Township
- Lancaster City
- Lancaster Township
- Leacock Township
- Lititz Borough
- Manheim Borough
- Manheim Township
- Manor Township
- Marietta Borough
- Martic Township
- Millersville Borough
- Mountville Borough
- Mt. Joy Borough
- Mt. Joy Township
- Paradise Township
- Pequea Township
- Providence Township
- Quarryville Borough
- Rapho Township
- Sadsbury Township
- Salisbury Township
- Strasburg Borough
- Strasburg Township
- Terre Hill Borough
- Upper Leacock Township
- Warwick Township
- West Cocalico Township
- West Donegal Township
- West Earl Township
- West Hempfield Township
- West Lampeter Township

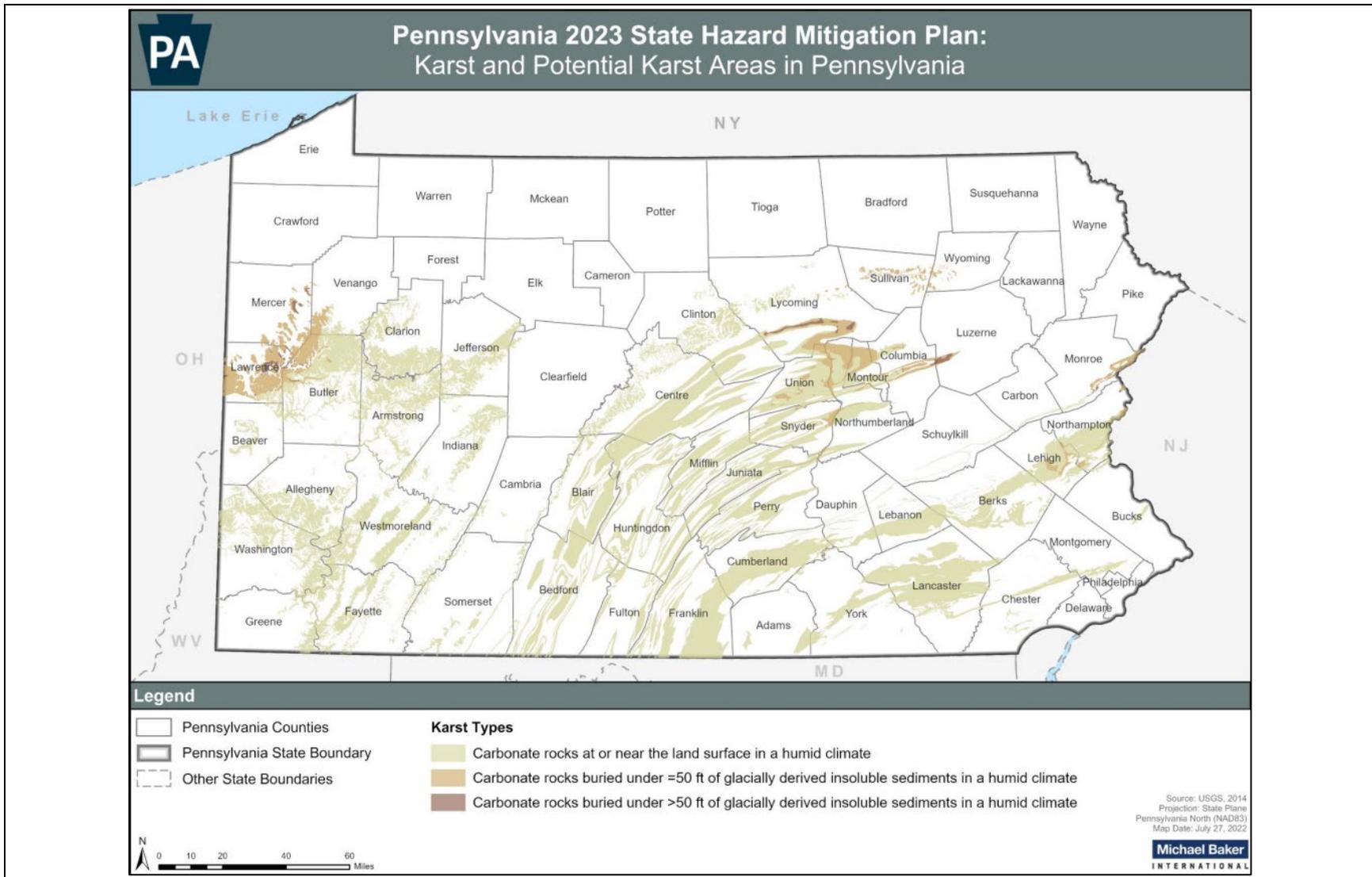


- Eden Township
- Penn Township

According to a subset of data contained in the Office of Surface Mining Reclamation and Enforcement (OSMRE) Abandoned Mine Land Inventory, there are no abandoned mines located in Lancaster County.



Figure 4-22. Areas in Pennsylvania with Karst or Potential for Karst Development

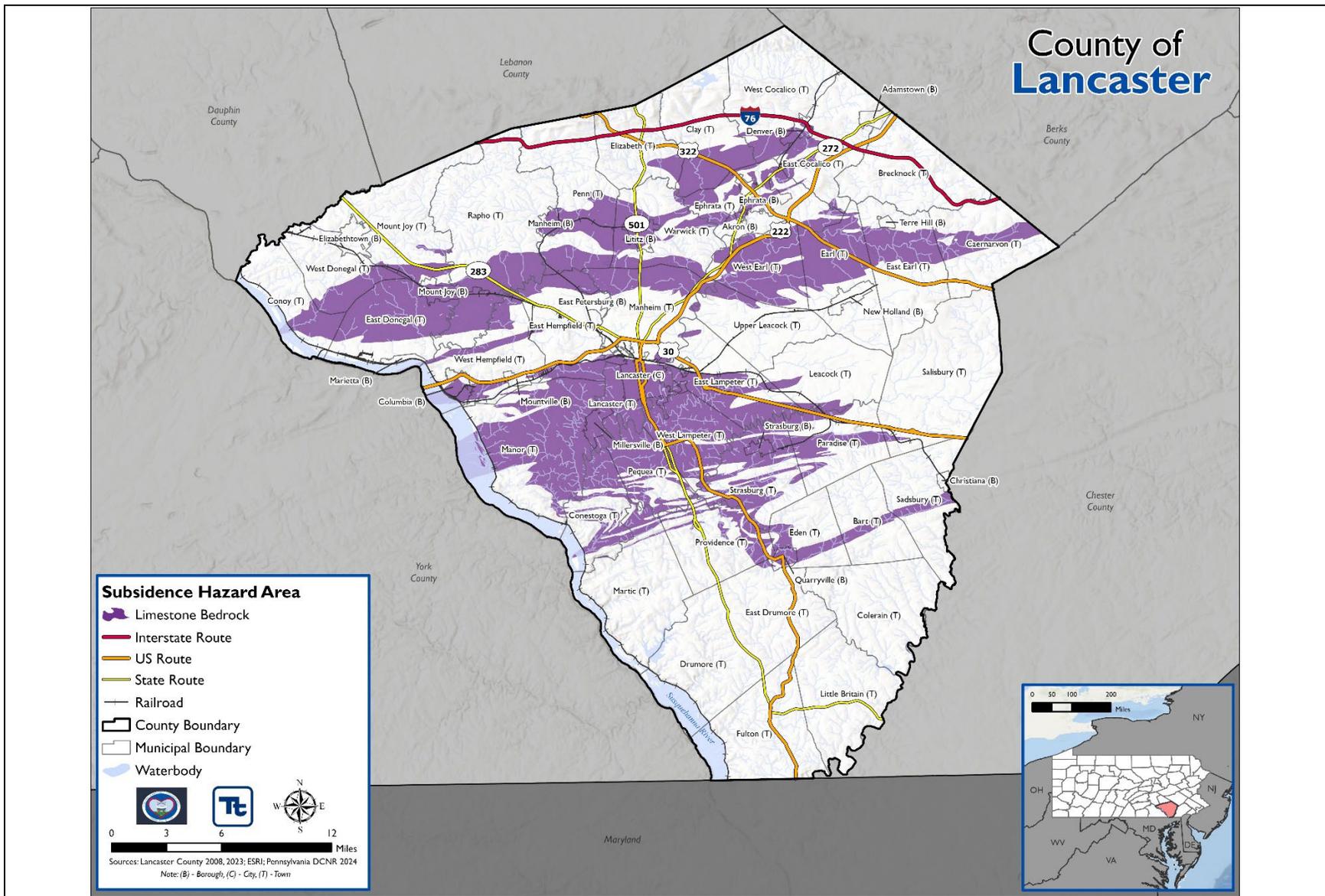


Source: PEMA 2023





Figure 4-23. Subsidence Hazard Area in Lancaster County





### Range of Magnitude

Based on the geologic formations underlying parts of Lancaster County, subsidence and sinkhole events may occur gradually or abruptly. Events could result in minor elevation changes or deep, gaping holes in the ground surface. Abrupt subsidence and sinkhole events can cause severe damage in urban environments; gradual events can be addressed before significant damage occurs. If long-term subsidence or sinkhole formation is not recognized and mitigation measures are not implemented, fractures or complete collapse of building foundations and roadways may result.

Sinkholes may have negative effects on local groundwater. Groundwater in limestone and other similar carbonate rock formations can be easily polluted because water moves readily from the earth's surface down through solution cavities and fractures, undergoing very little filtration. Contaminants such as sewage, fertilizers, herbicides, pesticides, or industrial products are of concern.

The worst-case scenario for the subsidence/sinkhole hazard in Lancaster County would be a series of large sinkholes opening in Lancaster City, which is home to 564 critical facilities and 55,058 people residing over limestone bedrock. The majority of the City has near-surface limestone, making it vulnerable to sinkholes. This series of sinkholes could close roads, cause power outages, prevent the delivery of emergency services, cause injuries or death to residents, and cause millions of dollars in property damage.

### Past Occurrence

There have been dozens of sinkholes and hundreds of surface depressions in Lancaster County, as shown in Figure 4-24 (PEMA 2023, DCNR 2023). Recently, local officials reported a sinkhole near Pine Street in Ephrata Borough in the spring of 2017, and along a French drain along Harrisburg Pike at North Berry Street and Pine Street in Lancaster City. A sinkhole opened under six vehicles in the parking lot of the Tanger Outlets in East Lampeter Township in 2018. The sinkhole continued to grow double its size. The sinkhole formed following a weekend full of heavy rains (LancasterOnline 2018). In 2023, a sinkhole in Lancaster City caused closures on Duke Street after the rear tire of a South Central Transit Authority Bus became caught. The sinkhole was caused by a water main break that eroded the soil under the street (LancasterOnline 2023). Because large-scale or fast-moving subsidence events can trigger landslides, landslides can be an indication of a potentially greater or secondary hazard.

### Future Occurrence

Subsidence and sinkhole occurrences will continue to be a possibility in Lancaster County. According to Pennsylvania's 2023 HMP and the PaGEODE interactive map, there have been 159 sinkholes and approximately 25,000 surface depressions, indicative of subsidence and sinkhole activity, in Lancaster County (PEMA 2023, DCNR 2023). Based on the historical record, karst geology, and presence of filled ground and utilities, the future occurrence of subsidence and sinkholes is considered *likely*.

### Vulnerability Assessment

To complete the vulnerability assessment for the subsidence and sinkhole hazard, areas underlain by limestone bedrock were used as the hazard areas. Limestone bedrock data was sourced from the Pennsylvania DCNR.

### Life, Health, and Safety

#### General Population

As shown in Table 4-70, 43.2 percent of Lancaster County's population is located in a subsidence hazard area. Sinkhole events are typically isolated and impact only the population within the immediate vicinity.

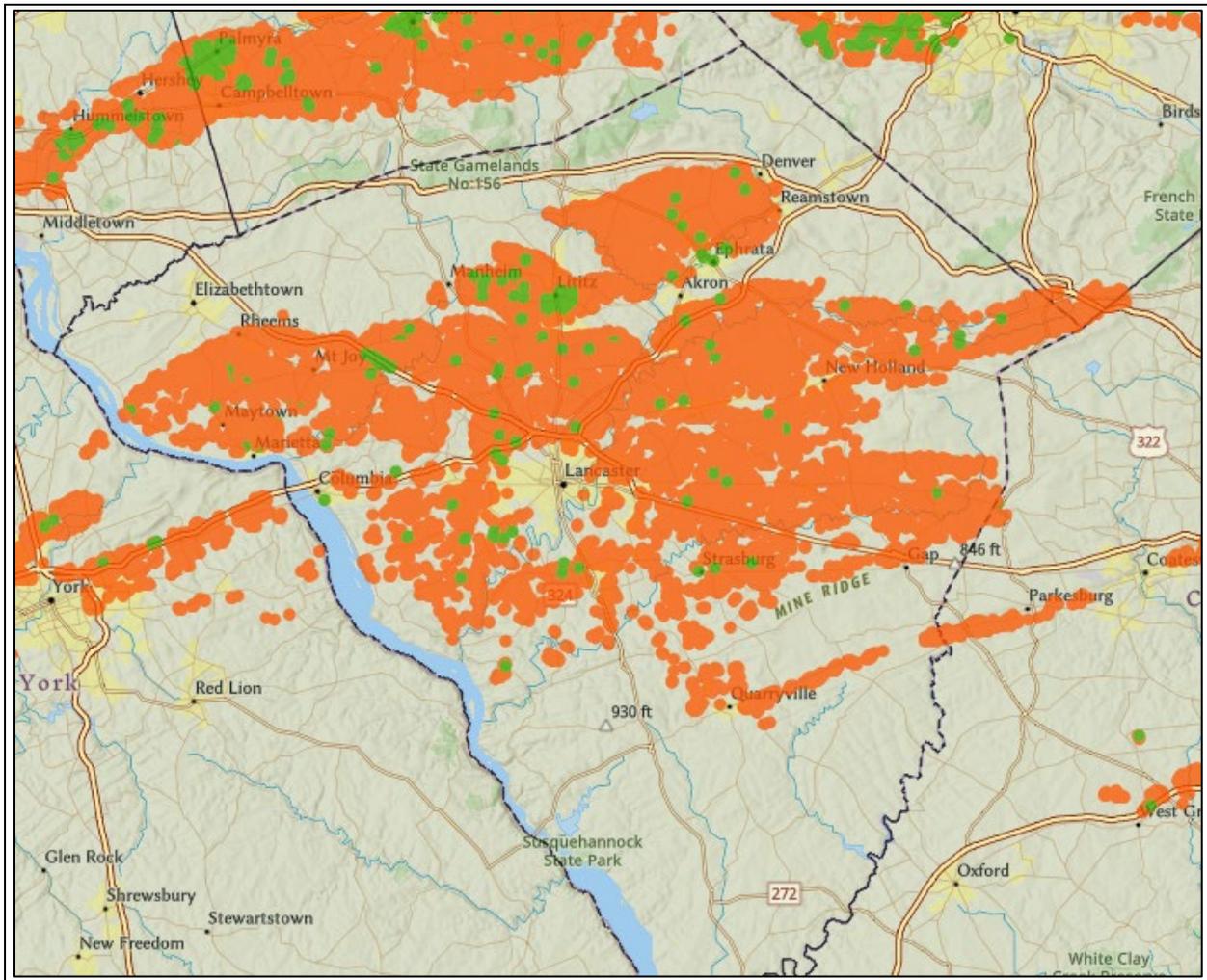
#### Socially Vulnerable Populations

According to FEMA's National Risk Index, socially vulnerable populations are more susceptible than the general population to the adverse impacts of natural hazards, including geological hazards. As shown in Table 4-71,



Lancaster City has the highest population over 65 (5,109), the highest population under the age of 5 (3,741), the largest population of non-English speaking persons (4,103), the largest disabled population (8,476), and the greatest population of individuals living in poverty (9,673) located in the subsidence hazard area. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

**Figure 4-24. Historical Sinkholes and Surface Depressions in Lancaster County**



Source: DCNR 2023

Note:

Sinkholes are shown with green dots; surface depressions are shown with orange dots

DCNR mapping may not include all experienced or identified sinkholes which have occurred in the County, in particular within Lancaster City.

**Table 4-70. Estimated Population Living in the Subsidence Hazard Area**

Jurisdiction	Total Population (2020 Decennial Census)	Estimated Population Living in the Subsidence (Limestone Bedrock) Hazard Area	
		Number of Persons	Percent of Total
Adamstown Borough	1,916	0	0.0%
Akron Borough	4,152	496	11.9%
Bart Township	3,181	66	2.1%



Section 4.3.13. Risk Assessment: Subsidence and Sinkholes

Jurisdiction	Total Population (2020 Decennial Census)	Estimated Population Living in the Subsidence (Limestone Bedrock) Hazard Area	
		Number of Persons	Percent of Total
Brecknock Township	7,557	0	0.0%
Caernarvon Township	4,609	518	11.2%
Christiana Borough	1,112	0	0.0%
Clay Township	6,857	2,979	43.4%
Colerain Township	3,883	0	0.0%
Columbia Borough	10,207	7,629	74.7%
Conestoga Township	3,914	1,439	36.8%
Conoy Township	3,361	616	18.3%
Denver Borough	3,792	1,781	47.0%
Drumore Township	2,561	0	0.0%
Earl Township	7,144	1,969	27.6%
East Cocalico Township	10,767	1,182	11.0%
East Donegal Township	8,684	5,867	67.6%
East Drumore Township	3,936	111	2.8%
East Earl Township	6,699	943	14.1%
East Hempfield Township	26,304	5,134	19.5%
East Lampeter Township	17,776	11,528	64.9%
East Petersburg Borough	4,573	399	8.7%
Eden Township	2,239	240	10.7%
Elizabeth Township	3,985	100	2.5%
Elizabethtown Borough	11,639	0	0.0%
Ephrata Borough	13,794	6,456	46.8%
Ephrata Township	10,386	3,385	32.6%
Fulton Township	3,214	0	0.0%
Lancaster City	58,039	55,058	94.9%
Lancaster Township	18,642	18,641	100.0%
Leacock Township	5,652	340	6.0%
Lititz Borough	9,381	8,652	92.2%
Little Britain Township	4,118	0	0.0%
Manheim Borough	5,046	4,424	87.7%
Manheim Township	43,977	10,706	24.3%
Manor Township	21,849	18,738	85.8%
Marietta Borough	2,623	0	0.0%
Martic Township	5,221	548	10.5%
Millersville Borough	7,903	7,902	100.0%
Mount Joy Borough	8,325	7,123	85.6%
Mount Joy Township	10,721	958	8.9%
Mountville Borough	3,017	46	1.5%
New Holland Borough	5,743	0	0.0%
Paradise Township	5,672	2,237	39.4%
Penn Township	10,210	1,004	9.8%
Pequea Township	5,474	3,905	71.3%
Providence Township	6,995	1,575	22.5%
Quarryville Borough	2,843	2,484	87.4%



Jurisdiction	Total Population (2020 Decennial Census)	Estimated Population Living in the Subsidence (Limestone Bedrock) Hazard Area	
		Number of Persons	Percent of Total
Rapho Township	12,024	3,344	27.8%
Sadsbury Township	3,536	58	1.6%
Salisbury Township	11,494	5	<0.1%
Strasburg Borough	3,117	3,117	100.0%
Strasburg Township	4,457	2,050	46.0%
Terre Hill Borough	1,357	3	0.2%
Upper Leacock Township	8,921	119	1.3%
Warwick Township	19,022	5,423	28.5%
West Cocalico Township	7,456	151	2.0%
West Donegal Township	8,944	2,174	24.3%
West Earl Township	8,560	5,092	59.5%
West Hempfield Township	17,020	3,156	18.5%
West Lampeter Township	17,383	16,822	96.8%
<b>Lancaster County</b>	<b>552,984</b>	<b>238,693</b>	<b>43.2%</b>

Source: U.S. Census Bureau 2020; Lancaster County 2023, 2024; Pennsylvania DCNR 2024

**Table 4-71. Estimated Number of Vulnerable Persons Living in the Subsidence Hazard Area**

Jurisdiction	Vulnerable Population Living in the Subsidence Hazard Area				
	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	0	0	0	0	0
Akron Borough	94	47	14	60	45
Bart Township	7	7	3	6	3
Brecknock Township	0	0	0	0	0
Caernarvon Township	89	37	14	55	40
Christiana Borough	0	0	0	0	0
Clay Township	522	198	45	230	160
Colerain Township	0	0	0	0	0
Columbia Borough	1,626	257	190	1,452	1,230
Conestoga Township	253	40	0	187	87
Conoy Township	92	44	0	85	44
Denver Borough	289	97	53	152	119
Drumore Township	0	0	0	0	0
Earl Township	507	179	59	195	195
East Cocalico Township	222	43	25	123	60
East Donegal Township	876	422	16	523	207
East Drumore Township	28	7	0	13	8
East Earl Township	202	54	40	92	32
East Hempfield Township	1,351	174	88	528	155
East Lampeter Township	1,839	893	528	1,252	1,028
East Petersburg Borough	85	13	0	54	26
Eden Township	30	27	3	15	10



Section 4.3.13. Risk Assessment: Subsidence and Sinkholes

Jurisdiction	Vulnerable Population Living in the Subsidence Hazard Area				
	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Elizabeth Township	21	6	0	6	4
Elizabethtown Borough	0	0	0	0	0
Ephrata Borough	1,123	434	540	1,089	593
Ephrata Township	673	147	132	370	179
Fulton Township	0	0	0	0	0
Lancaster City	5,109	3,741	4,103	8,476	9,673
Lancaster Township	4,110	1,387	964	1,856	1,632
Leacock Township	50	25	9	19	20
Lititz Borough	2,230	521	87	879	315
Little Britain Township	0	0	0	0	0
Manheim Borough	500	453	31	584	489
Manheim Township	2,448	555	178	1,180	586
Manor Township	3,546	1,076	1,200	2,221	1,820
Marietta Borough	0	0	0	0	0
Martic Township	77	55	2	66	36
Millersville Borough	1,030	144	49	873	1,809
Mount Joy Borough	1,304	377	145	969	765
Mount Joy Township	140	62	8	85	41
Mountville Borough	12	2	0	4	4
New Holland Borough	0	0	0	0	0
Paradise Township	281	192	31	229	190
Penn Township	237	52	6	76	41
Pequea Township	711	255	0	375	177
Providence Township	349	74	12	215	156
Quarryville Borough	388	169	0	323	416
Rapho Township	794	169	0	373	105
Sadsbury Township	7	7	0	5	6
Salisbury Township	0	0	0	0	0
Strasburg Borough	821	176	0	310	192
Strasburg Township	340	239	0	132	170
Terre Hill Borough	0	0	0	0	0
Upper Leacock Township	18	8	7	11	9
Warwick Township	1,116	262	55	453	303
West Cocalico Township	20	16	1	11	12
West Donegal Township	818	84	0	307	132
West Earl Township	1,002	458	139	367	177
West Hempfield Township	610	178	105	410	91
West Lampeter Township	5,183	620	96	2,006	532
<b>Lancaster County</b>	<b>43,180</b>	<b>14,483</b>	<b>8,978</b>	<b>29,302</b>	<b>24,124</b>

Source: U.S. Census Bureau 2022; Lancaster County 2023, 2024; Pennsylvania DCNR 2024





General Building Stock

Land subsidence and sinkholes can destabilize the foundation of structures, which may result in monetary losses to businesses and residents. These events can expose the underlying bedrock adjacent to structures, which can erode and threaten the structural integrity and safety of the structure above. In general, the built environment located on limestone is exposed to this hazard. Table 4-72 lists the replacement cost value (RCV) (structure and contents) of general building stock and number of structures located within the defined hazard area. Table 4-73 lists the buildings in the hazard area by general occupancy class. The residential occupancy is the most exposed to the subsidence hazard area.

Table 4-72. Estimated Building Stock in the Subsidence Hazard Area

Jurisdiction	Jurisdiction Total Buildings		Buildings in the Subsidence Hazard Area	
	Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value
Adamstown Borough	1,061	\$567,784,670	0	\$0
Akron Borough	1,946	\$780,121,864	200	\$81,746,527
Bart Township	2,746	\$1,885,029,231	179	\$170,150,510
Brecknock Township	6,458	\$3,832,548,357	0	\$0
Caernarvon Township	3,617	\$2,383,292,372	642	\$670,306,703
Christiana Borough	584	\$307,647,839	2	\$843,331
Clay Township	4,929	\$3,411,423,294	2,222	\$1,931,248,084
Colerain Township	3,177	\$2,533,877,481	0	\$0
Columbia Borough	4,036	\$4,983,733,544	3,119	\$3,814,943,438
Conestoga Township	2,953	\$1,420,507,504	1,185	\$693,674,851
Conoy Township	2,599	\$1,789,579,577	458	\$299,791,813
Denver Borough	1,918	\$2,747,960,874	1,043	\$2,399,955,841
Drumore Township	2,426	\$1,886,590,595	0	\$0
Earl Township	5,290	\$10,279,323,543	2,357	\$3,552,032,819
East Cocalico Township	7,428	\$5,177,824,554	973	\$901,520,035
East Donegal Township	4,506	\$6,877,402,214	3,180	\$3,420,820,239
East Drumore Township	3,043	\$3,747,277,368	91	\$47,908,131
East Earl Township	5,648	\$6,797,710,925	1,339	\$2,338,707,148
East Hempfield Township	11,417	\$42,919,064,493	2,779	\$9,564,513,158
East Lampeter Township	8,359	\$16,552,653,977	5,093	\$9,218,806,569
East Petersburg Borough	2,033	\$1,076,855,572	155	\$91,102,480
Eden Township	1,797	\$1,268,005,230	288	\$408,667,311
Elizabeth Township	3,194	\$2,173,694,928	145	\$151,555,698
Elizabethtown Borough	4,454	\$6,918,177,890	0	\$0
Ephrata Borough	6,357	\$13,348,895,113	3,325	\$7,806,351,500
Ephrata Township	5,383	\$6,162,339,672	1,729	\$2,288,837,678
Fulton Township	3,035	\$2,732,951,621	0	\$0
Lancaster City	14,223	\$49,154,384,225	13,016	\$32,032,806,287
Lancaster Township	5,365	\$16,948,222,966	5,365	\$16,948,222,966
Leacock Township	4,771	\$5,521,489,045	236	\$299,234,469
Lititz Borough	4,389	\$10,053,673,662	4,142	\$9,857,323,250
Little Britain Township	3,545	\$3,060,610,596	0	\$0
Manheim Borough	2,956	\$4,013,795,389	2,713	\$3,928,066,409
Manheim Township	16,101	\$25,203,355,402	3,989	\$5,208,338,576



Jurisdiction	Jurisdiction Total Buildings		Buildings in the Subsidence Hazard Area	
	Number of Buildings	Replacement Cost Value	Number of Buildings	Replacement Cost Value
Manor Township	10,400	\$20,927,614,237	8,499	\$16,247,573,897
Marietta Borough	1,402	\$754,834,832	0	\$0
Martic Township	4,469	\$2,359,595,108	468	\$308,208,141
Millersville Borough	2,611	\$4,408,036,349	2,611	\$4,408,036,349
Mount Joy Borough	3,925	\$4,719,474,554	3,374	\$4,432,756,978
Mount Joy Township	5,918	\$7,127,138,587	519	\$757,996,246
Mountville Borough	1,189	\$1,106,163,051	29	\$14,110,851
New Holland Borough	2,819	\$5,086,885,413	0	\$0
Paradise Township	4,470	\$4,125,868,997	1,648	\$1,229,166,673
Penn Township	6,163	\$6,256,819,382	1,197	\$2,675,897,614
Pequea Township	3,612	\$2,379,058,553	2,513	\$1,700,429,170
Providence Township	4,666	\$3,832,302,966	1,062	\$1,373,487,204
Quarryville Borough	1,451	\$1,138,506,005	1,306	\$1,045,674,210
Rapho Township	8,253	\$7,968,083,321	1,722	\$3,090,486,471
Sadsbury Township	2,765	\$2,150,137,506	146	\$147,895,932
Salisbury Township	8,204	\$7,541,703,016	54	\$158,849,422
Strasburg Borough	1,716	\$965,120,267	1,716	\$965,120,267
Strasburg Township	3,777	\$4,508,049,956	2,004	\$3,183,900,324
Terre Hill Borough	840	\$352,866,296	1	\$638,856
Upper Leacock Township	5,549	\$12,221,244,032	205	\$207,928,079
Warwick Township	8,483	\$13,241,309,844	2,317	\$5,776,249,301
West Cocalico Township	5,957	\$3,405,206,014	262	\$298,878,268
West Donegal Township	4,332	\$7,574,423,332	1,193	\$798,726,657
West Earl Township	5,356	\$5,324,536,861	3,700	\$4,096,310,493
West Hempfield Township	8,662	\$10,809,249,135	1,849	\$2,073,954,091
West Lampeter Township	7,031	\$18,752,932,700	6,747	\$18,588,485,492
<b>Lancaster County</b>	<b>285,764</b>	<b>\$427,554,965,900</b>	<b>105,107</b>	<b>\$191,708,236,807</b>

Source: Lancaster County 2023, 2024; RS Means 2024; Pennsylvania DCNR 2024

Table 4-73. Buildings in the Subsidence Hazard Area by General Occupancy Class

Jurisdiction	Number of Buildings in the Subsidence Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>
Adamstown Borough	0	0	0	0
Akron Borough	141	59	0	0
Bart Township	12	147	0	20
Brecknock Township	0	0	0	0
Caernarvon Township	106	485	0	51
Christiana Borough	0	2	0	0
Clay Township	716	1,440	0	66
Colerain Township	0	0	0	0
Columbia Borough	1,643	1,382	9	85
Conestoga Township	417	697	0	71
Conoy Township	180	254	5	19



Jurisdiction	Number of Buildings in the Subsidence Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>
Denver Borough	482	508	23	30
Drumore Township	0	0	0	0
Earl Township	341	1,780	25	211
East Cocalico Township	328	612	3	30
East Donegal Township	1,423	1,585	16	156
East Drumore Township	25	64	0	2
East Earl Township	220	991	24	104
East Hempfield Township	1,382	1,311	31	55
East Lampeter Township	2,563	2,350	20	160
East Petersburg Borough	120	34	1	0
Eden Township	46	216	0	26
Elizabeth Township	30	102	0	13
Elizabethtown Borough	0	0	0	0
Ephrata Borough	1,598	1,634	37	56
Ephrata Township	740	886	12	91
Fulton Township	0	0	0	0
Lancaster City	6,595	5,935	79	407
Lancaster Township	3,750	1,529	20	66
Leacock Township	61	151	2	22
Lititz Borough	2,257	1,758	35	92
Little Britain Township	0	0	0	0
Manheim Borough	1,311	1,326	28	48
Manheim Township	2,756	1,149	15	69
Manor Township	4,644	3,540	29	286
Marietta Borough	0	0	0	0
Martic Township	159	288	0	21
Millersville Borough	1,584	929	2	96
Mount Joy Borough	1,815	1,446	42	71
Mount Joy Township	220	273	3	23
Mountville Borough	10	18	0	1
New Holland Borough	0	0	0	0
Paradise Township	469	1,083	7	89
Penn Township	256	857	10	74
Pequea Township	1,056	1,355	19	83
Providence Township	361	633	2	66
Quarryville Borough	645	627	8	26
Rapho Township	795	805	13	109
Sadsbury Township	11	115	0	20
Salisbury Township	1	47	1	5
Strasburg Borough	968	730	1	17
Strasburg Township	471	1,387	8	138
Terre Hill Borough	1	0	0	0
Upper Leacock Township	25	161	1	18
Warwick Township	1,346	876	11	84
West Cocalico Township	38	199	0	25



Jurisdiction	Number of Buildings in the Subsidence Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>
West Donegal Township	531	620	0	42
West Earl Township	1,172	2,251	28	249
West Hempfield Township	924	866	12	47
West Lampeter Township	4,050	2,543	9	145
<b>Lancaster County</b>	<b>50,795</b>	<b>50,036</b>	<b>591</b>	<b>3,685</b>

Sources: Lancaster County 2023, 2024; Pennsylvania DCNR 2024

a. Other = Government, Religion, Agricultural, and Education

### Community Lifelines and Other Critical Facilities

Table 4-74 summarizes critical facilities and lifelines located within the subsidence hazard area. These include the following types of critical infrastructure:

- **Roads**—Access to major roads is crucial to life safety after a disaster event and to response and recovery operations. Egress and ingress can be blocked on roads, causing isolation for neighborhoods, traffic problems, and delays for public and private transportation. This can result in economic losses for businesses.
- **Bridges**—Subsidence and sinkholes can significantly impact road bridges. These events can knock out bridge abutments or significantly weaken the soil supporting them, making them hazardous for use.
- **Power Lines**—While power lines are generally elevated, the towers supporting them can be subject to geologic hazards. Soil underneath a tower could become unstable, causing it to collapse and ripping down the lines. Power and communication failures due to subsidence and sinkholes can create problems for vulnerable populations and businesses.
- **Rail Lines**—Rail lines are important for response and recovery operations after a disaster. Subsidence and sinkholes can block travel along rail lines, for which it is more difficult to provide detour routes than it is for roads.
- **Utilities**—Water and sewer infrastructure can be damaged by subsidence and sinkholes. In some cases, water infrastructure may be the cause of a hazard’s formation due to the lines leaking.

**Table 4-74. Lifeline Facility Exposure to the Subsidence Hazard**

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines in Subsidence (Limestone Bedrock) Hazard Area
Communications	149	48
Energy	70	24
Food, Hydration, Shelter	12	9
Hazardous Materials	731	291
Health and Medical	1,147	529
Safety and Security	1,340	639
Transportation	44	19
Water Systems	449	197
Other Critical Facilities	2,534	1,112
<b>Total</b>	<b>6,476</b>	<b>2,868</b>

Source: Lancaster County 2008, 2019, 2023; HIFLD 2022, 2023; National Park Service; Pennsylvania DCNR 2024



### Economy

Subsidence and sinkholes can impose direct and indirect impacts on the economy. Direct costs include the actual damage sustained by buildings, property, and infrastructure. Indirect costs include clean-up costs, business interruption, loss of tax revenues, reduced property values, and loss of productivity (USGS 2000). Subsidence and sinkholes can cause several types of secondary effects, such as blocking access to roads, which can isolate residents and businesses and delay commercial, public, and private transportation.

The 2022 USDA Agricultural Census showed that Lancaster County had 19 percent of Pennsylvania's agricultural sales—\$1.8 million including livestock, poultry, and products. Roughly \$270,000 was spent in Lancaster County on repairs, supplies, and maintenance costs for farm production expenses, a 27 percent increase from 2017 (USDA 2022). Agricultural equipment and property may be damaged by a significant sinkhole or subsidence event, so costs to repair and maintain equipment and property will increase.

### Environment

The presence of sinkholes can result in increased potential for groundwater contamination. Due to their porous nature, sinkholes are sometimes used as instruments for enhancing groundwater recharge. However, if hazardous materials are spilled at a recharge point, groundwater can quickly be contaminated due to the lack of soil substrate that normally would slow migrating contaminants. Vegetation is usually damaged during abrupt subsidence events. However, re-growth takes place over time. Land subsidence can result in more frequent and expansive flooding and changes in river canal and drain flow systems.

### Future Growth and Development

#### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by subsidence and sinkholes if the structures are on karst soils and mitigation measures are not considered. Therefore, it is the intention of the county and all participating municipalities to discourage development in vulnerable areas or to encourage higher regulatory standards at the local level.

#### Projected Changes in Population

Any changes in population density throughout the County may impact the ability of persons in the County to mobilize or receive essential services. Population growth in municipalities more vulnerable to subsidence and sinkholes may be more at risk to such events.

Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

The May 2021 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures and precipitation in the 21st century (Commonwealth of Pennsylvania 2021). Climate change factors such as an extended growing season, higher temperatures, and the possibility of more intense and less frequent summer rainfall may lead to changes in water resource availability. Any over-withdrawal of groundwater, diversion of surface water from a large area to a single point, artificial creation of surface water ponds, or drilling of new water wells can cause sinkholes. These actions can also accelerate the natural processes of bedrock degradation, which can have a direct impact on sinkhole creation. The potential effects of climate change on Lancaster County's vulnerability to subsidence/sinkhole events will need to be considered as more information develops regarding regional climate change impacts.



### Change of Vulnerability Since 2019 Hazard Mitigation Plan

Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county.

Lancaster County does not have an official record of a significant subsidence-based disaster. However, there have been unofficial reports of sinkholes at several locations in the County, which are believed to be caused by flooding, poor fill, and construction over streams. More data is needed to identify these past events and possible locations to properly mitigate this hazard.



## 4.3.14 Substance Use Disorder and Mental Health

### Hazard Description

#### Substance Use Disorder

Substance use disorder occurs when an individual becomes physically dependent on a drug, either legal or illegal. The most likely cause are opioids, a class of drugs that reduces pain. “Opioid” is used as a broad term and includes opiates, which are drugs naturally extracted from certain types of poppy plants, and narcotics. Substance abuse can lead to overdose, which can be fatal. Opioids work by blocking the body’s pain receptors, and can create a feeling of euphoria, which can result in extremely addictive properties (PEMA 2023)

Substance use disorder (SUD) is a condition of people who are physically dependent upon a drug, either legally or illegally. Such disorders are treatable, but chronic cases are difficult to treat and may lead to further physical and behavioral impairments or even death. Pennsylvania is experiencing an unprecedented epidemic of drug abuse and drug-related deaths, affecting residents throughout the state. In 2022, 5,044 drug overdose deaths were recorded statewide (PDH 2022). Of those, 84.3 percent were opioid-related (PDH 2023). It is estimated that there has been a 4 percent decrease in overdose deaths since 2022 for the entire commonwealth (PDH 2023).

The Centers for Disease Control and Prevention (CDC) defines the following as the three most common types of opioids (PEMA 2023):

- **Prescription opioids** are medications prescribed by doctors for pain treatment. Prescription opioids can be synthetic (methadone, oxycodone [OxyContin], or hydrocodone [Vicodin]) or natural (morphine).
- **Fentanyl** is a synthetic opioid that is 50 to 100 times more powerful than morphine and used for treating severe pain. Illegally made and distributed fentanyl is becoming more prevalent.
- **Heroin** is an illegal, highly addictive natural opioid processed from morphine that is also becoming more commonly used in the United States. It is commonly used along with other substances including cocaine and prescription opioids.

People with a SUD may also have other mental health disorders, and people with mental health disorders may also struggle with substance use. These other mental health disorders can include anxiety disorders, depression, attention-deficit hyperactivity disorder (ADHD), bipolar disorder, personality disorders, and schizophrenia, among others. Though people might have both a SUD and a mental disorder, that does not mean that one caused the other. Research suggests three possibilities that could explain why SUDs and other mental disorders may occur together (National Institute of Mental Health 2024):

- Common risk factors can contribute to both SUDs and other mental disorders. Both SUDs and other mental disorders can run in families, meaning certain genes may be a risk factor. Environmental factors, such as stress or trauma, can cause genetic changes that are passed down through generations and may contribute to the development of a mental disorder or a substance use disorder.
- Mental disorders can contribute to substance use and SUDs. Studies found that people with a mental disorder, such as anxiety, depression, or post-traumatic stress disorder (PTSD), may use drugs or alcohol as a form of self-medication. However, although some drugs may temporarily help with some symptoms of mental disorders, they may make the symptoms worse over time. Additionally, brain changes in people with mental disorders may enhance the rewarding effects of substances, making it more likely they will continue to use the substance.
- Substance use and SUDs can contribute to the development of other mental disorders. Substance use may trigger changes in brain structure and function that make a person more likely to develop a mental disorder.



**Location and Extent**

This risk of substance use disorder and mental health in Lancaster County is not considered to be location specific. The entire county is considered to be at risk for the purposes of this HMP update.

**Range of Magnitude**

In 2017, the U.S. Drug Enforcement Administration (DEA) Philadelphia Division and the University of Pittsburgh prepared a report to assist law enforcement efforts to identify and combat drug suppliers, and ultimately drug abuse and related overdoses. The drugs included in the analysis were selected based on law enforcement intelligence regarding frequency of abuse and diversion, and the most common drugs present in drug-related overdose deaths according to national public safety and public health sources. This study ranked Lancaster County 43rd among Pennsylvania’s 65 counties for overdose deaths in 2016, with 22.3 deaths per 100,000 residents. This was a rise in rank from 2015, when the county was ranked 47th (DEA Philadelphia Division and University of Pittsburgh 2017).

Substance use disorders often result in overdose, which can result in depressed breathing and lack of oxygen to the brain, causing permanent brain damage, organ failure, or even death. A child in a mother’s womb can be severely impacted if the mother uses opioids. This is called neonatal abstinence syndrome, a disorder which has increased along with the opioid rise. Signs of someone who is experiencing an opioid overdose are depressed breathing, disorientation, small pupils, and clammy skin (PEMA 2023).

The Health and Medical lifeline in response and recovery as substance use has negative impacts on public health and may require medical treatment and mental health services. There may be cascading impacts to family and friends, who may require mental health services as well. Substance use disorders can span generations and reach all family members. Community hubs such as schools and businesses are impacted as individuals who suffer from opioid drug abuse are unable to properly function (PEMA 2023).

Penn Medicine Lancaster General Hospital completed an emergency department expansion project, doubling the number of behavioral-health treatment rooms to ten (Lancaster General Health 2024).

**Past Occurrence**

According to the 2023 Lancaster County Overdose Fatality Report, deaths from drug overdoses in Lancaster County increased from 53 in 2013 to 168 in 2017. As a result of community actions to reduce overdoses through evidence-based and data-driven public health practices, there was a significant decrease in deaths in 2018 and 2019, followed by another increase during the COVID-19 pandemic (Lancaster County Joining Forces 2023). Data from the Pennsylvania Department of Health shows that Lancaster County had 109 drug-related deaths in 2019, 148 in 2020, 150 in 2021, and 121 in 2022 (PA DOH 2024). Drug-related overdose and death statistics account for all drug types, but most involve opioids (PEMA 2023).

**Future Occurrence**

Information on previous substance use disorder and mental health occurrences in the County was used to calculate the probability of future occurrence of such events, as summarized in Table 4-75. Based on historical records and input from the Steering Committee, the probability of occurrence for substance use disorder in the county is considered *highly likely*.

**Table 4-75. Probability of Future Substance Use Disorder in Lancaster County**

Hazard Type	Number of Occurrences Between 1990 and 2024	Percent Chance of Occurring in Any Given Year
Drug-Induced Deaths	1,945	100%

Source: PA DOH 2024





Future occurrences of substance use disorder will be affected by implementation of overdose prevention initiatives. In January 2018, Pennsylvania’s governor declared opioid addictions a disaster emergency. This declaration enhanced coordination and data collection between state and local responders, improved tools for families and first responders, and expanded treatment access. Naloxone, a lifesaving drug that reverses the effects of a drug-overdose, has become more available as a result (PEMA 2023).

Lancaster County Joining Forces is a collection of organizations and individuals working with Penn Medicine Lancaster General Health to save lives and help others who are living with addiction in Lancaster County. The collaborative regularly reviews data to help community leaders understand who is at increased risk of overdose and what interventions are needed to prevent deaths. Lancaster County Joining Forces provides free naloxone as well as direct services and supports for children and families (Lancaster County Joining Forces 2024).

### Vulnerability Assessment

A qualitative assessment was performed to evaluate local assets’ vulnerability to and potential impacts from the substance use disorder and mental health hazard.

#### Life, Health, and Safety

##### General Population

Substance use disorder can affect anyone (PEMA 2023), but a DEA Philadelphia Division study found that people under the age of 35 have a higher vulnerability. From 2015 to 2016, fentanyl use increased by 380 percent among people 15 to 24 years old, and heroin increased 970 percent for people 25 to 34 years old. It is still unclear why these ages are more vulnerable to substance use disorder.

Some occupation-specific risks may make employees more vulnerable to this hazard. County employees working in direct patient care are vulnerable to fentanyl exposure. Since fentanyl can be ingested orally, inhaled through the nose or mouth, or absorbed through the skin or eyes, any substance suspected to contain fentanyl should be handled with extreme caution. Exposure to a small amount of fentanyl can lead to respiratory depression or death.

##### Socially Vulnerable Populations

A new study published in JAMA Psychiatry uncovers significant associations between social vulnerability and the prevalence and treatment of mental health disorders in the United States. The analysis revealed that socially vulnerable populations are at greater risk of specific mental health disorders, including bipolar I disorder, post-traumatic stress disorder, schizophrenia spectrum disorder, stimulant use disorder, and opioid use disorder (Gibbons, Robert D.; Olfson, Mark; Saulsberry, Loren 2024). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

Table 4-76. Socially Vulnerable Lancaster County Populations

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361



*Section 4.3.14. Risk Assessment: Substance Use Disorder and Mental Health*

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665





Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock and Community Lifelines and Other Critical Facilities

Buildings and facilities are not at risk from the substance use disorder hazard.

### Economy

Losses associated with substance use stem from lost wages, productivity, and resources. Lancaster County has seen an increase of time and resources devoted to the situation as overdose and response increases, with tracking mechanisms being used as a fairly new capability; however, there is no comprehensive database currently tracking monetary costs (PEMA 2023).

The American Enterprise Institute (AEI), using national data from the CDC and White House Council of Economic Advisors, calculated a total cost per capita (\$1,799), of the opioid crisis for Pennsylvania. AEI’s estimates were calculated using national estimates based on variations in local wages, health care costs, and criminal justice costs along with variation in opioid-related death and addiction rates, and average age-adjusted value of statistical lives lost, divided by the state’s population in the 2012-2016 American Community Survey. In Lancaster County, this amounts to a total estimated cost of more than \$976 million (PEMA 2023).

### Environment

Opioid drug traces can be found in streams, rivers, and lakes. These traces are from human urine and feces or from medication being improperly disposed of. Environmental impacts due to these opioid drug traces have not been determined. The U.S. EPA is working on further research to identify known impacts from this hazard on the natural environment (PEMA 2023).

### Future Changes That May Impact Vulnerability

#### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Changes in land use can impact the availability of safe housing, in particular to socially vulnerable populations who may be more at risk to the substance use disorder hazard. Providing safe, available housing may improve the mental health of populations by the reduction of stress, which may be a precursor to begin drug use.



### Projected Changes in Population

In general, jurisdictions that are more densely populated are more vulnerable to substance use threats as access to the drugs increases. However, rural communities often experience larger per-capita opioid-related death rates (PEMA 2023).

Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

Climate change is not anticipated to have a direct impact on substance use disorder. However, it may have a small indirect impact on the number of prescribed opioids. Climate has a large influence on people and human health. If large climatic events result in injury or pain, then physicians may prescribe more opioids, which could increase the reliance on painkillers in the community.

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Substance use disorder is a new hazard of concern identified for this Lancaster County HMP update.



## 4.3.15 Terrorism

### Hazard Description

Terrorism is use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyberattacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons. Cyberattacks have become an increasingly pressing concern (PEMA 2023).

The Federal Bureau of Investigation (FBI) defines terrorism as an unlawful use of force and violence against persons and property to intimate or coerce a government or the civilian population, or in the furtherance of political and social objectives. Facilities, landmarks, or buildings of international, national, or regional significance are at high risk of terrorist attack, including include military and civilian government installations, international airports, major cities, and cultural landmarks. Additional potential targets are large public events, water and food supplies, utilities, and corporate centers. Terrorists may also employ cyber-attacks or send explosive, chemical, or biological agents through the mail (PEMA 2023).

### Terrorism Types and Strategies

The FBI characterizes terrorism into two categories (PEMA 2023):

- **International Terrorism**—Violent acts committed by individuals or groups inspired by or associated with foreign terrorist organizations.
- **Domestic Terrorism**—Violent, criminal acts that are carried out by individuals or groups to further their ideological goals which stem from domestic influences, such as political, religious, social, and racial nature.

The following are common strategies of terrorism:

- **Agriterrorism**—Food contamination or pest/disease agents to destroy crops
- **Arson**—Malicious damage/destruction of property by fire/explosion
- **Armed Attack**—Armed groups who attack those who do not support their cause (Goodwin 2019)
- **Assassination**—The murder of a public figure, typically a political figure (Encyclopaedia Britannica 2024)
- **Biological Agent**—The deliberate release of bioweapons to cause death or disease in humans, plants, or animals. Can include bacteria, viruses, toxins, or fungi (Rathish, et al. 2023)
- **Chemical Agent**—The spread of toxic chemicals with the intent to do harm. Can include chemical weapons developed for military use (U.S. Department of Homeland Security 2022)
- **Cyberterrorism**—The act of using the internet and other forms of information/communication technologies to threaten or cause bodily harm, with the goal to gain political/ideological power (Akleylek 2024)
- **Conventional Bomb**—A streamlined cylinder consisting of an outer casing with inner explosive materials and an arming mechanism, activated through chemical energy (Encyclopaedia Britannica 2024)
- **Hijackings**—The illegal seizure of a vehicle, aircraft, or other conveyance while it is in transit (Jenkins 2024)
- **Intentional Hazardous Material Release**—The intentional release of hazardous material substances that pose a threat to human health and safety. Often includes substances that are explosive, toxic, or radioactive (U.S. Department of Homeland Security 2023)
- **Kidnapping**—The unlawful taking and carrying away of a person by force or fraud against their free will (Encyclopaedia Britannica 2024)
- **Nuclear Bomb**—A device that releases energy in an explosion as a result of nuclear fission and/or nuclear fusion (Cochran and Norris 2024)



- **Radiological Agent**—Any radioactive material that is released and causes adverse health impacts. Often exposing the community to radiological materials (EPA 2024)

### Notification System

The National Terrorism Advisory System (NTAS) communicates information about terrorist threats by providing detailed information to the public, government agencies, first responders, airports and other transportation hubs, and the private sector. Information can be distributed through two mediums:

- NTAS **Bulletins** are used to disseminate critical information regarding terrorism that may not relate to a specific threat.
- When a threat arises, the Secretary of Homeland Security announces an NTAS **Alert** and shares the news with the public. The alert may include specific information about the nature of the threat, including the geographic region, mode of transportation, or critical infrastructure potentially affected as well as steps that individuals and communities can take to protect themselves and help prevent, mitigate, or respond to the threat. The alert indicates whether the threat is elevated or imminent:
  - Elevated threats are those that include no specific information about the timing or location.
  - Imminent threats are threats believed to be impending or occurring very soon. The Department of Homeland Security will issue an NTAS advisory through its website, news media, and its social media channels such as Facebook and Twitter.

### Location and Extent

There are many community lifelines and other critical facilities within Lancaster County which may be potential terrorist targets, such as police stations, hospitals, fire stations, schools, bridges, utility facilities, historic and cultural resources, and government buildings. Because terrorists typically prefer to impact the greatest number of individuals in a given location, it can be inferred that individuals living in highly populated areas, or mass transit systems with a large number of commuters, will have a greater exposure to terrorist incidents than those living in rural areas. However, terrorism can be a result of a wide range of political, personal, and/or cultural agendas, so any location could be a target for terrorist activity (PEMA 2023).

### Range of Magnitude

Terrorism severity depends upon the method, the proximity of people or assets, and the duration. For example, if an explosive goes off in a public park, the severity would depend on the amount of people and critical assets exposed to the explosive and the duration and size of the explosion.

With technology continuing to grow and influencing daily lives and the economy, cyberterrorism is an ever-growing threat. Cyberterrorism can range from smaller attack such as taking control of a website to larger attacks such as using networked resources to cause direct destruction and harm to a community (PEMA 2023).

A worst-case scenario for a terrorism event in Lancaster County would be an active threat incident in a densely populated area, such as the City of Lancaster. The active threat incident would be a shooting or stabbing resulting in mass casualties. Another type of worst-case scenario would be a mass casualty event in the form of a vehicular attack or an improvised explosive device that could result in a combination of mass casualties, including fatalities. An event that results in mass casualties could overwhelm the capabilities of Lancaster County emergency services and healthcare facilities and hospitals.

### Past Occurrence

Table 4-77 shows dispatch statistics for terrorist-like activities in Lancaster County between 2017 and 2023 (LCWC 2024).



On September 11, 2001, as part of the coordinated terrorist attacks on the United States, United Flight 93 crashed in Pennsylvania. Terrorist who hijacked the plane planned to target a critical governmental asset in Washington D.C. They failed due to passengers who were able to gain control of the plane and crash it before it reached its destination. All 40 passengers and crew members perished.

Beginning in November 2024, clusters of drones have been seen across the Delaware Valley. United States Representative Brian Fitzpatrick, who serves parts of neighboring Bucks County, called for greater transparency into the investigation. The drone aircrafts have been seen flying over sensitive locations, including military bases and critical infrastructure. The United States Pentagon denied any link to Iran and the existence of a "mothership" of drones (Philly Voice 2024).

Table 4-77. Law Dispatches in Lancaster County, 2016 to 2023

Year	Number of Calls			
	Arson	Bomb Threat	Shooting	Stabbing
2016	8	5	64	39
2017	14	8	82	55
2018	7	27	67	34
2019	4	5	52	48
2020	11	3	72	45
2021	9	4	54	32
2022 <sup>a</sup>	-	-	-	-
2023	9	15	62	36
<b>Total</b>	<b>62</b>	<b>67</b>	<b>453</b>	<b>289</b>

Source: Lancaster County-Wide Communications (LCWC) 2024

Note: Additional incidents may have occurred that were not called in for an emergency response. Dispatches included in this table are limited to those indicated as "in progress" or "just occurred." It should be acknowledged that not all the identified dispatches may have been related to terrorist activity.

a. Dispatch totals were not available for 2022.

### Future Occurrence

Based on historical events, Lancaster County can expect to experience several suspicious activities each year that may be linked to terrorist activity (although previous events have not resulted in significant terrorist attacks). As long as fringe groups maintain radically different ideas from those of the government or general population, terrorism is a possibility (PEMA 2023). Based on historical records and input from the Steering Committee, the probability of occurrence for terrorism in the County is considered *possible*.

The 2025 Homeland Security Threat Assessment from the Department of Homeland Security indicates that looking forward, the threat of violence from United States-based violent extremists will remain high. The threat will continue to be characterized primarily by lone offenders or small cells motivated to violence by a combination of racial, religious, gender, or anti-government grievances; conspiracy theories; and personalized factors. Concern primarily surrounds the likelihood of violence motivated by developing domestic and global events, including the ongoing Israel-HAMAS conflict. Foreign Terrorist Organizations (FTO), like ISIS and al-Qa'ida, are thought to continue maintaining the intent to conduct or inspire attacks in the United States and have leveraged the conflict in the Middle East to reaffirm this intent. FTO media outlets promote rhetoric intended to inspire persons in the United States to mobilize to violence, while foreign terrorists continue engaging online supporters to solicit funds; create and share media; and encourage followers to attack the United States, its interests, and what the FTOs perceive as the West (Department of Homeland Security 2024).



## Vulnerability Assessment

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A qualitative assessment was performed to evaluate local assets' vulnerability to and potential impacts from the terrorism hazard.

### Life, Health, and Safety

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#### General Population

The entire population in Lancaster County is exposed to the terrorism hazard. A National Institute of Justice study reported that the most prominent terrorism risk profiles are locations characterized by the following (NIJ 2023):

- High population density
- Low white population
- Less-than-high-school education
- Moderate unemployment
- Low percentage of families below the poverty line
- Moderate percentage of families living in the same residence as one year prior (stability measure)
- Low percentage of vacant houses
- High percentage of foreign born

Large-scale incidents have the potential to kill or injure many residents in the immediate vicinity of the attack, and they may also affect people located a distance from the initial event.

A 2018 study indicates that some societal subgroups are more vulnerable to health impacts of terror attacks—in particular mental health—than others and need specific public health attention. This study focused on vulnerable subgroups including first responders, survivors, relatives of victims, bereaved persons who lost a loved one, and young children (Bilsen and Lindert 2018).

#### Socially Vulnerable Populations

Individuals who frequent historical or culturally sensitive locations may be more vulnerable to experiencing an act of terrorism. Historic and cultural resources and locations often symbolize the heritage and identity of a community, making the resources, and those within or around them, potential targets for terrorist activities aiming to disrupt and demoralize the community. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

#### General Building Stock and Community Lifelines and Other Critical Facilities

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All of the building stock in the county is exposed to the terrorism hazard. Vulnerability of individual properties is affected by accessibility, design, availability to roof access, driveways underneath buildings, unmonitored areas, and the proximity of structures to transportation routes, and underground pipelines. Terrorist groups would be likely to target structures of significant cultural or financial value (CISA 2019).

All community lifelines and other critical facilities in the county are exposed to the terrorism hazard, particularly because of the impact that an attack has on these types of facilities. Dams, power stations, and tunnels are all examples of critical infrastructure and facilities that are vulnerable. Additionally, communications systems, first-responder stations, and emergency operations centers are all vulnerable to terrorist attacks (FEMA 2002) (CISA 2019). Disrupting one of these facilities or destroying critical infrastructure would have severe and cascading impacts on Lancaster County.

#### Economy

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The initial impact of a terrorist attack on Lancaster County can be measured in immediate costs related to responding to the event or related to the immediate loss of productivity due to closed businesses. Should a



terrorist event be of a significant magnitude, there could be ramifications in the financial markets, which could affect a greater geographic area than Lancaster County. The fuller economic impact includes long-term costs such as terrorism mitigation activities and likely heightened anti-terrorism activities.

### Environment

The impacts of terrorism on the environment can vary from nominal to catastrophic, depending on the method of the attack, the volume of force applied, and proximity of the attack site to natural areas. Ancillary effects of terrorism—such as fires or, in the case of a radiological device, radioactive fallout—can multiply the impact of on the environment (PEMA 2023). Additionally, there are over 500 SARA Title III facilities as well as many transportation routes traversing the county, making intentional hazard material releases a potential threat to the environment.

### Future Changes That May Impact Vulnerability

#### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by the terrorism hazard because the entire county is vulnerable. Areas of denser population may be considered a higher target due to the increased potential for personal and structural damage.

#### Projected Changes in Population

Increases in population will expose more persons to the terrorism hazard. Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

#### Climate Change

Climate change is not expected to impact terrorist activity as a whole. However, it may exacerbate the impacts of agroterrorism, which can affect entire regions and economies that rely on agriculture for food, goods, and services.

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

Terrorism is a new hazard of concern identified for the Lancaster County HMP.



## 4.3.16 Tornado, Windstorm

### Hazard Description

A **tornado** is a narrow, violently rotating column of air that extends from a thunderstorm to the ground. The impact of tornado or wind storm hazards is ultimately dependent on the population or amount of property (i.e., buildings, infrastructure, agricultural land, etc.) present in the area in which they occur. Tornado events are often so severe that property loss or human fatality is typically inevitable if evacuation or proper construction standards are not implemented (PEMA 2023).

About 1,250 tornadoes hit the U.S. each year, with about 16 hitting the Commonwealth of Pennsylvania. Tornadoes can cause fatalities and devastate neighborhoods in seconds. Destruction from tornadoes depends on the size, intensity, and duration of the storm. High wind velocity and wind-blown debris cause most of the damage from tornadoes. These winds can have severe impacts on buildings, pulling off roof coverings, roof decks, or wall siding and pushing or pulling off windows. Tornadoes typically move at speeds between 30 and 125 miles per hour (mph) and can generate internal winds exceeding 300 mph. Damage paths can be greater than a mile wide and 50 miles long. The lifespan of a tornado rarely is longer than 30 minutes (NSSL 2023a).

**Straight-line winds** are generally any winds that are not associated with rotation, used mainly to differentiate them from tornadic winds. Straight-line winds are movements of air from areas of higher pressure to areas of lower pressure; the greater the difference in pressure, the stronger the winds. They occur at all scales, from local breezes generated by heating of land surfaces to global winds resulting from solar heating of the Earth (NOAA 2023d). Types of damaging straight-line winds include the following (NSSL 2023b):

- A **downdraft** is a small-scale column of air that rapidly sinks toward the ground and usually results in a downburst.
- A **downburst** is a strong downdraft with horizontal dimensions larger than 2.5 miles resulting in an outward burst of damaging winds on or near the ground. It is usually associated with thunderstorms but can occur with rainstorms too weak to produce thunder.
- A **microburst** is a small, concentrated downburst that is typically short-lived, lasting only 5 to 10 minutes, with maximum wind speeds up to 168 mph.
- A **gust front** is the leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. It is characterized by a wind shift, temperature drop, and gusty winds ahead of a thunderstorm.
- A **derecho** is a widespread and long-lived windstorm associated with thunderstorms.
- A **bow echo** is a wind identified by radar echo that is linear but bent outward in a bow shape. Damaging straight-line winds often occur near the center of a bow echo. Bow echoes can be up to 200 miles long, last for several hours, and produce extensive swaths of wind damage at the ground.

### Location and Extent

Tornadoes and windstorms can occur throughout Lancaster County, though events are usually localized. Tornadoes can occur at any time during the day or night but are most frequent during late afternoon into early evening, the warmest hours of the day, and most likely to occur from March through June.

### Range of Magnitude

#### Tornadoes

Tornado magnitude was originally categorized according to the Fujita Scale (F Scale) introduced in 1971. The F Scale rated the intensity of a tornado by examining the damage after the tornado had passed (NOAA n.d.). The F Scale categorized each tornado by intensity and area and is divided into six categories—F0 (Gale) to F5 (Incredible) (NOAA n.d.). Use of the F Scale often led to inconsistent rating of tornadoes and, in some cases, overestimates of tornado wind speeds. This led to the development of the Enhanced Fujita Scale (EF Scale), which became operational in 2007 (NOAA n.d.). The EF Scale assigns tornadoes a rating based on estimated



wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of damage indicators and degrees of damage, which help better estimate the range of wind speeds produced by the tornado. From that, a rating is assigned, similar to that of the F Scale, with six categories from EF0 to EF5, representing increasing degrees of damage (NWS 2022). Table 4-78 details the six categories of the EF Scale.

**Table 4-78. Enhanced Fujita Damage Scale**

EF Scale Number	Intensity Phrase	Wind Speed (mph)	Type of Damage Done
EF0	Light tornado	65–85	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
EF1	Moderate tornado	86-110	Moderate damage. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	Significant tornado	111-135	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	Severe tornado	136-165	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	Devastating tornado	166-200	Devastating damage. Well-constructed houses and whole-frame houses completely leveled; cars thrown, and small missiles generated.
EF5	Incredible tornado	>200	Incredible damage. Strong-frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air over distances exceeding 100 meters (109 yards); high-rise buildings undergo significant structural deformation; incredible phenomena occur.

Source: NWS 2022

The EF Scale assesses 28 damage indicators, as listed in Table 4-79. There are eight degrees of damage for each damage indicator, ranging from the beginning of visible damage to complete destruction. Each degree of damage is assigned an estimated wind speed, a lower boundary of wind speed, and an upper boundary of wind speed.

**Table 4-79. EF Scale Damage Indicators**

Number	Damage Indicator	Abbreviation	Number	Damage Indicator	Abbreviation
1	Small barns, farm outbuildings	SBO	15	School—1-story elementary (interior or exterior halls)	ES
2	One- or two-family residences	FR12	16	School—junior or senior high school	JHSH
3	Single-wide mobile home	MHSW	17	Low-rise (1-4 story) building	LRB
4	Double-wide mobile home	MHDW	18	Mid-rise (5-20 story) building	MRB
5	Apartment, condominium, townhouse (3 stories or less)	ACT	19	High-rise (over 20 stories)	HRB
6	Motel	M	20	Institutional building (hospital, government, or university)	IB
7	Masonry apartment or motel	MAM	21	Metal building system	MBS
8	Small retail building (fast food)	SRB	22	Service station canopy	SSC
9	Small professional (doctor office, branch bank)	SPB	23	Warehouse (tilt-up walls or heavy timber)	WHB
10	Strip mall	SM	24	Transmission line tower	TAT
11	Large shopping mall	LÂM	25	Free-standing tower	FST
12	Large, isolated (“big box”) retail building	LIEB	26	Free-standing pole (light, flag, luminary)	FSP



Number	Damage Indicator	Abbreviation
13	Automobile showroom	ASR
14	Automotive service building	ASB

Number	Damage Indicator	Abbreviation
27	Tree—hardwood	TH
28	Tree—softwood	TS

Source: Storm Prediction Center 2006

### Straight-Line Winds

Wind storms are generally defined as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration. They can vary from small microscale events that take place over only a few hundred meters to large-scale events associated with warm or cold fronts (PEMA 2023). High straight-line winds are often associated with other severe weather events such as thunderstorms, nor'easters, hurricanes, and tropical storms. Table 4-80 lists wind classifications used by the National Weather Service (NWS).

Table 4-80. NWS Wind Descriptions

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
Light, or light and variable wind	5-15 or 10-20
None	0-5

Source: NWS 2011

### Wind Zones

The American Society of Civil Engineers (ASCE) identifies wind speeds to use in building design (ASCE 2024):

- For Risk Category II structures, which include most residential buildings, the ASCE standard calls for a design that can withstand the 3-second gust wind speed that has a 7 percent chance of occurring in a 50-year period. In Lancaster County, that speed is 113 mph. Figure 4-25 shows the mapping of ASCE Risk Category II wind speeds in southeast Pennsylvania and surrounding areas.
- For Risk Category IV structures, defined as buildings that are critical for emergencies and defense (such as shelters and other critical facilities), the ASCE design standard is the 3-second gust wind speed that has a 1.6 percent chance of occurring in a 50-year period. In Lancaster County this is 126 mph.

### Past Occurrence

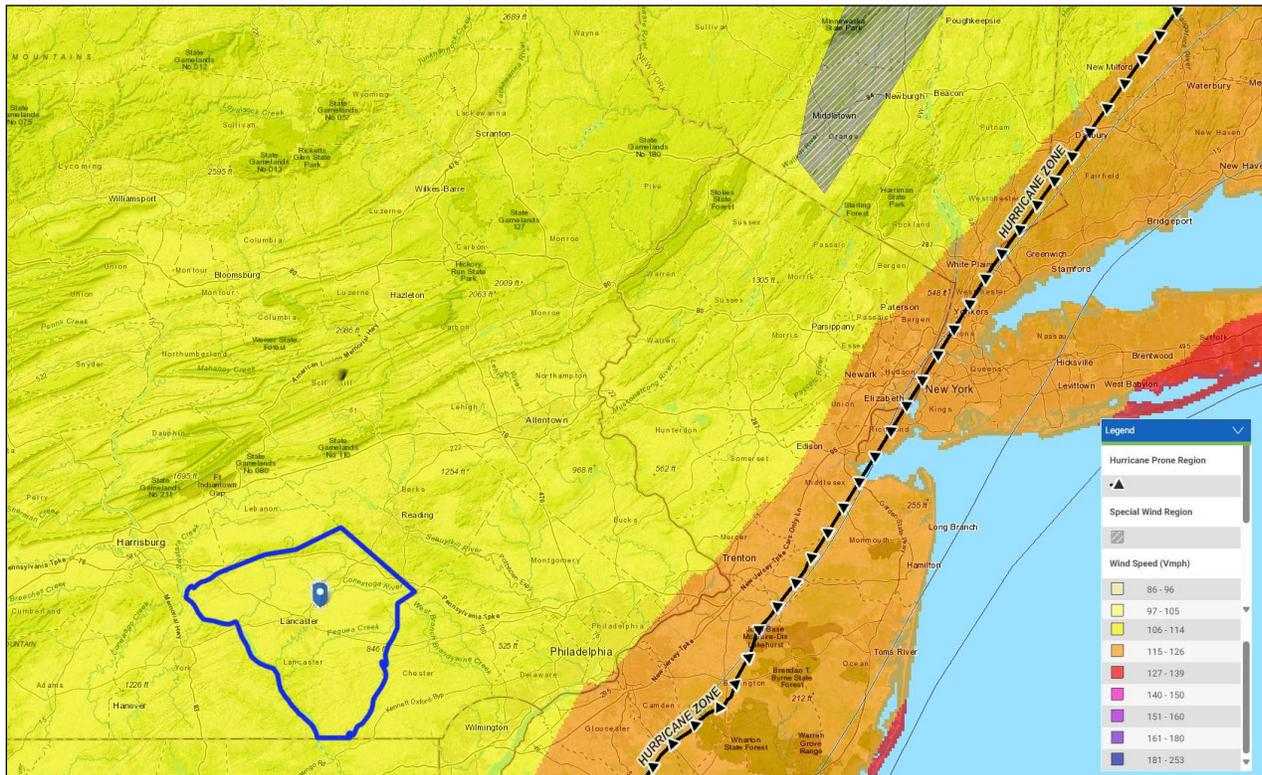
Between 1954 and April 2024, Pennsylvania was included in three FEMA declared tornado- or windstorm-related major disaster (DR) or emergency (EM) declarations. Lancaster County was not included in any of those declarations (FEMA 2023).

The NOAA-NCEI Storm Events database records tornado and windstorm events. According to the database, 38 tornadoes and funnel clouds were recorded in Lancaster County between 1950 and April 2024. These tornadoes include one with an intensity of E/EF 3, 10 with an intensity of F/EF2, 17 with an intensity of F/EF1, and six with an intensity of F/EF0. Between 1950 and April 2024, there were four strong wind events, 23 high wind events, and 292 thunderstorm wind events.

Table 4-81 lists tornadoes and wind events listed in the NOAA-NCEI database and the Storm Prediction Center severe weather database that resulted in a disaster declaration, caused injuries or fatalities, or resulted in \$10,000 or more in damage between 2017 and April 2024. For events prior to 2017, please see the previous HMP.



Figure 4-25. Wind Zones in the United States



Source: (ASCE 2024)

Table 4-81. Tornado and Windstorm Events, 2017 to 2023

Date	Event	Magnitude	Fatalities	Injuries	Total Property Damage	Description
February 25, 2017	Thunderstorm Wind/Funnel Cloud	N/A	0	0	\$5,002,000	A thunderstorm cell displayed a strong rotation and produced quarter-sized hail as it moved across Lancaster County. Another line of storms followed, producing a bow echo and wind damage.
August 4, 2017	Thunderstorm Wind/Tornado	60 mph/EF1	0	0	\$11,000	A line of storms produced numerous reports of wind damage, and a brief EF1 tornado formed.
September 5, 2017	Thunderstorm Wind	70 mph	0	0	\$22,000	A line of storms produced severe wind damage. Trees and wires were knocked over.
May 15, 2018	Thunderstorm Wind	60 mph	0	0	\$57,000	A line of severe thunderstorms produced widespread wind damage. Trees and wires were knocked onto multiple roads.
August 7, 2018	Thunderstorm Wind	60 mph	0	0	\$10,000	A broken line of thunderstorms brought wind damage that knocked down numerous trees.
May 19, 2019	Thunderstorm Wind/Tornado	60 mph/EF1	0	0	\$122,000	Thunderstorms produced wind damage in some areas of the County. The NWS confirmed an EF1 tornado in West Cocalico Township that had a maximum wind speed of 105 mph, a maximum path width of 125 yards, and a path length of approximately 1 mile.



Section 4.3.16. Risk Assessment: Tornado, Windstorm

Date	Event	Magnitude	Fatalities	Injuries	Total Property Damage	Description
May 28, 2019	Thunderstorm Wind/Tornado	60 mph/EF2	0	0	\$59,000	Thunderstorms produced wind that knocked down numerous trees and wires. An EF2 tornado was confirmed in Morgantown with a maximum wind speed of 120 mph, a path just over 2.5 miles in length and a maximum width of 400 yards.
July 17, 2019	Thunderstorm Wind	60 mph	0	2	\$13,000	A line of thunderstorms produced sporadic wind that knocked down numerous trees and wires throughout the County.
June 3-4, 2020	Thunderstorm Wind	60 mph	0	0	\$22,000	Numerous rounds of thunderstorms produced intense wind that knocked down numerous trees and wires.
July 6, 2020	Thunderstorm Wind	60 mph	0	0	\$11,000	Scattered thunderstorms produced sporadic wind damage. Numerous trees were knocked down throughout the County.
August 28, 2020	Thunderstorm Wind	60 mph	0	0	\$15,000	A cluster of severe storms produced sporadic wind damage.
November 15, 2020	Thunderstorm Wind	60 mph	0	0	\$10,000	Strong winds from thunderstorms produced severe wind that knocked down trees and wires.
March 28, 2021	Thunderstorm Wind	75 mph	0	1	\$25,000	A severe thunderstorm producing winds estimated to be near 75 mph caused a partial collapse of a barn and roof damage to another barn on Millwood Road in Salisbury Township. One minor injury was reported.
May 26, 2021	Thunderstorm Wind	60 mph	0	0	\$20,000	Showers and thunderstorms produced wind that knocked down numerous large trees and blew a trailer out of a parking lot.
July 9, 2021	Thunderstorm Wind	60 mph	0	0	\$30,000	Scattered thunderstorms produced wind that knocked a tree onto a home in Manheim.
August 10-11, 2021	Thunderstorm Wind	60 mph	0	0	\$29,000	Several rounds of scattered thunderstorms produced damaging straight-line winds. Numerous utility wires were knocked over.
August 18, 2021	Thunderstorm Wind	60 mph	0	0	\$12,000	The remnants of Tropical Storm Fred brought strong thunderstorms along with a handful of tornadoes. Numerous wires and trees were knocked over.
May 27, 2022	Tornado	EF1	0	3	\$325,000	A tornado touched down in Kirkwood, Lancaster County. The tornado had estimated peak winds of 105 mph (EF-1), with a max width of 130 yards and a path length of just over 3 miles. The tornado touched down on the 400 block of Maple Shade Rd, where it uprooted 2 large hardwood trees and 1 large softwood tree at a private residence.
July 1, 2022	Thunderstorm Wind	60 mph	0	0	\$18,000	A cluster of thunderstorms caused straight line wind damage, knocking wires and trees down.
July 2, 2022	Thunderstorm Wind	60 mph	0	0	\$44,000	Several thunderstorms knocked down trees and wires.
April 22, 2023	Thunderstorm Wind	60 mph	1	0	\$75,000	Showers and thunderstorms knocked down numerous trees and wires.
June 16, 2023	Thunderstorm Wind	60 mph	0	0	\$22,000	A severe thunderstorm producing winds estimated near 60 mph knocked down trees and branches onto wires along Lancaster Pike.

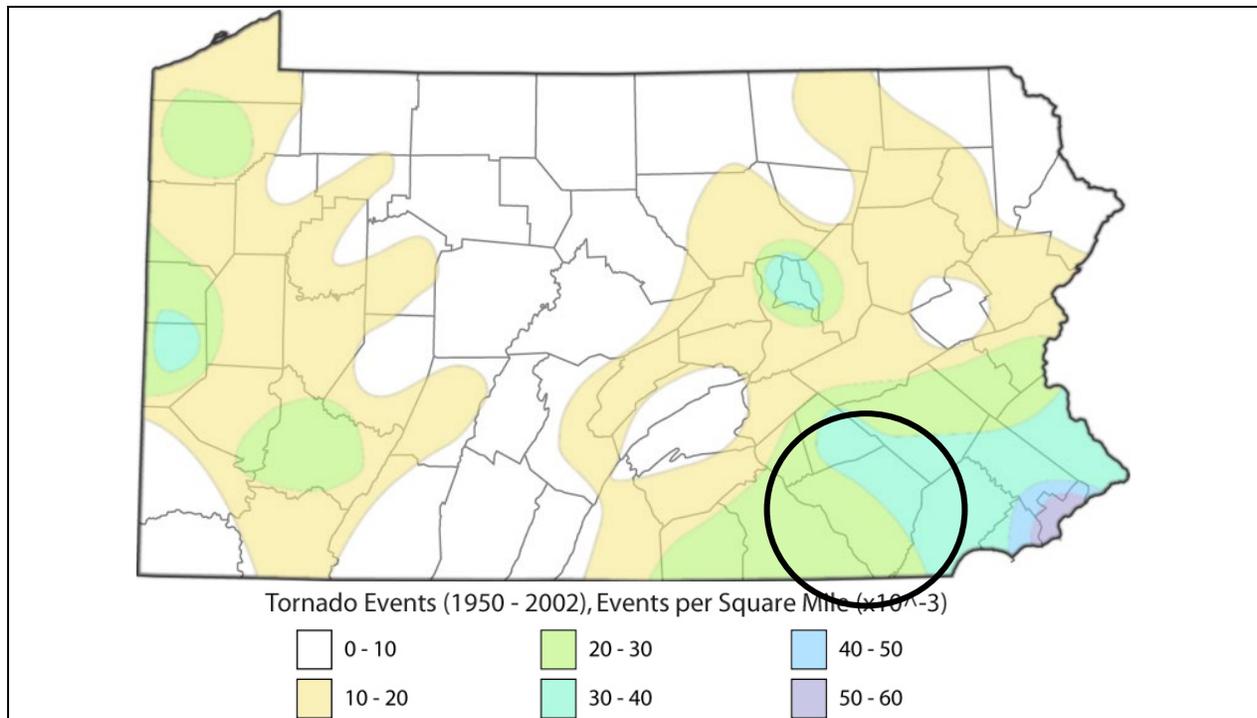


Date	Event	Magnitude	Fatalities	Injuries	Total Property Damage	Description
July 27-28, 2023	Thunderstorm Wind	60 mph	0	0	\$10,000	A severe thunderstorm producing winds estimated near 60 mph knocked down trees and wires.
August 7, 2023	Thunderstorm Wind/Tornado	EF0	0	0	\$83,000	A severe thunderstorm producing winds estimated near 70 mph knocked down numerous trees and wires that damaged nearby properties. An EF0 tornado appeared in a corn field south of Rawlinsville.
August 12, 2023	Thunderstorm Wind	60 mph	0	0	\$13,000	A severe thunderstorm producing winds estimated to be near 60 mph resulted in downed trees.
September 7-8, 2023	Thunderstorm Wind	60 mph	0	0	\$35,000	A severe thunderstorm producing winds estimated near 60 mph knocked wires and trees down.

Source: NOAA-NCEI 2023; FEMA 2023  
 mph Miles per hour

Using State Climatologist data for events between 1950 and 2002, Figure 4-26 shows the number of tornado events per square mile across Pennsylvania. Most of Lancaster County experienced a higher frequency of tornado events than the central and northern portions of the Commonwealth. Pennsylvania State Climatologist data for 1986 through 2017 shows that Lancaster County experienced a higher frequency of strong wind events per Census tract than the northwestern parts of the Commonwealth (see Figure 4-27).

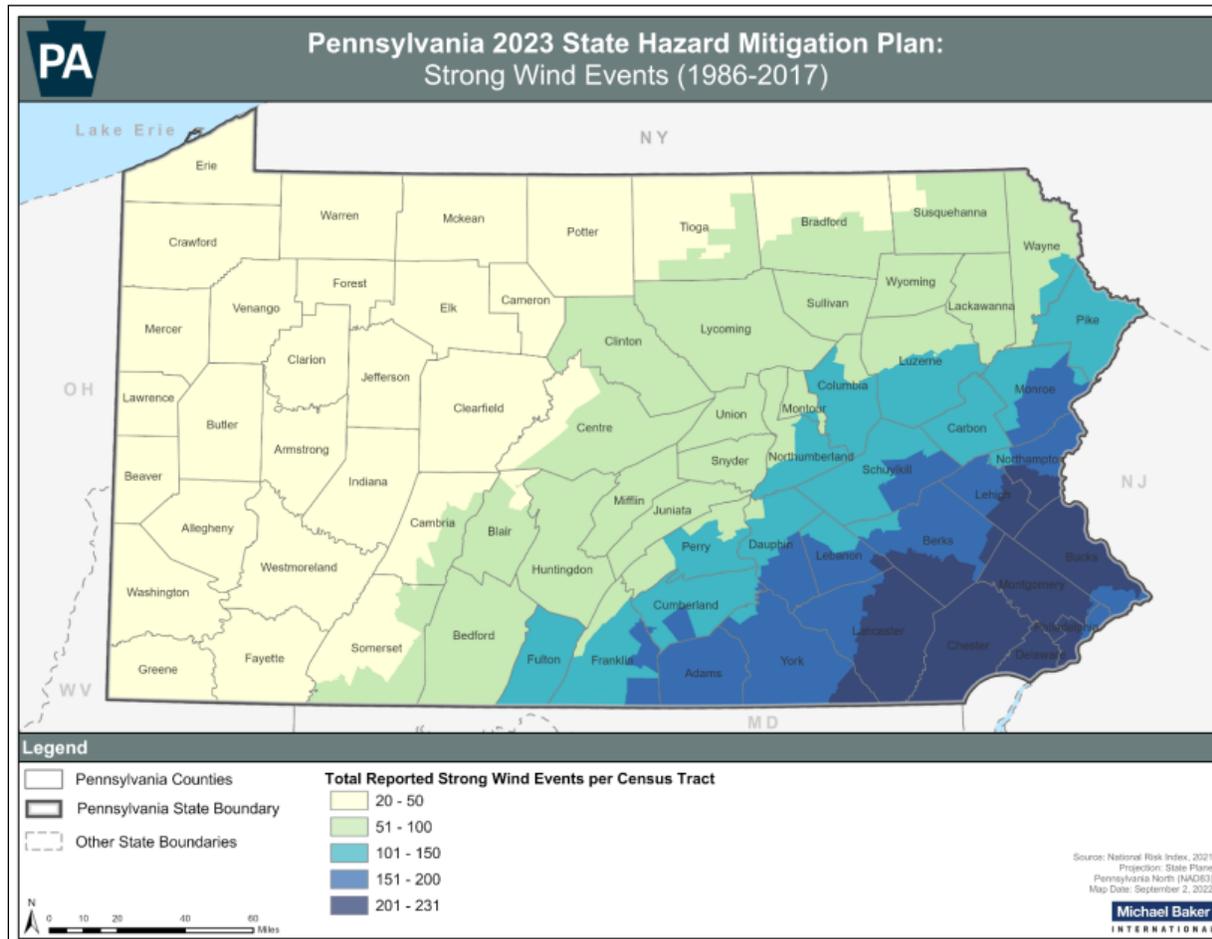
**Figure 4-26. Total Tornado Events Per Square Mile in Pennsylvania**



Source: Pennsylvania State Climatologist 2016  
 Note: The black circle indicates the location of Lancaster County.



Figure 4-27. Number of Strong Wind Events per Census Tract in Pennsylvania, 1986 – 2017



Source: PEMA 2023

### Future Occurrence

For the 2025 HMP update, the most up-to-date historical data was collected to calculate the probability of future occurrence of tornado and windstorm events for Lancaster County. Information and data from NOAA-NCEI Storm Events database was used to identify the number of tornado and wind events that occurred between 1950 and 2022. Table 4-82 presents the probability of future occurrence of tornado events in Lancaster County. The probability of occurrence for severe tornado and windstorm events in Lancaster County is considered *possible*.

Table 4-82. Probability of Future Tornado and Windstorm Events

Hazard Type	Number of Occurrences Between 1950 and 2023	Percent Chance of Occurrence in a Given Year
High Wind	23	31.51%
Strong Wind	4	5.48%
Thunderstorm Wind	292	100%
Funnel Cloud	5	6.85%
Tornado	32	43.84%
<b>TOTAL</b>	<b>356</b>	<b>100%</b>

Source: NOAA-NCEI 2023



Vulnerability Assessment

The vulnerability assessment for the tornado and wind hazard includes a qualitative assessment of exposure and tornado impacts as well as a quantitative Hazus analysis of the impacts of 500-year mean return period (MRP) straight-line wind event.

Life, Health, and Safety

General Population

Impacts of a tornado or windstorm on life, health, and safety depend on the severity of the event and whether adequate warning time is provided to residents. All residents in Lancaster County are exposed to the tornado hazard. Downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life. First responders' safety is at risk during on-scene operations, and they may have limited access to roads to respond to incidents.

Residents may be displaced by a strong wind event or require temporary to long-term sheltering. Hazus estimates 28 households will be displaced and 16 persons will seek short-term, temporary shelter as a result of the 500-year MRP event, as shown in Table 4-83.

Table 4-83. Impacted Persons From the 500-Year Mean Return Period Wind Event

Table with 3 columns: Jurisdiction, Displaced Households, and Persons Seeking Short-Term Sheltering. Rows list various townships and boroughs in Lancaster County with their respective counts.





Jurisdiction	Displaced Households	Persons Seeking Short-Term Sheltering
Lancaster Township	1	1
Leacock Township	3	1
Lititz Borough	0	0
Little Britain Township	1	1
Manheim Borough	0	0
Manheim Township	3	2
Manor Township	1	1
Marietta Borough	0	0
Martic Township	0	0
Millersville Borough	0	0
Mount Joy Borough	0	0
Mount Joy Township	0	0
Mountville Borough	0	0
New Holland Borough	1	1
Paradise Township	1	1
Penn Township	0	0
Pequea Township	1	0
Providence Township	1	1
Quarryville Borough	0	0
Rapho Township	1	0
Sadsbury Township	0	0
Salisbury Township	2	1
Strasburg Borough	0	0
Strasburg Township	1	0
Terre Hill Borough	0	0
Upper Leacock Township	1	1
Warwick Township	1	0
West Cocalico Township	0	0
West Donegal Township	0	0
West Earl Township	0	0
West Hempfield Township	0	0
West Lampeter Township	1	0
<b>Lancaster County</b>	<b>28</b>	<b>16</b>

Source: Hazus v6.1

### Socially Vulnerable Populations

Similar to other natural hazards, socially vulnerable populations are most susceptible based on factors including their physical and financial ability to react or respond during a hazard, and locations and construction quality of their housing.

Economically disadvantaged populations are more vulnerable because they may lack financial resources to evacuate or to repair property damage after a wind event. The population over the age of 65 may have more difficulty evacuating because they require extra time or outside assistance. They are also more likely to need medical attention that may not be available due to isolation during a wind storm event. Interruptions in heating or cooling utilities can affect populations such as the young and elderly, who are particularly vulnerable to temperature-related health impacts. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.



As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

**Table 4-84. Socially Vulnerable Lancaster County Populations**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

The entire county’s building stock is exposed to the tornado and high wind hazard. Manufactured housing (i.e., mobile homes) is particularly vulnerable to high winds and tornadoes. Because of their lightweight and often unanchored design, manufactured homes are extremely vulnerable to high winds and will generally sustain the most damage. While the chance of being hit by a tornado is small, the damage that results is devastating. An EF4 tornado can carry wind velocities of 200 mph, resulting in a force of more than 100 pounds per square foot of surface area. This is a “wind load” that exceeds the design limits of most buildings.

The County’s entire general building stock is exposed to the wind hazard. Impacts on the general building stock from the 500-year MRP wind event were assessed using the probabilistic hurricane model in Hazus. Potential damage is the modeled loss that could occur to the exposed inventory based on wind alone, including damage to structural and content value. Although the estimate is based on a hurricane event, the data can also be used to estimate potential damage from other windstorm events. Hazus estimates the 500-year MRP peak gust wind speeds for Lancaster County to be 74 to 95 mph, which equates to a Category 1 Storm, as shown in Figure 4-28.

Hazus evaluated wind damage across the categories defined in Table 4-85. Table 4-86 summarizes the results. Up to 41 buildings will be destroyed and another 352 will experience severe damage from the 500-year MRP event. Furthermore, up to 3,143 will be moderately damaged and 14,077 will have minor damage. Many of the estimated losses are in the commercial and residential occupancy classes. As shown in Table 4-87, it is estimated there will be over \$454 million in structure damage across the County for the 500-year MRP event.



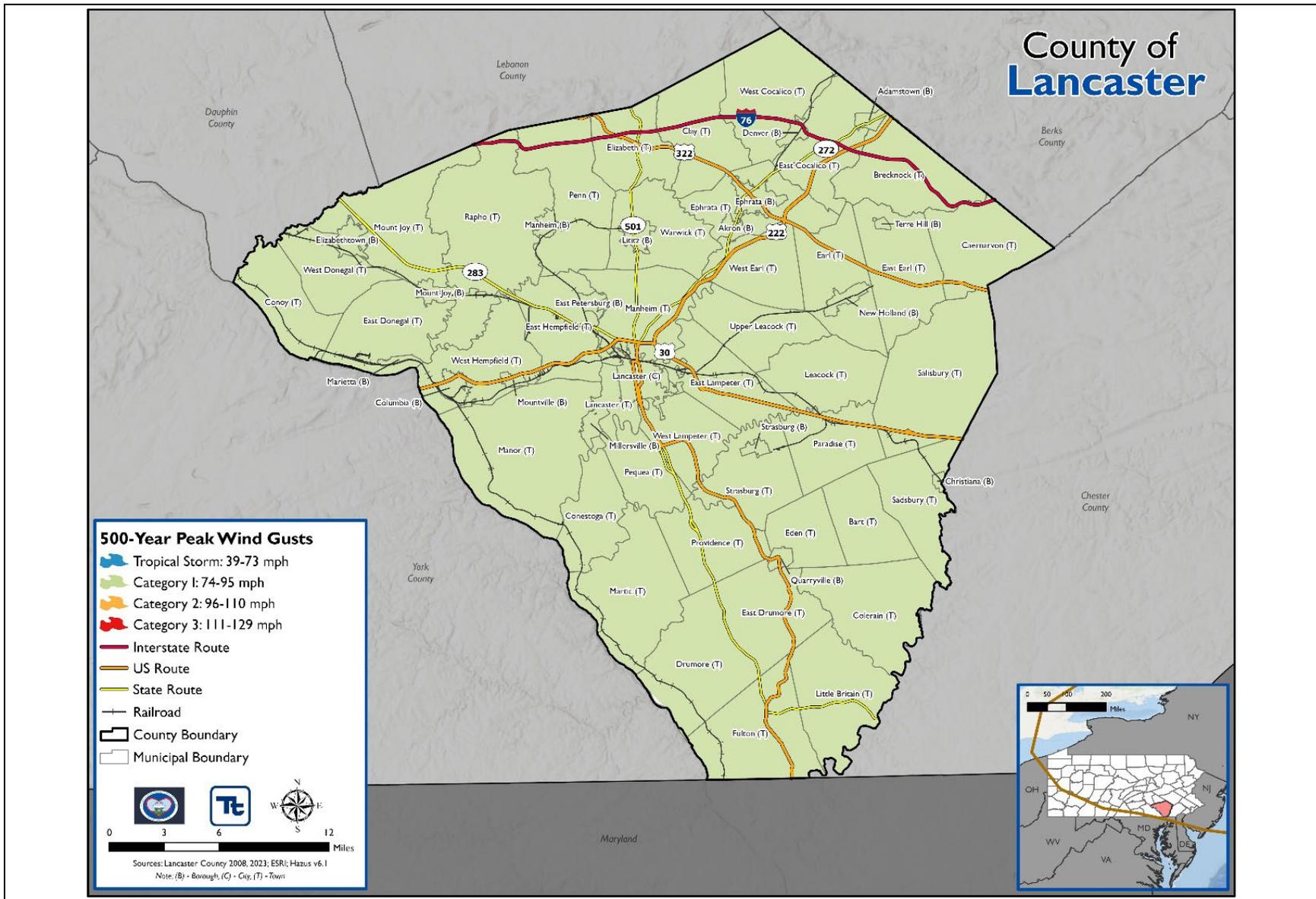
Table 4-85. Description of Damage Categories

Qualitative Damage Description	Roof Cover Failure	Window Door Failures	Roof Deck	Missile Impacts on Walls	Roof Structure Failure	Wall Structure Failure
<b>No Damage or Very Minor Damage</b> Little or no visible damage from the outside. No broken windows, or failed roof deck. Minimal loss of roof over, with no or very limited water penetration.	≤ 2%	No	No	No	No	No
<b>Minor Damage</b> Maximum of one broken window, door, or garage door. Moderate roof cover loss that can be covered to prevent additional water entering the building. Marks or dents on walls requiring painting or patching for repair.	> 2% and ≤ 15%	One window, door, or garage door failure	No	< 5 impacts	No	No
<b>Moderate Damage</b> Major roof cover damage, moderate window breakage. Minor roof sheathing failure. Some resulting damage to interior of building from water.	> 15% and ≤ 50%	> the larger of 20% & 3 and ≤ 50%	1 to 3 Panels	Typically 5 to 10 impacts	No	No
<b>Severe Damage</b> Major window damage or roof sheathing loss. Major roof cover loss. Extensive damage to interior from water.	> 50%	> one and ≤ the larger of 20% & 3	> 3 and ≤ 25%	Typically 10 to 20 impacts	No	No
<b>Destruction</b> Complete roof failure or failure of wall frame. Loss of more than 50 percent of roof sheathing.	Typically > 50%	> 50%	> 25%	Typically > 20 impacts	Yes	Yes

Source: FEMA 2013



Figure 4-28. 500-Year Peak Wind Gusts in Lancaster County





**Table 4-86. Expected Damage Levels from the 500-Year MRP Winds**

Occupancy Class	Total Number of Buildings in Occupancy Class	Severity of Expected Damage	Building Count	Percent Buildings in Occupancy Class
Residential Exposure (Single and Multi-Family Dwellings)	127,057	None/Very Minor	119,534	94.1%
		Minor	7,025	5.5%
		Moderate	446	0.4%
		Severe	11	<0.1%
		Destruction	41	<0.1%
Commercial Buildings	146,874	None/Very Minor	137,199	93.4%
		Minor	6,691	4.6%
		Moderate	2,649	1.8%
		Severe	335	0.2%
		Destruction	0	0.0%
Industrial Buildings	1,464	None/Very Minor	1,394	95.2%
		Minor	62	4.2%
		Moderate	8	0.5%
		Severe	0	0.0%
		Destruction	0	0.0%
Government, Religion, Agricultural, and Education Buildings	10,368	None/Very Minor	10,023	96.7%
		Minor	299	2.9%
		Moderate	40	0.4%
		Severe	6	0.1%
		Destruction	0	0.0%

Source: Hazus v6.1, Lancaster County 2023, 2024

**Table 4-87. Estimated Building Structure Damage for the 500-Year MRP Winds, by Occupancy Class**

Jurisdiction	Estimated Building Losses (Replacement Cost Value)				
	Total	Residential	Commercial	Industrial	All Other
Adamstown Borough	\$639,275	\$480,850	\$142,432	\$128	\$15,866
Akron Borough	\$1,958,515	\$1,807,324	\$126,292	\$0	\$24,899
Bart Township	\$5,043,746	\$2,099,100	\$2,262,046	\$3,973	\$678,628
Brecknock Township	\$4,212,655	\$2,527,497	\$1,359,920	\$1,512	\$323,727
Caernarvon Township	\$3,048,140	\$1,561,777	\$1,123,592	\$9,792	\$352,980
Christiana Borough	\$913,448	\$429,928	\$362,749	\$3,726	\$117,046
Clay Township	\$4,514,479	\$2,943,781	\$1,203,325	\$272	\$367,101
Colerain Township	\$6,265,548	\$2,921,966	\$2,337,336	\$35,159	\$971,088
Columbia Borough	\$3,952,250	\$2,491,340	\$1,243,849	\$56,996	\$160,065
Conestoga Township	\$2,563,827	\$2,036,186	\$415,238	\$266	\$112,137
Conoy Township	\$1,501,421	\$1,071,153	\$329,406	\$6,720	\$94,141
Denver Borough	\$1,834,756	\$1,126,600	\$522,515	\$80,112	\$105,530
Drumore Township	\$4,018,051	\$1,671,174	\$1,658,753	\$49,355	\$638,768
Earl Township	\$13,992,817	\$5,728,108	\$5,849,607	\$688,377	\$1,726,725
East Cocalico Township	\$5,073,653	\$3,261,372	\$1,642,991	\$7,720	\$161,569
East Donegal Township	\$6,476,705	\$3,232,970	\$2,377,902	\$114,162	\$751,671
East Drumore Township	\$6,657,992	\$3,128,052	\$2,177,092	\$15,668	\$1,337,180
East Earl Township	\$8,630,791	\$3,567,393	\$3,830,190	\$374,628	\$858,579



Section 4.3.16. Risk Assessment: Tornado, Windstorm

Jurisdiction	Estimated Building Losses (Replacement Cost Value)				
	Total	Residential	Commercial	Industrial	All Other
East Hempfield Township	\$29,750,104	\$13,014,918	\$15,057,517	\$370,928	\$1,306,740
East Lampeter Township	\$21,532,319	\$10,770,142	\$9,415,972	\$324,198	\$1,022,008
East Petersburg Borough	\$3,660,406	\$1,738,896	\$1,793,946	\$29,273	\$98,290
Eden Township	\$2,201,582	\$1,205,866	\$741,166	\$11,442	\$243,108
Elizabeth Township	\$1,714,388	\$1,127,137	\$432,919	\$911	\$153,420
Elizabethtown Borough	\$3,537,935	\$2,505,505	\$677,076	\$202,909	\$152,445
Ephrata Borough	\$9,080,058	\$3,883,421	\$4,744,466	\$68,284	\$383,887
Ephrata Township	\$6,707,924	\$4,080,447	\$1,920,233	\$125,996	\$581,248
Fulton Township	\$5,026,704	\$2,090,690	\$2,075,151	\$61,745	\$799,118
Lancaster City	\$28,872,378	\$10,589,948	\$15,412,701	\$516,021	\$2,353,708
Lancaster Township	\$16,561,112	\$6,354,241	\$10,021,982	\$26,096	\$158,793
Leacock Township	\$12,676,979	\$5,092,130	\$5,727,619	\$232,468	\$1,624,762
Lititz Borough	\$5,996,248	\$2,827,536	\$2,401,601	\$432,858	\$334,254
Little Britain Township	\$7,128,866	\$3,044,120	\$3,149,844	\$28,163	\$906,739
Manheim Borough	\$2,632,766	\$1,510,747	\$918,537	\$111,979	\$91,503
Manheim Township	\$32,224,083	\$20,658,123	\$10,073,029	\$682,335	\$810,596
Manor Township	\$21,842,900	\$9,315,309	\$10,265,905	\$1,083,706	\$1,177,980
Marietta Borough	\$971,075	\$797,131	\$146,496	\$5,601	\$21,847
Martic Township	\$2,882,042	\$1,907,112	\$732,260	\$22,185	\$220,486
Millersville Borough	\$4,590,629	\$3,519,649	\$689,441	\$431	\$381,108
Mount Joy Borough	\$3,418,728	\$2,096,841	\$1,076,220	\$106,704	\$138,964
Mount Joy Township	\$5,339,433	\$3,237,736	\$1,263,644	\$129,196	\$708,857
Mountville Borough	\$1,446,239	\$963,212	\$370,631	\$51,518	\$60,878
New Holland Borough	\$5,074,858	\$2,262,680	\$2,296,598	\$176,772	\$338,807
Paradise Township	\$6,533,951	\$2,694,092	\$3,006,805	\$144,511	\$688,542
Penn Township	\$6,963,153	\$4,099,251	\$2,279,855	\$24,656	\$559,390
Pequea Township	\$4,596,408	\$3,343,165	\$906,655	\$42,121	\$304,467
Providence Township	\$4,653,414	\$2,411,159	\$1,832,801	\$119,192	\$290,262
Quarryville Borough	\$1,777,455	\$973,530	\$598,440	\$9,258	\$196,226
Rapho Township	\$8,863,452	\$5,360,421	\$2,476,548	\$32,474	\$994,009
Sadsbury Township	\$4,324,800	\$2,035,532	\$1,717,467	\$17,639	\$554,163
Salisbury Township	\$13,618,356	\$5,483,146	\$6,637,627	\$74,429	\$1,423,154
Strasburg Borough	\$3,449,628	\$1,772,793	\$1,324,597	\$25,554	\$326,684
Strasburg Township	\$7,592,800	\$3,902,005	\$2,915,503	\$56,246	\$719,047
Terre Hill Borough	\$1,461,249	\$544,212	\$625,254	\$96,950	\$194,833
Upper Leacock Township	\$15,704,264	\$4,492,711	\$9,575,449	\$834,440	\$801,664
Warwick Township	\$14,567,958	\$8,581,031	\$5,486,868	\$33,184	\$466,875
West Cocalico Township	\$2,812,292	\$1,805,574	\$782,229	\$783	\$223,707
West Donegal Township	\$4,826,564	\$3,097,038	\$1,577,427	\$30,315	\$121,784
West Earl Township	\$7,483,980	\$3,818,317	\$2,685,206	\$89,697	\$890,759
West Hempfield Township	\$10,982,635	\$6,952,423	\$3,646,487	\$164,538	\$219,187
West Lampeter Township	\$18,391,701	\$14,812,422	\$2,742,846	\$28,692	\$807,741
<b>Lancaster County</b>	<b>\$454,771,884</b>	<b>\$232,858,929</b>	<b>\$181,188,253</b>	<b>\$8,074,963</b>	<b>\$32,649,738</b>

Sources: Hazus v6.1, Lancaster County 2023, 2024; RS Means 2024





Community Lifelines and Other Critical Facilities

Utility infrastructure could suffer damage from high winds associated with falling tree limbs or other debris, resulting in the loss of power. Loss of service can impact residents and business operations alike. Loss of power can impact other public utilities, including potable water, wastewater treatment, and communications. In addition to public water services, property owners with private wells might not have access to potable water until power is restored, due to pump failure. Lack of power to emergency facilities, including police, fire, EMS, and hospitals, will inhibit a community’s ability to effectively respond to an event and maintain the safety of its citizens.

Table 4-88 summarizes the damage state probabilities determined by Hazus for community lifelines during the 500-year MRP event. There are no days recorded for loss of function of any lifeline. Hazus estimates that the hazardous materials lifeline has the greatest chance of sustaining minor damage (4.6 percent), followed by the safety and security lifeline (4.2 percent probability). Hazardous materials lifelines also have the greatest chance of moderate damage, at a 2.3 percent probability, and severe damage, at 0.5 percent. The probability of complete damage to lifelines is negligible, ranging from 0.0 to 0.1 percent.

Table 4-88. Impacts on Community Lifelines and Other Critical Facilities for the 500-Year MRP Winds

Lifelines	Loss of Days	Average Percent Probability of Sustaining Damage from 500-Year MRP Winds			
		Minor	Moderate	Severe	Complete
Communications	0	2.5%	0.7%	0.1%	0.0%
Energy	0	4.0%	0.4%	<0.1%	0.0%
Food, Hydration, Shelter	0	1.2%	0.2%	<0.1%	0.0%
Hazardous Materials	0	4.6%	2.3%	0.5%	<0.1%
Health and Medical	0	2.3%	0.4%	<0.1%	0.0%
Safety and Security	0	4.2%	1.3%	<0.1%	0.0%
Transportation	0	1.6%	0.2%	<0.1%	0.0%
Water Systems	0	3.8%	0.4%	<0.1%	0.0%

Source: Hazus v6.1, Lancaster County 2008, 2019, 2023; HIFLD 2022, 2023; National Park Service; National Register of Historic Places

Economy

Tornadoes and strong winds impact the economy, including loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, and wage loss and rental loss due to repair/replacement of buildings. When a business is closed during storm recovery, there is lost economic activity in the form of day-to-day business and wages to employees. Impacts on transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical systems) could sustain damage and impacts could result in loss of power, which could also affect business operations and provision of heating or cooling to the population.

Debris management can be costly and impact the local economy. Hazus estimates the amount of debris that might be produced as result of the 500-year MRP wind event. Table 4-89 summarizes the estimated debris by municipality. Because the estimated debris production does not include debris generated by flooding, this is likely a conservative estimate and could be higher if multiple impacts occur. Debris production from trees is the greatest, with the 500-year MRP event creating 253,415 tons of tree debris.

Table 4-89. Debris Production for and 500-Year Mean Return Period Event Winds

Jurisdiction	Estimated Debris Created During the 500-Year MRP Wind Event (tons)			
	Brick and Wood	Concrete and Steel	Tree	Eligible Tree Volume
Adamstown Borough	76.7	0.0	342.6	1,130.3
Akron Borough	163.3	0.0	354.5	3,328.9





Jurisdiction	Estimated Debris Created During the 500-Year MRP Wind Event (tons)			
	Brick and Wood	Concrete and Steel	Tree	Eligible Tree Volume
Bart Township	677.4	4.0	7,367.0	11,051.3
Brecknock Township	563.0	0.0	3,975.0	8,346.5
Caernarvon Township	439.0	0.0	4,426.0	6,195.8
Christiana Borough	130.8	0.0	1,461.3	2,338.2
Clay Township	572.9	0.0	4,138.4	9,327.9
Colerain Township	877.4	5.0	10,219.0	13,286.5
Columbia Borough	507.0	0.0	620.0	4,861.1
Conestoga Township	228.0	0.0	5,830.0	11,076.8
Conoy Township	144.1	0.0	3,538.3	5,309.1
Denver Borough	227.1	0.0	332.6	2,857.2
Drumore Township	513.5	3.1	9,092.3	11,819.9
Earl Township	1,863.2	0.0	4,948.4	10,887.6
East Cocalico Township	667.1	0.0	3,151.8	10,607.5
East Donegal Township	902.8	0.0	4,874.0	9,144.2
East Drumore Township	878.4	5.0	8,901.1	12,461.0
East Earl Township	1,237.4	0.0	5,982.2	12,794.3
East Hempfield Township	3,691.7	0.0	4,562.2	28,024.3
East Lampeter Township	3,173.4	0.0	5,404.0	21,821.5
East Petersburg Borough	532.1	0.0	1,215.5	3,403.5
Eden Township	314.6	0.0	2,207.8	3,973.8
Elizabeth Township	225.5	0.0	2,720.4	4,353.1
Elizabethtown Borough	379.6	0.0	604.0	5,059.3
Ephrata Borough	1,311.6	0.0	829.5	7,070.0
Ephrata Township	891.3	0.0	4,511.0	14,542.9
Fulton Township	642.5	3.9	11,374.7	14,787.1
Lancaster City	4,392.8	0.0	1,975.6	15,325.0
Lancaster Township	1,982.8	0.0	1,850.2	13,717.6
Leacock Township	1,687.5	7.0	1,321.3	2,118.2
Lititz Borough	847.9	0.0	669.7	5,822.0
Little Britain Township	933.0	6.0	10,566.0	13,735.5
Manheim Borough	348.0	0.0	358.0	3,078.7
Manheim Township	4,178.4	0.0	7,179.3	46,264.3
Manor Township	2,847.4	0.0	13,898.6	28,059.9
Marietta Borough	104.6	0.0	196.2	1,645.0
Martic Township	381.6	0.0	7,291.8	11,667.5
Millersville Borough	537.5	0.0	668.6	5,678.4
Mount Joy Borough	423.6	0.0	550.8	4,804.7
Mount Joy Township	704.4	0.0	3,268.0	7,928.3
Mountville Borough	207.0	0.0	368.4	2,468.0
New Holland Borough	760.5	0.0	185.9	1,415.9
Paradise Township	926.5	0.0	6,581.7	12,505.0
Penn Township	935.6	0.0	3,768.6	7,999.1
Pequea Township	532.5	0.0	4,356.8	10,459.0
Providence Township	663.9	<0.1	3,851.2	8,847.0
Quarryville Borough	254.0	0.0	1,782.3	3,208.3



Jurisdiction	Estimated Debris Created During the 500-Year MRP Wind Event (tons)			
	Brick and Wood	Concrete and Steel	Tree	Eligible Tree Volume
Rapho Township	1,130.0	0.0	12,220.0	20,805.6
Sadsbury Township	619.3	0.0	6,918.7	11,070.5
Salisbury Township	1,982.6	0.0	15,121.5	26,760.3
Strasburg Borough	446.7	3.7	2,318.0	5,099.5
Strasburg Township	983.3	8.3	5,102.0	11,224.3
Terre Hill Borough	204.4	0.0	1,072.0	2,251.1
Upper Leacock Township	2,355.0	0.0	2,218.0	5,146.8
Warwick Township	1,788.9	0.0	5,582.9	22,793.9
West Cocalico Township	369.0	0.0	2,648.0	5,166.8
West Donegal Township	551.9	0.0	3,088.7	8,756.5
West Earl Township	999.4	0.0	2,638.2	8,856.6
West Hempfield Township	1,297.2	0.0	5,620.0	20,941.6
West Lampeter Township	2,255.1	0.0	5,194.2	20,002.9
<b>Lancaster County</b>	<b>60,464.0</b>	<b>46.0</b>	<b>253,415.0</b>	<b>625,482.8</b>

Source: Hazus v6.1

### Environment

Tornado events are typically localized; therefore, environmental impacts are rarely widespread. Impacts of windstorms on the environment usually occur over a larger area. Severe damage to plant species is likely from both tornado and windstorm events. This includes uprooting or total destruction of trees, and increased threat of wildfire in areas of tree debris. See Table 4-89 for the total tonnage of estimated tree debris from the 500-year MRP wind event.

To avoid contamination of the environment, hazardous material facilities should meet design requirements for the wind zones identified in Figure 4-25.

### Future Changes That May Impact Vulnerability

As discussed in Section 4.4.4, areas targeted for future growth, development and re-development have been identified across Lancaster County. Any areas of growth could be affected by the tornado and windstorm hazard because the entire county is exposed and potentially vulnerable to the wind hazard. Residential development, specifically manufactured homes, may be more vulnerable to the tornado hazard.

### Projected Changes in Population

Any changes in the density of population can impact the number of persons vulnerable to the tornado and windstorm hazard. Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### Climate Change

An increase in storms will produce more wind events and may increase tornado activity. An increase in temperature will provide more energy to produce storms that generate tornadoes (Center for Climate and Energy Solutions n.d.). With an increased likelihood of strong winds and tornado events, all of the county’s assets are at risk for losses as a result of extreme wind events.



### Change of Vulnerability Since 2019 Hazard Mitigation Plan

Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county.

In time, Hazus versions will be released with modules that address tornado events. As updated versions are released, the county will be able to run analyses for an overall picture of the wind damage and debris generated from tornado events. Over time, Lancaster County can obtain additional data to support the analysis of this hazard. This additional data would include details on past events and impacts, and an updated building inventory that would provide specific building information, such as type of construction and details on protective features (for example, shutters and safe rooms).



## 4.3.17 Transportation Accident

### Hazard Description

Transportation incidents are defined as incidents involving highway, air, and rail travel. These incidents are collectively the costliest of all hazards in the Commonwealth in terms of lives lost, injuries, and economic losses. Pennsylvania has the fifth largest state highway system in the United States – larger than New York, New Jersey, and New England combined. Significant passenger vehicle, air, and rail transportation incidents can result in a wide range of outcomes from damage solely to property to serious injury or death (PEMA 2023).

### Vehicular Accidents

A vehicular accident is a road traffic incident that involves one vehicle colliding with another vehicle or other road user, such as an animal or a stationary roadside object. A vehicular accident may result in injury, property damage, or fatalities. Such accidents can occur at any point along the county's roadways, with many occurring at an intersection of two or more roadways. There is no warning time for vehicular accidents. Most vehicular accidents are attributed to the driver. Factors contributing to these accidents are typically associated with the driver, vehicle, and environment:

- Factors associated with the driver include error, speeding, experience, and blood-alcohol level.
- Factors associated with the vehicle include type, condition, and center of gravity.
- Environmental factors include quality of the infrastructure, weather, and obstacles.

Vehicular accidents can severely affect those directly involved, as well as others not directly involved. Other effects of vehicular accidents may include severe traffic delays, lost sales to businesses, delayed commodity shipments, and increased insurance costs (U.S. Federal Highway Administration 2011).

### Aviation Accidents

An aviation accident occurs during operation of an aircraft between the time a person boards the aircraft with intent to fly to a destination and the time the person has disembarked from the aircraft. Aviation accidents may result in serious injuries or fatalities. An aviation **incident** is an occurrence other than an accident associated with operation of an aircraft that affects or could affect the safety of operation (ICAO 1994). Three situations qualify as an aviation accident:

- A person is fatally or seriously injured
- The aircraft sustains damage or structural failure
- The aircraft is missing or inaccessible.

The Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) are the agencies responsible for monitoring air travel and investigating accidents. Aviation accidents often occur as a result of violations of FAA and NTSB regulations. Approximately 80 percent of all aviation accidents occur shortly before or during take-off and landing. Human error is a factor in most of the accidents. The NTSB has records of 11,739 accidents with findings between 2012 and 2021. The findings identify multiple factors for each accident, with totals as follows (NTSB 2022):

- Personnel error was a factor in 9,506 accidents
- An aircraft issue was a factor in 9,439 accidents
- Environmental issues were factors in 5,216 accidents
- Organizational issues were factors in 155 accidents
- Other undetermined causes were factors in 1,182 accidents

The following findings have been reported about contributing causes to aviation accidents (Wilson Kehoe Wingham 2022):



- Pilot or flight crew errors—Pilot error is the number one cause of aviation accidents and accounts for the highest number of fatalities.
- Faulty equipment—Faulty aircraft equipment is a common cause of aviation accidents.
- Aircraft design flaws—The manufacturer of an aircraft is responsible for an aviation accident if the structural design is flawed and results in an accident.
- Failure to properly fuel or maintain the aircraft—If any regulations and safety standards set by the FAA or NTSB are violated, an accident may occur.
- Negligence of federal air traffic controllers—Failure of air traffic controllers to properly monitor the airways is a potential cause of aviation accidents.

### Railway Accidents

Railway accidents involve one or more trains and generally fit into one of three categories (PEMA 2023):

- Derailment—the train leaves the rails
- Collision—a train strikes another train or a vehicle
- Other—including objects on the rails, fires, or explosions

### Location and Extent

#### Vehicular Accidents

Lancaster County is home to several major east-west roadways, including the Pennsylvania Turnpike (I-76), US-30, US-322, and PA-283. US-222 is the major north-south highway, running through the middle of the County from the Maryland line, through Lancaster City, and north toward Reading. Additional major roadways in Lancaster County include PA-72, PA-272, PA-372, and PA-501. Lancaster County has nearly 3,900 miles of roadways, as listed in Table 4-90, and illustrated on Figure 4-29. The county as a whole is at risk from vehicular accidents of all degrees.

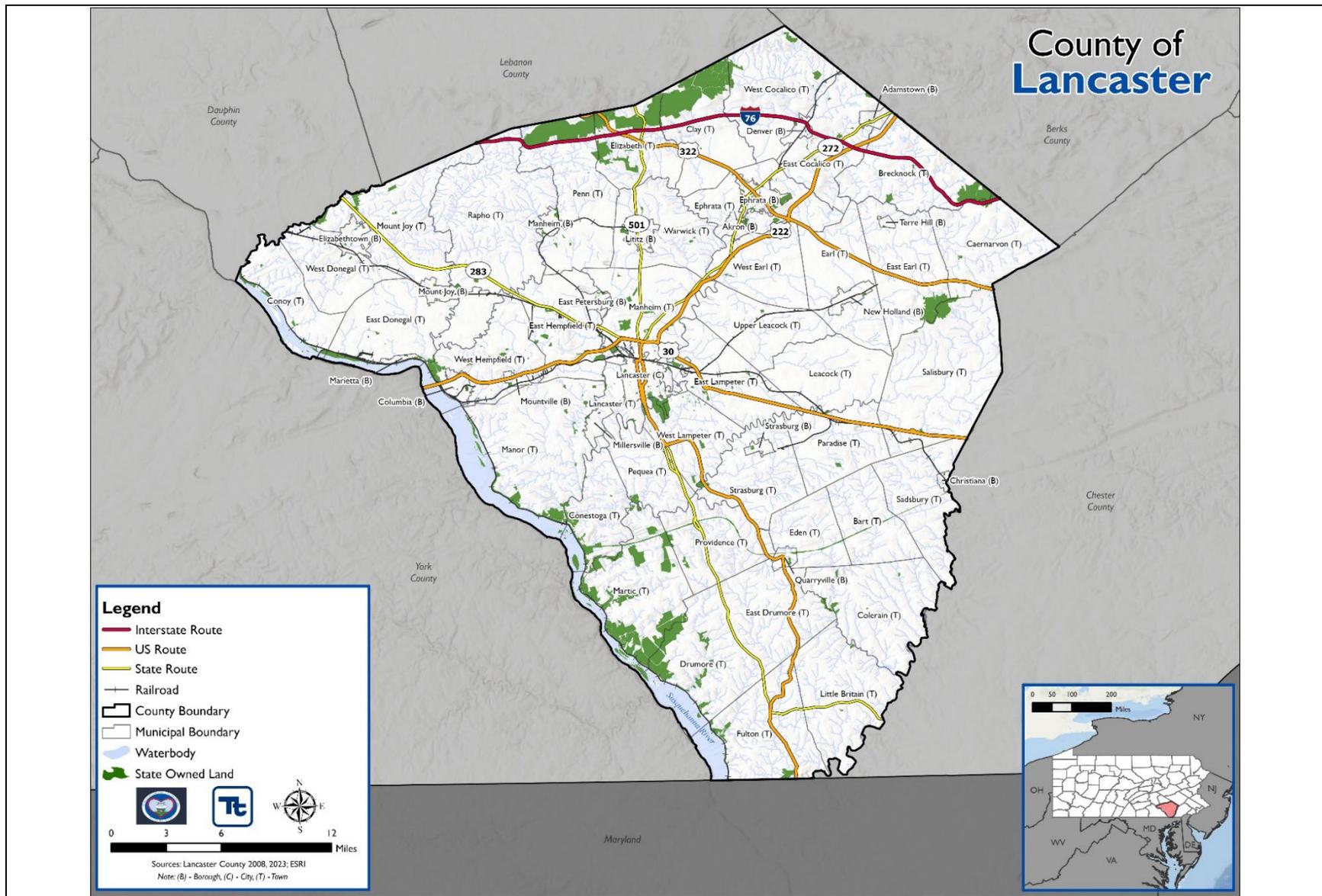
Table 4-90. Lancaster County Transportation Network

Category	Miles
Interstate Highway	30.6
Freeways/Expressways	20.0
Principal Arterials	99.7
Minor Arterials	291.2
Major Collectors	456.7
Minor Collectors	234.3
Local Road: State-Owned	143.7
Local Road: Municipal-Owned	2,586.6
<b>Total</b>	<b>3,896.8</b>

Source: Lancaster County 2020



Figure 4-29. Transportation Routes in Lancaster County





Structurally deficient bridges pose a risk for transportation accidents. In response to the collapse of the I-35W Bridge in Minneapolis in August 2007, PennDOT assessed the structural integrity of all bridges in the Commonwealth. Table 4-91 lists the total number of bridges in Lancaster County, as well as the number of those that are rated as being in poor condition.

**Table 4-91. PennDOT Bridge Condition Findings for Lancaster County**

	Total Bridges in County	Bridges in Poor Condition
Bridges on State Roads	724	77
Bridges on Local Roads	304	56
<b>Total</b>	<b>1,028</b>	<b>133</b>

Source: PennDOT 2023; PennDOT 2023

### Aviation Accidents

Lancaster County has one airport with a Federal Aviation Administration (FAA) tower: Lancaster Airport. Three privately owned airports are also available to the public:

- Donegal Springs Air Park (Mount Joy/Marietta)
- McGinnis Airport (Columbia)
- Smoketown Airport (Smoketown)

In addition, aircraft traveling the major air route between Harrisburg and Philadelphia travel over Lancaster County.

### Railway Accidents

There are 264.6 miles of rail lines in Lancaster County, of which 259.2 miles are considered active. Four railroads operate track within the County:

- Amtrak (National Railroad Passenger Corporation)
- Norfolk Southern
- Strasburg Railroad
- Delaware & Hudson/Canadian (Pacific Railroad)

The main freight rail line through Lancaster County is operated by Norfolk Southern Corporation, which acquired it in 1999 from the Consolidated Railroad Corporation (Conrail). Passenger rail service is provided by Amtrak and Pennsylvanian & Three Rivers. Several passenger trains serve the County daily, via the Lancaster Railroad Station, located in Lancaster City. Amtrak is the only rail service that crosses the entire commonwealth. The Strasburg Railroad, “America’s Oldest Short-Line Railroad,” is one of Lancaster County’s leading tourist attractions. Other short lines operating in Lancaster County include the following:

- Lancaster Northern Line (East Penn Railroad)
- Dillerville Rail Yard (Tybur Railroad)
- Columbia and Reading Railway (CORY)

### Range of Magnitude

#### Vehicular Accidents

Roadway accidents in Lancaster County range from minor crashes to serious incidents that involve injuries or fatalities or result in a release of hazardous materials. The majority of motor vehicle crashes are non-fatal in Pennsylvania, but PennDOT estimates that 10 people are injured in a car crash every hour, and someone dies in a car crash every 7 hours. Most fatal crashes occur in July, August, and September (PEMA 2023). PennDOT



statistics for fatalities associated with automobile crashes are shown in Table 4-92. Table 4-93 summarizes fatalities of pedestrians involved in transportation incidents.

Table 4-92. Fatalities from Automobile Crashes

Year	Pennsylvania	Lancaster County
2017	1,137	43
2018	1,190	45
2019	1,059	44
2020	1,129	47
2021	1,230	73
2022	1,179	57
<b>Total</b>	<b>5,787</b>	<b>266</b>

Source: PennDOT 2022

Table 4-93. Fatalities of Pedestrians

Year	Pennsylvania	Lancaster County
2017	150	5
2018	201	8
2019	154	7
2020	146	6
2021	182	7
2022	184	5
<b>Total</b>	<b>867</b>	<b>33</b>

Source: PennDOT 2022

### Aviation Accidents

Most air incidents are nonfatal and cause minor injuries or property damage. Aircraft accidents can vary from a single-engine aircraft having a “hard landing” causing damage to the aircraft, to a crash of a small turboprop or jet aircraft, to a crash of a large commercial jet. Aviation accidents could include helicopter or experimental aircraft crashes. They also can involve radio-controlled or drone aircraft devices, many of which are experimental and not subject to defined regulatory oversight, potentially complicating issues that could arise if one of these devices crash.

### Railway Accidents

Rail accidents can vary widely in terms of injuries, fatalities, property damage, and interruption of service, depending on the nature and severity of the accident.

### Scenario

A worst-case transportation accident scenario within the County would be the overturn of a tractor-trailer carrying an extremely hazardous substance resulting in a massive release of its cargo on a major roadway. This incident would block traffic on Lancaster County’s major transportation routes and could threaten the health and safety of individuals on the roadways and in surrounding neighborhoods. In addition, a release could necessitate closure of County critical facilities near the accident.

The most likely transportation accident in the County would involve a single vehicle hitting an object and sustaining minimal damage.



Past Occurrence

Table 4-94 summarizes major accidents (such as multi-vehicle accidents, those that close roads or bridges, or those involving school buses) reported by Lancaster County to PennDOT from 2012 to 2023. These reports omit many minor accidents.

Table 4-94. Summary of Major Accidents in Lancaster County, 2012 to 2023

Year	Vehicle Accidents (fatalities)	Railroad Accidents (fatalities)	Aircraft Accidents (fatalities)
2012	5,249 (47)	3 (0)	2 (0)
2013	5,251 (45)	8 (0)	2 (0)
2014	5,339 (62)	4 (0)	0 (0)
2015	5,605 (48)	3 (1)	2 (0)
2016	5,931 (44)	4 (0)	2 (0)
2017	5,822 (43)	4 (0)	1 (0)
2018	6,038 (45)	6 (0)	0 (0)
2019	5,955 (44)	8 (0)	1 (0)
2020	4,794 (47)	1 (0)	1 (0)
2021	5,625 (73)	7 (1)	2 (0)
2022	5,571 (57)	4 (0)	0 (0)
2023	5,574 (49)	5 (0)	0 (0)
<b>Total</b>	<b>66,754 (604)</b>	<b>57 (2)</b>	<b>13 (0)</b>

Source: PennDOT 2023; NTSB 2024; U.S. Federal Railroad Administration 2024

One of the worst transportation accidents in the County occurred in Marietta on August 1, 2002, when a plane crashed into a cornfield minutes after taking off from Donegal Springs Air Park, killing all four people on board.

Recent transportation accident counts nationwide and in Pennsylvania are as follows:

- In 2022, the National Highway Traffic Safety Administration (NHTSA) reported 42,795 people died in motor vehicle traffic crashes. Of those fatalities, 1,191 occurred in Pennsylvania (NHTSA 2023).
- The NTSB reported 1,270 aviation incidents in 2022—35 of them in Pennsylvania (NTSB 2024).
- The National Safety Council reported 954 railroad deaths and 6,252 nonfatal railroad injuries nationwide in 2022 (NSC 2023).

Future Occurrence

For this HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of transportation accident events for Lancaster County. Information from PennDOT, NTSB, and FRA were used to identify the number of transportation accident events that occurred between 2012 and 2023. Table 4-95 shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year.

Table 4-95. Probability of Future Transportation Accident Events

Hazard Type	Number of Occurrences Between 2012 and 2023	Percent Chance of Occurrence in any Given Year
Vehicular	66,754	100%
Railway	57	100%
Aviation	13	61.9%



Source: PennDOT 2023; NTSB 2024; U.S. Federal Railroad Administration 2024

The future probability of transportation accidents is considered to be *likely*. However, the low number of rail and air traffic accidents in the County indicates that the bulk of future transportation accidents will be roadway accidents.

Considering the current transportation network within the County and the steady increase in traffic volume, it is assumed that the number of vehicle accidents will increase. Incidents involving air or rail should remain low. The County's population has increased over the last decade, meaning it is likely that traffic volumes have also risen. New residents have limited knowledge of detour routes and alternate routes around accidents, which contributes to accident-related congestion. The trucking industry is expected to continue, maintaining and possibly increasing the number of tractor-trailers on the County's road system. Transportation accidents may increase slightly over the next five years without proper mitigation strategies in place.

### Vulnerability Assessment

A qualitative assessment was performed to evaluate local assets' vulnerability to and potential impacts from the transportation accident hazard.

#### Life, Health, and Safety

Vehicular accidents may result in injury or death to drivers and passengers on the road, the public in the immediate vicinity, and emergency services personnel. The number of people exposed to a hazard depends on population density, whether exposure occurs during day or night, and percentage of the population in the accident area located indoors and outdoors.

The county and its municipalities are prepared to manage and respond to transportation hazards. However, the risk to first responders increases when they respond to transportation accidents in high-traffic areas. For information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

#### General Building Stock, Community Lifelines and Other Critical Facilities, and Economy

Loss of roadway use and public transportation services would affect thousands of commuters, employment, day-to-day operations within the county, and delivery of critical municipal and emergency services. Disruption of one or more of these modes of transportation can lead to congestion of another and affect both the county and the region.

The 2022 USDA Agricultural Census showed that Lancaster County had 19 percent of Pennsylvania's agricultural sales—\$1.8 million including livestock, poultry, and products. Roughly \$270,000 was spent in Lancaster County on repairs, supplies, and maintenance costs for farm production expenses, a 27 percent increase from 2017. A transportation accident that involves farming equipment or vehicles transporting farming equipment and/or agricultural goods could increase the cost for supplies to repair and maintain equipment (USDA 2022).

#### Environment

In the case of a simple motor vehicle crash, train derailment, or aviation accident, the environmental impact is minimal. However, if the accident involves any type of vehicle moving chemicals or other hazardous materials, the impact will be considerably larger due to an explosion or the release of potentially hazardous material (PEMA 2023).

#### Future Growth and Development

##### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by the transportation accident hazard because the



entire County is exposed and vulnerable. Increased development in the county and region will lead to increased road traffic, which could lead to increased transportation accidents.

The Lancaster County Local Emergency Planning Committee will be conducting a commodity flow study to better understand the hazards moving through Lancaster County via its transportation routes.

### **Projected Changes in Population**

An increase in the county's and region's population will lead to increased road traffic, which could lead to increased transportation accidents. Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

### **Climate Change**

Since the transportation accident hazard is human-caused, climate change will not influence future vulnerability of Lancaster County to this hazard.

### **Change of Vulnerability Since 2019 Hazard Mitigation Plan**

Since the 2019 Hazard Mitigation Plan, the County's vulnerability to transportation accidents has increased due to the larger population and new development.

Based on limited data regarding the probability and potential impact of this hazard, a quantitative loss estimate was not completed for this HMP. Over time, the County can work with appropriate agencies to collect additional data to support mitigation planning, consideration of potential risks, and prioritization of mitigation measures for this hazard.

Lancaster County must compile and maintain data regarding specific concerns and past losses from this hazard. The data should include specific information regarding damage or loss of life, property, or infrastructure; and any reports pertaining to potential or actual cost and logistics of responding to an event caused by this hazard (locations of road closures, map detours, traffic counts, durations of closures and detours; and costs to respond). These data will be included in future revisions of the HMP and can be used to support future mitigation grant efforts (benefit-cost analysis).

Studying traffic and potential transportation accident patterns could provide information on vulnerability of specific road segments and nearby populations. Increased understanding of the types of hazardous materials transported through the County will also support mitigation efforts. Maintaining a record of frequently transported materials can facilitate development of preparatory measures to respond to a release. Predicting costs needed to respond to a release, remediate the environment, or repair damaged infrastructure would be useful for developing mitigation options.



## 4.3.18 Utility Interruption

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### Hazard Description

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Utility interruption hazards are hazards that impair the functioning of important utilities in the energy, telecommunications, public works, and information network sectors. The focus of utility interruptions as a hazard lies in fuel, energy, or utility failure; this hazard is often secondary to other natural hazard events, particularly transportation accidents, lightning strikes, extreme heat or cold events, and coastal and winter storms. Utility interruptions occur throughout the Commonwealth but are usually small-scale, localized incidents (PEMA 2023).

Interruptions in basic utilities (such as power, data/telecommunications, water, natural gas, or sewer) can have a detrimental impact on Lancaster County. Utilities that employ aboveground wiring (power and data/telecommunications) are vulnerable to the effects of other hazards such as high wind, heavy snow, ice, rain, and vehicular accidents.

For the purpose of this plan, utility interruption focuses on power failure, because it is the major cause of utility failure and has had widespread impacts on Lancaster County. A power failure is defined as any interruption or loss of electrical service from disruption of power transmission caused by accident, sabotage, natural hazards, or equipment failure. Local companies, such as PPL, that provide electricity to Lancaster County are capable of handling minor interruptions.

A significant power failure is defined as any incident of a long duration that would require the involvement of the local or state emergency management organizations to coordinate provision of food, water, heating, cooling, and shelter.

### Location and Extent

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Utility interruptions occur throughout Lancaster County but are usually of small scale and short duration. Utility interruptions in Lancaster County are primarily power failures and are often a secondary impact of another hazard event. For example, severe thunderstorms or winter storms could bring down power lines and cause widespread disruptions in electricity service. Strong heat waves may result in rolling blackouts, causing loss of power for an extended period. Local outages may be caused by traffic accidents or wind damage. Interruptions are possible anywhere utility service has been installed.

### Range of Magnitude

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The most severe utility interruptions are regional or widespread power outages. With the loss of power, electrically powered equipment and systems will not be operational. Regional loss of power affects lighting; heating, ventilation, and air conditioning (HVAC) and other support equipment; communications; fire and security systems; and refrigeration, which can in turn cause loss of water and sewer service, and food spoilage (PEMA 2023). Loss of heating and cooling capability is most dangerous during periods of extreme hot or cold temperatures.

At a minimum, power outages can cause short-term disruption in the orderly functioning of businesses, government operations, and private citizen functions and activities. Examples of everyday functions that would be affected by power outages include traffic signals, elevators, and retail sales. A worst-case scenario for utility interruption in Lancaster County would be a countywide power outage during a winter cold spell, forcing the evacuation of populations with no heat in their homes.

Sabotage plays a role in some utility outages. Sabotage may be the direct result of a malicious attack against utilities or may be the secondary effect of the theft of copper wiring. In 2010, the U.S. Department of Energy's Office of Electricity Delivery and Energy Reliability reported that United States-based utilities suffer copper thefts costing several million dollars annually (US DOE 2010).



**Past Occurrence**

Every year, Lancaster County is susceptible to minor utility interruptions either through technological failure or as the result of inclement weather. Table 4-96 shows major utility interruptions in the County since 2013. There were five incidents that included power outages from 2013 to April 2024. Events that simply included downed trees and power lines are not listed in Table 4-96.

**Table 4-96. Utility Interruptions from 2013–2024**

Dates of Event	Event Type	Location	FEMA Declaration Number (if applicable)	County Designated?	Description
June 13, 2013	Thunderstorm Wind	Christiana	N/A	N/A	Thunderstorms with damaging winds knocked down numerous trees and wires causing several thousands of customers to lose power in various locations.
February 4-5, 2014	Winter Storm	Countywide	EM-3367-PA	Yes	A storm downed several trees and utility lines creating widespread power outages. At the height of the storm nearly 850,000 customers statewide were without power (primarily in the southeastern PA).
July 8, 2014	Thunderstorm Wind	Lancaster Airport	N/A	N/A	Widespread damaging straight-line winds with embedded microburst damage knocked down numerous trees and utility wires. The winds caused localized structural damage and thousands of power outages.
February 24-25, 2019	High Wind	Countywide	N/A	N/A	Very gusty winds caused scattered power outages and downed trees in Lancaster County.
August 7, 2020	Flash Flood, Heavy Rain	Old Line, Bainbridge	N/A	N/A	Scattered thunderstorms produced wind damage, as well as flash flooding. PPL’s outage center showed 805 customers without power in Lancaster County.

Source: NOAA NCEI 2023; PEMA 2023

**Future Occurrence**

Minor power failure may occur several times a year around the County. Major events (long, widespread outage events) take place once every few years. Power failures often occur during severe weather; therefore, they should be expected during those events.

For the 2025 HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of utility interruption events for Lancaster County. Information from the NOAA NCEI Storm Events Database, and input from Lancaster County were used to identify the number of utility interruption events between 2003 and 2024. Table 4-97 shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident in a given year. Based on available historical data, the future occurrence of utility interruption events is considered *likely*, with minor events happening more frequently than major or long-term interruptions in the future.

**Table 4-97. Probability of Future Utility Interruption Events**

Hazard Type	Number of Occurrences Between 2003 and 2024	Percent Chance of Occurrence in a Given Year
Utility Outage	17	80.9%

Source: NOAA NCEI 2023; PEMA 2018

Note: Information on events for 2003 to 2024 was limited and based on NOAA NCEI Storm Events and newspaper coverage. Therefore, it can be assumed that the number of events listed for that time period is conservative.



## Vulnerability Assessment

Regarding utility interruption events, all of Lancaster County has been identified as the hazard area. A qualitative vulnerability assessment was prepared.

### Life, Health, and Safety

Utility interruptions most severely affect individuals with access and functional needs (such as children, the elderly, and individuals with special medical needs). Special medical equipment will not function without power. A loss of air conditioning during periods of extreme heat or the loss of heating during extreme cold can be especially detrimental to those with medical needs, children, and the elderly. Additionally, first responders' safety may be at risk during on-scene operations, and they may not be able to respond in a timely manner due to electrical or utility fires. For information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

**Table 4-98. Socially Vulnerable Lancaster County Populations**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock and Community Lifelines and Other Critical Facilities

All critical facilities are vulnerable to the loss of power. The establishment of reliable backup power at these facilities is extremely important to continue to provide for the health, safety, and well-being of Lancaster County’s population.

### Economy

During a utility interruption event, the County may experience losses because of an interruption of critical services. Further, increased costs may be incurred related to shelters and cooling and heating centers. Extended power outages will require officials to shelter victims who need heat and power for activities of daily living.





Power interruptions can cause economic impacts stemming from lost income, spoiled food and other goods, costs to the owners/operators of the utility facilities, and costs to government and community service groups. Power failures that result in interruption of utility gas or potable water could cause significant economic impacts such as costs for bringing in water tenders to maintain fire suppression capabilities; opening additional warming centers for residential areas; and distribution of potable water for public consumption. There could be significant costs associated with reimbursing fire departments from other counties to travel, staff, and maintain water tenders within Lancaster County during the duration of a water outage event.

Additional modeling of economic impacts from utility interruption would be calculating interruption of service costs which is derived from a standard value per person per day multiplied out by the number of customers served. This would help to provide an estimate of the impact of the interrupted utility service but may not be representative of the complete economic impact of a prolonged utility interruption. The FEMA Benefit-Cost Analysis (BCA) Toolkit has standard values based on the daily cost per rate-paying connection. The daily cost-per-connection value is shown in Table 4-99.

Table 4-99. FEMA BCA Toolkit Daily Standard Values of Utility Services

Utility	Daily Value (per connection/per day)
Electric	\$174.00
Potable Water	\$114.00
Wastewater	\$58.00

Source: FEMA 2020

The 2022 USDA Agricultural Census showed that Lancaster County had 19 percent of Pennsylvania’s agricultural sales—\$1.8 million including livestock, poultry, and products (USDA 2022). Utility failure may impact the agricultural community if livestock and poultry goods are frozen prior to transport. These goods would thaw and lose viability, causing farmers to incur a financial loss.

A number of secondary impacts are associated with utility interruptions. First, interruptions could affect the ability of the government to function, especially if backup power generators or supply is inadequate or unavailable. Utility interruptions also can reduce the efficient and effective communication that is essential to first responders. Heating loss and severe cold can also impact the health and safety of at-risk populations like young children, the elderly, and individuals with disabilities (PEMA 2023).

Environment

The most significant impact associated with utility interruptions is when the interruption causes a release of hazardous materials. This hazardous material may be released in a pipeline accident or when a material is in transit. Pipelines carrying flammable materials also have the possibility of exploding or starting a fire (PEMA 2023). Section 4.3.5 and 4.3.6, Environmental Hazards, includes a complete discussion on the impacts of a hazardous materials release.

Future Growth and Development

Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by the utility interruption hazard because the entire county is exposed and potentially vulnerable. An increase in development and population will increase demand for power supply and has the ability to increase the likelihood of utility interruption incidents. However, due to increased standards, codes, and technology, new development may be less vulnerable to the utility interruption hazard than the aging building stock in the County.



### Projected Changes in Population

Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012). Increased population results in a greater number of people at risk from this hazard.

### Climate Change

The May 2021 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures and precipitation in the 21st century. Increased average temperatures as a result of climate change make the occurrence of extreme heat more likely (Commonwealth of Pennsylvania 2021). Extreme heat and cold result in greater strain on utilities, increasing the likelihood of utility interruption. Some climatologists have suggested that warming in the Arctic could impact the position of the jet stream, allowing for more extreme cold weather events to occur (National Geographic 2019).

An increase in the intensity of severe weather events is anticipated as the climate continues to change. This will include wind events, which will increase the chance of impacts on the utility infrastructure. Additionally, an increase in precipitation is projected, which could come in the form of heavy downpours or winter weather, causing additional utility interruptions. Increased risk of drought may also threaten water utilities (Commonwealth of Pennsylvania 2021).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, population statistics have been updated using the 2022 American Community Survey Population Estimates. The County’s risk from utility interruptions has not changed.



## 4.3.19 Wildfire

### Hazard Description

Wildfires occur throughout wooded and open vegetation areas of Pennsylvania. Open fields, grass, dense brush, and forest-covered areas are typical sites for wildfire events. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands. Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes. Large events may require evacuation from one or more communities and necessitate regional or national firefighting support (PEMA 2023).

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. Any fire, without the quick response or attention of firefighters, forestry personnel, or visitors to the forest, has the potential to become a wildfire.

The greatest potential for wildfires in Pennsylvania is in March, April, and May, and again in October and November. These months generally bring clear skies, high winds, low relative humidity, and prolonged periods of dry weather. In the spring and fall, bare trees allow sunlight to reach the forest floor, drying fallen leaves and other ground debris that can burn.

### Location and Extent

Wildfires take place in less developed or completely undeveloped areas, spreading rapidly through vegetative fuels. Most are caused by human actions, though some are caused by lightning strikes. Wildfires can occur at any time of the year but are most likely in Lancaster County during a drought. Under dry conditions, wildfires have the potential to burn fields, grass, brush, forests, and croplands. Figure 4-30 illustrates the land cover across Lancaster County. A small percentage of Lancaster County is forested; much of the land cover is agricultural.

Areas with large home developments built in volatile fuel types are at risk for catastrophic wildfires. In southeastern Pennsylvania, communities are most susceptible to large fires accidentally started by people. This includes people burning debris, as well as fires ignited by sparks from railroad cars that run parallel to and on the banks of the Susquehanna River (PEMA 2023). Several fires have started in a person's backyard and traveled through dead grasses and weeds into bordering woodlands.

Tools for estimating fire potential include WUI mapping, the Wildland Fire Assessment System, and the DCNR Priority Landscape Analysis. These tools are discussed in the sections below.

### Wildland/Urban Interface

The WUI is the area where houses and wildland vegetation coincide. The WUI is divided into two categories:

- Intermix WUI are areas where housing and vegetation intermingle. Intermix areas have more than one house per 40 acres and have more than 50 percent vegetation.
- Interface WUI are areas with housing in the vicinity of contiguous wildland vegetation. Interface areas have more than one house per 40 acres, have less than 50 percent vegetation, and are within 1.5 miles of an area larger than 1,235 acres that is more than 75 percent vegetated (Stewart 2015).

Areas within 1.5 miles of wildland vegetation are the approximate distance that firebrands can be carried from a wildland fire to the roof of a house. Therefore, even structures not located within the forest are at risk from wildfire. This buffer distance, along with housing density and vegetation type, were used to define the WUI (Stewart 2015).

Lancaster County is identified as having many areas of low-density housing or very low-density housing because of the large amount of agricultural area. Areas where recreation and tourism dominate are also places where WUI is common (Stewart 2015). Concentrations of WUI areas greater than 50 percent are classified as WUI



(intermix or interface). Figure 4-31 depicts the WUI for Pennsylvania in 2010, and Figure 4-32 illustrates the WUI for Lancaster County.



Figure 4-30. Land Cover in Lancaster County

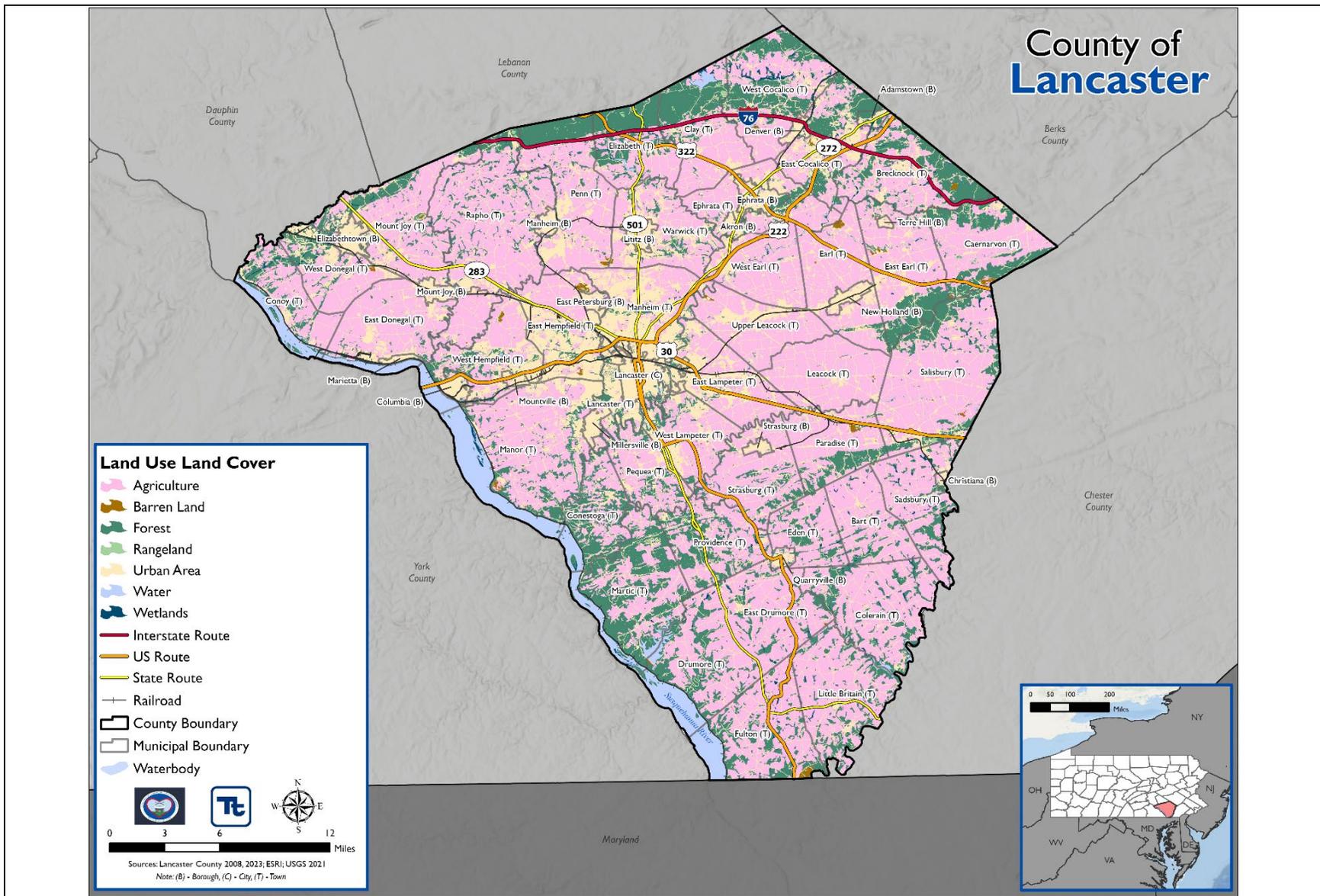
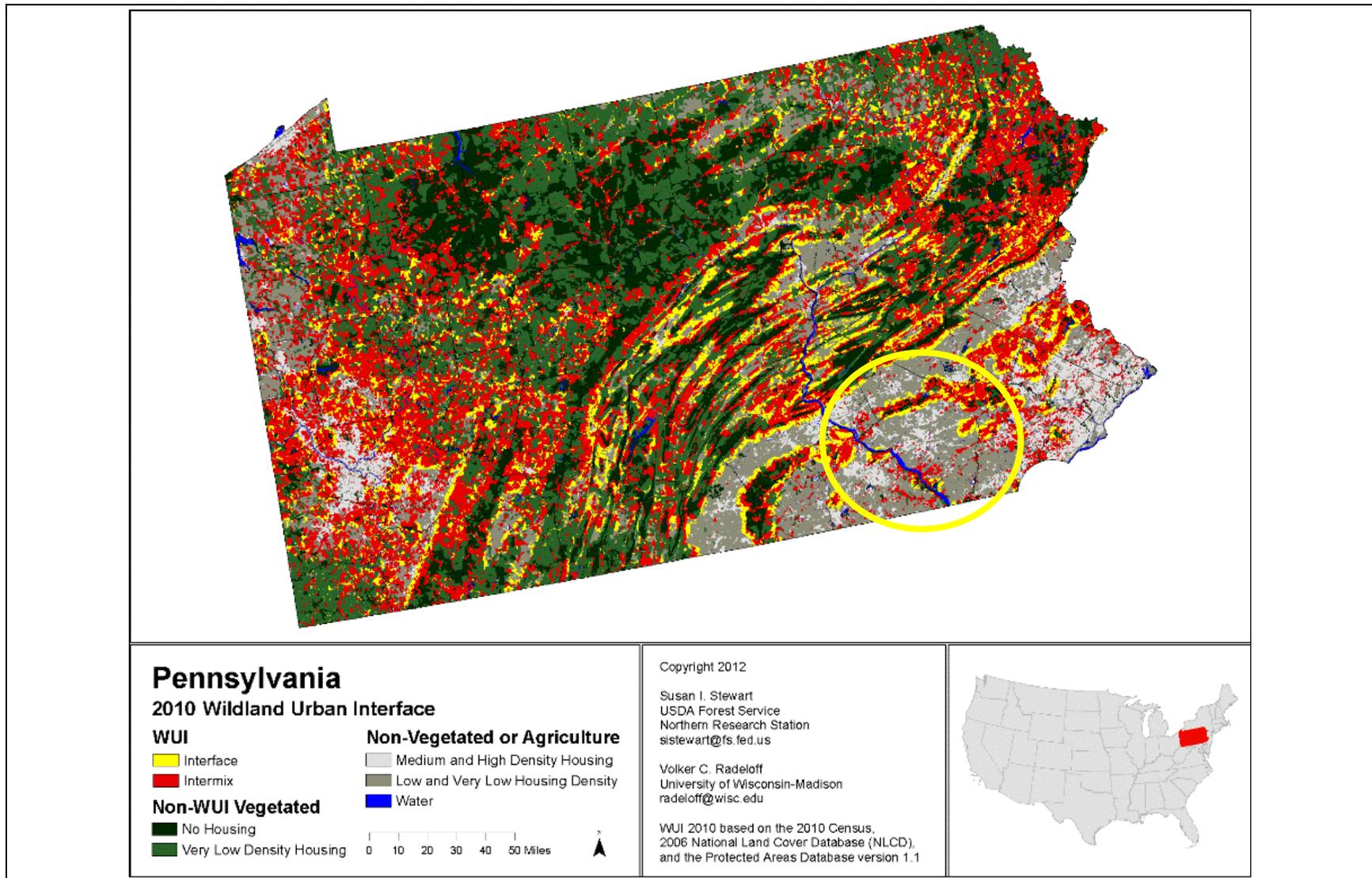




Figure 4-31. 2010 WUI for Pennsylvania



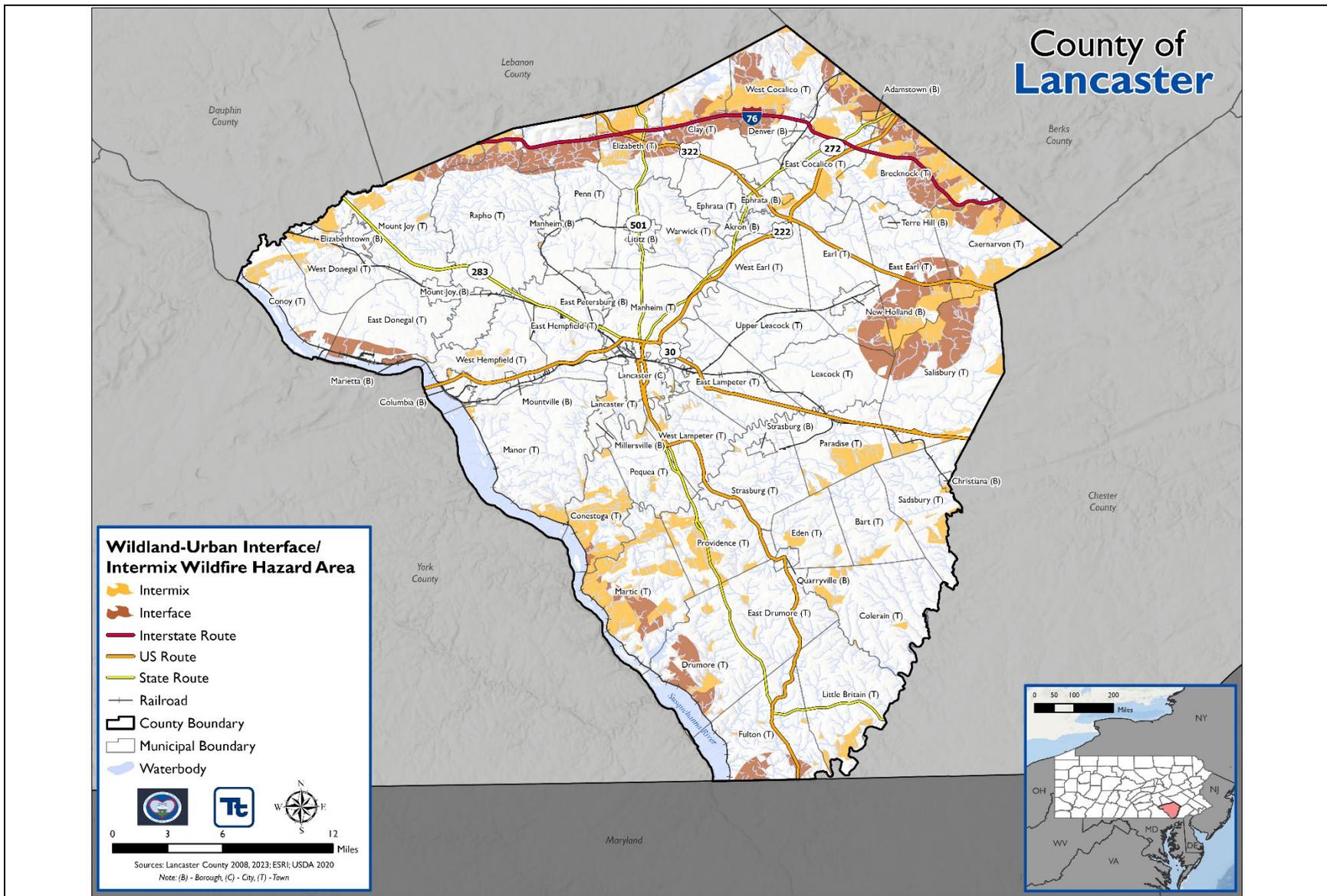
Source: Stewart 2015

Note: Yellow oval highlights Lancaster County's location.





Figure 4-32. Wildfire Urban Intermix/Interface for Lancaster County





Wildland Fire Assessment System

The Wildland Fire Assessment System is an internet-based information system maintained at the National Interagency Fire Center that provides a national view of weather and fire potential, including national fire danger information, weather maps, and satellite-derived “Greenness” maps (USFS, Wildland Fire Assessment System 2023). Each day during the fire season, the system produces national maps of selected fire weather and fire danger components of the National Fire Danger Rating System (USFS, Fire Danger Rating 2023). The Fire Danger Rating level, described in Table 4-100, takes into account current and antecedent weather, fuel types, and fuel moisture (USFS, Fire Danger Rating 2023).

Table 4-100. Fire Danger Rating and Color Code

Fire Danger Rating and Color Code	Description
Low (Dark Green)	Fuels do not ignite readily from small firebrands, although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burning in irregular fingers. There is little danger of spotting.
Moderate (Light Green)	Fires can start from most accidental causes, but apart from lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. Short-distance spotting may occur but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (Yellow)	All fine dead fuels ignite readily, and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly, and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while they are small.
Very High (Orange)	Fires start easily from all causes and, immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics such as long-distance spotting and fire whirlwinds when they burn into heavier fuels.
Extreme (Red)	Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash (trunks, branches, and treetops) or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes, or the fuel supply lessens.

Source: USFS, Fire Danger Rating 2023

Pennsylvania Department of Conservation and Natural Resources Priority Landscape Analysis

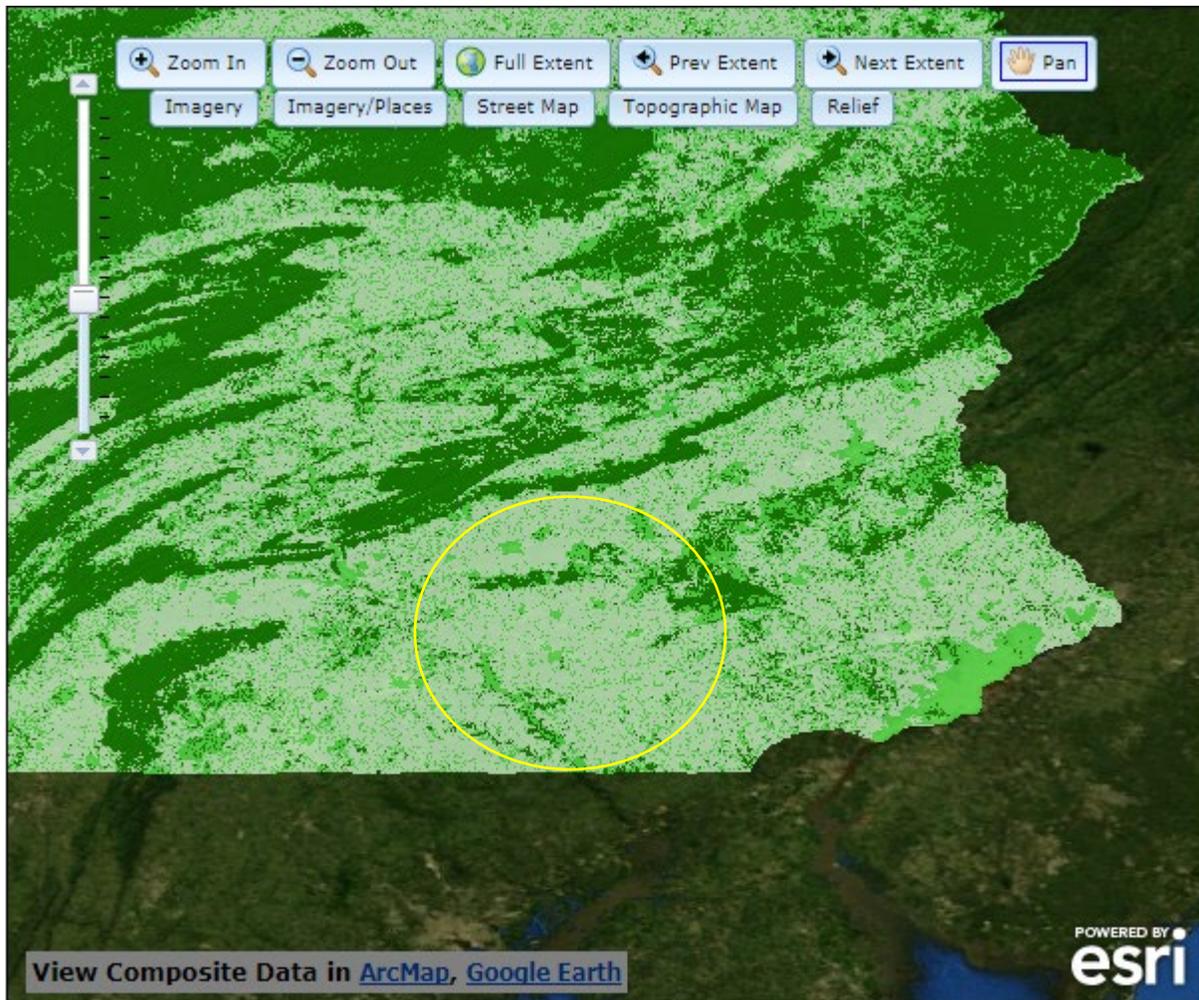
The DCNR conducted a wildfire priority landscape analysis identifying where wildland fires are likely to become problematic. The following five datasets were used for this analysis:

- **2002 WUI**—Areas where homes and other human development meet or intermingle with undeveloped land
- **2006 LANDFIRE**—Characterizes the land’s vegetation into fuel models that predict various fire behavior intensities
- **2002 – 2008 Pennsylvania Wildfire Point Origin Occurrences**—Records of wildland fire origins that have been reported
- **Percent Slope**—Aids in predicting fire behavior from the terrain
- **2009 Local Assessment of Values, Risks, Hazards**—A municipality-based rating system; this assessment has been made by local wildland fire managers



Areas are classified as high, medium, or low priority. The high classification is defined as an area prone to extreme fire behavior, with the potential to cause extensive property damage, or that could threaten the safety of the Commonwealth’s citizens. Figure 4-33 illustrates the output for the wildfire priority landscapes model for Lancaster County.

**Figure 4-33. Wildfire Priority Landscapes in Lancaster County**



Source: DCNR 2017

Notes: Low Priority = 0–0.21 (light green); Medium Priority = 0.21–0.35 (medium green); High Priority = 0.35–1 (dark green)  
Lancaster County location within yellow oval

### Range of Magnitude

Wildfire events in Lancaster County can range from small fires that can be managed by local firefighters to large fires burning many acres of land. Large events may require evacuation from one or more communities and necessitate regional or national firefighting support. The impact of a severe wildfire can be devastating. Wildfires have the potential to kill people, livestock, fish, and wildlife. They often destroy property, valuable timber, forage, and recreational and scenic resources. According to the Pennsylvania Hazard Mitigation Plan, 92 percent of Pennsylvania wildfires burn less than 10 acres and are suppressed within the first burning period (PEMA 2023).



In addition to the risk wildfires pose to the general public and property owners, the safety of firefighters is a concern. Although loss of life among firefighters does not occur often in Pennsylvania, it is always a risk. More common firefighting injuries include falls, sprains, abrasions, or heat-related injuries, such as dehydration. Response to wildfires also exposes emergency responders to the risk of motor vehicle accidents and can place them in remote areas away from the communities that they are chartered to protect.

The worst-case scenario for Lancaster County would occur if an uncontrolled wildfire spread across the northern region of the County, specifically within West Cocalico Township, where 4,188 people (56 percent of the population) are located within the WUI hazard area. Additionally, 3,358 structures valued at \$1.8 billion are exposed to the hazard area in West Cocalico Township.

**Past Occurrence**

Figure 4-34 shows the locations and size of wildfires in Pennsylvania from 2014 to 2022. Pennsylvania has not been included in any FEMA fire management assistance (FMA) declarations (FEMA 2023). Table 4-101 describes the single reported wildfire event that impacted Lancaster County between 2017 and April 2024. For events prior to 2017, see the 2018 HMP. Wildfires are known to be an underreported event, and some smaller fires may not be represented in wildfire records reviewed to prepare this table. Table 4-102 shows fire dispatch statistics in Lancaster County between 2017 and 2023. This table displays the total number of calls for each year by incident type.

**Table 4-101. Wildfire Events in Lancaster County, 2017 to April 2024**

Dates of Event	Event Type	Fatalities	Injuries	Property Damage	FEMA Disaster Declaration Number	Location	Description
March 22, 2024	Wildfire	0	0	15.8 Acres burned	N/A	East Earl Township	A total of 15.8 acres were burned by a human caused fire that also saw departments from Chester County be called in to help fight it.

Source: FEMA 2024; NOAA-NCEI 2023; Fire Weather & Avalanche Center 2023

Note: Not all events that have occurred in Lancaster County are included due to the extent of documentation and the fact that not all sources have been identified or researched.

**Table 4-102. Fire Dispatches in Lancaster County, 2017 to 2023**

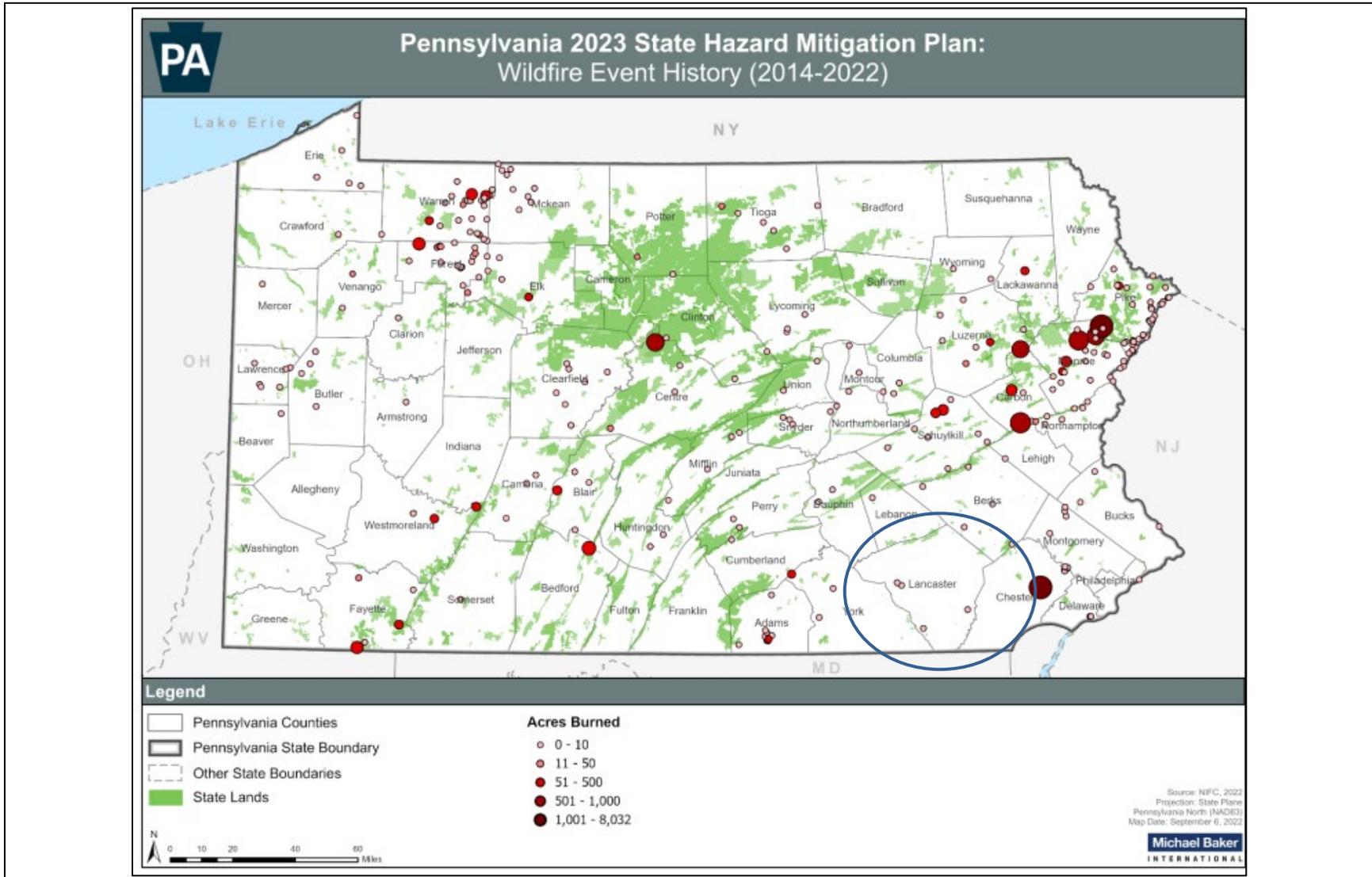
Year	Number of Dispatches				
	Large Brush Fire	Small Brush Fire	Controlled Burning	Large Woods Fire	Small Woods Fire
2017	13	461	844	0	92
2018	0	394	749	0	107
2019	0	413	959	0	37
2020	1	258	998	1	20
2021	1	315	825	1	24
2022	53	483	874	45	40
2023	104	728	878	22	37
<b>Total</b>	<b>172</b>	<b>3,052</b>	<b>6,127</b>	<b>69</b>	<b>357</b>

Source: LCWC 2024

Note: Additional incidents may have occurred which were not called in for an emergency response.



Figure 4-34. Location and Size of Wildfire Events from 2014 to 2022



Source: PEMA 2018

Note: Blue oval indicates location of Lancaster County





### Future Occurrence

In Pennsylvania, wildfire events will continue to occur each year. Invasive forest insects can increase the likelihood of wildfires; insects that attack and kill trees increase the total wildfire fuel available in wooded areas. Climate change is also likely to increase the probability of future wildfires. Prolonged periods of drought caused by climate change can increase the length of the wildfire season and provide a more favorable climate for ignition (PEMA 2023).

For this 2025 HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of wildfire events for Lancaster County. Information from the Lancaster County-wide Communications, NOAA NCEI, and input from Lancaster County were used to identify the number of wildfire events between 2017 and April 2024 (see Table 4-103). Based on available historical data, the future occurrence of wildfires in Lancaster County is considered *likely*.

**Table 4-103. Probability of Future Wildfire Events**

Hazard Type	Number of Occurrences Between 2017 and 2024	Percent Chance of Occurrence in Any Given Year
Brush Fire—Large	172	100%
Brush Fire—Small	3,052	100%
Controlled Burning	6,127	100%
Wildfires	1	14.2%
Woods Fire—Large	69	100%
Woods Fire—Small	357	100%

Source: NOAA-NCEI 2023; LCWC 2024

### Vulnerability Assessment

For the wildfire risk assessment, the WUI interface and intermix data was analyzed as the hazard area. The high-, medium-, and low-density interface areas were combined and used as the “Interface” hazard area. The high-, medium-, and low-density intermix areas were combined and used as the “Intermix” hazard areas. Asset data (population, building stock, and critical facilities) developed for this HMP update was used to support an evaluation of assets exposed and potential impacts.

### Life, Health, and Safety

#### General Population

Wildfires have the potential to impact human health and life of residents and responders. Public health impacts associated with wildfire include difficulty in breathing, odor, and reduction in visibility. Smoke generated by wildfire consists of visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides), and toxics (formaldehyde, benzene). Emissions from wildfires depend on the type of fuel, the moisture content of the fuel, the efficiency (or temperature) of combustion, and the weather.

The most vulnerable populations are emergency responders and those within a short distance of the interface between the built environment and the wildland environment. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. Table 4-104 summarizes the estimated population living in the evaluated wildfire hazard area, by municipality.



Table 4-104. Population Living in the WUI Interface/Intermix Hazard Areas in Lancaster County

Jurisdiction	Total Population (2020 Decennial Census)	Population in the WUI Interface Hazard Area		Population in the WUI Intermix Hazard Area	
		Number of People	% of Total	Number of People	% of Total
Adamstown Borough	1,916	799	41.7%	468	24.4%
Akron Borough	4,152	0	0.0%	28	0.7%
Bart Township	3,181	0	0.0%	232	7.3%
Brecknock Township	7,557	3,669	48.6%	1,001	13.2%
Caernarvon Township	4,609	845	18.3%	2,155	46.8%
Christiana Borough	1,112	0	0.0%	74	6.7%
Clay Township	6,857	2,650	38.6%	590	8.6%
Colerain Township	3,883	0	0.0%	372	9.6%
Columbia Borough	10,207	0	0.0%	18	0.2%
Conestoga Township	3,914	41	1.0%	2,164	55.3%
Conoy Township	3,361	44	1.3%	605	18.0%
Denver Borough	3,792	0	0.0%	25	0.7%
Drumore Township	2,561	422	16.5%	323	12.6%
Earl Township	7,144	1,796	25.1%	369	5.2%
East Cocalico Township	10,767	533	5.0%	1,045	9.7%
East Donegal Township	8,684	1,401	16.1%	20	0.2%
East Drumore Township	3,936	0	0.0%	362	9.2%
East Earl Township	6,699	2,942	43.9%	626	9.3%
East Hempfield Township	26,304	0	0.0%	81	0.3%
East Lampeter Township	17,776	0	0.0%	40	0.2%
East Petersburg Borough	4,573	0	0.0%	0	0.0%
Eden Township	2,239	0	0.0%	214	9.6%
Elizabeth Township	3,985	1,632	41.0%	794	19.9%
Elizabethtown Borough	11,639	0	0.0%	12	0.1%
Ephrata Borough	13,794	0	0.0%	202	1.5%
Ephrata Township	10,386	0	0.0%	681	6.6%
Fulton Township	3,214	275	8.6%	106	3.3%
Lancaster City	58,039	0	0.0%	225	0.4%
Lancaster Township	18,642	0	0.0%	830	4.5%
Leacock Township	5,652	234	4.1%	0	0.0%
Lititz Borough	9,381	0	0.0%	0	0.0%
Little Britain Township	4,118	0	0.0%	436	10.6%
Manheim Borough	5,046	0	0.0%	0	0.0%
Manheim Township	43,977	0	0.0%	77	0.2%
Manor Township	21,849	0	0.0%	492	2.3%
Marietta Borough	2,623	2,288	87.2%	39	1.5%
Martic Township	5,221	745	14.3%	1,735	33.2%
Millersville Borough	7,903	0	0.0%	4	0.1%
Mount Joy Borough	8,325	0	0.0%	0	0.0%
Mount Joy Township	10,721	235	2.2%	796	7.4%
Mountville Borough	3,017	0	0.0%	0	0.0%
New Holland Borough	5,743	0	0.0%	0	0.0%



Jurisdiction	Total Population (2020 Decennial Census)	Population in the WUI Interface Hazard Area		Population in the WUI Intermix Hazard Area	
		Number of People	% of Total	Number of People	% of Total
Paradise Township	5,672	0	0.0%	1,011	17.8%
Penn Township	10,210	1,530	15.0%	39	0.4%
Pequea Township	5,474	0	0.0%	244	4.5%
Providence Township	6,995	0	0.0%	2,203	31.5%
Quarryville Borough	2,843	0	0.0%	23	0.8%
Rapho Township	12,024	757	6.3%	534	4.4%
Sadsbury Township	3,536	0	0.0%	245	6.9%
Salisbury Township	11,494	2,774	24.1%	2,520	21.9%
Strasburg Borough	3,117	0	0.0%	0	0.0%
Strasburg Township	4,457	0	0.0%	43	1.0%
Terre Hill Borough	1,357	0	0.0%	0	0.0%
Upper Leacock Township	8,921	0	0.0%	0	0.0%
Warwick Township	19,022	0	0.0%	128	0.7%
West Cocalico Township	7,456	1,982	26.6%	2,206	29.6%
West Donegal Township	8,944	0	0.0%	1,367	15.3%
West Earl Township	8,560	0	0.0%	0	0.0%
West Hempfield Township	17,020	0	0.0%	655	3.8%
West Lampeter Township	17,383	0	0.0%	631	3.6%
<b>Lancaster County</b>	<b>552,984</b>	<b>27,594</b>	<b>5.0%</b>	<b>29,090</b>	<b>5.3%</b>

Source: U.S. Census Bureau 2020; Lancaster County 2023, 2024; USDA Forest Service Northern Research Station 2020

### Socially Vulnerable Populations

Smoke and air pollution from wildfires can be a severe health hazard, especially for sensitive populations, including children, the elderly, and those with respiratory and cardiovascular diseases. Economically disadvantaged populations are more vulnerable to wildfire because they may lack financial resources to evacuate. The population over 65 is also more vulnerable because they are more likely to need medical attention that may not be available due to isolation during a wildfire event, and they may have more difficulty evacuating.

Table 4-105 shows socially vulnerable populations living in the WUI hazard areas. For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2. Key findings are as follows:

- In the WUI Interface Hazard Area:
  - East Earl Township has the highest population over 65 (631) and the largest population of non-English speaking persons (125)
  - Brecknock Township has the highest population under the age of 5 (295)
  - Marietta Borough has the largest disabled population (379) and the greatest population of individuals living in poverty (293)
- In the WUI Intermix Hazard Area:
  - West Donegal Township has the highest population over 65 (514)
  - West Cocalico Township has the highest population under the age of 5 (244)
  - Salisbury Township has the largest population of non-English speaking persons (84)
  - Providence Township has the largest disabled population (301) and the greatest population of individuals living in poverty (218)



Table 4-105. Socially Vulnerable Persons Living in the WUI Interface and Intermix Hazard Areas

Jurisdiction	Vulnerable Persons Living in the WUI Interface Hazard Area					Vulnerable Persons Living in the WUI Intermix Hazard Area				
	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	104	80	13	46	98	61	47	8	27	57
Akron Borough	0	0	0	0	0	5	2	0	3	2
Bart Township	0	0	0	0	0	27	25	13	23	10
Brecknock Township	522	295	16	214	98	142	80	4	58	26
Caernarvon Township	145	62	23	90	66	370	158	60	230	168
Christiana Borough	0	0	0	0	0	15	4	0	9	5
Clay Township	464	176	40	205	142	103	39	9	45	31
Colerain Township	0	0	0	0	0	58	42	26	27	67
Columbia Borough	0	0	0	0	0	3	0	0	3	2
Conestoga Township	7	1	0	5	2	381	61	0	281	132
Conoy Township	6	3	0	6	3	91	43	0	83	43
Denver Borough	0	0	0	0	0	4	1	0	2	1
Drumore Township	54	28	22	45	30	41	21	17	35	23
Earl Township	463	163	54	178	178	95	33	11	36	36
East Cocalico Township	100	19	11	55	27	196	38	22	109	53
East Donegal Township	209	101	4	125	49	3	1	0	1	0
East Drumore Township	0	0	0	0	0	91	25	0	43	26
East Earl Township	631	168	125	287	102	134	35	26	61	21
East Hempfield Township	0	0	0	0	0	21	2	1	8	2
East Lampeter Township	0	0	0	0	0	6	3	1	4	3
East Petersburg Borough	0	0	0	0	0	0	0	0	0	0
Eden Township	0	0	0	0	0	27	24	2	13	9
Elizabeth Township	355	111	0	102	75	173	54	0	50	36
Elizabethtown Borough	0	0	0	0	0	2	0	0	1	0
Ephrata Borough	0	0	0	0	0	35	13	16	34	18
Ephrata Township	0	0	0	0	0	135	29	26	74	36
Fulton Township	39	37	10	23	20	15	14	4	9	7
Lancaster City	0	0	0	0	0	20	15	16	34	39
Lancaster Township	0	0	0	0	0	183	61	42	82	72
Leacock Township	34	17	6	13	14	0	0	0	0	0
Lititz Borough	0	0	0	0	0	0	0	0	0	0
Little Britain Township	0	0	0	0	0	91	33	27	52	42



Jurisdiction	Vulnerable Persons Living in the WUI Interface Hazard Area					Vulnerable Persons Living in the WUI Intermix Hazard Area				
	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Manheim Borough	0	0	0	0	0	0	0	0	0	0
Manheim Township	0	0	0	0	0	17	4	1	8	4
Manor Township	0	0	0	0	0	93	28	31	58	47
Marietta Borough	617	153	0	379	293	10	2	0	6	5
Martic Township	105	75	3	89	49	244	174	8	209	115
Millersville Borough	0	0	0	0	0	0	0	0	0	1
Mount Joy Borough	0	0	0	0	0	0	0	0	0	0
Mount Joy Township	34	15	1	20	10	116	52	6	71	34
Mountville Borough	0	0	0	0	0	0	0	0	0	0
New Holland Borough	0	0	0	0	0	0	0	0	0	0
Paradise Township	0	0	0	0	0	127	86	14	103	85
Penn Township	361	80	10	116	63	9	2	0	2	1
Pequea Township	0	0	0	0	0	44	15	0	23	11
Providence Township	0	0	0	0	0	488	104	17	301	218
Quarryville Borough	0	0	0	0	0	3	1	0	3	3
Rapho Township	179	38	0	84	23	126	27	0	59	16
Sadsbury Township	0	0	0	0	0	30	31	3	21	26
Salisbury Township	284	263	92	203	160	258	239	84	185	145
Strasburg Borough	0	0	0	0	0	0	0	0	0	0
Strasburg Township	0	0	0	0	0	7	5	0	2	3
Terre Hill Borough	0	0	0	0	0	0	0	0	0	0
Upper Leacock Township	0	0	0	0	0	0	0	0	0	0
Warwick Township	0	0	0	0	0	26	6	1	10	7
West Cocalico Township	268	219	13	148	164	298	244	15	164	183
West Donegal Township	0	0	0	0	0	514	52	0	193	83
West Earl Township	0	0	0	0	0	0	0	0	0	0
West Hempfield Township	0	0	0	0	0	126	36	21	85	19
West Lampeter Township	0	0	0	0	0	194	23	3	75	19
<b>Lancaster County</b>	<b>4,981</b>	<b>2,104</b>	<b>443</b>	<b>2,433</b>	<b>1,666</b>	<b>5,258</b>	<b>2,034</b>	<b>535</b>	<b>3,015</b>	<b>1,992</b>

Source: U.S. Census Bureau 2022; Lancaster County 2023, 2024; USDA Forest Service Northern Research Station 2020



### General Building Stock

The most vulnerable structures to wildfire are those within the WUI interface and intermix hazard areas. Buildings constructed of wood or vinyl siding are generally more likely to be impacted by the fire hazard than buildings constructed of brick or concrete.

To estimate the buildings exposed to the wildfire hazard, the WUI was overlaid upon the updated building inventory (refer to Table 4-106). Within the general building stock, 6.7 percent of structures are in the WUI interface area and 6.9 percent are in the WUI intermix area. Brecknock Township has the greatest number of buildings in the WUI interface area (2,485 buildings). West Cocalico Township has the greatest number of buildings in the WUI intermix area (1,653 buildings). The replacement cost value of the structures with their center in the WUI were totaled.

Table 4-107 displays the buildings by general occupancy in the WUI interface and intermix hazard areas. The analysis indicates that commercial occupancy is the most exposed to the wildfire hazard, with 11,557 structures in the wildfire interface area and 12,259 structures in the wildfire intermix area.

### Community Lifelines and Other Critical Facilities

Wildfires can have an impact on the water supplies throughout the County because of residual pollutants like char or debris landing in water resources, which can clog wastewater pipes, culverts, etc. Wildfires may also impact transportation routes, blocking residents and commuters from getting in and out of the County because of char and smoke in the air making it difficult to drive, or flames near the roadways making the route unsafe.

Community lifelines and other critical facilities at risk of impact from a wildfire include locations for vulnerable populations (i.e., schools and senior facilities) and emergency response agencies (i.e., fire and police). As shown in Table 4-108, 288 lifelines are exposed in the WUI inface hazard area, and 252 lifelines are exposed in the WUI intermix hazard area.

### Economy

Wildfire events can have major economic impacts on a community from the initial loss of structures and the subsequent loss of revenue from destroyed business. These events may cost thousands of taxpayer dollars to suppress and control and may involve hundreds of operating hours on fire apparatus and thousands of hours from volunteer firefighters. There are also many direct and indirect costs to local businesses that excuse volunteers from working to fight these fires.

### Environment

Post-fire runoff polluted with debris and contaminants can be extremely harmful to ecosystem and aquatic life (Basso, et al. 2021). The age and density of infrastructure within Lancaster County can exacerbate consequences of fires on the environment because of the increased amount of chemicals and contaminants that would be released from burning infrastructure. These chemicals, such as iron, lead, and zinc, may leach into the storm water, contaminate nearby streams, and impair aquatic life.

The most significant environmental impacts are the potential for severe erosion, silting of stream beds and reservoirs, and flooding due to ground-cover loss following a fire event. Wildfires can also have a positive environmental impact in that they burn dead trees, leaves, and grasses to allow more open spaces for new vegetation to grow and receive sunlight. Another positive effect is that fire stimulates the growth of new shoots on trees and shrubs and its heat can open pinecones and other seed pods.



Table 4-106. Estimated Building Stock Located Within the Wildland-Urban Interface/Intermix (WUI) Wildfire Fuel Hazard Areas

Jurisdiction	Jurisdiction Total Buildings		Buildings in the WUI Interface Hazard Area		Buildings in the WUI Intermix Hazard Area	
	Count	Replacement Cost Value	Count	Replacement Cost Value	Count	Replacement Cost Value
Adamstown Borough	1,061	\$567,784,670	495	\$205,373,834	351	\$191,118,022
Akron Borough	1,946	\$780,121,864	0	\$0	11	\$5,117,078
Bart Township	2,746	\$1,885,029,231	0	\$0	113	\$53,250,934
Brecknock Township	6,458	\$3,832,548,357	2,485	\$1,612,708,436	1,558	\$722,147,780
Caernarvon Township	3,617	\$2,383,292,372	602	\$369,777,573	1,451	\$686,218,828
Christiana Borough	584	\$307,647,839	0	\$0	54	\$23,905,462
Clay Township	4,929	\$3,411,423,294	1,760	\$821,962,065	488	\$209,302,773
Colerain Township	3,177	\$2,533,877,481	0	\$0	210	\$118,637,014
Columbia Borough	4,036	\$4,983,733,544	0	\$0	16	\$33,758,706
Conestoga Township	2,953	\$1,420,507,504	34	\$13,154,572	1,509	\$611,315,149
Conoy Township	2,599	\$1,789,579,577	53	\$162,137,763	401	\$157,279,581
Denver Borough	1,918	\$2,747,960,874	0	\$0	7	\$2,495,607
Drumore Township	2,426	\$1,886,590,595	354	\$220,055,464	230	\$129,701,156
Earl Township	5,290	\$10,279,323,543	793	\$497,529,093	162	\$62,689,556
East Cocalico Township	7,428	\$5,177,824,554	468	\$276,704,030	980	\$428,223,416
East Donegal Township	4,506	\$6,877,402,214	611	\$690,868,695	14	\$6,537,397
East Drumore Township	3,043	\$3,747,277,368	0	\$0	167	\$63,754,919
East Earl Township	5,648	\$6,797,710,925	2,051	\$1,978,124,032	499	\$206,577,033
East Hempfield Township	11,417	\$42,919,064,493	0	\$0	25	\$14,812,524
East Lampeter Township	8,359	\$16,552,653,977	0	\$0	13	\$5,297,439
East Petersburg Borough	2,033	\$1,076,855,572	0	\$0	0	\$0
Eden Township	1,797	\$1,268,005,230	0	\$0	122	\$57,211,851
Elizabeth Township	3,194	\$2,173,694,928	1,198	\$904,035,966	628	\$317,848,232
Elizabethtown Borough	4,454	\$6,918,177,890	0	\$0	3	\$5,763,848
Ephrata Borough	6,357	\$13,348,895,113	0	\$0	64	\$26,105,664
Ephrata Township	5,383	\$6,162,339,672	0	\$0	267	\$119,748,152
Fulton Township	3,035	\$2,732,951,621	183	\$74,130,795	76	\$20,745,164
Lancaster City	14,223	\$49,154,384,225	0	\$0	52	\$23,441,772
Lancaster Township	5,365	\$16,948,222,966	0	\$0	238	\$109,172,263
Leacock Township	4,771	\$5,521,489,045	255	\$193,906,330	0	\$0
Lititz Borough	4,389	\$10,053,673,662	0	\$0	0	\$0
Little Britain Township	3,545	\$3,060,610,596	0	\$0	298	\$156,522,684



Jurisdiction	Jurisdiction Total Buildings		Buildings in the WUI Interface Hazard Area		Buildings in the WUI Intermix Hazard Area	
	Count	Replacement Cost Value	Count	Replacement Cost Value	Count	Replacement Cost Value
Manheim Borough	2,956	\$4,013,795,389	0	\$0	0	\$0
Manheim Township	16,101	\$25,203,355,402	0	\$0	33	\$14,022,503
Manor Township	10,400	\$20,927,614,237	0	\$0	281	\$2,308,115,469
Marietta Borough	1,402	\$754,834,832	1,221	\$626,312,563	26	\$40,621,857
Martic Township	4,469	\$2,359,595,108	644	\$261,676,503	1,551	\$639,322,496
Millersville Borough	2,611	\$4,408,036,349	0	\$0	1	\$539,021
Mount Joy Borough	3,925	\$4,719,474,554	0	\$0	0	\$0
Mount Joy Township	5,918	\$7,127,138,587	264	\$252,822,069	590	\$769,812,885
Mountville Borough	1,189	\$1,106,163,051	0	\$0	0	\$0
New Holland Borough	2,819	\$5,086,885,413	0	\$0	0	\$0
Paradise Township	4,470	\$4,125,868,997	0	\$0	926	\$439,412,519
Penn Township	6,163	\$6,256,819,382	1,238	\$995,062,366	26	\$12,078,775
Pequea Township	3,612	\$2,379,058,553	0	\$0	171	\$102,806,187
Providence Township	4,666	\$3,832,302,966	0	\$0	1,373	\$1,231,456,051
Quarryville Borough	1,451	\$1,138,506,005	0	\$0	11	\$2,830,535
Rapho Township	8,253	\$7,968,083,321	575	\$379,379,731	349	\$188,238,561
Sadsbury Township	2,765	\$2,150,137,506	0	\$0	195	\$108,453,417
Salisbury Township	8,204	\$7,541,703,016	2,039	\$1,055,315,085	1,281	\$729,696,814
Strasburg Borough	1,716	\$965,120,267	0	\$0	0	\$0
Strasburg Township	3,777	\$4,508,049,956	0	\$0	39	\$15,940,055
Terre Hill Borough	840	\$352,866,296	0	\$0	0	\$0
Upper Leacock Township	5,549	\$12,221,244,032	0	\$0	0	\$0
Warwick Township	8,483	\$13,241,309,844	0	\$0	57	\$24,600,804
West Cocalico Township	5,957	\$3,405,206,014	1,705	\$1,091,067,675	1,653	\$712,939,142
West Donegal Township	4,332	\$7,574,423,332	0	\$0	584	\$230,328,652
West Earl Township	5,356	\$5,324,536,861	0	\$0	0	\$0
West Hempfield Township	8,662	\$10,809,249,135	0	\$0	426	\$153,731,637
West Lampeter Township	7,031	\$18,752,932,700	0	\$0	221	\$116,399,749
<b>Lancaster County</b>	<b>285,764</b>	<b>\$427,554,965,900</b>	<b>19,028</b>	<b>\$12,682,104,639</b>	<b>19,801</b>	<b>\$12,410,047,128</b>

Source: Lancaster County 2023, 2024; RS Means 2024; USDA Forest Service Northern Research Station 2020





Table 4-107. Building Stock in the Wildland-Urban Interface/Intermix Hazard Areas by General Occupancy Class

Jurisdiction	Buildings in the WUI Interface Hazard Area				Buildings in the WUI Intermix Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>	Residential	Commercial	Industrial	Other <sup>a</sup>
Adamstown Borough	227	263	0	5	133	215	0	3
Akron Borough	0	0	0	0	8	3	0	0
Bart Township	0	0	0	0	42	68	0	3
Brecknock Township	923	1,481	0	81	252	1,275	1	30
Caernarvon Township	173	407	0	22	441	960	1	49
Christiana Borough	0	0	0	0	18	36	0	0
Clay Township	637	1,063	1	59	142	341	0	5
Colerain Township	0	0	0	0	72	119	1	18
Columbia Borough	0	0	0	0	4	12	0	0
Conestoga Township	12	20	0	2	627	834	1	47
Conoy Township	13	30	5	5	177	214	0	10
Denver Borough	0	0	0	0	7	0	0	0
Drumore Township	90	238	0	26	69	154	0	7
Earl Township	311	445	1	36	64	94	0	4
East Cocalico Township	148	303	0	17	290	661	4	25
East Donegal Township	340	249	1	21	5	9	0	0
East Drumore Township	0	0	0	0	81	86	0	0
East Earl Township	686	1,265	5	95	146	335	0	18
East Hempfield Township	0	0	0	0	22	3	0	0
East Lampeter Township	0	0	0	0	9	4	0	0
East Petersburg Borough	0	0	0	0	0	0	0	0
Eden Township	0	0	0	0	41	77	0	4
Elizabeth Township	485	660	0	53	236	377	3	12
Elizabethtown Borough	0	0	0	0	3	0	0	0
Ephrata Borough	0	0	0	0	50	14	0	0
Ephrata Township	0	0	0	0	149	113	2	3
Fulton Township	57	118	1	7	22	54	0	0
Lancaster City	0	0	0	0	27	25	0	0
Lancaster Township	0	0	0	0	167	69	0	2
Leacock Township	42	192	1	20	0	0	0	0
Lititz Borough	0	0	0	0	0	0	0	0
Little Britain Township	0	0	0	0	99	188	0	11



Jurisdiction	Buildings in the WUI Interface Hazard Area				Buildings in the WUI Intermix Hazard Area			
	Residential	Commercial	Industrial	Other <sup>a</sup>	Residential	Commercial	Industrial	Other <sup>a</sup>
Manheim Borough	0	0	0	0	0	0	0	0
Manheim Township	0	0	0	0	20	13	0	0
Manor Township	0	0	0	0	122	124	27	8
Marietta Borough	636	553	6	26	11	12	3	0
Martic Township	216	410	1	17	503	988	2	58
Millersville Borough	0	0	0	0	1	0	0	0
Mount Joy Borough	0	0	0	0	0	0	0	0
Mount Joy Township	54	185	0	25	183	386	1	20
Mountville Borough	0	0	0	0	0	0	0	0
New Holland Borough	0	0	0	0	0	0	0	0
Paradise Township	0	0	0	0	212	688	1	25
Penn Township	390	790	3	55	10	15	0	1
Pequea Township	0	0	0	0	66	101	1	3
Providence Township	0	0	0	0	505	820	7	41
Quarryville Borough	0	0	0	0	6	5	0	0
Rapho Township	180	364	2	29	127	216	0	6
Sadsbury Township	0	0	0	0	46	138	0	11
Salisbury Township	547	1,384	3	105	497	753	0	31
Strasburg Borough	0	0	0	0	0	0	0	0
Strasburg Township	0	0	0	0	10	28	0	1
Terre Hill Borough	0	0	0	0	0	0	0	0
Upper Leacock Township	0	0	0	0	0	0	0	0
Warwick Township	0	0	0	0	32	25	0	0
West Cocalico Township	496	1,137	0	72	552	1,069	2	30
West Donegal Township	0	0	0	0	334	247	0	3
West Earl Township	0	0	0	0	0	0	0	0
West Hempfield Township	0	0	0	0	192	225	1	8
West Lampeter Township	0	0	0	0	152	66	2	1
<b>Lancaster County</b>	<b>6,663</b>	<b>11,557</b>	<b>30</b>	<b>778</b>	<b>6,984</b>	<b>12,259</b>	<b>60</b>	<b>498</b>

Source: Lancaster County 2023, 2024; USDA Forest Service Northern Research Station 2020

a. Other = Government, Religion, Agricultural, and Education



Table 4-108. Lifeline Facility Exposure to the Wildfire Hazard

FEMA Lifeline Category	Number of Lifelines	Number of Lifelines Located in Wildland-Urban Interface Wildfire Hazard Area	Number of Lifelines Located in Wildland-Urban Intermix Wildfire Hazard Area
Communications	149	8	24
Energy	70	2	4
Food, Hydration, Shelter	12	0	1
Hazardous Materials	731	24	26
Health and Medical	1,147	7	9
Safety and Security	1,340	65	31
Transportation	44	2	0
Water Systems	449	12	30
Other Critical Facilities	2,534	168	127
<b>Total</b>	<b>6,476</b>	<b>288</b>	<b>252</b>

Source: Lancaster County 2008, 2019, 2023; HIFLD 2022, 2023; National Park Service; National Register of Historic Places; USDA Forest Service Northern Research Station 2020

Future Changes That May Impact Vulnerability

Projected Development

Areas targeted for potential future development have been identified across the County at the municipal level. Any new development in the WUI will be exposed to the wildfire hazard. Local fire suppression capabilities are high, but new development with a mix of additional structures, ornamental vegetation, and wildland fuels will require continued assessment of the hazard risk and mitigation. The County should implement wildfire management strategies in existing building codes to protect structures against residual impacts from wildfire such as heat, debris, and char. Communities at risk for wildfires can adopt by local ordinance the “International Wildland-Urban Interface Code” of the Uniform Construction Code. Furthermore, development should be built with access to transportation routes that will enable easier evacuation during a wildfire event.

Projected Changes in Population

Any changes in the density of population can impact the number of persons exposed to the wildfire hazard. Projections by the Center for Rural Pennsylvania indicate that Lancaster County’s population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).

Climate Change

According to U.S. Forest Service, climate change will likely alter the atmospheric patterns that affect fire weather. Changes in fire patterns will, in turn, affect carbon cycling, forest structure, and species composition. Climate change associated with elevated greenhouse gas concentrations may create an atmospheric and fuel environment that is more conducive to large, severe fires (USFS 2011).

Fire interacts with climate and vegetation (fuel) in predictable ways. Understanding the interactions of climate, fire, and vegetation is essential for addressing issues associated with climate change that include (USFS 2011):

- Effects on regional circulation and other atmospheric patterns that affect fire weather
- Effects of changing fire regimes on the carbon cycle, forest structure, and species composition
- Complications from land use change, invasive species, and an increasing WUI.



Nationwide, higher summer temperatures will likely increase the fire risk by 10 to 30 percent. Fire occurrence and areas burned could increase across the United States as a result of the increase of lightning activity; the frequency of surface pressure and associated circulation patterns conducive to surface drying; and fire weather conditions, in general, which are conducive to severe wildfires. Warmer temperatures will increase the effects of drought and increase the number of days each year with flammable fuels, extending fire seasons and areas burned (USFS 2011).

#### **Change of Vulnerability Since 2019 Hazard Mitigation Plan**

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Since the 2019 analysis, population statistics have been updated using the 2022 5-Year American Community Survey estimates. The general building stock inventory was updated to set replacement cost value for each building based on RSMMeans 2024 building valuations. An updated critical facility dataset was provided by the county.

Overall, the entire County continues to be vulnerable to wildfires. As the data and resources become available, a custom-building inventory can be generated to capture the construction of structures (such as roofing material, fire detection equipment, and structure age) to further refine the vulnerability analysis. Buildings constructed of wood or vinyl siding are generally more likely to be damaged by the fire hazard than buildings constructed of brick or concrete. The proximity of these building types to the WUI should be identified for further evaluation. Development and availability of these data would permit a more detailed estimate of potential vulnerabilities, including loss of life and potential structural damage.

Lancaster County Department of Public Safety has been working with the three primary affiliated forest fire crews to establish a joint working group. This group would focus topics surrounding any out-of-control fire in a wildland environment (woods / field / open land). This is different from Department of Conservation and Natural Resources (DCNR) forest fire crews who are limited to operate in wooded wildlands with DCNR approval. There are several areas this working group would focus on collectively.



## 4.3.20 Winter Storm

### Hazard Description

Winter storms are regional events and most often impact a large portion or all of Pennsylvania. Winter storms consist of cold temperatures, heavy snow or ice and sometimes strong winds. They begin as low-pressure systems that move through Pennsylvania usually following the jet stream. A winter storm can adversely affect roadways, utilities, business activities, and can cause loss of life, frostbite and freezing conditions. They can result in the closing of secondary roads, particularly in rural locations, loss of utility services and depletion of oil heating supplies (PEMA 2023). Flooding can result from winter storm events as well. Types of severe winter weather events or conditions are as follows (NWS 2009, NWS 2019):

- **Heavy Snow** is generally considered snowfall accumulating to a depth of 4 inches or more within 12 hours or snowfall accumulating to a depth of 6 inches or more within 24 hours.
- A **snow squall or snowstorm** is limited-duration period of moderate to heavy snowfall accompanied by strong, gusty surface winds and possibly lightning.
- **Blizzards** are characterized by low temperatures, wind gusts of 35 miles per hour (mph) or more and falling and/or blowing snow that reduces visibility to 0.25 mile or less for 3 hours or more. A severe blizzard is defined as having a wind velocity of 45 mph, temperatures of 10 °F or lower, and a high density of blowing snow with visibility frequently measured in feet over an extended period.
- **Sleet** is defined as pellets of frozen or mostly frozen raindrops or refrozen partially melted snowflakes. These ice pellets usually bounce after hitting the ground or other hard surfaces.
- **Freezing rain** is rain that falls as a liquid but freezes into a glaze upon contact with the ground.
- An **ice storm** is an occasion when damaging volumes of ice accumulate from freezing rain. Significant accumulations of ice pull down trees and utility lines, resulting in loss of power and means of communication. These accumulations of ice render walking and driving extremely dangerous and can create extreme hazards to motorists and pedestrians.
- **Nor'easters**—low pressure fronts that move northward along the Atlantic coastline, pulling large amounts of moisture off the Atlantic Ocean—progress generally northeastward and typically attain maximum intensity near New England and the Maritime Provinces of Canada. They nearly always bring precipitation in the form of heavy rain or snow, as well as winds of gale force, rough seas, and, occasionally, coastal flooding. These storms are most frequent and most violent between September and April. Effects on inland areas, like Lancaster County, may include heavy snow, strong winds, and blizzards.

From November through April, Pennsylvania is exposed to winter storms that move up the Atlantic coast or sweep in from the west. Every county in the Commonwealth is vulnerable to severe winter storms (PEMA 2023).

### Location and Extent

Major winter storms occur as regional events in Pennsylvania several times annually. Every county in the commonwealth, including Lancaster County, is subject to severe winter storms. According to Figure 4-35, between 1991 and 2020, Lancaster County experienced between 10.3 and 40 inches of snow each year (PEMA 2023). Being located in the southeast portion of Pennsylvania, Lancaster County often experiences the effects of Nor'easter storms.

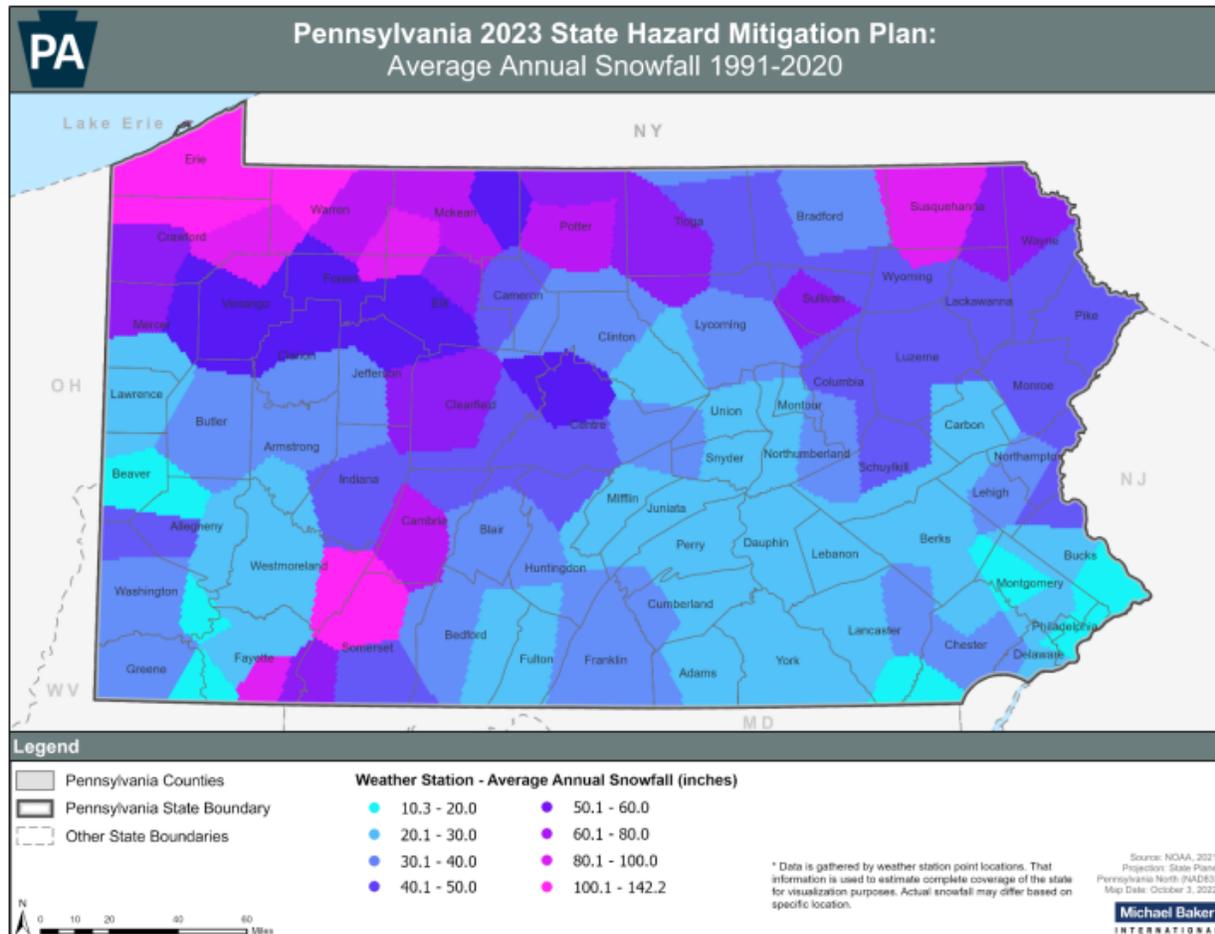
### Range of Magnitude

The National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) produce the Regional Snowfall Index (RSI) for significant snowstorms that affect the eastern two-thirds of the United States. The RSI ranks snowstorm impacts on a scale categorized from 1 to 5, as shown in Table 4-109, where the RSI values indicate the range of snowfall received (NCEI n.d.). It is based on the interaction of the area affected by the storm, the amount of snowfall, and the population (based on the 2010



Census) (Squires, et al. 2014). The NCEI has analyzed and assigned RSI values to over 500 storms since 1900 (NCEI n.d.).

Figure 4-35. Average Annual Snowfall (1991-2020) for Pennsylvania



Source: PEMA 2023

Table 4-109. RSI Ranking Categories

Category	Description	RSI Value
1	Notable	1-3
2	Significant	3-6
3	Major	6-10
4	Crippling	10-18
5	Extreme	18+

Source: NCEI n.d.

The magnitude or severity of a severe winter storm depends on several factors, including a region’s climatological susceptibility to snowstorms, snowfall amounts, snowfall rates, wind speeds, temperatures, visibility, storm duration, topography, time of occurrence during the day (e.g., morning vs. night), and season of the year. Due to their regular occurrence, these storms are considered hazards only when they result in damage



to communications networks, impact vegetation, cause structural collapse, or cause very serious transportation problems and utility interruptions. Winter storms have been known to contribute to severe flooding. A winter storm can adversely affect roadways, utilities, business activities, and can cause frostbite or loss of life.

Winter storm events can result in the closing of major or secondary roads, particularly in rural locations, stranded motorists, transportation accidents, loss of utility services, and depletion of heating supplies. High temperatures following a heavy snowfall can cause rapid surface water runoff and severe flooding.

**Past Occurrence**

**FEMA Major Disasters and Emergency Declarations**

There have been eight winter storm-related disaster (DR) or emergency (EM) declarations that included the Commonwealth of Pennsylvania, classified as one or a combination of the following disaster types: severe winter storms, snowstorms, blizzards, winter storms, and snowfalls. Generally, these disasters covered a wide region of the Commonwealth and may have impacted many counties. Lancaster County has been included in seven of these declaration, as listed in Table 4-110.

**Table 4-110. FEMA DR and EM Declarations for Winter Storm Events in Lancaster County**

FEMA Declaration Number	Dates of Event	Date of Declaration	Details
EM-3105-PA	March 13-17, 1993	March 16, 1993	Pennsylvania Severe Snowfall and Winter Storm
DR-1015-PA	January 4 – February 25, 1994	March 10, 1994	Pennsylvania Winter Storm, Severe Storm
DR-1085-PA	January 6-12, 1996	January 13, 1996	Pennsylvania Blizzard
EM-3180-PA	February 14-19, 2003	March 14, 2003	Pennsylvania Snowstorm
DR-1898-PA	February 5-11, 2010	April 16, 2010	Pennsylvania Severe Winter Storms and Snowstorms
EM-3367-PA	February 4-20, 2014	February 6, 2014	Severe Winter Storm in Pennsylvania
DR-4267-PA	January 22-23, 2016	March 23, 2016	Severe Winter Storm and Snowstorm in Pennsylvania

Source: FEMA 2023

**Past Events**

The worst winter storm in Lancaster County occurred March 13 – 14, 1993. A blizzard dropped nearly 3 feet of snow on the county with significant drifting, causing many primary and secondary road closures. Both the County and Commonwealth emergency operations centers (EOCs) were staffed around the clock, working to provide food, medicine, and fuel to stranded motorists. There were two fatalities and an estimated \$5 million in property damage (1993 dollars). All airports and highways throughout the Commonwealth were closed, and the state of emergency lasted for nearly a week.

Table 4-111 lists known severe winter weather events that impacted Lancaster County between 2013 and 2024. This includes events listed in the 2019 Lancaster County HMP, the 2023 Pennsylvania HMP, and the NOAA-NCEI storm events database. Other data sources may include additional events, so those presented in the table represent a minimum for the county.



Table 4-111. Major Winter Storm Events in Lancaster County between 2013 and 2024

Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated ?	Description
December 14-15, 2013	Winter Storm	Countywide	N/A	N/A	Snow accumulations in excess of 6 inches overspread the area. A changeover from snow to sleet and freezing rain, with significant ice accretions was observed. The wintry precipitation tapered off to light snow and freezing drizzle. The heavy snow topped by a layer of ice caused dangerous travel conditions, with numerous vehicle accidents resulting in major road closures, including portions of I-80, I-81, and US-322.
January 2-3, 2014	Heavy Snow	Countywide	N/A	N/A	Heavy snow fell with occasional 1 inch/hour snowfall rates, producing accumulations between 4 and 8 inches.
January 20, 2014	Heavy Snow	Countywide	N/A	N/A	Heavy snow produced accumulations of 6 to 8 inches. Hazardous driving conditions were commonplace. Schools were closed across most of southern Pennsylvania.
February 3, 2014	Heavy Snow	Countywide	N/A	N/A	Heavy snowfall produced 4 to 8 inches of snow along and south of the US-22/I-81 corridors, with 2 to 4 inches to the north from US-22 to I-80.
February 4-5, 2014	Winter Storm	Countywide	EM-3367-PA	Yes	A wintry mix of heavy snow, sleet, freezing rain, and rain occurred across the region. Widespread heavy icing (0.25- to 0.50 inches) was observed. Total snow accumulations ranged from 6 to 10 inches. The heavy snow and significant icing prompted many schools to close. Road travel was extremely dangerous across the area, with severe traffic impacts. The storm downed several trees and utility lines, creating widespread power outages. Nearly 850,000 customers statewide were without power (primarily in southeastern Pennsylvania). The commonwealth EOC maintained activation throughout the storm. Shelters and warming centers were opened throughout the southeast region. The Governor declared a disaster emergency for Lancaster County.
February 13-14, 2014	Heavy Snow	Countywide	EM-3367-PA	Yes	Heavy snow produced accumulations of 12 to 18 inches over the south-central and lower Susquehanna Valley zones, 6 to 12 inches over the central ridge-valley and the mid/upper Susquehanna Valley, and 2 to 5 inches in the northwest mountains.
November 25-26, 2014	Heavy Snow	Countywide	N/A	N/A	Heavy snowfall produced accumulations of 4 to 8 inches. Numerous offices and schools were closed, and multiple flights were delayed or cancelled. The storm made the Northeast Snowfall Impact Scale (NESIS) scale as a category 1.
January 22-23, 2016	Winter Storm	Countywide	DR-4267-PA	Yes	A Nor'easter produced record-breaking snowfall across southern Pennsylvania, with a large swath of 20+ inches of snow and localized areas of 30+ inches. The storm was rated as a Category 4 (crippling) on the Regional Snowfall Index for the northeastern United States. The Governor declared a disaster emergency. Snowfall amounts of 21 to 28 inches were observed across the county, along with near-blizzard conditions. A 70-year-old Willow Street man and a 76-year-old Elizabethtown man died of cardiac arrest while clearing snow.
February 8-9, 2016	Winter Storm	Countywide	N/A	N/A	A winter storm produced 5 to 8 inches of snow across the Lower Susquehanna Valley, with lighter amounts to the north and west.
February 15-16, 2016	Winter Storm	Countywide	N/A	N/A	A winter storm spread a couple inches of snow before changing to a wintry mix of sleet and freezing rain. A quarter of an inch or more of ice accumulation was observed across the county.



Dates of Event	Event Type	Location	FEMA Declaration Number	County Designated ?	Description
March 13-14, 2017	Winter Storm	Countywide	N/A	N/A	A winter storm produced 5 to 10 inches of snow across Lancaster County.
March 20-21, 2018	Winter Storm	Countywide	N/A	N/A	A snowstorm produced 10 to 18 inches of snow in a 24-hour period across Lancaster County.
November 15-16, 2018	Winter Storm	Countywide	N/A	N/A	A winter storm produced 4 to 8 inches of snow and sleet across Lancaster County.
February 11-12, 2019	Winter Storm	Countywide	N/A	N/A	Snow fell before changing over to sleet and freezing rain. The storm produced 2 to 4 inches of snow and sleet, and greater than 0.25 inches of freezing rain and ice accumulation across Lancaster County.
February 20-21, 2019	Winter Storm	Countywide	N/A	N/A	A winter storm produced 3 to 6 inches of snow and sleet followed by greater than 0.25 inches of freezing rain across Lancaster County.
March 3-4, 2019	Winter Storm	Countywide	N/A	N/A	A winter storm produced up to 7 inches of snow across Lancaster County.
December 16-17, 2020	Winter Storm	Countywide	N/A	N/A	A Nor'easter produced 6 to 10 inches of snow across Lancaster County. Widespread travel impacts were observed.
January 31 – February 2, 2021	Winter Storm	Countywide	N/A	N/A	A winter storm produced 9 to 16 inches of snow across Lancaster County.
February 18, 2021	Winter Storm	Countywide	N/A	N/A	A winter storm produced 6 to 8 inches of snow across southern Lancaster County, most of which fell in an 11-hour period.
February 22, 2021	Winter Weather	Countywide	N/A	N/A	A snow squall dropped visibility to under one quarter mile and produced flash-freeze conditions in northwestern Lancaster County.
January 6-7, 2022	Winter Storm	Countywide	N/A	N/A	A winter storm produced 5 inches of snow across Lancaster County.
January 17, 2022	Winter Weather	Countywide	N/A	N/A	A Nor'easter produced 2 to 11 inches of snowfall. The lowest snowfall amounts fell in the Lower Susquehanna Valley and the highest amounts fell across the northwest mountains. There was also a period of sleet and freezing rain, producing less than 0.10 inches of ice accretion. A disabled tractor trailer closed the westbound lanes of I-283 at the Route 743 exit in Mount Joy.
January 23, 2022	Winter Weather	Countywide	N/A	N/A	A winter storm produced 1 to 3 inches of snow. Multiple accidents were reported due to slick conditions on the Pennsylvania Turnpike near mile post 293.5 in Lancaster County.
March 12, 2022	Winter Storm	Countywide	N/A	N/A	A winter storm produced 3 to 5 inches of snow across Lancaster County in less than 12 hours. Gusty northwest winds resulted in blowing snow and reduced visibilities. An eight-vehicle accident occurred on the eastbound lanes of the Pennsylvania Turnpike at the Lebanon Interchange, closing the eastbound lanes.
December 15, 2022	Winter Weather	Countywide	N/A	N/A	A wintry mix of sleet, freezing rain, and snow fell; widespread accumulations of sleet over 1 inch, along with some freezing rain and snow. There were reports of up to 0.25 inches of ice accretion from freezing rain across portions of southern Pennsylvania. 0.10 to 0.20 inches of freezing rain fell across Lancaster County. An accident on Pennsylvania Route 23 in Manheim Township closed the road in both directions from Pleasure Road to US Route 30 for over an hour.

Source: FEMA 2023; NOAA NCEI 2023; PEMA 2023



Many sources were consulted to provide an update of previous occurrences and losses; event details and loss/impact information may vary and have been summarized in the above table. No property damage or crop loss was reported by NOAA and USDA.

### Future Occurrence

Given the history of winter storm events that have impacted Lancaster County, future winter storm events of varying degrees will occur every year. For the 2025 HMP update, the most up-to-date data was collected to calculate the probability of future occurrence of winter storm (heavy snow, blizzard, sleet/freezing rain, winter weather, and winter storm) events for Lancaster County. Information from the NOAA-NCEI storm events database was used to identify the number of winter storm events between 1996 and 2023. Table 4-112 shows these statistics, as well as the annual average number of events and the estimated percent chance of an incident occurring in a given year. Based on available historical data, future occurrences of winter storm events are considered likely.

Table 4-112. Probability of Future Winter Storm Events

Hazard Type	Number of Occurrences Between 1996 and 2023	Percent Chance of Occurrence in Any Given Year
Blizzard	1	3.70%
Heavy Snow	28	100%
Ice Storm	7	25.93%
Winter Storm	32	100%
Winter Weather	5	18.52%

Source: FEMA 2023; NOAA NCEI 2023

Note: Disaster occurrences include federally declared disasters since the 1950 Federal Disaster Relief Act, and selected storm events since 1950. Due to limitations in data, not all winter storm events occurring between 1950 and 1996 are accounted for in the tally of occurrences. As a result, the number of hazard occurrences is underestimated.

### Vulnerability Assessment

All of Lancaster County has been identified as the hazard area for winter storm. Therefore, all assets (population, structures, critical facilities, and lifelines) are potentially vulnerable.

#### Life, Health, and Safety

##### General Population

Winter weather indirectly kills hundreds of people in the United States every year. Most deaths and other impacts or losses are indirectly related to the storm. People can die in traffic accidents on icy roads, of heart attacks while shoveling snow, or of hypothermia from prolonged exposure to cold (NOAA 2023).

##### Socially Vulnerable Populations

The elderly (there are 104,082 persons over the age of 65 in Lancaster County) are considered most susceptible to the winter storm hazard because of their increased risk of injuries and death from falls and overexertion and/or hypothermia from exposure while attempting to clear snow and ice. In addition, winter storm events can reduce ability of these populations to access emergency services. People who are homeless or who live below the poverty level may not have access to adequate shelter against the cold (e.g., homes with poor insulation and heating supply). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

As shown in Table 4-25, Manheim Township has the highest population over 65 (10,059), and Lancaster City has the highest population of people under 5 (3,944), non-English speaking persons (4,326), people with



disabilities (8,935), and the people living in poverty (10,197). For more information on socially vulnerable populations in Lancaster County, refer to Section 2.3.2.

**Table 4-113. Socially Vulnerable Lancaster County Populations**

Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
Adamstown Borough	250	193	33	112	236
Akron Borough	792	395	121	503	376
Bart Township	380	350	180	317	148
Brecknock Township	1,077	609	33	441	203
Caernarvon Township	792	338	129	492	361
Christiana Borough	226	67	7	146	89
Clay Township	1,203	457	105	531	369
Colerain Township	607	443	281	283	704
Columbia Borough	2,176	344	255	1,943	1,646
Conestoga Township	690	111	0	510	239
Conoy Township	505	241	0	465	244
Denver Borough	616	208	113	325	255
Drumore Township	329	174	136	279	188
Earl Township	1,842	650	216	711	710
East Cocalico Township	2,028	397	232	1,127	549
East Donegal Township	1,297	626	25	775	307
East Drumore Township	994	279	0	469	289
East Earl Township	1,439	384	286	654	234
East Hempfield Township	6,926	895	451	2,705	798
East Lampeter Township	2,836	1,378	815	1,932	1,586
East Petersburg Borough	975	156	0	625	309
Eden Township	284	259	28	140	97
Elizabeth Township	868	273	0	251	184
Elizabethtown Borough	1,834	531	495	1,586	812
Ephrata Borough	2,400	929	1,155	2,328	1,269
Ephrata Township	2,066	452	407	1,138	552
Fulton Township	459	433	126	276	239
Lancaster City	5,386	3,944	4,326	8,935	10,197
Lancaster Township	4,111	1,387	964	1,856	1,633
Leacock Township	844	422	162	323	338
Lititz Borough	2,418	565	95	953	342
Little Britain Township	863	315	263	494	397
Manheim Borough	571	517	36	666	558
Manheim Township	10,059	2,282	732	4,849	2,407
Manor Township	4,135	1,255	1,400	2,590	2,123
Marietta Borough	708	176	0	435	336
Martic Township	736	526	25	630	347
Millersville Borough	1,031	144	49	874	1,809
Mount Joy Borough	1,525	441	170	1,133	894
Mount Joy Township	1,571	702	90	956	460
Mountville Borough	792	158	0	320	313



Jurisdiction	Persons Over 65	Persons Under 5	Non-English-Speaking Persons	Persons with a Disability	Persons in Poverty
New Holland Borough	1,152	366	46	654	323
Paradise Township	713	487	79	583	482
Penn Township	2,413	537	67	777	424
Pequea Township	997	358	0	526	249
Providence Township	1,552	332	56	957	695
Quarryville Borough	444	194	0	370	476
Rapho Township	2,855	608	0	1,342	378
Sadsbury Township	446	450	54	313	379
Salisbury Township	1,177	1,091	384	845	665
Strasburg Borough	821	177	0	311	192
Strasburg Township	741	521	0	287	371
Terre Hill Borough	145	102	0	140	119
Upper Leacock Township	1,358	615	590	894	718
Warwick Township	3,917	922	196	1,591	1,066
West Cocalico Township	1,009	825	51	557	620
West Donegal Township	3,367	346	0	1,265	546
West Earl Township	1,685	771	234	618	299
West Hempfield Township	3,293	960	570	2,214	496
West Lampeter Township	5,356	641	100	2,073	550
<b>Lancaster County</b>	<b>104,082</b>	<b>34,709</b>	<b>16,368</b>	<b>62,395</b>	<b>44,195</b>

Source: U.S. Census Bureau 2022 ACS Vulnerable Population Totals

### General Building Stock

The entire general building stock inventory in Lancaster County is vulnerable to the winter storm hazard. In general, structural impacts include damage to roofs and building frames rather than building contents. Current modeling tools are not available to estimate specific losses from this hazard.

An area especially vulnerable to the winter storm hazard is the floodplain. Snow and ice melt can cause both riverine and urban flooding. Generally, losses from flooding associated with winter storms should be less than those associated with a 1 percent or 0.2 percent annual chance flood.

### Community Lifelines and Other Critical Facilities

Full functionality of community lifelines and other critical facilities such as police, fire and medical facilities is essential for response during and after a severe winter storm event to ensure functionality of the community lifeline. These critical facility structures are largely constructed of concrete and masonry; therefore, they should only suffer minimal structural damage from severe winter storm events. Because power interruption can occur, backup power is recommended.

Infrastructure at risk for this hazard includes roadways that could be damaged due to the application of salt and intermittent freezing and warming conditions that can damage roads over time. Severe snowfall requires the clearing of roadways and alerting of citizens to dangerous conditions; following the winter season, resources for road maintenance and repair are required (NWS 2019). Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians. Bridges and overpasses are particularly dangerous because they freeze before other surfaces.



## Economy

The economic impact of winter weather each year is huge, with costs for snow removal, damage, and loss of business in the millions. Heavy snow can immobilize a region, shutting down all air and rail transportation and disrupting medical and emergency services. The weight of snow can cause roofs to collapse and knock down trees and power lines. Homes and farms may be isolated for days, and unprotected livestock may be lost (NWS 2019).

The cost of snow and ice removal and repair of roads from the freeze/thaw process can drain local financial resources. Another impact on the economy includes impacts on commuting into or out of the area for work or school. The loss of power and closure of roads prevents the commuter population traveling to work.

According to the 2017 USDA Agricultural Census, Lancaster County has 19 percent of Pennsylvania's agricultural sales, equaling to roughly \$1.2 million in total (inclusive of livestock, poultry, and products) (USDA 2017). Losses due to winter storms have occurred in Lancaster County. In 2022, the agricultural community in the County experienced a \$4,343 loss due to frost and freeze.

## Environment

Severe winter weather can have a major impact on the environment. Winter weather creates changes in natural processes, and the residual impacts of a community's methods to maintain its infrastructure through winter weather maintenance may also have an impact on the environment. For example, an excess amount of snowfall and earlier warming periods may affect natural processes such as flow within water resources (NSIDC n.d.). Rain-on-snow events can also exacerbate runoff rates with warming winter weather. Consequentially, these flow rates and excess volumes of water can erode banks, tear apart habitat along the banks and coastline, and disrupt terrestrial plants and animals.

Chemically based winter maintenance practices have their own effect on the natural environment. Melting snow and ice that carry de-icing chemicals onto vegetation and into soils can contaminate local waterways. Elevated salt levels may hinder vegetation from absorbing nutrients, slowing plant growth. Road-salt runoff can cause groundwater salinization, modify the soil structure, and result in loss or reduction in lake turnover. Additionally, road salt can cause changes in the composition of aquatic invertebrate assemblages and pose threats to birds, roadside vegetation, and mammals (Tiwari and Rachlin 2018).

Environmental impacts can include damage to brush and trees due to heavy snow loading, ice build-up, and/or high winds, which can break limbs or even bring down large trees. Gradual melting of snow and ice provides excellent groundwater recharge.

## Future Growth and Development

### Projected Development

As discussed in Section 4.4.4, areas targeted for future growth and development have been identified across Lancaster County. Any areas of growth could be impacted by the severe winter weather hazard because the entire County is exposed and vulnerable. However, due to increased standards and codes, new development may be less vulnerable to the severe winter weather hazard than the aging building stock in the County.

### Projected Changes in Population

Municipalities that experience increases in population may require utility system upgrades to keep up with utility demands (e.g., water, electric) during winter weather events to prevent increased stresses on these systems. Projections by the Center for Rural Pennsylvania indicate that Lancaster County's population will increase by about 30,000 by 2040—a 5.6 percent increase from 2020 (Center for Rural PA 2023). The Pennsylvania Department of Environmental Protection estimates that the population of the county will grow by about 90,000 by 2040—a 16.9 percent increase from 2020 (PA DEP 2012).



### Climate Change

The May 2021 Pennsylvania Climate Impact Assessment indicated that Pennsylvania is very likely to undergo increased temperatures and precipitation in the 21st century. An overall increase in winter precipitation is anticipated, with decrease in snow and increase in rain during the winter. Based on available information and projections, winter storms are anticipated to continue to affect Pennsylvania in the future. Future improvements in modeling smaller-scale climatic processes can be expected and will lead to improved understanding of ways in which changing climate will alter temperature, precipitation, and storm events in Pennsylvania (Commonwealth of Pennsylvania 2021).

### Change of Vulnerability Since 2019 Hazard Mitigation Plan

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Since the 2019 analysis, the County's risk to winter storms has not changed.



## 4.4 HAZARD VULNERABILITY SUMMARY

### 4.4.1 Risk Assessment Methodology

#### Asset Inventories

Lancaster County identified county assets to assess potential exposure and loss associated with the hazards of concern. For the HMP update, Lancaster County assessed the vulnerability of the following types of assets: population, buildings, and community lifelines and other critical facilities. Some assets are more vulnerable because of their physical characteristics or socioeconomic uses. To protect individual privacy and the security of community lifelines and other critical facilities, information on properties assessed is presented in aggregate without details about specific individual personal or public properties.

#### Population

##### General Population

Lancaster County used the total population statistics from the 2020 Decennial Census data and 2018-2022 American Community Survey (ACS) 5-year estimate to assess risks to the county's population. Population statistics by jurisdiction were extracted directly from the Census Bureau and ACS and were averaged among the total number of residential properties to estimate the population at the structure level. This estimate provides a more precise distribution of population across the county compared to only using the Census block or Census tract boundaries. Limitations of these analyses are recognized, so the results are used only to provide a general estimate for planning purposes.

##### Socially Vulnerable Population

Some populations are at greater risk from hazard events because of decreased resources or physical abilities. Vulnerable populations in Lancaster County included in the risk assessment are children, elderly, and people living in low-income households.

#### Buildings

For this update, a custom-building inventory for Lancaster County was developed at the structure level. The updated building stock was integrated into Hazus. The building stock update was performed by using the most current parcels, building footprints, and tabular assessor data, which were provided by Lancaster County (2023, 2024). The building inventory attributes were updated using the same datasets. Attributes provided in the associated files were used to further define each structure, such as year built, number of stories, basement type, occupancy class, and square footage.

The centroid of each building footprint was used to estimate the building location in most of the inventory. For the remainder of the inventory, where there was evidence of multiple structures on a parcel, the tabular assessor data was joined to these structures, and their parcel centroid was used to estimate the building location. This is due to limitations in accurately plotting each structure's location with the corresponding attributes from the tabular assessor data. It was determined that preserving the attributes were a higher priority in these structures.

Structural and content replacement cost values (RCV) were calculated for each building using assessor data, the building footprint, and RSMMeans 2024 values. The analysis used residential and non-residential location factors associated by location zip-code, as follows:

- Zip codes beginning with 170—Residential 0.96; Non-Residential 0.99
- Zip codes beginning with 175—Residential 0.92; Non-Residential 0.94
- Zip codes beginning with 176—Residential 0.92; Non-Residential 0.94
- Zip codes beginning with 193—Residential 1.02; Non-Residential 1.04
- Zip codes beginning with 195—Residential 0.96; Non-Residential 0.99



RCV is the current cost of returning a destroyed asset to its pre-damaged condition using present-day cost of labor and materials. Total RCV consists of both the structural cost to replace a building and the estimated value of contents of a building.

The occupancy classes available in Hazus were condensed into the categories of residential (both multi-family and single-family), commercial, industrial, and other (agricultural, religious, governmental, and educational) to facilitate analysis and presentation of results.

Community Lifelines and Other Critical Facilities

The critical facility inventory, which includes essential facilities, utilities, transportation features, and user-defined facilities (as outlined in Appendix I), was updated with GIS data provided by Lancaster County and supplemented data from Homeland Infrastructure Foundation-Level Data (HIFLD), and the National Park Service/National Register of Historic Places. The development of this inventory involved a review for accuracy, additions, or deletions of new or moved critical assets, identification of backup power for each asset (if known) and whether the critical facility is considered a lifeline in accordance with FEMA’s definition (refer to Appendix G, Critical Facilities). To protect individual privacy and the security of assets, information is presented in aggregate, without details about specific individual properties or facilities.

New Development

The 2022 American Community Survey estimates that Lancaster County has 218,987 housing units. Between the 2010 and 2020, the County has seen the construction of 12,113 housing units.

Vulnerability and Loss Estimation

Hazus Model

Hazus is FEMA’s GIS-based software tool for estimating losses caused by earthquake, wind and flood (riverine) hazards based on engineering and scientific risk calculations. Its methodologies provide a consistent framework for assessing risk across a variety of hazards. Hazus uses GIS technology to produce damage reports, detailed maps, and analytical reports that estimate a community’s direct physical damage to building stock, community lifelines, transportation systems, and utility systems. To generate this information, Hazus uses default data for inventory, vulnerability, and hazards. This default data can be supplemented with local data to provide a more refined analysis. Table 4-114 describes the levels of analyses that can be conducted using the Hazus software.

Table 4-114. Summary of Hazus Analysis Levels

Table with 2 columns: Level and Description. Level 1: Minimal outside data collection. Level 2: Augmenting with local data. Level 3: Adjusting built-in models with local data.

Damage estimates can include induced damage (inundation, fire, threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, economic impact) depending on the hazard and available local data. The open data architecture of Hazus can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage.

In general, probabilistic analyses were performed to develop expected and estimated distribution of losses (mean return period losses) for the flood, earthquake, and wind hazards. The probabilistic model generates estimated damage and losses for specified return periods (e.g., 100- and 500-year). For annualized losses, Hazus calculates the maximum potential annual dollar loss resulting from various return periods averaged on a per year basis. The



model sums all Hazus-supplied return periods (e.g., 10, 50, 100, 200, 500) multiplied by the return period probability (as a weighted calculation) to calculate the estimated cost of a hazard each year.

**Hazard-Specific Analyses**

The risk assessment used standardized tools, combined with local, state, and federal data and expertise, to assess potential vulnerability and losses associated with hazards of concern. Three levels of analysis were used, depending upon the data available for each hazard:

- **Historical Occurrences and Qualitative Analysis (Q)**—This analysis examines historical impacts to understand potential impacts of future events of similar size. Potential impacts and losses are discussed qualitatively using best-available data and subject matter expertise.
- **Vulnerability Analysis (V)**—This analysis overlays available spatial hazard layers with the asset inventory to determine which assets intersect with the hazard’s expected path and impacts.
- **Loss Estimation (H)**—The FEMA Hazus modeling software was used to estimate potential losses for the following hazards: flood, earthquake, and wind (using the Hazus hurricane model).

Table 4-115 summarizes the type of analysis conducted by hazard of concern. The sections below provide additional information on the risk assessment approach for each hazard.

**Table 4-115. Summary of Risk Assessment Analyses**

Hazard	Data Analyzed			
	Population	General Building Stock	Community Lifelines and Other Critical Facilities	Environment
Cyber Incidents	Q	Q	Q	Q
Dam Failure	V	V	V	Q
Drought	Q	Q	Q	Q
Earthquake	H	H	H	H
Environmental Hazards—Gas and Liquid Pipelines	V	V	V	V
Environmental Hazards—Hazardous Materials Releases	V	V	V	V
Extreme Temp	Q	Q	Q	Q
Flood, Flash Flood, Ice Jams	V, H	V, H	V, H	V, H
Hailstorms	Q	Q	Q	Q
Invasive Species	Q	Q	Q	Q
Nuclear Incidents	Q	Q	Q	Q
Pandemic and Infectious Disease	Q	Q	Q	Q
Radon Exposure	Q	Q	Q	Q
Subsidence and Sinkholes	V	V	V	V
Substance Use Disorder and Mental Health	Q	Q	Q	Q
Terrorism	Q	Q	Q	Q
Tornado and Windstorms	H	H	H	H
Transportation Accidents	Q	Q	Q	Q
Utility Interruption	Q	Q	Q	Q
Wildfire	V	V	V	V
Winter Storms	Q	Q	Q	Q

*V = Vulnerability analysis; H = Hazus analysis; Q = Qualitative analysis*



### Dam Failure

Lancaster County assessed the dam failure hazard area by leveraging the FEMA DSS-WISE program to develop spatial dam inundation hazard areas for the eleven high hazard dams analyzed. To estimate exposure to the dam failure hazard, the individual dam inundation boundaries were overlaid on the centroids of updated assets (population, building stock, and critical facilities). Centroids that intersected the dam inundation boundaries were totaled to estimate the building replacement cost value and population vulnerable to the dam failure hazard area.

### Earthquake

Lancaster County conducted a probabilistic assessment for the 500-year mean return period (MRP) earthquake through a Level 2 analysis in Hazus to analyze the earthquake hazard and provide a range of loss estimates. The probabilistic method uses information from historical earthquakes and inferred faults, locations and magnitudes, and computes the probable ground shaking levels that may be experienced during a recurrence period by Census tract.

As noted in the Hazus Earthquake User Manual, “Although the software offers users the opportunity to prepare comprehensive loss estimates, it should be recognized that uncertainties are inherent in any estimation methodology, even with state-of-the-art techniques. Any region or city studied will have an enormous variety of buildings and facilities of different sizes, shapes, and structural systems that have been constructed over a range of years under diverse seismic design codes. There are a variety of components that contribute to transportation and utility system damage estimations. These components can have differing seismic resistance.” However, the Hazus potential loss estimates are acceptable for the purposes of this HMP.

Groundwater was set at a depth of 5 feet (default setting). The default assumption is a magnitude 7.0 earthquake for all return periods. Although damage is estimated at the census tract level, results were presented at the municipal level. Since multiple census tracts contain more than one jurisdiction, a density analysis was used to extract the percent of building structures that fall within each tract and jurisdiction. The percentage was multiplied against the results calculated for each tract and summed for each municipality.

Damage estimates are calculated for losses to buildings (structural and non-structural) and contents; structural losses include load-carrying components of the structure, and non-structural losses include those to architectural, mechanical, and electrical components of the structure, such as nonbearing walls, veneer and finishes, HVAC systems, boilers, etc.

### Environmental Hazard—Hazardous Material Release

Data regarding hazardous materials incidents were obtained from Lancaster County and the Planning Partnership as well as appropriate state and federal resources. An exposure analysis was conducted for the county’s assets (population, building stock, community lifelines and other critical facilities) using a radius around potential hazardous materials incident sites as follows: exposure within a quarter mile of major roadways, railways, and pipelines, as well as exposure within unique radii supplied by the county for hazardous material fixed facilities.

To estimate exposure to hazardous materials, the buffered datasets were overlaid on the centroids of updated assets. Centroids that intersected the hazardous materials buffer areas were totaled to estimate the building replacement cost value and population vulnerable to hazardous material release.

### Flood, Flash Flood, Ice Jam

Lancaster County examined the 1 percent and 0.2 percent annual chance flood events to evaluate the county’s risk from the flood hazard. These flood events are generally those considered by planners and evaluated under federal programs, such as NFIP.

The flood data and depth grid developed from the 2019 HMP were used to evaluate exposure potential future losses for this plan update. The FEMA Lancaster County Risk Map (2016) and 5-foot contour data were used to develop the flood depth grid in the last plan. Lancaster County used the effective Lancaster County FEMA



DFIRM published in 2016 to evaluate exposure to the county’s assets. The depth grid developed was integrated into the Hazus riverine model to estimate potential losses for the 1 percent annual chance flood event.

To estimate exposure to the 1 percent- and 0.2 percent annual chance flood events, the DFIRM flood boundaries were overlaid on the centroids of updated assets (population, building stock, and critical facilities). Centroids that intersected the flood boundaries were totaled to estimate the building replacement cost value and population vulnerable to the flood inundation areas. A Level 2 Hazus riverine flood analysis was performed. The community lifelines and other critical facilities were formatted to be compatible with Hazus and its Comprehensive Data Management System. Once updated with the inventory data, the Hazus riverine flood model was run to estimate potential losses in Lancaster County for the 1 percent annual chance flood event. Hazus calculated the estimated potential losses to the population (default 2020 U.S. Census data across dasymetric blocks), potential damage to the general building stock, and potential damage to critical facility inventories based on the depth grids generated and the default Hazus damage functions in the flood model.

### **Subsidence/Sinkholes**

Lancaster County assessed the subsidence/sinkhole hazard area with delineated areas of limestone bedrock, which was sourced from Pennsylvania DCNR (2024). To estimate exposure to the subsidence hazard, the limestone bedrock boundaries were overlaid on the centroids of updated assets (population, building stock, and critical facilities). Centroids that intersected the limestone bedrock boundaries were totaled to estimate the building replacement cost value and population vulnerable to the subsidence hazard areas.

### **Tornado/Windstorm**

A level 2 Hazus hurricane analysis was performed for the 500- year mean return period. The probabilistic Hazus hurricane model activates a database of thousands of potential storms reflecting the full spectrum of Atlantic hurricanes observed since 1886. The analysis for this HMP identified those with tracks affecting Lancaster County. Hazus contains data on historical hurricane events and wind speeds. It also includes surface roughness and vegetation (tree coverage) maps for the area, which support the modeling of wind force.

Default demographic and updated building and critical facility inventories in Hazus were used for the analysis. Although damage is estimated at the census tract level, results were presented at the municipal level. Because there are multiple census tracts that contain more than one jurisdiction, a density analysis was used to extract the percent of building structures that fall within each tract and jurisdiction. The percentage was multiplied against the results calculated for each tract and summed for each jurisdiction.

### **Wildfire**

Lancaster County referenced wildfire-urban interface (interface and intermix) mapping obtained from the SILVIS Laboratory, Department of Forest Ecology and Management, University of Wisconsin—Madison, to delineate wildfire hazard areas. The data are based on the 2020 Census and 2021 National Land Cover Dataset (NLCD) developed by Multi-Resolution Land Characteristics (MRLC) Consortium. For this risk assessment, the high-, medium-, and low-density interface areas were combined and used as the “Interface” hazard area, and the high-, medium-, and low-density intermix areas were combined and used as the “Intermix” hazard areas.

Asset data (population, building stock, and critical facilities) were used to support an evaluation of assets exposed and potential impacts and losses associated with this hazard. To determine what assets are exposed to wildfire, available and appropriate GIS data were overlaid with the hazard area.

### **Qualitative Analyses**

For many of the hazards evaluated in this risk assessment, historical data are not adequate to model future losses at this time. Where GIS data are not available, Lancaster County conducted a qualitative analysis for the following hazards using the best available data and professional judgment. Multiple federal, state, and academic sources were used to evaluate these hazards:

- Cyber incidents



- Dam failure
- Drought
- Environmental hazard—hazardous material release
- Hailstorms
- Invasive species
- Nuclear incidents
- Pandemic and infectious disease
- Radon exposure
- Substance use disorder
- Terrorism
- Tornado and windstorm
- Transportation accidents
- Utility interruption
- Winter storm

Data Source Summary

Table 4-116 summarizes the sources of data used in the risk assessment.

Table 4-116. Data Source Summary

Data	Source	Date	Format
Population data	U.S. Census Bureau; American Community Survey 5-Year Estimates	2020; 2018-2022	CSV converted to Digital (GIS) format
Building Inventory	Lancaster County; RS Means	2023, 2024; 2024	Digital (GIS) format; Text File (.txt) format
Community lifelines and other critical facilities	Lancaster County; HIFLD; National Park Service/National Register of Historic Places	2008, 2019, 2023; 2022-2023	Digital (GIS) format
Dam Inundation Boundaries	DSS-WISE	2025	Digital (GIS) format
Risk Maps; DFIRM	FEMA	2016/2017	Digital (GIS) format
Road Network	Lancaster County	2023	Digital (GIS) format
Rail Network	Lancaster County	2023	Digital (GIS) format
Wildfire	University of Wisconsin-Madison; MRLC Consortium, U.S. Census Bureau	2023; 2021; 2020	Digital (GIS) format
Limestone Bedrock	Pennsylvania DCNR	2024	Digital (GIS) format
Pipelines	HIFLD	2019, 2023	Digital (GIS) format
Tier II Facilities	Lancaster County	2023	CSV converted to Digital (GIS) format
Land Use	NLCD/USGS	2021	Digital (GIS) format

Limitations

Uncertainties are inherent in any loss estimation methodology, due to factors such as the following:

- Incomplete scientific knowledge about natural hazards and their effects on the built environment
- Approximations and simplifications necessary to estimate losses for large numbers of assets
- Incomplete or dated inventory, demographic, or economic parameter data
- The unique nature, geographic extent, and severity of each hazard
- Mitigation measures already employed by the participating municipalities



- The amount of advance notice residents have to prepare for a specific hazard event

These factors can result in a range of uncertainty in loss estimates, possibly by a factor of two or more. Therefore, potential exposure and loss estimates are approximate. These results do not predict precise results and should be used only to understand relative risk. Over the long term, Lancaster County will collect additional data and update and refine existing inventories to assist in estimating potential losses.

Potential economic loss is based on the present value of the general building stock, utilizing best available data. Significant impacts could occur to critical facilities as a result of the hazard events assessed in this plan, causing great economic loss, but monetized damage estimates to critical facilities and associated economic impacts were not quantified. In addition, economic impacts on industries such as tourism and the real-estate market were not analyzed.

## 4.4.2 Relative Hazard Risk Ranking

### Ranking Methodology

A relative hazard risk ranking process was conducted using the Risk Factor (RF) methodology identified in of PEMA’s All-Hazard Planning Standard Operating Guide (PEMA 2020). The RF approach produces numerical values that allow hazards to be ranked against one another—the higher the RF value, the greater the hazard risk. RF values for each hazard are obtained by assigning scores of 1 to 4 in five categories: *probability*, *impact*, *spatial extent*, *warning time*, and *duration*. Assigned scores are multiplied by a weighting factor indicating the relative importance of each category. The sum of the weighted scores in all five categories equals the final RF value:

**Risk Factor Equation**

$$\text{RF Value} = (\text{Probability} \times 0.3) + (\text{Impact} \times 0.3) + (\text{Spatial Extent} \times 0.2) + (\text{Warning Time} \times 0.1) + (\text{Duration} \times 0.1)$$

Hazards are identified as high-risk for RFs greater than or equal to 2.5, moderate-risk for RFs of 2.0 to 2.4, and low-risk for RFs less than 2.0. Table 4-117 identifies the five risk assessment categories, the criteria and associated risk level used to assign scores, and the weighting factor applied to each category.

### Ranking Results

Table 4-118 shows the values of five risk assessment categories for each of Lancaster County’s hazards and each hazard’s RF.

Based on these results, there are three high-risk hazards, nine moderate-risk hazards, and four low-risk hazards in Lancaster County. Mitigation actions were developed for all hazards (see Section 6.4). The threat posed to life and property for moderate-risk and high-risk hazards is considered significant enough to warrant the need for establishing hazard-specific mitigation actions.

A risk assessment result for the entire county does not mean that each municipality is at the same amount of risk to each hazard. Table 4-119 shows the different municipalities in Lancaster County and indicates whether each municipality considers their risk is greater than (>), less than (<), or equal to (=) the RF assigned to the county.



Table 4-117. Summary of Risk Factor (RF) Approach

Level	Degree of Risk Criterion	Score	Weight
<b>Probability: What is the likelihood of a hazard event occurring in a given year?</b>			
Unlikely	Less than 1% annual probability	1	30%
Possible	1% to 49.9% annual probability	2	
Likely	50% to 90% annual probability	3	
Highly Likely	Greater than 90% annual probability	4	
<b>Impact: Anticipated level of impacts (injuries, damage, or death) when a significant hazard event occurs</b>			
Minor	Very few or no injuries, minor property damage, minimal disruption to quality of life, temporary shutdown of critical facilities	1	30%
Limited	Minor injuries, damage, or destruction to more than 10% of property in affected area, complete shutdown of critical facilities for more than one day	2	
Critical	Multiple deaths/injuries, damage, or destruction to more than 25% of property in affected area, complete shutdown of critical facilities for more than one week	3	
Catastrophic	High number of deaths/injuries, damage, or destruction to more than 50% of property in affected area, complete shutdown of critical facilities for more than 30 days	4	
<b>Spatial Extent: How large of an area could be impacted by a hazard event? (Impacts local or regional)</b>			
Negligible	Less than 1% of area affected	1	20%
Small	1% to 10.9% of area affected	2	
Moderate	11% to 25% of area affected	3	
Large	Greater than 25% of area affected	4	
<b>Warning Time: Is there usually lead time before the hazard event? Are warning measures in place?</b>			
—	More than 24 hours of warning time	1	10%
—	12 to 24 hours of warning time	2	
—	6 to 12 hours of warning time	3	
—	Less than 6 hours of warning time	4	
<b>Duration: How long does the hazard event usually last?</b>			
—	Less than 6 hours	1	10%
—	Less than 24 hours	2	
—	Less than 1 week	3	
—	Greater than 1 week	4	

Source: PEMA 2020



Table 4-118. Risk Ranking for Lancaster County

Hazard Risk	Hazards	Risk Assessment Category					Risk Factor (RF)
		Probability	Impact	Spatial Extent	Warning Time	Duration	
<b>HIGH</b>	Flood, Flash Flood, Ice Jam	4	3	3	3	3	3.3
	Cyber Incident	3	3	4	3	4	3.3
	Subsidence, Sinkhole	3	2	3	4	4	2.9
	Radon Exposure	4	1	4	1	4	2.8
	Utility Interruption	4	2	2	2	3	2.7
	Transportation Accident	3	3	1	4	2	2.6
<b>MODERATE</b>	Env Hazards—Gas and Liquid Pipelines	3	2	2	3	2	2.4
	Terrorism	2	3	3	2	1	2.4
	Winter Storm	3	2	3	1	2	2.4
	Wildfire	3	2	2	2	3	2.4
	Hailstorm	3	2	3	2	1	2.4
	Pandemic and Infectious Disease	1	3	3	1	4	2.3
	Tornado, Windstorm	2	3	2	3	1	2.3
	Env Hazards—Hazardous Materials	3	2	2	2	2	2.3
	Mental Health and Substance Use Disorder	4	1	2	1	2	2.2
	Nuclear Incident	1	3	2	2	3	2.1
	Drought	3	1	2	1	3	2
	Invasive Species	3	1	2	1	3	2
<b>LOW</b>	Dam Failure	1	2	2	2	3	1.8
	Earthquake	2	2	1	3	1	1.8



Table 4-119. Jurisdictional Risk by Municipality

Municipality	Cyber Incidents	Dam Failure	Drought	Earthquake	Env Haz—Gas and Liquid Pipelines	Env Haz—HAZMAT Release	Flood, Flash Flood, Ice Jams	Hailstorm	Invasive Species	Nuclear Incidents	Pandemic and Infectious Disease	Radon Exposure	Subsidence and Sinkholes	Substance Use Disorder and Mental Health	Terrorism	Tornado and Windstorm	Transportation Accidents	Utility Interruption	Wildfires	Winter Storm	
	3.3	1.8	2	1.8	2.4	2.3	3.3	2.4	2	2.1	2.3	2.8	2.9	2.2	2.4	2.3	2.6	2.7	2.4	2.4	
Adamstown (B)																					
Akron (B)	=	=	=	=	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=	=	=
Bart (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Brecknock (Twp)																					
Caernarvon (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Christiana (B)																					
Clay (Twp)																					
Colerain (Twp)	=	=	=	=	<	=	=	=	=	=	=	=	<	=	=	=	=	=	=	=	=
Columbia (B)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Conestoga (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Conoy (Twp)																					
Denver (B)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Drumore (Twp)																					
Earl (Twp)																					
East Cocalico (Twp)	=	<	=	=	=	=	<	=	=	=	=	=	=	=	=	=	=	=	=	=	=
East Donegal (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
East Drumore (Twp)																					
East Earl (Twp)																					
East Hempfield (Twp)																					
East Lampeter (Twp)	=	>	=	=	=	=	=	=	=	=	=	=	=	>	=	=	=	=	=	=	=
East Petersburg (B)																					
Eden (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Elizabeth (Twp)	=	>	=	=	<	=	=	=	=	<	=	=	=	=	=	=	=	=	=	>	=
Elizabethtown (B)																					
Ephrata (B)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=



Section 4.4. Risk Assessment: Hazard Vulnerability Summary

Municipality	Cyber Incidents	Dam Failure	Drought	Earthquake	Env Haz—Gas and Liquid Pipelines	Env Haz—HAZMAT Release	Flood, Flash Flood, Ice Jams	Hailstorm	Invasive Species	Nuclear Incidents	Pandemic and Infectious Disease	Radon Exposure	Subsidence and Sinkholes	Substance Use Disorder and Mental Health	Terrorism	Tornado and Windstorm	Transportation Accidents	Utility Interruption	Wildfires	Winter Storm		
	3.3	1.8	2	1.8	2.4	2.3	3.3	2.4	2	2.1	2.3	2.8	2.9	2.2	2.4	2.3	2.6	2.7	2.4	2.4		
Ephrata (Twp)																						
Fulton (Twp)																						
Lancaster (City)	=	=	=	=	=	=	<	=	<	=	=	<	=	=	=	=	<	=	<	=	=	
Lancaster (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
Leacock (Twp)	=	>	=	>	>	=	<	<	<	=	>	<	<	>	<	=	<	=	<	>	=	
Lititz (B)	=	=	=	=	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=	<	=	
Little Britain (Twp)																						
Manheim (B)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
Manheim (Twp)	=	=	=	=	>	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
Manor (Twp)	=	>	>	=	=	=	=	=	=	=	>	=	=	=	=	=	=	=	=	>	=	
Marietta (B)																						
Martic (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
Millersville (B)	=	=	=	=	=	=	=	=	=	=	>	=	=	>	=	=	=	=	=	=	=	
Mount Joy (B)	=	=	<	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=	=	<	=	
Mount Joy (Twp)	=	=	=	=	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=	=	=	
Mountville (B)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
New Holland (B)																						
Paradise (Twp)																						
Penn (Twp)																						
Pequea (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
Providence (Twp)																						
Quarryville (B)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	<	=	
Rapho (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	
Sadsbury (Twp)																						
Salisbury (Twp)																						
Strasburg (B)																						
Strasburg (Twp)																						



Section 4.4. Risk Assessment: Hazard Vulnerability Summary

Municipality	Cyber Incidents	Dam Failure	Drought	Earthquake	Env Haz—Gas and Liquid Pipelines	Env Haz—HAZMAT Release	Flood, Flash Flood, Ice Jams	Hailstorm	Invasive Species	Nuclear Incidents	Pandemic and Infectious Disease	Radon Exposure	Subsidence and Sinkholes	Substance Use Disorder and Mental Health	Terrorism	Tornado and Windstorm	Transportation Accidents	Utility Interruption	Wildfires	Winter Storm	
	3.3	1.8	2	1.8	2.4	2.3	3.3	2.4	2	2.1	2.3	2.8	2.9	2.2	2.4	2.3	2.6	2.7	2.4	2.4	
Terre Hill (B)																					
Upper Leacock (Twp)																					
Warwick (Twp)	=	>	=	=	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=	=	=
West Cocalico (Twp)																					
West Donegal (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
West Earl (Twp)	=	=	=	=	=	=	=	=	=	>	=	=	=	=	=	=	=	=	=	=	=
West Hempfield (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
West Lampeter (Twp)	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Bainbridge Water Authority	<	>	=	=	=	=	=	=	=	=	=	=	<	<	=	=	<	=	=	=	=
Cocalico SD																					
Columbia Borough SD	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Conestoga Valley SD																					
Donegal SD																					
East Cocalico (Twp) Water and Sewer	=	=	>	=	=	=	<	<	<	=	=	<	=	<	=	=	<	=	=	=	=
Eastern Lancaster County SD																					
Elizabethtown Area SD																					
Ephrata Area SD	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Hempfield SD																					
Lampeter-Strasburg SD	=	=	<	=	=	=	=	=	<	=	=	=	<	=	=	=	=	=	=	<	=
Lancaster Area Sewer Authority	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=



Section 4.4. Risk Assessment: Hazard Vulnerability Summary

Municipality	Cyber Incidents	Dam Failure	Drought	Earthquake	Env Haz—Gas and Liquid Pipelines	Env Haz—HAZMAT Release	Flood, Flash Flood, Ice Jams	Hailstorm	Invasive Species	Nuclear Incidents	Pandemic and Infectious Disease	Radon Exposure	Subsidence and Sinkholes	Substance Use Disorder and Mental Health	Terrorism	Tornado and Windstorm	Transportation Accidents	Utility Interruption	Wildfires	Winter Storm	
	3.3	1.8	2	1.8	2.4	2.3	3.3	2.4	2	2.1	2.3	2.8	2.9	2.2	2.4	2.3	2.6	2.7	2.4	2.4	
Lancaster Bible College																					
Lancaster County Conservation District																					
Lancaster SD																					
Lancaster-Lebanon Intermediate Unit																					
Manheim Area Water and Sewer Authority																					
Manheim Central SD	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Manheim Township SD																					
Octara Area School District	=	=	=	=	=	=	<	=	=	=	=	=	=	=	=	=	=	=	=	=	=
Penn Manor SD																					
Penn State Health																					
Pequea Valley SD																					
Solanco SD																					
Warwick SD	=	=	=	=	=	=	<	=	=	=	=	<	<	=	=	=	<	<	=	=	=
Well Span Health																					

Notes:

- ">" indicates that the risk is greater than the RF assigned to the county
- "<" indicates that the risk is lower than the RF assigned to the county
- "=" indicates that the risk is equal to the RF assigned to the county
- A blank cell indicates the jurisdiction did not perform this activity
- "B" indicates Borough
- "Twp" indicates Township
- "SD" indicates School District







### 4.4.3 Potential Loss Estimates

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Potential loss estimates for hazard events help a community understand the monetary value of what might be at stake during a hazard event. Estimates are considered *potential* in that they generally represent losses that could occur in a countywide hazard scenario. Localized events could yield lower losses, while regional events could yield higher losses.

The data utilized to conduct the vulnerability assessment came from a variety of sources, as noted throughout each hazard profile and Appendix A. The 2020 U.S. Census demographic data, a custom-developed general building stock inventory, its associated replacement cost value of the structures and contents, and a comprehensive critical facility inventory update were used for Lancaster County.

Potential loss estimates provided in Section 4.3 (Hazard Profiles) were based on historical losses, current-condition losses, or predictive losses by performing spatial analyses in GIS and hazard probabilistic modeling. Hazus v6.1 was used to estimate potential losses for the flood, earthquake, and tornado/windstorm hazards. For many of the hazards evaluated, historical data are not adequate to model future losses at this time. For these hazards of concern, areas and inventory susceptible to specific hazards were mapped, and exposure was evaluated to help guide mitigation efforts (mitigation efforts are discussed further in Section 6). Spatial analyses were conducted to assess potential exposure for hazards of concern with delineated hazard areas: environmental hazard hazardous materials release; subsidence and sinkhole; and wildfire. Where GIS data are not available for some hazards, a qualitative analysis was conducted using the best available data and professional judgment.

### 4.4.4 Future Development and Vulnerability

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Risk and vulnerability to natural and human-caused hazard events will increase or decrease as counties and municipalities see changes in land use and development, as well as changes in population. Population change (in terms of total and demographics) and the age of the housing stock continue to be the main indicators of vulnerability change in Lancaster County.

#### Population

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Lancaster County experienced a 6.4 percent increase in population from 2010 to 2020, as summarized in Section 2 of this HMP. According to PA DEP, the population in Lancaster County is projected to increase over the coming decades (PA DEP 2012).

Continued analysis of the population's age structure in Lancaster County will provide deeper understanding of future vulnerability to at-risk populations. Approximately 19 percent of Lancaster County's population is age 65 or older (ACS 2022). As these residents continue to age in the county, they might have increased access and functional needs. For example, many residents in this age bracket might be unable to drive; therefore, development of special evacuation plans for them will be necessary. They might also have hearing or vision impairments that could hinder their reception of emergency instructions. Both older and younger populations are at higher risks for contracting certain diseases. Lancaster County's combined under-5-years-of-age and over-65 populations constitute approximately 25 percent of its population (ACS 2022).

A portion of Lancaster County's population lives in group quarters, which are communal settings that can include inmates in a prison, students in a dorm, or elderly or mentally disabled in group-care homes. Many residents living in group quarters have special needs. It is important to ensure that each group-quarter facility has an emergency plan to account for the unique needs of its residents during a hazard event.

Future hazard mitigation strategies should consider addressing language barriers to ensure that all residents can receive emergency instructions since 3 percent of Lancaster County's population are non-English speaking.

In addition, remote and sparsely populated municipalities face higher vulnerability to hazards because they do not have as easy access to care facilities or response personnel. For instance, sparsely populated municipalities



face increased vulnerability to tornadoes, windstorms, and winter storms due to isolation, access issues, and longer emergency response times.

### Development

The aging housing stock in Lancaster County is a source of current and future vulnerability in many hazard events. Lancaster County can experience strong gusts of wind during windstorms, tornadoes, or Nor'easters. The structures of these older buildings can put them at greater risk of destruction under these strong wind conditions. These structures might also be at risk during flooding and winter storm events if the materials are either not strong enough to withstand the pressure or weight of the precipitation or are liable to leak, causing further risk of destruction to the house.

While any development increases the risk of damage and loss to natural hazards, a number of factors indicate that this increase in risk is low and mitigated by existing federal, state, county, and local regulations, policies, and programs. Municipalities in Lancaster County have adopted subdivision regulations, and local zoning regulations.

Lancaster County has identified areas of new potential growth in the County's comprehensive master plan: *Places2040*. Lancaster County is largely agricultural land; however, urban growth has been steadily increasing, with the comprehensive master plan noting more land is being utilized for urban growth than necessary, as these areas are being built at lower densities than recommended. Currently, the county is consuming 70 percent more land in urban growth than at the target density. As Lancaster County continues to be built out, the future land use policies of the county focus largely on infill development, particularly around centers. For areas that are not currently built out, responsible development can take place adjacent to existing activity corridors or centers. *Places2040* notes that other undeveloped areas of high scenic, environmental, recreational, or agricultural value should be preserved in their undeveloped or minimally developed state (Lancaster County Planning 2018).

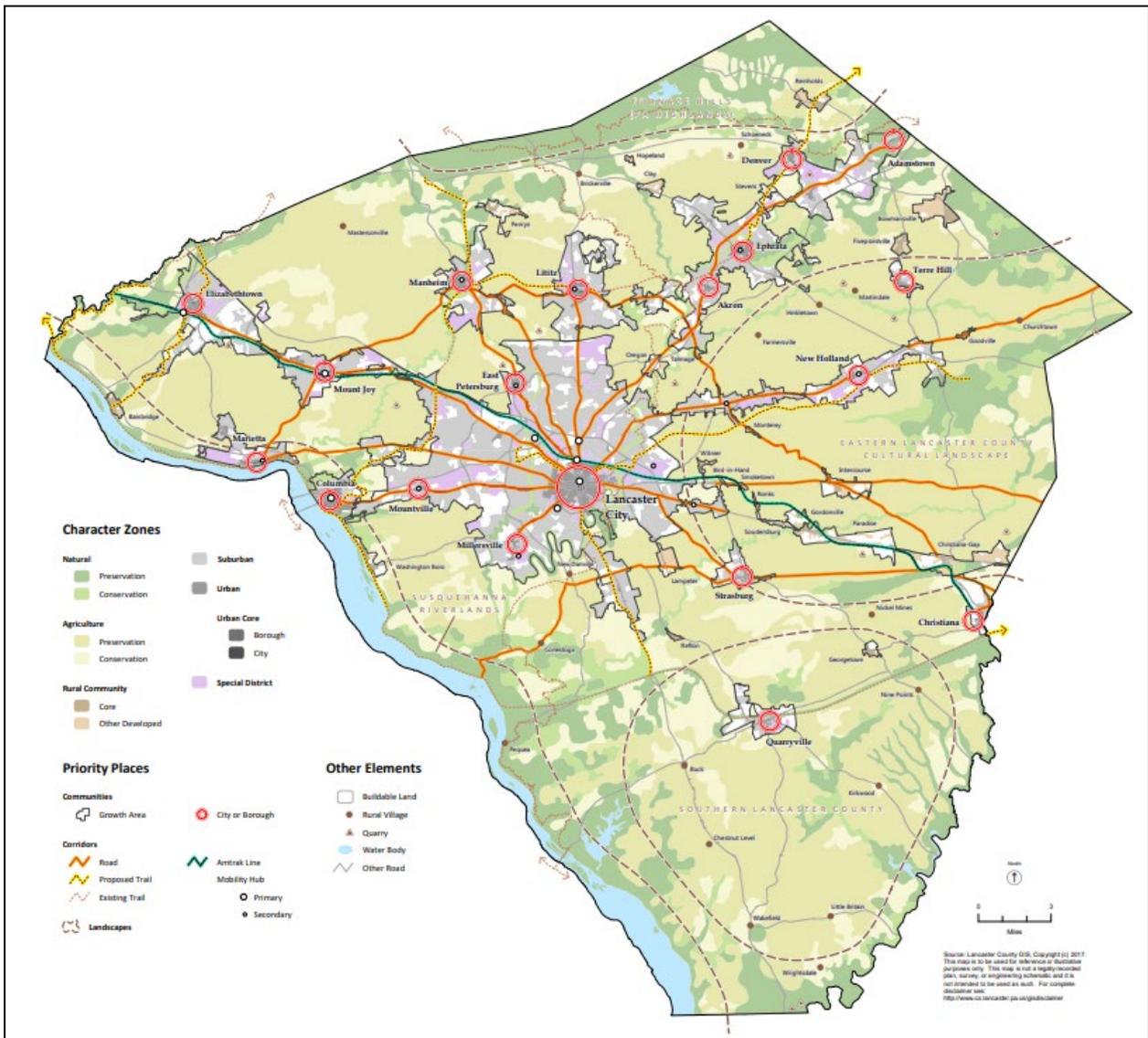
During the planning process for *Places2040*, the County used 2020 census data to develop population projections across Lancaster County. The projections were lower than expected and it was discovered that Lancaster County has enough buildable land within existing Growth Areas to accommodate projected population growth through 2040. Therefore, the recommendation is not for large areas to be added to the established Growth Areas, the focus is more on updating additions and removals of areas in urban and village growth boundaries. The growth area component of the County's Future Land Use Map will include a newly adopted map after being presented to all municipalities, the County Planning Commission, and the County Commission. The FLUTM will serve as a guide for land use, development, transportation, growth management, and stormwater management. Lancaster County Planning has been working with multiple municipal planning partners in drafting regional comprehensive plans that model after the framework of *Places2040*. Working across municipal boundaries encourages a regional approach and improved cooperation between municipalities to accommodate hazard mitigation actions such as improved development patterns, transportation networks and infrastructure, stormwater management, green infrastructure, open space, natural and agricultural land preservation.

Lancaster County Planning is updating its Act 167 Countywide Stormwater Management Plan to reduce the damaging impacts of accelerated stormwater runoff that can result from land development, by encouraging creative and innovative stormwater management strategies and approaches, including regional stormwater facilities, floodplain restoration and wetland creation, critical aquifer recharge areas, and increased tree canopy. As part of the Phase 2 of the Act 167 Plan, municipalities are encouraged to adopt a new model stormwater ordinance for consistency throughout entire watersheds, and across municipal boundaries. Stormwater issues such as flooding, public water and sewer challenges are a priority for Lancaster County. The state Department of Environmental Protection (DEP) is providing assistance to the County for development and implementation of watershed-based stormwater management plans under the Storm Water Management Act (1978 Act 167).

Figure 4-36 shows the projected future land and transportation use in Lancaster County.



Figure 4-36. Future Land Use and Transportation Map



Source: Lancaster County Planning 2017



## SECTION 5 CAPABILITY ASSESSMENT

The capability assessment evaluates capabilities and resources already in place at the municipal, county, state, and federal levels to reduce hazard risks in Lancaster County. Lancaster County has several capabilities available to implement hazard mitigation actions, including emergency response measures, local planning and regulatory tools, administrative assistance and technical expertise, fiscal resources, and participation in local, regional, state, and federal programs. These capabilities enable community resiliency through actions taken before, during, and after a hazard event. Emergency services, labor, equipment, and fiscal resources are important in addressing hazard potential and mitigation in Lancaster County communities. For each basic capability, one or more of the following resources may be available (PEMA 2020):

- **Human resources** include local police, fire, ambulance, and emergency management and response personnel; local government services; and electric, gas, and other utility providers that are critical during disasters.
- **Physical resources** include the equipment and vehicles (such as emergency response and recovery equipment and vehicles), public lands, facilities, and buildings available to the community.
- **Technical/technological resources** include early warning systems, weather alert radios, stream-level monitoring gauges, and 911 communications systems. They also include technical requirements established by law, regulation, or ordinance.
- **Informational resources** include materials about disasters and hazard mitigation and planning; these resources are available from a wide variety of sources, such as applicable websites, libraries, and state and federal agencies.
- **Financial resources** identify the sources of funding available for hazard mitigation. Most state and federal grant programs require local communities to provide at least part of the necessary project funding in real dollars or through in-kind services. Local communities need to assess their financial capability and resources to implement hazard mitigation strategies.

The capability assessment also identifies where improvements can be made to increase disaster resistance through future mitigation actions. Mitigation strategies directly affect the establishment of new capabilities in the community or the strengthening of existing capabilities.

This section describes and summarizes the federal, state, county, and local capabilities to address hazard risk in Lancaster County. All references utilized in this section can be found in Appendix A.

### 5.1 UPDATE PROCESS SUMMARY

Lancaster County and all participating municipalities assessed their mitigation planning capabilities. A Capability Assessment Survey (derived from the October 2020 edition of the PEMA All-Hazard Mitigation Planning Standard Operating Guide (PEMA 2020)) was provided to each municipal planning point of contact at the Planning Team kickoff meeting. Appendix D provides the completed surveys. If municipalities did not update or only partially updated their capabilities information, the information provided for the 2019 Hazard Mitigation Plan (HMP) was carried forward into this plan update.

### 5.2 CAPABILITY ASSESSMENT FINDINGS

A jurisdiction's ability to effectively manage natural hazard risk is directly related to its level of hazard mitigation capabilities. As such, mitigation strategies developed in coordination with Lancaster County's municipalities have a direct effect on establishing new capability functions in the community or strengthening existing capabilities.

All municipalities in Lancaster County, aside from the Boroughs of New Holland and Terre Hill, participate in the National Flood Insurance Program (NFIP); no municipalities participate in the Community Rating System (CRS). Participating in CRS can reduce insurance premiums for properties located outside of Special Flood



Hazard Areas by up to 10 percent. Properties located in Special Flood Hazard Areas can reduce premiums up to 45 percent by participating in the CRS program. These discounts can be obtained by undertaking public information, mapping and regulations, flood damage reduction and flood preparedness activities (FEMA 2021).

Finally, limited funding is a critical barrier to the implementation of hazard mitigation activities in Lancaster County. The county will need to rely on regional, state, and federal partnerships for financial assistance. Lancaster County will continue to alert municipalities when FEMA grant funding is available to apply for to implement eligible projects in this HMP update.

### 5.2.1 Planning and Regulatory Capability

#### County and Municipal Planning Capabilities

Municipalities in Pennsylvania must comply with the minimum regulatory requirements established under the Pennsylvania Municipal Planning Code. They otherwise have considerable latitude in adopting ordinances, policies, and programs that can be used to manage natural and non-natural hazard risks. Municipalities can manage these risks through comprehensive land use planning, hazard-specific ordinances (e.g., flood damage prevention, sinkholes, and steep slopes), zoning, site-plan approval, and building code enforcement.

For example, the adoption of the NFIP and the Pennsylvania Flood Plain Management Act (Act 166 of 1978) established minimum floodplain management criteria. A municipality must adopt and enforce these minimum criteria to be eligible for participation in the NFIP. Municipalities have the option of adopting a single-purpose ordinance or incorporating these provisions into their zoning and/or subdivision and land development ordinances or building codes, thereby mitigating the potential impacts of local flooding.

When effectively prepared and administered, these regulations can lead to hazard mitigation. Guiding documents to help municipalities develop regulations and best management practices can be found in the [Pennsylvania Department of Community and Economic Development Library](#) under Local Government—Handbooks and Guides—Community Planning.

Lancaster County has a variety of informational resources available, and many of the publications discussed here are available for review by the public on the Lancaster County Planning Commission website: <https://lancastercountypanning.org/>. Information is also posted on municipal websites, and hard copies of informational materials are available in municipal offices.

#### Lancaster County Comprehensive Plan

A comprehensive plan is a policy document that states objectives and guides a community's future growth and physical development. The comprehensive plan is a blueprint for housing, transportation, community facilities, utilities, and land use. It examines how the past led to the present and charts the community's future path. The Pennsylvania Municipalities Planning Code (MPC) Act 247 of 1968 requires counties to prepare and maintain a comprehensive plan and to update the plan every 10 years.

The MPC requires comprehensive plans to include a plan for land use, which, among other provisions, suggests that the plan should give consideration to floodplains and other areas of special hazards and other similar uses. It also requires comprehensive plans to include a plan for community facilities and services and recommends giving consideration to storm drainage and floodplain management. Although the MPC requires that municipal plans be in accord with the County plan, the code provides no measures for ensuring this occurs. Several municipalities have adopted single- or multi-jurisdictional regional comprehensive plans.

Lancaster County's comprehensive plan, "Places2040," provides guidance for Lancaster County through 2040. It was prepared using five guiding principles:

- Placed-Based—Focus on the fundamentals of growth management: location, pattern, and timing. Use the concepts of character zones and "whole" places (communities, corridors, and landscapes)



- to promote countywide and regional thinking. Provide a framework for regional and place-based plans facilitated by the Lancaster County Planning Commission.
- Innovative—Integrate existing plans into one accessible document. Build on past planning efforts and principles but push the envelope toward new ways of doing things. Respect—but look beyond—traditional boundaries (municipal, school, political, organizational) to address the challenges the community faces.
  - Catalytic—Identify 6 to 8 tools and strategies that have the greatest potential to spur broader action in the community.
  - Leadership-Oriented—Involve the public, private, and nonprofit sectors. Establish strong collaboration among key individuals, organizations, agencies, and local governments to accomplish the plan’s goals.
  - Measurable—Identify performance measures to monitor the progress that the county and its partners are making to implement places2040.

Rather than including hundreds of potential actions, places2040 boils everything down to a handful of actions that are most likely to achieve results in the next 10 to 15 years. It is summed up in five big ideas, 26 policies, and seven catalytic tools and strategies.

### Stormwater Management Planning

Pennsylvania’s Stormwater Management Act of 1978 (Act 167) requires counties to prepare stormwater management plans on a watershed-by-watershed basis, in consultation with affected municipalities. Each plan is required to include standards for control of runoff from new development based on a detailed hydrologic assessment. A key objective of each plan is to coordinate the stormwater management decisions of all municipalities in the watershed. Each plan is implemented through mandatory municipal adoption of ordinance provisions consistent with the plan.

Plans prepared under Act 167 will not resolve all drainage issues. The planning process does not solve existing flooding problems, but it aims to prevent them from getting worse. A key goal of the planning process is to maintain existing peak runoff rates throughout a watershed as land development continues. Each municipality is responsible for correcting existing flooding problems.

The Lancaster County Board of Commissioners adopted “Blueprints: An Integrated Water Resources Plan for Lancaster County (Act 247 and 167)” (referred to as “Blueprints”) in 2012 as an element of the Lancaster County Comprehensive Plan. Blueprints promotes watershed-based planning and management to protect, conserve, and improve water resources in Lancaster County. It emphasizes the relationships among water resource issues and programs—such as stormwater management and drinking water supply or source water protection and manure management—and recommends strategies to address these issues more effectively.

Blueprints outlines strategies to protect, conserve, and improve surface and groundwater resources for human and non-human use. It identifies the following objectives:

- Provide water, sewer, and stormwater infrastructure to accommodate 85 percent of future growth in urban growth areas.
- Deliver essential infrastructure services to both urban and rural settlements in a cost-effective manner.
- Reduce the number of miles of impaired streams.
- Institutionalize integrated water resources management in Lancaster County.
- Increase the use of green infrastructure in water resources management.

Act 167 required municipalities subject to the Stormwater Management Plan to enact or amend and implement ordinances as necessary to regulate development in a manner consistent with the Stormwater Management Plan by November 2013. The Act 167 provisions contained in Blueprints, including the model ordinance, were approved by the Pennsylvania Department of Environmental Protection (PA DEP) in October 2013.



## Natural Resource Planning

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### Natural Heritage Inventory

The 2008 Natural Heritage Inventory was compiled and written by the Pennsylvania Natural Heritage Program of the Western Pennsylvania Conservancy (WPC). It builds on the original Natural Areas Inventory of Lancaster County completed in 1990 by the Pennsylvania Science Office of The Nature Conservancy. The document is a conservation tool that includes information on the locations of rare, threatened, and endangered species and of the highest quality natural areas in Lancaster County.

### Alternative Energy Guide

The Alternative Energy Guide lists policy points that municipal officials should address in determining the appropriate location and scale of alternative energy systems, including wind, solar, manure digesters, outdoor wood-fired boilers, and geothermal. The list addresses smaller scale applications typically seen in residential and some non-residential districts as well as more land-consumptive and impact-intensive uses typically seen in rural and agricultural districts. The guide provides examples of specific zoning ordinance language.

### Lancaster Planning Commission Zoning Tools

The Lancaster Planning Commission has developed two zoning tools for municipalities to consider integrating into existing zoning ordinances:

- A collection of natural resource protection standards to use as an “overlay” applicable in all zoning districts of a municipality
- A set of regulations for a model conservation district.

Both are focused on incorporating natural resource identification and protection into subdivision and development proposals through site-specific performance standards.

### Lancaster County Conservation District

The Lancaster County Conservation District encourages stewardship and conservation of natural resources. A board of directors made up of local citizen volunteers leads the Conservation District, studying natural resource issues and making decisions that enhance and protect communities within Lancaster County. The Conservation District employs managers and staff personnel to serve clientele from both farm and urban communities, reflecting complex and ever changing environmental and land use issues.

The Conservation District provides assistance to citizens, landowners, organizations, agencies, and local governments in critical land use decisions (both regulatory and non-regulatory), water quality issues, nonpoint source pollution abatement, and other resource-related areas.

Under delegated authority from the PA DEP and the Pennsylvania Conservation Commission, the Conservation District administered the Erosion and Sediment Pollution Control Program at a Level II authority under Chapter 102 regulations and the Pennsylvania Clean Streams Law. It also operates the following:

- Dirt, Gravel, and Low Volume Road Program
- Environmental Stewardship and Watershed Protection Grant Program
- Chesapeake Bay Program
- Agricultural Land Preservation
- Numerous environmental education programs.

## Open Space Planning

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Lancaster County has prepared several plans with the goal of preserving open space in the County for recreational and environmental purposes:



- *Connections in Our Landscape Greenways and Open Space Network Plan* (The Southern Alleghenies Planning and Development Commission 2007) identifies regional conservation and cultural, recreational, conservation, and scenic greenways and evaluates ways local ordinances may protect greenways (a greenway is a corridor of open space).
- As part of the Places2040 update of the County comprehensive plan, *Lancaster County: Growing & Preserving, 2002–2015* takes stock of how Lancaster County changed between 2002 and 2015, how it grew (in terms of land development), and what land was preserved during that time. The report builds on the “Envision Lancaster County” comprehensive plan, which provided a foundation of policies and actions to direct growth to appropriate areas, protect agricultural and natural resources, and encourage intermunicipal cooperation.
- *Lancaster County: Buildable Lands, 2015–2040* is part of Places2040 and builds upon the *Growing and Preserving* report. It aims to determine how much of the land remaining inside Lancaster County’s Urban Growth Areas and Village Growth Areas could be developed. The report contains an inventory of buildable lands inside both of these areas as of 2015.

### Lancaster County Emergency Management

The Lancaster County Emergency Management Division provides emergency management capability for Lancaster County. The County operates an emergency 9-1-1 call center and activates its own emergency operations center (EOC) during emergencies. In addition, the County provides or supports emergency service programs and measures, including emergency response, public alert and warning systems, emergency communications systems, hazard event monitoring systems, and public information and outreach programs.

#### 9-1-1 Center

9-1-1 is the telephone number used to report emergencies. Citizens use the service in the event of the presence or potential for an immediate threat to life or property and to request response from police, fire, or emergency medical services (EMS) agencies. The 9-1-1 system is capable of accepting calls from hearing or speech-impaired callers using a telecommunications device for the deaf (TDD), and text messages. Computerized mapping of streets with address information is critical for emergency response purposes. The 9-1-1 center is also used to alert citizens during an emergency. Each county in Pennsylvania operates a 9-1-1 public safety answering point. Personnel at these operations coordinate their efforts in a regional hazard event.

#### Emergency Operations Center

In the event of an impending emergency or disaster, Lancaster County activates its EOC. The purpose of the EOC is to manage an emergency response and coordinate the distribution of resources to a disaster incident. When activated, the EOC is in constant communication with the 9-1-1 center to ensure coordination of activities. When the EOC is operational, it is staffed by personnel able to take command and make coordinated decisions relative to the following fields of expertise, in accordance with the National Response Framework and the Commonwealth Emergency Operations Plan (EOP):

- Transportation
- Search and rescue
- Communications and warning
- Oil and hazardous materials /radiation
- Public works and engineering
- Agriculture and natural resources
- Firefighting
- Energy and utilities
- Emergency management
- Public safety and security
- Mass care, evacuation and human services
- Long-term community recovery
- Logistics management and resource support
- Public information officer external affairs
- Public health and medical services

Each discipline is assigned a coordinating agency and at least one primary agency and one support agency. In cases where more than one agency has primary jurisdiction over a discipline, a coordinating agency is designated



from among them. Where there is only one agency with primary jurisdiction, that agency is also the coordinating agency.

### Emergency Service Measures

Emergency service measures protect people during and immediately following a disaster. The County monitors several systems that will disseminate emergency information and warnings:

- Satellite Emergency Voice Alerting Network (SEVAN) is the voice component of the satellite warning system. This allows PEMA, Pennsylvania counties, regional offices, and cities to communicate directly in real time regardless of the status of the telephone system. Warning messages are routinely broadcast by PEMA using the system.
- Auxiliary Communications Service (ACS) is a group of individual volunteer radio operators performing supportive functions serving Lancaster EMA. ACS members are activated upon request by key Lancaster EMA personnel and are coordinated through an ACS Emergency Coordinator (ACS EC). When activated, ACS members can work in the Amateur Radio Room in the Manheim facility to coordinate field ACS members (at assigned locations). ACS members can also provide communication to fire, police and other served agencies, acting as County level personnel. ACS members are capable of complementing County resources by using Amateur Radio and other deployed communication equipment during incidents/drills
- National Oceanic and Atmospheric Administration (NOAA) Weather Radio All-Hazards (NWR) is a nationwide network of radio stations broadcasting continuous weather information directly from a nearby National Weather System (NWS) office. NWR broadcasts NWS warnings, watches, forecasts, and other hazard information 24 hours a day. NWR also broadcasts warning and post-event information for all types of hazards.
- The 800-MHz radio system provides two-way voice and data communications for all Lancaster County and Pennsylvania agencies. The primary function of this system is to provide redundant communications between the County and partner agency facilities in the event that the primary means of communication becomes interrupted.
- EMNet is a fast, reliable alert and warning system, with 362 terminals across Pennsylvania over 214 broadcast stations and 62 cable networks. It provides an avenue for text-based messages to be sent among system users.

### Emergency Response Planning

#### *Emergency Operations Plan*

The Lancaster County EOP documents the County’s emergency preparedness planning. The EOP includes County-specific emergency response procedures during significant emergency events. Lancaster County’s EOP complies with the National Incident Management System and is updated every 2 years. The updated risk assessment information from this HMP will be incorporated into subsequent updates to the EOP. The County’s EOP was last adopted in 2010 and updated in 2018.

#### *Mutual Aid Agreements*

Lancaster County has mutual aid agreements with the contiguous Pennsylvania counties as a result of the Pennsylvania Intrastate Mutual Assistance Program. Every county participates in this program.

Lancaster County is also part of a larger county consortium, the South-Central Task Force, which works together and shares resources during times of emergency. Originally formed in response to the increasing threat of weapons of mass destruction and other terroristic activity, the Task Force provides all-hazards preparedness, mitigation, prevention, response, and recovery services to citizens in its purview. This intergovernmental agreement is between the following counties:

- Adams
- Lancaster
- Cumberland
- Lebanon



- Dauphin
- Franklin
- Perry
- York

*Regional Planning Initiatives*

Lancaster County assists in County or regional planning and preparation for the following:

- Local (municipal) EOPs
- Medical facilities
- Dams
- Airports
- Pandemic
- Mass casualty/fatality incidents
- Counterterrorism preparedness
- Special events, such as concerts, parades, etc.
- School emergency planning
- Day care, group home, and special needs facilities
- Evacuation and detour plan
- Superfund Amendments and Reauthorization Act of 1986 (SARA)—The Local Emergency Planning Committee program is based on SARA Title III, which requires local planning by businesses and response agencies whenever hazardous materials are involved. SARA also requires the establishment of a system in each community that informs the citizens of chemicals used, manufactured, and stored locally.
- In cooperation with the American Red Cross, the County has designated shelters that may be used during emergencies and disasters.

*Local Emergency Management Capabilities*

The following requirements of Pennsylvania Title 35 (Emergency Management Services Code), Chapter 7500, apply to local jurisdictions:

- Each political subdivision of the Commonwealth must establish a local emergency management organization in accordance with the plan and program of PEMA. Each local organization has responsibility for emergency response and recovery within the territorial limits of the political subdivision within which it is organized and outside of its jurisdictional limits as required.
- The governing body of a political subdivision may declare a local disaster emergency upon finding a disaster has occurred or is imminent. The effect of a declaration of a local disaster emergency is to activate the response and recovery aspects of any and all applicable local emergency management plans and to authorize the furnishing of aid and assistance.
- Each local organization of emergency management must have a coordinator who is responsible for the planning, administration, and operation of the local organization.
- Direction of disaster emergency management services is first the responsibility of the lowest level of government affected. When two or more political subdivisions in a county are affected, the county organization will exercise responsibility for coordination and support to the area of operations. When two or more counties are involved, coordination will be provided by PEMA or by area organizations established by PEMA.
- When all appropriate locally available forces and resources are fully committed by the affected political subdivision, assistance from a higher level of government will be provided.
- Local coordinators of emergency management must develop mutual aid agreements with adjacent political subdivisions for reciprocal emergency assistance. The agreements must be consistent with the plans and programs of PEMA.

Existing federal, state, regional, and county programs (regulatory and otherwise) to manage specific hazard risks are described in the hazard profiles in Section 4.3 of this plan update. While the risk of certain hazards can be addressed at least partially through mitigation, the risks of other hazards (particularly certain non-natural hazards) are primarily managed through preparedness and response activities or through regulatory programs at the federal and state levels.



### Mutual Aid Agreements

Under the commonwealth’s Emergency Management Services Code, each political subdivision must adopt an intergovernmental cooperation agreement with other political subdivisions to accomplish the following:

- Prepare, maintain, and keep current a disaster emergency management plan for the prevention and minimization of injury and damage caused by a disaster, prompt and effective response to disaster, and disaster emergency relief and recovery, consistent with the Pennsylvania Emergency Management Plan.
- Establish, equip, and staff an EOC (integrated with warning and communication systems) to support government operations in emergencies and provide other essential facilities and equipment for agencies and activities assigned emergency functions.
- Provide training programs to ensure prompt, efficient, and effective disaster emergency services.
- Organize, prepare, and coordinate all locally available resources necessary for disaster emergency readiness, response, and recovery.
- Adopt and implement precautionary measures to mitigate the effects of a disaster. Execute and enforce rules and orders that the agency adopts and promulgates under the authority of this code.
- Cooperate and coordinate with public or private entities to achieve any purpose of this code.
- Have available for inspection at the EOC all emergency management plans, rules, and orders of the governor and PEMA.
- Provide prompt and accurate information regarding local disaster emergencies to appropriate commonwealth and local officials and agencies and the general public.
- Participate in all tests, drills, and exercises—including remedial drills and exercises—scheduled by the agency or by the federal government.
- Participate in the program of integrated flood warning systems.

Lancaster County has formal mutual aid agreements in place with its municipalities.

### Emergency Operations Centers

In the event of an impending emergency or disaster, a local EOC may be activated to manage emergency response and coordinate distribution of resources at the local level.

### Emergency Response

Each municipality is responsible for providing local emergency response consisting of EMS, fire, and police. A municipality that does not have one of these providers should have mutual aid agreements with an adjacent political subdivision or the commonwealth to respond. Municipalities may also be equipped with systems to monitor emergency information and warnings, including ACS and the NWS. They also may assist with emergency response planning for the following:

- EOPs
- Medical facilities
- Dams
- Counterterrorism preparedness
- Special events
- School emergencies
- Day care, group homes, and special needs facilities
- Evacuation

### Participation in the National Flood Insurance Program

The NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damage. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk in floodplains, the federal government will make flood insurance available within the community. This insurance is designed to provide an alternative to disaster assistance and reduce the escalating



costs of repairing damage to buildings and their contents caused by floods (FEMA 2024). All Lancaster County municipalities except the Boroughs of New Holland and Terre Hill participate in the NFIP.

NFIP-participating communities are required to adopt a flood damage prevention ordinance (also sometimes called a floodplain management ordinance) and update it when Flood Insurance Rate Maps (FIRMs) are officially updated. The Pennsylvania Department of Community and Economic Development (DCED) (the legislated commonwealth coordinating agency for the NFIP) and PEMA (the commonwealth agency that carries out floodplain coordination in practice) provide suggested text for floodplain management ordinances.

All participating municipalities in Lancaster County have adopted a floodplain ordinance, and many have adopted a stormwater management ordinance. The municipalities' floodplain administrators, who are often either the code enforcement officer or the zoning officer, enforce the floodplain ordinances locally. Zoning or building permit applications for the county's municipalities include a space for applicants to state whether the proposed development is in the floodplain, and the permit application reviewer confirms this. If the property is in the floodplain, the municipal floodplain administrator reviews the proposed development against the municipality's floodplain management ordinance. The floodplain administrator conducts similar reviews of any revisions to the permit application until all requirements are met. The floodplain administrator works with the code enforcement officer and/or zoning officer to conduct inspections and ensure that the proposed development is carried out as it was permitted.

NFIP-participating communities in Lancaster County are required to make current NFIP FIRMs available to their residents for review and may provide mapping assistance through their floodplain administrators. Typically, this mapping is available at the municipal offices. Floodplain administrators provide information about mapping to their residents using established outreach methods such as municipal websites, newsletters, and mailings. Floodplain administrators also use established outreach methods to provide information about flood insurance to residents and business owners. They can provide information on the availability of flood insurance, how to get a flood insurance policy, and appropriate levels of coverage.

Municipal participation in and compliance with the NFIP is supported at the federal level by FEMA Region 3 and the Insurance Services Organization and at the state level by the PA DEP, DCED, and PEMA. The county's Planning Commission and Conservation District both support flood mitigation efforts, associated training, and public education and awareness programs. A compilation of suggested provisions is available to municipalities to help to ensure the municipalities meet the minimum requirements of the NFIP and the Pennsylvania Flood Plain Management Act (Act 166). Every flood-prone municipality is required to submit an annual report detailing floodplain management activities to PEMA to ensure compliance with floodplain regulations.

The flood hazard profile in Section 4.3.7 provides additional information on the NFIP program and its implementation within the county.

### **Community Rating System**

The federal CRS offers flood insurance rate reductions for local property owners to encourage local governments to increase their standards for floodplain development beyond the requirements of the NFIP. CRS is a voluntary program that rewards participating jurisdictions for their efforts to create more flood-resistant communities.

Under the CRS, flood insurance premiums are reduced based on the community's CRS class rating. Class 1 requires the most credit points and gives the largest premium reduction; Class 10 receives no premium reduction. CRS premium discounts on insurance range from 5 percent for Class 9 communities to 45 percent for Class 1 communities. Communities can earn credits for 18 creditable activities in four categories: public information, mapping and regulations, flood damage reduction, and flood preparedness. Currently, no Lancaster County governments participate in the CRS Program.



### **Municipal Capabilities**

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Participating municipalities in this planning effort were provided a capability assessment survey. Table 5-1 summarizes the responses related to planning and regulatory capability, supplemented by information received from the county regarding municipal capabilities. Appendix D includes the municipal survey responses with detailed information regarding the Lancaster County municipalities' planning and regulatory capabilities.



Table 5-1. Planning and Regulatory Capability

Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	Continuity of Operations Plan	NFIP	NFIP—CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farmland Preservation	Building Code	Fire Code	Other
Lancaster County	+	X	+	+	X						X	+		+	X	X	X	X	X	X		
Adamstown (B)						X																
Akron (B)	X	X	X	X	X	X		X	X	X	X	X		X		X				X		
Bart (Twp)	X	X			X	X			X	X	X	X		X					X	X		
Brecknock (Twp)		X			X	X		X	X	X	X	X	X	X	X				X	X		
Caernarvon (Twp)	X	X				X		X	X	X	X	X		X					X	X	X	
Christiana (B)	X	X				X		X	X	X	X	X	X	X		X				X	X	
Clay (Twp)	X	X				X		X	X	X	X	X	X	X	X	X				X	X	X
Colerain (Twp)		X				X		X		X	X	X		X					X	X		
Columbia (B)	X	X	X	X	X	X		X	X	X	X	X	X	X		X	X	X	-	X	X	X
Conestoga (Twp)	X	X				X		X	X	X	X	X	X	X			X	X	X	X	X	
Conoy (Twp)						X		X	X	X	X	X		X				X	X	X		
Denver (B)	X	X			+	X		X	X	X	X	X	X	X		X				X		
Drumore (Twp)	X	X				X		X	X	X	X	X		X						X		
Earl (Twp)	X	X				X		X	X	X	X	X	X	X						X	X	
East Cocalico (Twp)						X		X	X	X	X	X		X	X	X		X		X	X	
East Donegal (Twp)	X	X		X	X	X		X	X	X	X	X	X	X						X	X	
East Drumore (Twp)	X			X		X		X	X	X	X	X		X					X	X		
East Earl (Twp)						X																
East Hempfield (Twp)	X	X				X		X	X	X	X	X	X	X					X	X		
East Lampeter (Twp)	X	X				X		X	X	X	X	X	X	X	X		X	X	X	X	X	X
East Petersburg (B)	X	X	X	X	X	X		X	X	X			+	X						X		
Eden (Twp)	X	X		+	+	X		X	X	X	X	X	X	X	X	X	X	-	X	X	+	
Elizabeth (Twp)	X	X				X		X		X	X	X	X	X	X	X			X	X	X	
Elizabethtown (B)	X					X		X		X	X	X		X		X				X		
Ephrata (B)	X	X	X	X	+	X		X	X	X	X	X		X		+	+			X		
Ephrata (Twp)	X	X				X			X	X		X		X						X	X	



Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	Continuity of Operations Plan	NFIP	NFIP—CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farmland Preservation	Building Code	Fire Code	Other
Fulton (Twp)						X																
Lancaster (City)		+		+	+	X				X	X	X	X	X	X	X	X	X		X	X	
Lancaster (Twp)		X				X			X	X	X	X	X	X	X			X		X		
Leacock (Twp)		X				X				X	X	X		X				X		X		
Lititz (B)	X	X			+	X		X	X	X	X	+	X	X		X	+	X	-	X	X	
Little Britain (Twp)		X	X	X	+	X		X	X	X	X	+	-	X	-	-	-	-	X	X	X	
Manheim (B)	X	X				X		X	X	X	X	X	X	X						X	X	
Manheim (Twp)	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Manor (Twp)	+	+				X				X	X	X	X			X		X	X	X	X	
Marietta (B)	X	X	X	X	X	X			X	X	X	X		X			X					
Martic (Twp)						X				X	X	X	X						X	X		
Millersville (B)	+	+				X				X	X	X	X			X		X	X	X	X	
Mount Joy (B)	X	+				X		X		X				X						X	X	
Mount Joy (Twp)	X					X		X		X	X	+	X	X		X				X		
Mountville (B)						X																
New Holland (B)		+				+				+	X	X		X						X		
Paradise (Twp)	+	+	+	+	+	X	+	X	X	X	X	X	X	X	+	+	+		X	X	X	
Penn (Twp)	X	X				X		X		X	X	+		X		X			X	X		
Pequea (Twp)						X																
Providence (Twp)	X					X			X	X	X	X		X								
Quarryville (B)		X	X	X	X	X		X		X	X	X	+	X		+				X		X
Rapho (Twp)	X	X			X	X		X	X	X	X	+		X						X		
Sadsbury (Twp)	+	+	+	+		X				X	X			X						X	X	
Salisbury (Twp)						X																
Strasburg (B)		X				X				X				X		X						
Strasburg (Twp)	X	X	X	X	X	X			X	X	X	X		X						X		
Terre Hill (B)																						
Upper Leacock (Twp)		X				X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Warwick (Twp)	X	X			+	X		X	X	X	X	+	X	X	X	+	X	X	X	X	X	



Municipality	Hazard Mitigation Plan	EOP	Disaster Recovery Plan	Evacuation Plan	Continuity of Operations Plan	NFIP	NFIP—CRS	Floodplain Regulations	Floodplain Mgmt. Plan	Zoning Regulations	Subdivision Regulations	Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	Open Space Mgmt. Plan	Stormwater Mgmt. Plan/Ordinance	Natural Resource Protection Plan	Capital Improvements Plan	Economic Dev. Plan	Historic Preservation Plan	Farmland Preservation	Building Code	Fire Code	Other
West Cocalico (Twp)						X																X
West Donegal (Twp)	X	+	+	+	+	X		X	X	X	X	X	X	X	+	+	+	+	X	X	X	
West Earl (Twp)	X					X		X	X	X	X	X		X		X	X		X	X	X	
West Hempfield (Twp)	X	X	X	X	X	X		X	X	X	X	X		X					X	X	X	
West Lampeter (Twp)	+	X	+	X	X	X		X	X	X	X	X		X		+			X	X	X	
Cocalico SD	X	X	X	X	X																	
Columbia Borough SD																						
Conestoga Valley SD	X	+	X	+	X																	
Donegal SD																						
Eastern Lancaster County SD																						
Elizabethtown Area SD	X			X	X																	
Ephrata Area SD																						
Hempfield SD		X	X	X	X																	
Lampeter-Strasburg SD		X	X	X	X											X						
Lancaster SD	X	X	X	X	X			X	X	X	X	X	X	X	X	X	X	X		X	X	
Lancaster-Lebanon Intermediate Unit		X		X																		
Manheim Central SD																						
Manheim Township SD																						
Penn Manor SD	X	X	X	X																		
Pequea Valley SD																						
Solanco SD	X	X		X	X																	
Warwick SD	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	
Lancaster County Conservation District																						
East Cocalico (Twp) Water and Sewer		X		X	X										X	X						

Notes: “X” = municipality currently has this capability; “-” = capability not currently in place; “+” = capability is under development; blank space = no response received from the municipality; “SD” = School District; “N/A” = Not applicable



## 5.2.2 Administrative and Technical Capability

Administrative capability is the availability of departmental and personnel resources for implementing mitigation-related activities. Technical capability is the knowledge and technical expertise of local government employees to execute mitigation activities or the ability to contract outside resources for this expertise. Technical personnel needed for hazard mitigation include planners, engineers, building inspectors, scientists, emergency managers, floodplain managers, land surveyors, and other professionals, with expertise in land development, construction practices, natural and human-caused hazards and community vulnerability, geographic information systems, resource development, and grant writing. The administrative and technical capabilities of municipalities are supported by those of the county, regional, state, and federal governments.

Most administrative and technical agencies and resources have been identified and referenced throughout this HMP update. Lancaster County and many of its municipalities have identified specific mitigation actions in this plan update to create or enhance mitigation-related administrative and technical capabilities.

### Federal and Commonwealth Capabilities

The following federal agencies can provide technical assistance for mitigation activities:

- Army Corps of Engineers
- Department of Housing and Urban Development
- Department of Agriculture
- Economic Development Administration
- Emergency Management Institute
- Environmental Protection Agency
- FEMA
- Small Business Administration

The following commonwealth agencies can provide technical assistance for mitigation activities:

- Department of Community and Economic Development
- Department of Conservation and Natural Resources
- Emergency Management Agency
- Department of Environmental Protection
- Silver Jackets

### Municipal Capabilities

Participating municipalities in this planning effort were provided with a capabilities survey. Table 5-2 summarizes the responses of the municipalities based on administrative and technical capability. Appendix D includes copies of the individual municipal responses.



Table 5-2. Administrative and Technical Capability

Municipality	Planners with land use/ land development knowledge	Planners or engineers with hazard knowledge	Engineers or professionals trained in building or infrastructure construction practices	Emergency managers	NFIP floodplain administrator	Land surveyors	Scientists or staff familiar with hazards of the community	Personnel skilled in GIS or Hazus	Grant writers or fiscal staff to handle large, complex grants	Other
Lancaster County	X	X	X	X		X		X	X	
Adamstown (B)				X						
Akron (B)	X	X	X	X	X	-	X	X	X	
Bart (Twp)	X	-	X	X	X	-	-	-	-	
Brecknock (Twp)	-	-	X	X	X	-	-	-	-	-
Caernarvon (Twp)	-	X	X	X	X	-	-	X	-	
Christiana (B)	X	X	X	X	X	X	-	X	X	
Clay (Twp)	X	X	X	X	X	X	X	X	X	
Colerain (Twp)	X	X	X	X	X	-	-	-	-	
Columbia (B)	X	X	X	X	-	X	X	X	X	X
Conestoga (Twp)	X	X	X	X	-	-	-	-	-	-
Conoy (Twp)	X		X	X	X	X		X	X	
Denver (B)	-	-	-	X	X	-	-	-	X	
Drumore (Twp)*	X	X	X	X	X	X			X	
Earl (Twp)	-	-	-	X	X	-	-	-	-	-
East Cocalico (Twp)	X	X	X	X	X	-	-	-	X	
East Donegal (Twp)	X	-	-	X	X	-	-	-	-	
East Drumore (Twp)*	X		X	X	X					
East Earl (Twp)				X						
East Hempfield (Twp)	X	X	X	X	X	-	X	X	-	
East Lampeter (Twp)	X	X	X	X	X	X	X	X	X	
East Petersburg (B)	X		X	X				X		
Eden (Twp)	X	X	X	X	X	-	-	X	-	
Elizabeth (Twp)	X	X	X	X	-	-	-	-	-	
Elizabethtown (B)	X	-	X	X	-	X	-	-	X	
Ephrata (B)	X	-	X	X	X	-	-	X	X	
Ephrata (Twp)	X	X	X	X	X			X		
Fulton (Twp)				X						
Lancaster (City)	X	X	X	X	X	X	X	X	X	
Lancaster (Twp)	X	X	X	X						



Municipality	Planners with land use/ land development knowledge	Planners or engineers with hazard knowledge	Engineers or professionals trained in building or infrastructure construction practices	Emergency managers	NFIP floodplain administrator	Land surveyors	Scientists or staff familiar with hazards of the community	Personnel skilled in GIS or Hazus	Grant writers or fiscal staff to handle large, complex grants	Other
Leacock (Twp)			X	X						
Lititz (B)	X	X	X	X	X		X	X	X	
Little Britain (Twp)	X	-	X	X	X	-	X	X	-	
Manheim (B)	X	-	X	X	X	-	-	-	-	-
Manheim (Twp)	X	X	X	X	X	X	X	X	X	
Manor (Twp)	X	-	X	X	-	-	-	-	-	
Marietta (B)	X	X	X	X						
Martic (Twp)	-	X	X	X	-	X	-	-	X	
Millersville (B)	X	-	X	X	-	-	-	-	-	
Mount Joy (B)				X					X	
Mount Joy (Twp)	X		X	X	X			X		
Mountville (B)				X						
New Holland (B)	X	X	-	X	-	-	-	X	X	
Paradise (Twp)	X	X	X	X	-	X	-	X	X	
Penn (Twp)	X	X		X	X		X	X	X	
Pequea (Twp)				X						
Providence (Twp)	-	-	-	X	-	-	-	-	-	
Quarryville (B)	-	-	-	X	-	-	-	-	-	
Rapho (Twp)	X	-	X	X	X	-	-	-	-	-
Sadsbury (Twp)	X	X	X	X				-		
Salisbury (Twp)				X						
Strasburg (B)		X	X	X						
Strasburg (Twp)	-	-	X	X	X	-	-	-	-	-
Terre Hill (B)				X						
Upper Leacock (Twp)	X	X	X	X	X	X	X	X	X	
Warwick (Twp)	X	X	X	X	X	X	X	X	X	
West Cocalico (Twp)	-	X	X	X	X	-	X	X	-	
West Donegal (Twp)	X	-	X	X	X	-	-	X	-	
West Earl (Twp)	X	X	X	X	X	X	X	X	X	
West Hempfield (Twp)	X	X	X	X	X	-	X	X	-	-
West Lampeter (Twp)	X	X	X	X	X	-	-	-	X	



Municipality	Planners with land use/ land development knowledge	Planners or engineers with hazard knowledge	Engineers or professionals trained in building or infrastructure construction practices	Emergency managers	NFIP floodplain administrator	Land surveyors	Scientists or staff familiar with hazards of the community	Personnel skilled in GIS or Hazus	Grant writers or fiscal staff to handle large, complex grants	Other
Cocalico SD	-	-	-	X	-	-	-	-	X	
Columbia Borough SD										
Conestoga Valley SD	-	-	-	X	-	-	-	-	-	
Donegal SD										
Eastern Lancaster County SD										
Elizabethtown Area SD	-	X	X	-	-	-	-	-	-	
Ephrata Area SD										
Hempfield SD	-	-	-	X	-	-	-	-	-	
Lampeter-Strasburg SD	-	-	-	-	-	-	-	-	-	
Lancaster SD	X	X	X	X		X	X	X	X	
Lancaster-Lebanon Intermediate Unit									X	
Manheim Central SD										
Manheim Township SD										
Penn Manor SD										
Pequea Valley SD										
Solanco SD	-	-	-	-	-	-	-	-	-	
Warwick SD	-	-	X	X	-	-	-	-	-	
Lancaster County Conservation District										
East Cocalico (Twp) Water and Sewer	X	X	X	X	-	-	-	X	X	X

Notes:

“X” indicates that the municipality currently has this capability in place.

“-” indicates no capability is currently in place.

“SD” means School District

Blank space indicates no response was received from the municipality.

\* indicates jurisdictions which are currently hiring to fill the emergency management coordinator position.



### 5.2.3 Financial Capability

Mitigation actions are largely dependent on available funding, so it is critical to identify available funding sources to support the implementation of the mitigation strategies identified in this plan update. Jurisdictions fund mitigation projects through existing local budgets, local appropriations (including referendums and bonding), and myriad federal and state loan and grant programs.

Federal mitigation grant funding is available to all communities with a current HMP (this plan). Most of these grants require a “local share” in the range of 10 to 25 percent of the total grant amount.

#### Federal Hazard Mitigation Funding Opportunities

##### Federal Emergency Management Agency

##### Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) (Stafford Act 404 and 406) is a post-disaster mitigation program made available to states by FEMA after each federal disaster declaration. The HMGP can provide up to 75 percent funding for hazard mitigation measures and can be used to fund cost-effective projects to protect public or private property in an area covered by a federal disaster declaration or that projects to reduce the likely damage from future disasters. Examples of projects include acquisition and demolition of structures in hazard-prone areas, flood proofing, or elevation to reduce future damage, minor structural improvements, and development of state or local standards.

Projects must fit into an overall mitigation strategy for the area identified as part of a local planning effort. All applicants must have a FEMA-approved HMP. Eligible applicants include state and local governments, certain nonprofit organizations or institutions that perform essential government services, and federally recognized tribes. Individuals or homeowners cannot apply directly for the HMGP; a local government must apply on their behalf. Applications are submitted to PEMA and ranked order for available funding and submitted to FEMA for final approval. Eligible projects not selected for funding are placed in an inactive status and may be considered as additional HMGP funding becomes available.

Sections 404 and 406 hazard mitigation funding are two distinct criteria associated with mitigation funding. Participation in FEMA 404 HMGP may cover mitigation activities, including raising, removing, relocating, or replacing structures within flood hazard areas. FEMA 406 Public Assistance mitigation is applied after a Presidentially Declared Disaster. This assistance covers parts of a facility that were actually damaged and the mitigation measures that provide protection from subsequent events.

##### Flood Mitigation Assistance Program

Flood Mitigation Assistance (FMA) provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP. FMA is funded annually; no federal disaster declaration is required. Only NFIP-insured homes and businesses are eligible for mitigation in this program. Funding for FMA is limited, and, as with the HMGP, individuals cannot apply directly. Applications must come from local governments or other eligible organizations.

The federal government cost-share for an FMA project is 75 percent. At least 25 percent of the total eligible costs must be provided by a non-federal source. At a minimum, a FEMA-approved local HMP is required before a project can be approved. FMA funds are distributed from FEMA to the Commonwealth. PEMA serves as the grantee and program administrator for FMA.

Residential and non-residential properties currently insured with NFIP are eligible to receive FMA funds if they meet the definition of repetitive loss properties or severe repetitive loss property, as described in Section 4.3.7 of this plan. These properties are eligible to receive an increased federal cost share.



### Building Resilient Infrastructure and Communities Program

The Building Resilient Infrastructure and Communities Program (BRIC) provides funding for research-supported, proactive investment in community resilience, with a focus on infrastructure projects benefitting disadvantaged communities, nature-based solutions, climate resilience and adaptation, and adopting hazard resistant building codes. No disaster declaration is required. Federal funds will cover 75 percent of a project's cost up to \$50 million per sub-application. As with the HMGP and FMA, a FEMA-approved local HMP must be approved for funding under the BRIC program. An increased federal cost share is available for economically disadvantaged rural communities.

### Extraordinary Circumstances

For HMGP, BRIC, and FMA, funding may be awarded without a currently approved HMP if the FEMA region determines that extraordinary circumstances exist and FEMA headquarters concurs. If this exception is granted, a local HMP must be approved by FEMA within 12 months of the award of the project subaward to that community. Extraordinary circumstances exist when a determination is made by an applicant and FEMA that the proposed project is consistent with the priorities and strategies identified in the state mitigation plan and that the jurisdiction meets at least one of the following criteria:

- The jurisdiction is a small, impoverished community.
- The jurisdiction has been determined to have had insufficient capacity due to lack of available funding, staffing, or other necessary expertise to satisfy the mitigation planning requirement prior to the current disaster or application deadline.
- The jurisdiction has been determined to have been at low risk from hazards because of low frequency of occurrence or minimal damage from previous occurrences as a result of sparse development.
- The jurisdiction experienced significant disruption from a declared disaster or another event that impacts its ability to complete the mitigation planning process prior to award or final approval of a project award.
- The jurisdiction does not have a mitigation plan for reasons beyond the control of the state, federally recognized tribe, or local community, such as Disaster Relief Fund restrictions that delay FEMA from granting a subaward prior to the expiration of the local or Tribal Mitigation Plan.

The applicant must provide written justification that identifies the specific criteria or circumstance listed above, explains why there is no longer an impediment to satisfying the mitigation planning requirement, and identifies the actions or circumstances that eliminated the deficiency.

When an HMGP project funding is awarded under extraordinary circumstances, the recipient acknowledges in writing to the FEMA Region that a plan will be completed within 12 months of the subaward. The recipient must provide a work plan for completing the local HMP, including milestones and a timetable. This requirement must be incorporated into the award (both the planning and project subaward agreements if a planning subaward is also awarded).

### Federal Disaster Assistance Programs

Following a disaster, various types of assistance may be made available by local, state, and federal governments. The types and levels of disaster assistance depend on the severity of the damage and the declarations that result from the disaster event. General types of assistance that may be provided should the President of the United States declare the event a major disaster include the following:

- **Individual Assistance**, largely funded by the U.S. Small Business Administration, provides help for homeowners, renters, businesses, and some nonprofit entities after disasters occur:
  - For homeowners and renters, those who suffered uninsured or underinsured losses may be eligible for a Home Disaster Loan to repair or replace damaged real estate or personal property. Renters are eligible for loans to cover personal property losses. Individuals may borrow up to



\$200,000 to repair or replace real estate, \$40,000 to cover losses to personal property, and an additional 20 percent for mitigation.

- For businesses, loans of up to \$2 million may be made to repair or replace disaster damage to property owned by the business, including real estate, machinery and equipment, inventory, and supplies. Businesses of any size are eligible.
- Nonprofit organizations, such as charities, churches, private universities, etc., are also eligible. An Economic Injury Disaster Loan provides necessary working capital until normal operations resume after a physical disaster. These loans are restricted to small businesses only.
- **Public Assistance** provides cost reimbursement aid to local governments (state, county, local, municipal authorities, and school districts) and certain nonprofit agencies that were involved in disaster response and recovery programs or that suffered loss or damage to facilities or property used to deliver government-like services.

### High Hazard Potential Dam Program

The Rehabilitation of High Hazard Potential Dam (HHPD) grant program provides technical, planning, design, and construction assistance in the form of grants to non-federal sponsors for rehabilitation of eligible high hazard potential dams (FEMA 2020). Funding is available for activities to repair, remove, or complete structural and nonstructural rehabilitation of eligible HHPDs. The following are basic eligibility requirements:

- The applicant must be a non-federal government entity or a nonprofit and work with the state administrative agency, which will serve as the applicant and/or pass-through entity for a sub-recipient.
  - It is recommended that applicants pursue this grant in coordination with the state dam safety officer and the state hazard mitigation officer. For Pennsylvania, Roger Adams is the PA DEP Dam Safety Division Chief and Tom Hughes is the State Hazard Mitigation Officer.
- The sub-recipient must:
  - Act in accordance with the state dam safety program.
  - Be a full participant in the NFIP.
  - Commit to operation and maintenance for 50 years, provide an operation and maintenance plan, and assure that the plan will be carried out.
  - Have a floodplain management plan in place.
  - Comply with the Stafford Act, Davis-Bacon Act, Copeland Anti-Kickback Act, and the Brook Architect-Engineers Act.
- The dam to be repaired, removed or rehabilitated must:
  - Be located in a state with a state dam safety program.
  - Be classified as “high hazard potential” by the state dam safety program.
  - Have an emergency action plan approved by the state dam safety program.
  - Fail to meet minimum state dam safety standards and pose an unacceptable risk to the public.
  - Have a non-federal cost-share of 35 percent of entire project cost.
- The project must comply with other requirements, including:
  - Environmental and historic preservation
  - Non-discrimination
  - Conflicts of interest
  - Procurement rules



### Emergency Management Performance Grants Program

The Emergency Management Performance Grant (EMPG) provides emergency management agencies with resources to implement the National Preparedness System. The grants support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response, and recovery mission areas.

### U.S. Department of Housing and Urban Development Community Development Block Grants

#### Community Development Block Grants

The U.S. Department of Housing and Urban Development (HUD) Community Development Block Grants (CDBG) are federal funds intended to provide low- and moderate-income citizens with decent housing, a suitable living environment, and expanded economic opportunities. Eligible activities include community facilities and improvements, roads and infrastructure, housing rehabilitation and preservation, development activities, public services, economic development, planning, and administration.

Public improvements may include flood and drainage improvements. In limited instances, and during times of “urgent need” (for example, post-disaster) as defined by the CDBG National Objectives, CDBG funding may be used to acquire a property in a floodplain that was severely damaged by a recent flood, demolish a structure severely damaged by an earthquake, or repair a public facility severely damaged by a hazard event. All municipalities in the county are eligible for CDBG funds through the county, which receives CDBG funding directly from U.S. HUD.

#### Disaster Housing Assistance Program

The Disaster Housing Assistance Program provides emergency assistance for housing, including minor home repairs to establish livable conditions as well as mortgage and rental assistance.

#### HOME Investment Partnerships Program

The HOME Investment Partnerships Program (HOME) provides grants to states and localities that communities use—often in partnership with local nonprofit groups—to fund activities including building, buying, and/or rehabilitating affordable housing for rent or homeownership or providing direct rental assistance to low-income people. HOME is the largest federal block grant to state and local governments designed exclusively to create affordable housing for low-income households. HOME funds are awarded annually as grants to participating jurisdictions. The program’s flexibility allows states and local governments to use HOME funds for grants, direct loans, loan guarantees or other forms of credit enhancements, or rental assistance or security deposits. The program requires that participating jurisdictions match 25 cents of every dollar in program funds.

#### Section 108 Loan Guarantee Program

The Section 108 Loan Guarantee Program provides communities with a source of low-cost, long-term financing for economic and community development projects. Section 108 financing provides an avenue for communities to undertake larger, more costly projects, where they may have limited resources to invest upfront. Section 108 can fund economic development, housing, public facilities, infrastructure, and other physical development projects, including improvements to increase resilience against natural disasters. Section 108 assistance can be deployed in two ways:

- Directly by the community or its governmental or non-profit partner to carry out an eligible project
- Indirectly, with a community or its partner re-lending (or, in limited circumstances, granting) the funds to a developer or business to undertake an eligible project

### U.S. Department of Health and Human Services Social Services Block Grant Program

The Social Services Block Grant provides funding for states to provide essential social services that help reduce dependency and promote self-sufficiency; protect children and adults from neglect, abuse, and exploitation; and



help individuals who are unable to take care of themselves to stay in their homes or to find the best institutional arrangements.

### U.S. Department of Transportation

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#### Federal Highway Administration Emergency Relief

Federal Highway Administration (FHWA) Emergency Relief is a grant program that can be used for the repair or reconstruction of federal-aid highways and roads on federal lands that have suffered serious damage as a result of a disaster. PennDOT serves as the liaison between local municipalities and FHWA. The program is appropriated \$100 million annually.

#### Federal Transit Administration Emergency Relief

Federal Transit Authority (FTA) Emergency Relief is a grant program that funds capital projects to protect, repair, reconstruct, or replace equipment and facilities of public transportation systems. This transportation-specific fund is administered by the FTA and directly allocated to mass transit and port authorities.

#### Federal Highway Administration Recreational Trails

The Recreational Trails Program is an assistance program of the FHWA that provides funds to states to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. The program requires that states use 30 percent of funds for non-motorized recreation, 30 percent for motorized recreation, and 40 percent for diverse recreational trail use.

#### Rebuilding American Infrastructure with Sustainability and Equity Grant Program

The Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant program invests in road, rail, transit, and port projects that promise to achieve national objectives. Project sponsors at the state and local levels can obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional USDOT programs. RAISE can provide funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, or others. This flexibility allows RAISE to work directly with entities that own, operate, and maintain much of that nation's transportation infrastructure but otherwise cannot turn to the federal government for support.

### U.S. Department of Agriculture

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#### Community Facilities Direct Loan and Grant Program

This program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service for the orderly development of the community in a primarily rural area and does not include private, commercial, or business undertakings. Funds can be used to purchase, construct, or improve essential community facilities, purchase equipment, and pay related project expenses. Rural areas including cities, villages, townships, towns, and federally recognized tribal lands, with no more than 20,000 residents according to the latest U.S. Census, are eligible for this program.

#### Emergency Conservation Program

The Emergency Conservation Program provides emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland damaged by natural disasters and for carrying out emergency water conservation measures in periods of severe drought. The Emergency Conservation Program is administered by the commonwealth and county Farm Service Agency committees. Locally elected county committees are authorized to implement the Emergency Conservation Program for all disasters except drought, which is authorized at the national office.



### Non-Insured Crop Disaster Assistance Program

The Non-Insured Crop Disaster Assistance Program provides financial assistance to producers of non-insurable crops when low yields, loss of inventory, or prevented planting occur due to natural disasters.

### Emergency Loan Program

The Emergency Loan Program is triggered when a natural disaster is designated by the Secretary of Agriculture, or a natural disaster or emergency is declared by the President under the Stafford Act. These loans help producers who suffer qualifying farm-related losses directly caused by the disaster in a county declared or designated as a primary disaster or quarantine area. Farmers in counties that are contiguous to the declared, designated, or quarantined area also may qualify for emergency loans. For production losses, a 30 percent reduction in a primary crop in a designated or contiguous county is required. Losses to quality, such as receiving a 30 percent reduced price for flood-damaged crops, may be eligible for assistance, too.

### Emergency Watershed Protection Program

The Emergency Watershed Protection (EWP) Program offers technical and financial assistance to help local communities relieve imminent threats to life and property caused by floods, fires, windstorms, and other natural disasters that impair a watershed. EWP does not require a disaster declaration by federal or state government officials for program assistance to begin. The Natural Resources Conservation Service (NRCS) state conservationist can declare a local watershed emergency and initiate EWP program assistance in cooperation with an eligible sponsor. The sponsor must sign a cooperative agreement with NRCS. The EWP program offers financial and technical assistance for activities including the following:

- Remove debris from stream channels, road culverts, and bridges
- Reshape and protect eroded streambanks
- Correct damaged or destroyed drainage facilities
- Establish vegetative cover on critically eroding lands
- Repair levees and structures
- Repair certain conservation practices

### *EWP—Recovery*

The EWP—Recovery program is aimed at relieving imminent hazards to life and property caused by floods, fires, windstorms, and other natural occurrences. Public and private landowners are eligible for assistance but must be represented by a project sponsor that is a legal subdivision of the state, such as a city, county, township, or conservation district, or Native American tribes or tribal governments. NRCS will pay up to 75 percent of the construction cost of emergency measures. The remaining 25 percent must come from local sources in the form of cash or in-kind services.

NRCS completes a damage survey report that provides an investigation of the work necessary to repair or protect a site. Watershed impairments that the program addresses are debris-clogged stream channels, undermined and unstable streambanks, jeopardized water control structures and public infrastructures, wind-borne debris removal, and damaged upland sites stripped of protective vegetation by fire or drought.

### *EWP—Floodplain Easement*

The EWP—Floodplain Easement program funds projects to restore easements to the natural environment to the extent practicable. Work can include both structural and nonstructural practices to restore flood storage and flow, control erosion, and improve the practical management of the easement. To be eligible, lands must meet one of the following criteria:

- Lands that have been damaged by flooding at least once within the previous calendar year or have been subject to flood damage at least twice within the previous 10 years
- Other lands within the floodplain that would contribute to the restoration of flood storage and flow, provide for control of erosion, or improve the practical management of the floodplain easement



- Lands that would be inundated or adversely impacted as a result of a dam breach

Structures, including buildings, within the floodplain easement must be demolished and removed or relocated outside the floodplain or dam breach inundation area.

### Regional Conservation Partnership Program

The Regional Conservation Partnership Program promotes coordination of NRCS conservation activities with partners that offer contributions to address on-farm, watershed, and regional natural resource concerns. Through this program, NRCS seeks to co-invest with partners to implement projects that demonstrate innovative solutions to conservation challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address.

### U.S. Fish and Wildlife Service Partners for Fish and Wildlife Program

The Partners for Fish and Wildlife Program provides free technical and financial assistance to landowners, managers, tribes, corporations, schools, and nonprofits interested in improving wildlife habitat on their land. These projects range in size from a wetland of a few acres to a grassland restoration covering several hundred thousand acres.

Many Partners for Fish and Wildlife projects take place on working landscapes such as forests, farms, and ranches. Efforts are focused on areas of conservation concern, such as upland forests, wetlands, native prairies, marshes, rivers, and streams. Projects are designed to benefit federal trust species, including migratory birds and endangered, threatened, or at-risk species.

### U.S. Environmental Protection Agency

#### Smart Growth Implementation Assistance Program

The Smart Growth Implementation Assistance program focuses on complex issues such as stormwater management, code revision, transit-oriented development, affordable housing, infill development, corridor planning, green building, and climate change. Applicants can submit proposals under four categories: community resilience to disasters, job creation, the role of manufactured homes in sustainable neighborhood design, or medical and social service facilities siting.

#### Clean Water Act Section 604(b) Water Quality Planning Grants

Water Quality Planning Grants provide funding to implement regional comprehensive water quality management planning activities as described in Section 604(b) of the federal Clean Water Act. Funds are to be used for water quality management planning activities, including tasks to determine the nature, extent, and causes of point and nonpoint source water pollution problems, and to develop plans to resolve these problems.

### U.S. Economic Development Administration

The U.S. Economic Development Administration (USEDA) provides funding to support comprehensive planning and makes strategic investments that foster employment creation and attract private investment in economically distressed areas of the United States:

#### Public Works Program

Through its Public Works Program, USED A invests in key public infrastructure, such water and sewer system improvements, expansion of port and harbor facilities, brownfields, multitenant manufacturing, business and industrial parks, business incubator facilities, redevelopment technology-based facilities, telecommunications, and development facilities.



### Economic Adjustment Program

Through its Economic Adjustment Program, USEDA supplies small businesses and entrepreneurs with gap financing to start or expand a business in areas that have experienced or are under threat of serious structural damage to the underlying economic base.

### National Park Service Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) invests earnings from offshore oil and gas leasing to help strengthen communities, preserve history, and protect the national endowment of lands and waters. The LWCF program is divided into the “State Side,” which provides grants to State and local governments, and the “Federal Side,” which is used to acquire lands, waters, and interests therein necessary to achieve the natural, cultural, wildlife, and recreation management objectives of federal land management agencies.

### U.S. Department of Energy Weatherization Assistance Program

The U.S. Department of Energy Weatherization Assistance Program minimizes the adverse effects of high-energy costs on low-income populations, older residents, and people with disabilities through client education activities and weatherization services such as modifying heating systems and adding insulation (U.S. Department of Energy n.d.).

### Commonwealth Hazard Mitigation Funding Opportunities

#### Marcellus Shale Legacy Fund—Act 13 of 2012

Act 13 of 2012 establishes the Marcellus Legacy Fund and allocates funds to the Commonwealth Financing Authority for the following types of projects:

- **Watershed Restoration and Protection Program**—The overall goal of this program is to restore and maintain restored stream reaches impaired by the uncontrolled discharge of non-point source polluted runoff, and ultimately to remove these streams from the PA DEP’s Impaired Waters list.
- **Greenways, Trails and Recreation Program**—Planning, acquisition, development, rehabilitation, and repair of greenways, recreational trails, open space, parks, and beautification projects. Projects can involve development of or rehabilitation and improvements to public parks, recreation areas, greenways, and trails; and designing river conservation methods.
- **Flood Mitigation Program**—Statewide initiatives to assist with flood mitigation projects.

While most of the identified fiscal capabilities are available to all municipalities in Lancaster County, the extent to which communities have leveraged these funding sources varies widely. It is expected that communities familiar with accessing grant programs will continue to pursue those grant sources, as appropriate.

#### Other Commonwealth Hazard Mitigation Funding Opportunities

Other commonwealth programs that provide financial support for mitigation activities include the following:

- Community Conservation Partnerships Program
- Community Revitalization Program
- Floodplain Land Use Assistance Program
- Growing Greener Program
- Keystone Grant Program
- Local Government Capital Projects Loan Program
- Land Use Planning and Technical Assistance Program
- Pennsylvania Heritage Areas Program
- Pennsylvania Recreational Trails Program
- Shared Municipal Services



- Technical Assistance Program
- H2O PA

### Lancaster County Capabilities

Lancaster County has legal authority to fund mitigation projects through existing budgets, referendums, bonding, and federal and commonwealth loans and grants. County funding agencies and programs include the following:

- Lancaster County Housing & Redevelopment Authorities
  - **Community Development Block Grant Program**—Funds a variety of housing, community development, and public service activities that benefit low- and moderate-income persons.
  - **Rental Housing Rehabilitation Program**—Funds the new construction or rehabilitation of existing rental properties. Projects with a mix of unit types and affordability levels are encouraged but not required.
- Lancaster County Metropolitan Planning Organization
  - **Connects2040 Implementation Program**—Funds transportation construction projects or land use and transportation studies that support the vision of connects2040 by providing for a safer, more walkable, bikeable, and transit friendly transportation system.
  - **Transportation Alternatives**—Funds smaller scale projects, such as pedestrian and bicycle facilities, recreational trails, safe routes to school projects, community improvements such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity.
  - **Transportation Alternatives Set-Aside**—Funds projects and activities defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, environmental mitigation, trails that serve a transportation purpose, and safe routes to school projects.
- Lancaster Bike Club
  - **Lancaster Bike Club Grant Program**—Funds projects that will improve the bicycling experience in Lancaster County, consistent with the Club’s mission.
- Lancaster Conservancy
  - **Susquehanna Riverlands Mini-Grant Program**—Funds projects that advance the mission of the Susquehanna Riverlands Conservation Landscape and focus on the following areas:
    - Habitat and trail connectivity
    - Sustainable public access to the Susquehanna River and its surrounding natural lands
    - Emphasize community partnership and collaboration
    - Ecosystem health.
- Susquehanna River Basin Commission
  - **Consumptive Use Mitigation Grant Program**—Funds projects that mitigate consumptive use or otherwise improve drought resilience in the Susquehanna River Basin. Open to a wide range of water resource projects like aquifer recharge, water conservation, wetland and stream restoration, floodplain restoration, stormwater BMPs, etc.
- Lancaster Clean Water Partners Clean Water Fund
  - **Community Conservation Grant**—Funds education, outreach, and regional engagement projects that improve Lancaster’s water quality through collaboration and creativity. This grant does not fund implementation projects. Projects can range from educational campaigns to art installations to water quality monitoring equipment.



- **Large Implementation Grant**—Funds the installation of high-impact projects in priority locations to achieve nitrogen reductions for Lancaster’s Countywide Action Plan.
- **Small Implementation Grant**—Funds collaborative, watershed-scale restoration projects that encourage diverse audiences to improve Lancaster’s water quality at a rapid pace.

### Municipal Capabilities

It is important for municipalities that funds be available locally to implement mitigation policies and projects. Financial resources are particularly important when jurisdictions require local-match contributions to take advantage of commonwealth or federal mitigation grant funding.

#### Capital Improvement Planning

Capital improvement plans identify specific capital projects to be funded and completed according to a defined schedule. Some of these projects provide hazard mitigation benefits. The county and its municipalities are encouraged to consider the mitigation benefits of capital projects to help prioritize their execution and recognize when mitigation grants may be available for project funding.

#### Special Purpose Taxes

Communities may exercise their taxing authority to raise funds for any project they see fit. This includes special taxes to fund mitigation measures. Spreading the cost of a community project among the community’s taxpayers helps provide the greatest public good for relatively little individual cost.

#### Gas/Electric Utility Fees

A community can dedicate a portion of homeowners’ gas and electric utilities’ fees to upgrade and maintain related infrastructure. Projects such as burying transmission lines, thereby mitigating lines from the effects of winds and ice storms, are expensive. These fees help to offset that cost.

#### Water Authorities and Fees

Water authorities are multipurpose authorities that operate both water and sewer systems. The financing of water systems for lease back to a municipality is among the principal activities of the local government facilities’ financing authorities. A water authority issues bonds to purchase existing facilities or to construct, extend, or improve a system. The primary source of revenue is user fees based on metered usage.

The cost of constructing or extending water supply lines can be funded by special assessments against abutting property owners. Tapping fees also help fund water system capital costs. Water utilities are directly operated by municipal governments and by privately owned public utilities regulated by the Pennsylvania Public Utility Commission. The PA DEP has a program to assist with consolidation of small individual water systems to make system upgrades more cost-effective.

#### Sewer Authorities and Fees

Sewer authorities include multipurpose authorities with sewer projects. The authorities issue bonds to finance acquisition of existing systems or to finance construction, extension, and improvements. Sewer authority operating revenues originate from user fees. The fee frequently is based on the amount of water consumed, and payment is enforced by the ability to terminate service or the imposition of liens against real estate. In areas with no public water supply, flat rate charges are calculated on average use per dwelling unit.

#### Stormwater Utility Fees

Stormwater utility fees are assessed and collected to offset the cost of maintaining and upgrading stormwater management structures, such as drains, retention ponds, and culverts.



### Development Impact Fees

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Development impact fees are one-time fees assessed to offset the cost of providing public services to a new development. They may be dedicated to providing the related new water or sewer infrastructure, roads, parks, recreational areas, libraries, schools, etc. The new infrastructure may be less vulnerable to hazard impacts.

### General Obligation, Revenue, and/or Special Tax Bonds

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Jurisdictions may dedicate general fund or similar financing to implement hazard mitigation projects.

### Partnering Arrangements or Intergovernmental Agreements

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Intergovernmental cooperation is a way to accomplish common goals, solve mutual problems, and reduce expenditures. Each of Lancaster County's 60 municipalities conducts its daily operations and provides community services according to local needs and limitations. The municipalities vary in staff size, resource availability, fiscal status, service provision, population, overall size, and vulnerability to the identified hazards.

### Financial Capabilities Survey Results

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Municipalities participating in this planning effort were provided with a capabilities survey. Table 5-3 summarizes the responses of the municipalities based on financial capabilities. Appendix D includes copies of the individual municipal responses.



Table 5-3. Fiscal Capability

Municipality	Capital Improvement Program	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other
Lancaster County	X	-	-	-	-	-	-	-	X	
Adamstown (B)										
Akron (B)	X	-	-	-	X	X	X	-	-	-
Bart (Twp)	-	-	-	-	-	-	-	-	-	
Brecknock (Twp)	-	-	-	-	-	-	-	-	-	
Caernarvon (Twp)	-	-	-	-	-	-	-	-	-	
Christiana (B)	-	-	-	-	X	-	X	-	X	-
Clay (Twp)	X	X	-	-	X	-	-	-	-	
Colerain (Twp)	-	-	-	-	-	-	-	-	X	X
Columbia (B)	X	X	-	-	-	-	-	X	X	
Conestoga (Twp)									X	X
Conoy (Twp)	-	-	-	-	-	-	-	-	-	
Denver (B)	X	X	-	-	X	-	-	-	X	
Drumore (Twp)										
Earl (Twp)	-	-	-	-	-	-	-	-	-	-
East Cocalico (Twp)	X	X	-	X	-	-	X	X	X	
East Donegal (Twp)	-	-	-	-	X	-	-	-	-	
East Drumore (Twp)										
East Earl (Twp)										
East Hempfield (Twp)	X	-	-	X	-	X	X	X	X	
East Lampeter (Twp)	-	X	-	-	X	X	-	X	X	-
East Petersburg (B)	-	-	X	-	X	-	X	-	-	
Eden (Twp)	-	-	-	-	-	-	-	-	-	
Elizabeth (Twp)	-	-	-	-	-	X	X	-	X	
Elizabethtown (B)								X	X	
Ephrata (B)	X	X	-	X	X	X	-	-	X	
Ephrata (Twp)	-	-	-	-	-	-	-	-	-	



Municipality	Capital Improvement Program	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other
Fulton (Twp)										
Lancaster (City)	X	X	-	-	X	X	-	X	-	
Lancaster (Twp)		X		-	-	-				
Leacock (Twp)		X			X	X		X	X	
Lititz (B)	X	-	-	-	X	X	-	X	-	
Little Britain (Twp)	-	-	-	-	-	-	-	-	X	
Manheim (B)	X	X	X	-	-	-	-	X	X	
Manheim (Twp)	X	X	X	-	-	X	X	X	X	
Manor (Twp)	X	-	X	-	-	-	-		X	
Marietta (B)	-	-	-	-	-	-	-	-	-	
Martic (Twp)	X	-	-	-	-	-	-	-	-	
Millersville (B)	X	-	-	-	X	-	-		X	
Mount Joy (B)					X		X			
Mount Joy (Twp)	X	-	-	-	-	-	X	X	X	
Mountville (B)										
New Holland (B)	-	-	-	-	X	-	-	-	X	
Paradise (Twp)	-	X	X	-	X	-	-	X	X	
Penn (Twp)	X				X			X	X	
Pequea (Twp)										
Providence (Twp)	-	-	-	-	-	-	-	-	-	
Quarryville (B)	X	X	X	-	X	-	X	X	X	
Rapho (Twp)	-	-	-	-	-	-	-	-	-	
Sadsbury (Twp)										
Salisbury (Twp)										
Strasburg (B)	X				X				X	
Strasburg (Twp)	-	-	-	-	-	-	-	-	-	-
Terre Hill (B)										
Upper Leacock (Twp)	X	-	-	-	X	X	X	-	X	
Warwick (Twp)	X	X	-	-	X	X	X	-	X	



Municipality	Capital Improvement Program	Community Development Block Grants (CDBG)	Special Purpose Taxes	Gas/Electric Utility Fees	Water/Sewer Fees	Stormwater Utility Fees	Development Impact Fees	General Obligation, Revenue, and/or Special Tax Bonds	Partnering Arrangements or Intergovernmental Agreements	Other
West Cocalico (Twp)	-	-	-	-	X	-	-	-	-	
West Donegal (Twp)	X	-	X	-	-	-	-	-	X	
West Earl (Twp)	-	X	X	-	X	-	-	-	X	
West Hempfield (Twp)	X	-	-	-	X	X	X	X	X	-
West Lampeter (Twp)	X	-	-	-	-	-	X	X	X	
Cocalico SD	-	-	-	-	-	-	-	X	X	
Columbia Borough SD										
Conestoga Valley SD	-	-	-	-	-	-	-	-	-	
Donegal SD										
Eastern Lancaster County SD										
Elizabethtown Area SD	X	-	-	-	-	-	-	-	-	X
Ephrata Area SD										
Hempfield SD	-	-	-	-	-	-	-	-	X	
Lampeter-Strasburg SD	X	-	-	-	-	-	-	X	X	
Lancaster SD	X	X	X	X	X	X	X	X	X	
Lancaster-Lebanon Intermediate Unit										
Manheim Central SD										
Manheim Township SD										
Penn Manor SD										
Pequea Valley SD										
Solanco SD	-	-	-	-	-	-	-	-	-	
Warwick SD	-	-	-	-	-	-	-	-	-	
Lancaster County Conservation District										
East Cocalico (Twp) Water and Sewer	X	-	-	-	X	-	-	-	-	X

Notes:

“X” indicates that the municipality currently has this capability in place.

“-” indicates no capability is currently in place.

“SD” means School District

Blank space indicates no response was received from the municipality



## 5.2.4 Education and Outreach

Education and outreach are used to implement mitigation activities and communicate hazard-related information. Examples include obtaining certification in programs such as Firewise or StormReady and developing and communicating hazard awareness and safety information to residents.

In Lancaster County, some municipalities have the capability to handle outreach initiatives and others rely on county resources. Several municipal websites post local plans and ordinances, and many municipalities post information regarding hazard-related topics. Local fire departments and emergency managers participate in school programs and attend other community activities to conduct outreach. Appendix D details the outreach and education conducted at the municipal level.

### Flood Maps

Flood maps and flood data, including digital maps for Lancaster County, are available at the municipal offices for municipalities participating in the NFIP. County and municipality maps, tax maps, and property assessment records are available at the Recorder of Deeds Office.

### Library Education Tools

Libraries have educational materials, available upon request, which are used at public speaking events or county meetings, when appropriate. These materials are often available online or free for publication. Available educational materials include the following:

- Training videos
- Pennsylvania emergency preparedness guides
- Additional Pennsylvania educational resources including
  - Social media tool kits
  - School bus safety
  - Flood awareness and safety
- American Red Cross packets for flash flooding, hurricane, thunder and lightning, tornado, and winter storms
- Family disaster planning guides
- Homeland security information for businesses, families, individuals, neighborhoods, and schools
- Pandemic brochures

### Outreach Projects

Several public and private organizations have developed outreach projects, educational tools, and training programs. The county promotes both online and in-person programs to appeal to as wide an audience as possible.

### Are You Ready?

This in-depth program for citizen preparedness provides a step-by-step approach to disaster preparedness. Participants learn about local emergency plans, hazards that affect their area, and how to develop and maintain an emergency communications plan and disaster supply kit. Other topics include evacuation, emergency public shelters, animal handling during disasters, and information specific to people with disabilities. The program provides in-depth information on specific hazards such as the following:

- Floods
- Tornadoes
- Hurricanes
- Thunderstorms and lightning
- Winter storms and extreme cold
- Landslide and debris flows (mudslide)
- Tsunamis
- Fires and wildfires
- Hazardous materials incidents
- Household chemical emergencies



- Extreme heat
- Earthquakes
- Volcanoes
- Nuclear power plants
- Terrorism (explosion, biological, chemical, nuclear, and radiological hazards)

### ReadyPA Campaign

[ReadyPA.org](https://www.readypa.org) is a Commonwealth of Pennsylvania website that aims to prepare the public for times of disaster by providing education on the risks within Pennsylvania, emergency plans and kits, and ways to get involved with community organizations to help others.

### Community Emergency Response Teams (CERT)

CERT provides training to educate citizens about disaster preparedness and instruction in basic disaster response skills, such as fire suppression, medical operations during disasters, light search and rescue, team organization, disaster psychology, and terrorism awareness. Emergency personnel train members of neighborhoods, community organizations, or workplaces in basic response skills. If a disaster overwhelms or delays the community's professional response, CERT members can assist others by applying the basic response and organizational skills that they learned during training. These skills can help save and sustain lives following a disaster until help arrives. Although the County does not have a current and active CERT, Millersville University maintains a CERT that serves the university, Millersville Borough, and surrounding communities. The Lancaster County Department of Public Safety (LCDPS) is working on CERT programs in the County. LCDPS has staffed trained to teach CERT and have been working with local partners to bring CERT to the local communities.

### Emergency Management Courses

Emergency management courses are provided through the County Emergency Management Agency to local coordinators and elected officials, including "Duties and Responsibilities of the Local Emergency Management Coordinator," "Damage Assessment," and "Basic Orientation." The Lancaster County Public Safety Training Center (LCPSTC), as part of DPS, has a Training and Exercise coordinator. Available trainings can be found on the LCPSTC calendar (<https://pstconline.lancastercountypa.gov/calendar/view.php?view=upcoming>).

### Local Emergency Planning Committee

The Local Emergency Planning Committee (LEPC) works with the business community to protect the general population from hazardous material incidents. LEPC agendas can be found on the County website (<https://www.lancastercountypa.gov/agendacenter>). The LEPC must have a minimum of seven members, with at least one representative from each of the following groups:

- Group 1—Elected officials representing local government within the county
- Group 2—Law enforcement, first aid, health, environmental, hospital, and transportation personnel
- Group 3—Firefighting personnel
- Group 4—Civil defense and emergency management personnel
- Group 5—Broadcast and print media personnel
- Group 6—Community groups not affiliated with emergency service groups
- Group 7—Owners and operators of facilities subject to the requirements of SARA Title III

The threshold for which facilities are required to have a material safety data sheet is 10,000 pounds of hazardous chemicals. This document provides workers and emergency personnel with procedures for handling or working with hazardous materials in a safe manner. It includes information on the chemicals' physical properties, toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures. The reporting threshold for extremely hazardous substances (as designated under SARA Title III) is 500 pounds or



the threshold planning quantity, whichever is lower. Qualifying facilities are subject to additional reports and accident prevention regulations.

### **Technical Assistance**

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Lancaster County Emergency Management Division supports public and private entities through coordination and provision of information and equipment, drawing upon county capabilities and private and public resources.

### **Education and Outreach Capabilities Survey Results**

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Municipalities participating in this planning effort were provided with a capability assessment survey. Table 5-4 summarizes the responses of the municipalities regarding education and outreach capabilities. Appendix D includes copies of the individual municipal responses.



Table 5-4. Education and Outreach Capability

Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
Lancaster County	-	X	X	X	X	X	
Adamstown (B)							
Akron (B)	-	-	-	-	-	-	
Bart (Twp)	-	-	X	X	-	-	
Brecknock (Twp)	-	-	-	-	-	-	-
Caernarvon (Twp)	-	-	-	X	X	-	
Christiana (B)	-	-	-	-	-	-	
Clay (Twp)	-	X	-	X	-	X	
Colerain (Twp)	-	-	-	-	-	-	-
Columbia (B)	-	-	-	X	-	-	
Conestoga (Twp)	-	-	-	X	-	X	
Conoy (Twp)	-	-	-	-	-	-	
Denver (B)	-	X	-	X	-	X	
Drumore (Twp)							
Earl (Twp)	-	X	-	X	-	-	-
East Cocalico (Twp)	-	-	-	-	-	-	
East Donegal (Twp)	-	-	-	X	-	-	
East Drumore (Twp)							
East Earl (Twp)							
East Hempfield (Twp)	-	-	X	X	-	X	
East Lampeter (Twp)	X	-	X	X	X	X	X
East Petersburg (B)	-	X	-	X	-	-	
Eden (Twp)	-	X	X	X	X	-	
Elizabeth (Twp)	-	X	-	X	-	X	
Elizabethtown (B)	-	-	-	-	-	-	
Ephrata (B)	-	-	X	X	X	X	
Ephrata (Twp)	-	-	-	X	-	X	



Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
Fulton (Twp)							
Lancaster (City)	-	-	-	X	-	X	
Lancaster (Twp)			X	X			
Leacock (Twp)						X	
Lititz (B)	-	X	-	X	-	X	
Little Britain (Twp)	-	-	-	-	-	-	
Manheim (B)	-	X	-	X	-		
Manheim (Twp)	-	-	X	X	X	X	
Manor (Twp)	-	X	-	X	-	X	
Marietta (B)	-	-	-	-	-	-	
Martic (Twp)	-	-	-	-	-	-	-
Millersville (B)	-	X	-	X	-	X	
Mount Joy (B)							
Mount Joy (Twp)	-	-	-	-	-	-	
Mountville (B)							
New Holland (B)	-	-	-	X	-	-	
Paradise (Twp)	-	-	-	X	-	-	-
Penn (Twp)						X	
Pequea (Twp)							
Providence (Twp)	-	-	-	X	-	-	
Quarryville (B)	-	-	X	X	-	-	
Rapho (Twp)	-	-	-	X	-	X	-
Sadsbury (Twp)				X			
Salisbury (Twp)	-	-	-	-	-	-	-
Strasburg (B)							
Strasburg (Twp)							
Terre Hill (B)							
Upper Leacock (Twp)	-	X	X	X	X	X	
Warwick (Twp)	-	X	-	X	-	X	



Municipality	Firewise Communities Certification	StormReady Certification	Natural Disaster or Safety-Related School Programs	Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Public-private partnership initiatives addressing disaster-related issues	Local citizen groups or nonprofit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	Other
West Cocalico (Twp)	-	-	-	-	-	-	-
West Donegal (Twp)	-	-	-	X	-	-	
West Earl (Twp)		X	X	X	X	X	
West Hempfield (Twp)	-	-	-	X	X	-	-
West Lampeter (Twp)	-	-	-	-	X	-	
Cocalico SD	-	-	X	-	-	-	
Columbia Borough SD							
Conestoga Valley SD	-	-	-	-	-	-	
Donegal SD							
Eastern Lancaster County SD							
Elizabethtown Area SD	-	-	-	X	-	-	-
Ephrata Area SD							
Hempfield SD	-	-	X	-	-	-	
Lampeter-Strasburg SD	-	-	X	-	-	-	
Lancaster SD	-	X	X	X	X	X	
Lancaster-Lebanon Intermediate Unit							
Manheim Central SD							
Manheim Township SD							
Penn Manor SD							
Pequea Valley SD							
Solanco SD	-	-	X	-	-	-	
Warwick SD	-	-	-	-	-	-	-
Lancaster County Conservation District							
East Cocalico (Twp) Water and Sewer	-	-	-	X	-	X	-

Notes:

“X” indicates that the municipality currently has this capability in place.

“-” indicates no capability is currently in place.

“SD” means School District

Blank space indicates no response was received from the municipality.



### 5.2.5 Plan Integration

Many existing Lancaster County plans and programs support hazard risk management. It is critical that this HMP integrate, coordinate with, and complement those mechanisms. Integration of hazard mitigation principles into other local planning mechanisms (comprehensive plans, transportation plans, floodplain ordinances, etc.) and vice versa is vital to build a safer, more resilient community. This two-way exchange of information supports community-wide risk reduction before and after disasters occur. This process also leads to a higher level of interagency coordination.

The intention of the participating jurisdictions is to incorporate mitigation planning as an integral component of daily government operations. Within this HMP, information from current jurisdictional mechanisms was incorporated by assessing existing capabilities. Planning Team members will work with local government officials to integrate the newly adopted hazard mitigation goals and actions into the general operations of government and partner organizations. By doing so, the Planning Team anticipates the following:

- Hazard mitigation planning will be formally recognized as an integral part of overall emergency management efforts.
- Hazard mitigation planning will be formally recognized as an integral part of land use policies and mechanisms.
- The HMP, the county and municipal comprehensive plans, and the county and municipal EOPs will become mutually supportive documents that work in concert to meet the goals and needs of county residents.
- Duplication of effort can be minimized.

Lancaster County has taken steps to reduce its vulnerability to natural and non-natural hazards in its planning and in its daily operations since the Lancaster County HMP was last updated in 2019. The county and its jurisdictions have implemented programs and projects to reduce the impacts of hazards (see Section 6.1.2). It is the intent of the county and participating municipalities to strengthen this focus on mitigation by continuing existing policies and by further implementing the mitigation policies contained in this HMP.

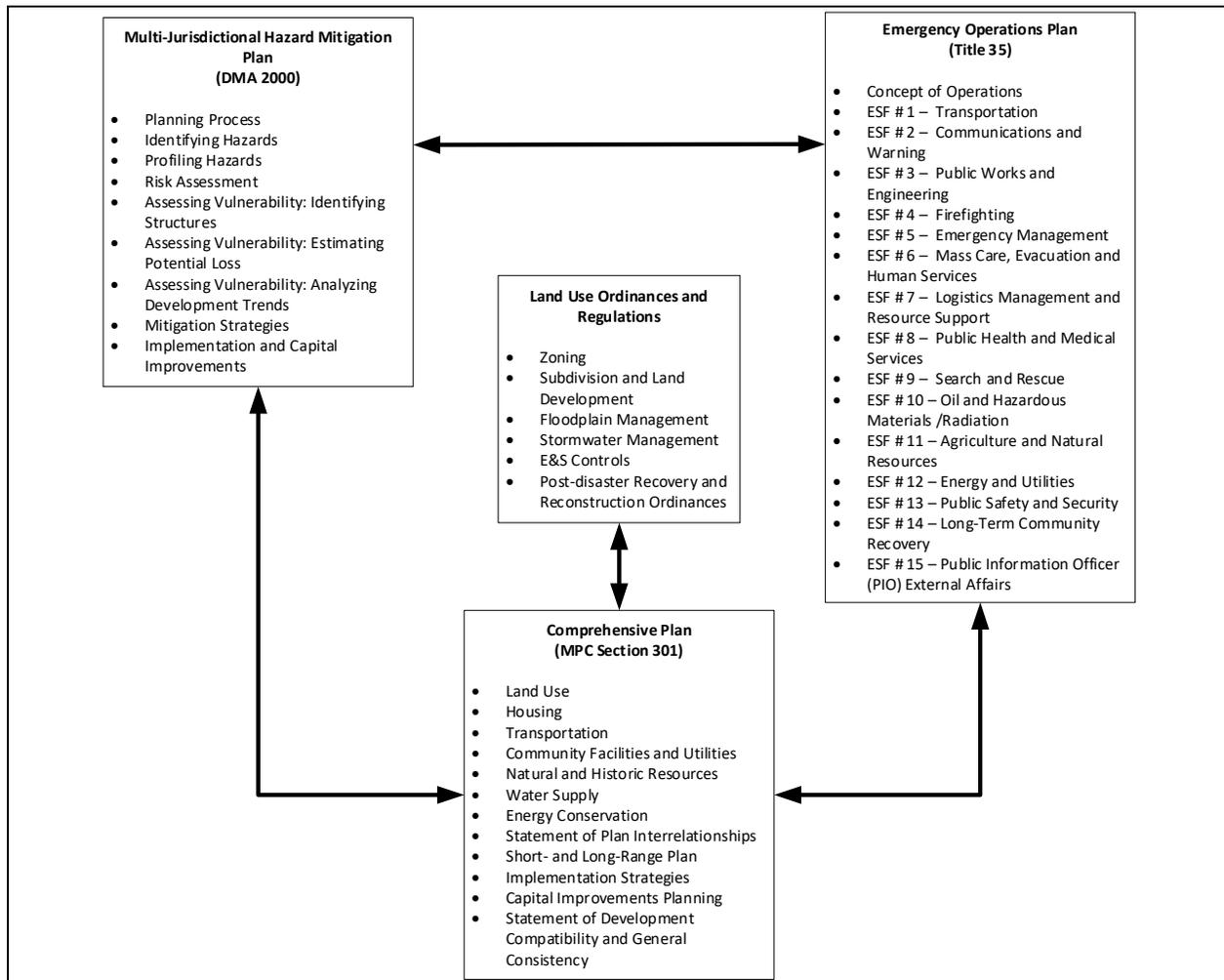
Integration actions will include incorporating the goals of the HMP into ongoing planning, zoning, building, and engineering activities. Specifically, the county will urge municipalities to take the following actions:

- Fund hazard mitigation projects or actions in operating budgets to the extent possible.
- Notify other municipalities about grant and other funding opportunities as they arise.
- Use data and maps from this HMP as supporting documentation in grant applications.
- Review mitigation actions when allocating funding for the municipal budgets.
- Include hazard mitigation when updating municipal ordinances.
- Identify hazard areas in updates of comprehensive plans to identify land use issues.
- Review the HMP prior to land use or zoning changes and permitting or development decisions.

The information on hazards, risk, vulnerability, and mitigation contained in this HMP is based on the best science and technology available at the time of the plan's preparation. All participating jurisdictions recognize that this information can be invaluable in making decisions under comprehensive, capital improvement, and emergency management plans. Figure 5-1 illustrates the interrelationships between the HMP, the Lancaster County comprehensive plan, the Lancaster County EOP, and other community planning mechanisms. Existing processes and programs through which the HMP should be implemented are described below.



Figure 5-1. Plan Interrelationships



Notes: E&S = erosion and sedimentation; ESF = emergency support function

**Administrative**

Administrative processes include departmental or organizational work plans, policies, or procedural changes that can be addressed by the following departments:

- Facility Maintenance
- Housing Authority
- Human Services
- Solid Waste Management and Recycling
- Public Safety
- Sheriff’s Department

Additional administrative measures may include the creation of paid or unpaid internships to assist in HMP maintenance.

Lancaster County Emergency Management Division is responsible for preparing and maintaining the county EOP, including conducting a minimum biennial review. Whenever portions of the plan are implemented in an emergency event or training exercise, a review is performed, and changes are made as necessary. Municipalities are notified of changes to the county EOP, which most of Lancaster County’s municipalities have adopted as





their own EOP. The risk assessment information presented in the 2019 HMP was used to update the Hazard Vulnerability Assessment section of the county EOP. The updated risk assessment information for this 2025 HMP update will affect subsequent updates to the EOP. Recommended changes to the HMP, based on changes to the EOP, will then be coordinated with the Planning Team.

The Lancaster County Planning Commission is responsible for maintaining and updating the county comprehensive plan, which covers all 60 municipalities. The Planning Commission meets monthly to review, discuss, and comment on municipal subdivision and land development plans, municipal floodplain ordinances, municipal stormwater management plans and ordinances, and other community planning and development matters. Since the adoption of the original Lancaster County HMP, these reviews have included informal cross-referencing of the planned development or regulatory activity with the provisions of the HMP. It uses this information to identify necessary revisions and to amend the County comprehensive plan. The Planning Commission’s meetings are open to the public and are advertised according to the Pennsylvania Sunshine Act (Pennsylvania Consolidated Statutes Title 65).

The current Lancaster County comprehensive plan, located on the Lancaster County Planning Commission’s website, was incorporated into multiple aspects of this HMP. Information from the comprehensive plan and other documents was used to formulate the County profile, identify the history of individual hazards, and detail the population projections for Lancaster County. The development of subsequent Lancaster County comprehensive plan updates will use information from this updated HMP.

### Budgetary Process

The county will review capital budgets and, if funding is available, include a line item for mitigation actions. The county will maximize mitigation aspects of proposed projects and encourage municipalities to do likewise.

### Regulatory Measures

Regulatory measures—such as the creation of executive orders, ordinances, and other directives—will be considered to support hazard mitigation in the following areas:

- Comprehensive Planning—Institutionalize hazard mitigation for new construction and land use.
- Zoning and Ordinances
- Building Codes—Enforce codes or higher standards in hazard areas.
- Capital Improvement Plan—Ensure that the person responsible for projects under this plan evaluates whether new construction is in a high hazard area (such as a flood plain) so the construction is designed to mitigate the risk. Revise requirements for the capital improvement plan to include hazard mitigation in the design of new construction.
- NFIP—Continue participation in this program and explore participation in CRS Program.
- Stormwater Management—Continue to implement stormwater management plans.
- HMP Plan Coordination—Prior to formal changes (amendments) to master plans, zoning, ordinances, capital improvement plans, or other mechanisms that control development, all above-mentioned plans must be reviewed to ensure they are consistent with the HMP.

### Funding

The county and its jurisdictions will consider multiple grant sources to fund eligible projects. These opportunities may include the following:

- Federal
  - FEMA Building Resilient Infrastructure and Communities Program (BRIC)
  - FEMA Flood Mitigation Assistance Program (FMA)
  - FEMA Hazard Mitigation Grant Program (HMGP)
  - HUD Community Development Block Grant (CDBG)



- USDA Community Facilities
- USEDA Public Works Program
- Public Assistance Program Mitigation Grants
- Federal Highway Administration
- Catalog of Federal Domestic Assistance
- U.S. Fire Administration Assistance to Firefighter Grants
- U.S. Small Business Administration Pre- and Post-Disaster Mitigation Loans
- U.S. Army Corps of Engineers
- U.S. Department of Interior, Bureau of Land Management
- Commonwealth
  - PennDOT Pennsylvania Infrastructure Bank
  - Act 13 Marcellus Shale Legacy Funds—Flood Mitigation Program
- Nonprofit organizations, foundations, and private sources

### Partnerships

The following opportunities for partnerships will be encouraged to provide a broader support and understanding of hazard mitigation:

- Existing Committees and Councils:
  - Lancaster County Agricultural Preserve Board
  - Lancaster County Conservancy
  - Lancaster County Conservation District
  - Lancaster County Economic Development Company
  - Lancaster County Housing and Redevelopment Authority
  - Lancaster County Land Bank
  - Lancaster County Local Emergency Planning Committee
  - Lancaster County Transportation Authority
- Creative Partnerships for Funding and Incentives:
  - Public-private partnerships, including utilities and businesses
  - Commonwealth of Pennsylvania cooperation
  - In-kind resources
- Working with Other Federal and Commonwealth Agencies:
  - U.S. Army Corps of Engineers
  - Department of Homeland Security
  - Federal Emergency Management Agency
  - National Oceanic and Atmosphere Administration
  - National Weather Service
  - Pennsylvania Emergency Management Agency
  - Pennsylvania Department of Transportation
  - Pennsylvania Department of Environmental Protection
  - Pennsylvania State Police
  - U.S. Department of Agriculture
  - U.S. Department of Transportation
  - U.S. Geological Service
  - American Red Cross
- Watershed Associations:
  - Chiques Creek Watershed Alliance



- Cocalico Creek Watershed Association
- Donegal Chapter of Trout Unlimited
- Donegal Fish & Conservation Association
- Friends of Fishing Creek
- Lititz Run Watershed Alliance
- Little Conestoga Watershed Alliance
- Mill Creek Preservation Association
- Octoraro Watershed Association
- Pequea Creek Watershed Association
- Tri-County Conewago Creek Association

During the plan evaluation process, the Steering Committee will identify additional policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions and will include these findings and recommendations in the HMP Progress Report.

### 5.2.6 Self-Assessment

In the capability assessment surveys, each participating jurisdiction provided a self-assessment of its capabilities to implement mitigation strategies. Respondents evaluated their degree of capability as “Limited,” “Moderate” or “High.” Table 5-5 summarizes the results. Detailed information regarding the municipalities’ capabilities self-assessments can be found in the municipal survey responses provided in Appendix D.

**Table 5-5. Capability Self-Assessment Matrix**

Municipality	Capability Rating			
	Planning and Regulatory Capability	Administrative and Technical Capability	Financial Capability	Education and Outreach Capability
Lancaster County	M	H	M	H
Adamstown Borough				
Akron Borough	H	H	H	L
Bart Township	L	L	L	L
Brecknock Township	L	L	L	
Caernarvon Township	L	M	M	L
Christiana Borough	L	L	L	L
Clay Township	M	M	H	M
Colerain Township	M	M	L	L
Columbia Borough	M	M	M	L
Conestoga Township	M	L	L	M
Conoy Township	L	L	L	L
Denver Borough	M	M	L	H
Drumore Township	L	L	L	L
Earl Township	M	M	L	L
East Cocalico Township	H	H	M	H
East Donegal Township	M	M	M	M
East Drumore Township				
East Earl Township				
East Hempfield Township	M	M	L	M
East Lampeter Township	H	H	L	H
East Petersburg Borough	L	L	L	M
Eden Township	M	M	L	H
Elizabeth Township	L	L	L	L
Elizabethtown Borough	M	M	L	M



Municipality	Capability Rating			
	Planning and Regulatory Capability	Administrative and Technical Capability	Financial Capability	Education and Outreach Capability
Ephrata Borough	M	M	L	L
Ephrata Township	M	M	M	M
Fulton Township				
Lancaster City	M	M	L	M
Lancaster Township	L	L	L	L
Leacock Township	M	M	M	M
Lititz Borough	H	M	H	L
Little Britain Township				
Manheim Borough	M	L	L	M
Manheim Township	H	H	H	H
Manor Township	M	M	M	L
Marietta Borough	M	M	L	L
Martic Township	M	L	L	L
Millersville Borough	M	M	M	L
Mount Joy Borough	L	L	M	L
Mount Joy Township	L	L	L	L
Mountville Borough				
New Holland Borough	L	M	L	M
Paradise Township	M	H	M	L
Penn Township	H	H	H	M
Pequea Township				
Providence Township	L	L	L	L
Quarryville Borough	M	M	M	M
Rapho Township	L	L	L	L
Sadsbury Township				
Salisbury Township				
Strasburg Borough				
Strasburg Township	L	L	L	L
Terre Hill Borough				
Upper Leacock Township	H	H	H	M
Warwick Township	H	H	H	H
West Cocalico Township	L	M	L	L
West Donegal Township	M	L	L	L
West Earl Township	M	M	M	M
West Hempfield Township	M	M	M	M
West Lampeter Township	H	H	H	H
Cocalico SD				
Columbia Borough SD				
Conestoga Valley SD	L	L	L	M
Donegal SD				
Eastern Lancaster County SD				
Elizabethtown Area SD	H	H	M	M
Ephrata Area SD				
Hempfield SD	L	L	L	L
Lampeter-Strasburg SD	L	L	L	L
Lancaster SD	M	M	M	M



Municipality	Capability Rating			
	Planning and Regulatory Capability	Administrative and Technical Capability	Financial Capability	Education and Outreach Capability
Lancaster-Lebanon Intermediate Unit	L	L	L	L
Manheim Central SD				
Manheim Township SD				
Penn Manor SD	L	L	L	L
Pequea Valley SD				
Solanco SD	L	L	L	H
Warwick SD	L	L	L	L
Lancaster County Conservation District				
East Cocalico (Twp) Water and Sewer	L	H	M	H

Note: Blank space indicates no response was received from the municipality. SD = School District



## SECTION 6 MITIGATION STRATEGY

This section describes the strategy the Lancaster County Planning Team will use to mitigate potential losses from the hazards identified and assessed in this HMP through existing and future actions. It outlines the mitigation goals and objectives set forth in the 2025 HMP update, describes the process for identifying and analyzing mitigation techniques, and provides the mitigation action plan.

### 6.1 UPDATE PROCESS SUMMARY

This section summarizes past mitigation goals and past mitigation action status and provides an update of mitigation strategies and additional past mitigation accomplishments. The Planning Team reviewed and updated the mitigation goals and objectives utilizing the latest information gathered through the hazard profiles and the risk assessment. The mitigation goals and objectives were also compared to goals and objectives in Pennsylvania’s 2023 HMP. Updated goals and objectives were presented at the Mitigation Solutions Workshop for final review and approval. Plan participants continued to review and provide progress on the 2019 mitigation actions throughout the planning process.

#### 6.1.1 Review of the Past Mitigation Goals

The 2019 version of the HMP listed the following mitigation goals:

- **Goal 1:** Prevent injury/death and damage from natural and human-made hazards in Lancaster County.
- **Goal 2:** Protect the citizens of Lancaster County as well as public and private property from the impacts of natural and human-caused hazards.
- **Goal 3:** Improve emergency services and capabilities in Lancaster County to protect citizens from natural and human-caused hazards.
- **Goal 4:** Increase public education and awareness of existing and potential hazards in Lancaster County.

Existing mitigation goals and objectives and the 2019 HMP mitigation actions were examined at the Steering Committee kickoff meeting and revisited during the Mitigation Strategy Workshop. Both of these meetings were open to members of the Steering Committee and stakeholders. Planning Team members were able to comment on the goals, objectives, and actions that were listed in the previous Lancaster County HMP by completing a 5-year plan review worksheet.

Table 6-1 shows the results of the Steering Committee and Planning Team review of the 2019 goals and objectives. The Steering Committee chose to reorganize the goals and objectives by moving away from organizing them by hazard, to reduce redundancy and overlap. Additional information on the Steering Committee’s evaluation of each goal and objective is provided in the table.

**Table 6-1. Steering and Planning Team Evaluation of 2019 Goals and Objectives**

2019 Lancaster County Hazard Mitigation Plan Goals and Objectives		Evaluation
<b>Goal 1</b>	<b>Prevent injury/death and damage from natural and human-caused hazards in Lancaster County.</b>	<b>No comments received</b>
Objective 1.1	Develop regulations limiting development in hazard-prone areas.	No comments received
Objective 1.2	Direct growth in designated growth areas away from hazard-prone areas and maintain natural hazard buffers in the County.	No comments received
Objective 1.3	Lessen impacts on natural resources from natural and human-caused hazards.	No comments received
<b>Goal 2</b>	<b>Protect the citizens of Lancaster County as well as public and private property from the impacts of natural and human-caused hazards.</b>	<b>No comments received</b>



2019 Lancaster County Hazard Mitigation Plan Goals and Objectives		Evaluation
Objective 2.1	Protect existing structures, including critical facilities, from damage that can be caused by hazards.	No comments received
Objective 2.2	Acquire, relocate, elevate, and/or retrofit existing structures located in hazard areas.	Objectives 2.2 and 2.3 are redundant. Combine these actions.
Objective 2.3	Acquire, relocate, elevate, and/or retrofit repetitive loss properties from flood-prone areas.	Objectives 2.2 and 2.3 are redundant. Combine these actions.
Objective 2.4	Improve and maintain stormwater management systems to reduce backup and flooding.	No comments received
Objective 2.5	Protect the health of County residents from disease.	Include “and apply lessons learned from recent pandemics.”
<b>Goal 3</b>	<b>Improve emergency services and capabilities in Lancaster County to protect citizens from natural and human-caused hazards.</b>	<b>No comments received</b>
Objective 3.1	Improve coordination and communication between departments.	No comments received
Objective 3.2	Ensure adequate training and resources for those involved in emergency response, services, relief, or hazard mitigation.	No comments received
Objective 3.3	Ensure adequacy of equipment and technology.	No comments received
<b>Goal 4</b>	<b>Increase public education and awareness of existing and potential hazards in Lancaster County.</b>	<b>No comments received</b>
Objective 4.1	Develop public education and outreach programs on hazards and hazard mitigation.	No comments received
Objective 4.2	Educate property owners in hazard risk areas regarding their risks and the precautions they can take.	No comments received
Objective 4.3	Encourage residents to implement hazard mitigation and preparedness measures on their properties.	No comments received
Objective 4.4	Encourage homeowners, renters, and businesses to insure their properties against all hazards, including flood coverage under the National Flood Insurance Program (NFIP).	Objective is primarily for municipalities; at the County level, the objective would be to encourage municipalities to talk to their residents.
Objective 4.5	Encourage local participation in the Community Rating System (CRS) Program.	No comments received

### 6.1.2 Past Mitigation Action Status and Update of Mitigation Strategies

In the 2019 HMP, Lancaster County identified 205 actions and initiatives to support an improved understanding of hazard risk and vulnerability, to enhance mitigation capabilities, and/or to reduce vulnerability of infrastructure. Progress on the 2019 mitigation actions was evaluated during the 2025 update process.

The mitigation strategy 5-year plan review worksheet identified all county and municipal actions from the 2019 HMP. Planning Team members were asked to indicate the status of each action—“No Progress/ Unknown,” “In Progress/ Not Yet Complete,” “Continuous,” “Completed,” or “Discontinued”—and provide review comments on each.

The completed Mitigation Action Plan Review Worksheet is provided in Table 6-2. Projects and initiatives identified as “Complete” and “Discontinued” have been removed from this plan update. The actions that the county has identified as “No Progress/ Unknown” or “In Progress/ Not Yet Complete” have been carried forward in the updated mitigation strategies (unless otherwise determined by the county to be a discontinued project). Actions from the 2019 HMP that reflect ongoing maintaining capabilities have also been removed. The language in some actions being carried over has been adjusted to reflect changes to local needs and capabilities. Some actions were merged to reduce redundant efforts on behalf of the county and its municipalities.



**Table 6-2. Past Mitigation Action Status**

Description	Status	Review Comments
<b>Lancaster County</b>		
Acquire properties in hazard areas, notably those in the 1 percent annual chance floodplain, to convert them to open space.	No Progress/Unknown	—
Educate residents in flood-prone areas about the benefits of purchasing flood insurance.	No Progress/Unknown	—
Elevate structures at risk of flooding.	No Progress/Unknown	—
Acquire repetitive loss properties to convert them to open space.	No Progress/Unknown	—
Remove any dilapidated or structurally unsound dams that pose a flooding threat to the community.	In Progress/ Not Yet Complete	—
Work with hazardous materials facilities in the floodplain to floodproof structures up to the 0.2% annual chance flood level.	No Progress/Unknown	—
Work with the Lancaster Conservancy to provide information at the Welsh Mountain Nature Preserve regarding the potential for wildfires and how visitors can prevent them.	In Progress/ Not Yet Complete	—
Nissley Acres Floodwater Storage Area—Create a floodwater storage area to assist in reducing flood levels in the Nissley Acres development and a downstream residential area in Ephrata Township that is also prone to flooding. The location of the storage area would be on Borough-owned property so it would not require acquisition of land.	No Progress/Unknown	Nissley Acres is in Ephrata Borough. Ephrata Township hopes to acquire approximately 10 acres of floodplain land downstream on Nissley Acres and complete a PRP project.
Work with the railroad and property owners to provide a wider buffer between the tracks and vegetation.	No Progress/Unknown	—
Protect the structures in Chickie’s Park to the 0.2% annual chance flood level.	No Progress/Unknown	—
Work with PPL to protect the Conestoga KV Substation to the 0.2% annual chance flood level.	No Progress/Unknown	—
Work with the Safe Harbor Water Power Corporation to protect their facilities to the 0.2% annual chance flood level.	No Progress/Unknown	—
Work with PPL to protect the Holtwood facility to the 0.2% annual chance flood level.	No Progress/Unknown	—
Develop a hazard information page on the County website, and link from each municipality’s website.	In Progress/ Not Yet Complete	—
Develop informational workshops on hazard risks and hazard mitigation for property owners in high-risk areas.	No Progress/Unknown	—
Encourage homeowners to install appropriate devices to alleviate radon concentrations within homes.	Continuous	—
Provide information to the public about the dangers of radon exposure.	Continuous	—
Enforce building codes, floodplain management ordinances, and other local regulations to protect new structures constructed in hazard-prone areas.	Continuous	—



Description	Status	Review Comments
<b>Akron Borough</b>		
Protect Wastewater Pump #126 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Upgrade sewer infrastructure in the Heritage Development to prevent stormwater infiltration.	No Progress/Unknown	—
<b>Brecknock Township</b>		
Protect the Northern Lancaster County Authority facility to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Northern Lancaster County Authority WWTP to the 0.2% annual chance flood level.	Discontinue	Duplicate action
Protect Well #7 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Caernarvon Township</b>		
Hammertown Road Bridge—Address flood problem at the bridge at 141 Hammertown Road.	No Progress/Unknown	—
Turkey Hill Road Culvert—Upgrade the culvert at 2051 Turkey Hill Road with one with a higher capacity.	No Progress/Unknown	—
<b>Columbia Borough</b>		
Improve stormwater drainage at 10th Street and Ridge Avenue.	Completed	—
Protect the Columbia Municipal Authority WWTP to the 0.2% annual chance flood level.	Discontinued	Not a feasible project for the Borough.
Provide information at the overlook regarding the potential for wildfires on the hill below, and how visitors can prevent them.	Continuous	—
Install a backup generator that can power the entire Municipal Building.	In Progress/ Not Yet Complete	—
<b>Conestoga Township</b>		
Improve drainage at the low spot in the road at Kendig Road and Elm Street.	Completed	—
Protect the Bainbridge Water Authority WWTP to the 0.2% annual chance flood level.	Discontinued	Not identified as critical facility in flood hazard area. Remove action.
<b>Denver Borough</b>		
Denver Beer Distributor Relocation—The Denver Beer Distributor is located at 4 Main Street, Denver, PA, in adjacent to the Cocalico Creek. During heavy rain and storm events, the business has faced repetitive loss due to flooding and is looking to relocate outside of this flood-prone area and to another location on Main Street in Denver Borough.	In Progress/ Not Yet Complete	PennDOT removing and installing new bridge
Protect Filtration #3 to the 0.2% annual chance flood level.	No Progress/Unknown	Develop plan to floodproof property to protect water infrastructure
<b>Earl Township</b>		
Relocate businesses along US-322 west of Martindale Road.	No Progress/Unknown	—
<b>East Cocalico Township</b>		
Protect the District Justice Office 1 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Reamstown EMS facility to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #8 to the 0.2% annual chance flood level.	No Progress/Unknown	—



Description	Status	Review Comments
Replace the Dogwood Drive bridge over Fry’s Run with one with a larger opening.	No Progress/Unknown	—
Replace the Miller Road bridge over the Little Cocalico Creek with one with a larger opening.	No Progress/Unknown	—
Replace the Reinholds Road bridge over Fry’s Run with one with a larger opening.	No Progress/Unknown	—
Replace the Smokestown Road bridge over Fry’s Run with one with a larger opening.	No Progress/Unknown	—
Replace the Stony Run culvert under Hill Road with one with a larger opening.	In Progress/ Not Yet Complete	Bid posted August 2024
Replace the White Oak Road bridge over Fry’s Run with one with a larger opening.	In Progress/ Not Yet Complete	—
<b>East Donegal Township</b>		
Protect the Mount Joy Borough Authority WWTP to the 0.2% annual chance flood level.	Discontinued	No longer applicable
Protect Wastewater Pump #50 to the 0.2% annual chance flood level.	Discontinued	No longer applicable
Protect Well #33 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #79 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>East Earl Township</b>		
Shirks Run Diversion—Work with landowners to reduce the possibility of flooding damage in an area east of Shirks Run at the Route 322 and Route 23 intersection.	No Progress/Unknown	—
Work with PENNDOT to realign and install a traffic light at the intersection of US-322 and PA-897.	No Progress/Unknown	—
Work with PENNDOT to realign the intersection of Routes 23 and 897.	No Progress/Unknown	—
<b>East Hempfield Township</b>		
Culvert Replacement—Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run. Replace old and undersized culverts along the Swarr Run located at Church Street, Snapper Dam Road, and Nolt Road. The three roads are subject to frequent flooding.	In Progress/ Not Yet Complete	Design work in progress
Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run.	In Progress/ Not Yet Complete	Estimated completion late fall 2024
Protect Potable Pump #37 to the 0.2% annual chance flood level.	Discontinued	No longer applicable
Protect Potable Pump #38 to the 0.2% annual chance flood level.	Discontinued	No longer applicable
Protect Well #22 to the 0.2% annual chance flood level.	Discontinued	No longer applicable
Replace old and undersized culverts along the Swarr Run located at Church St.	Completed	2024
Replace old and undersized culverts along the Swarr Run located at Nolt Road.	No Progress/Unknown	Seeking funding
Replace old and undersized culverts along the Swarr Run located at Snapper Dam Road.	No Progress/Unknown	Seeking funding
<b>East Lampeter Township</b>		
Backup generator—Purchase 10 more generators for use along Route 30 and Route 340 to make them functional emergency routes.	No Progress/Unknown	—



Description	Status	Review Comments
Backup generator—Install backup generators in two fire stations that are not yet equipped with backup power.	No Progress/Unknown	—
Identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents along Millcross Road.	No Progress/Unknown	—
Improve the design of the intersections at Oakview, Rte. 462, and Millstream along Rte. 30.	No Progress/Unknown	—
Install stormwater management infrastructure at Gibson’s Park at Nolt Mill.	No Progress/Unknown	—
Investigate retrofitting or other flood hazard mitigation measure for Oaks 1 Pump Station.	No Progress/Unknown	—
Investigate retrofitting or other flood hazard mitigation measure for properties along Hale Drive.	No Progress/Unknown	—
Investigate retrofitting or other flood hazard mitigation measure for properties along the south side of Millstream Road between Gridley and Strasburg Pike.	No Progress/Unknown	—
Investigate the removal of dam structures at Flory Park.	No Progress/Unknown	—
Investigate the removal of dam structures at Gibson’s Park at Nolt Mill.	No Progress/Unknown	—
Protect Lancaster Mennonite High School to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #97 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #98 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Upgrade stormwater management at Flory Park.	No Progress/Unknown	—
Upgrade stormwater management at Greenland near Flory Park entrance.	No Progress/Unknown	—
Upgrade stormwater management at North Cherry Lane.	No Progress/Unknown	—
Upgrade stormwater management at Susan Avenue.	No Progress/Unknown	—
Upgrade stormwater management at the northeast side properties along Strasburg Pike.	No Progress/Unknown	—
Upgrade the stormwater management system along Greenfield Road at Amtrak.	No Progress/Unknown	—
Upgrade the stormwater management system at Soudersburg Road at the pump station.	No Progress/Unknown	—
<b>East Petersburg Borough</b>		
Protect Filtration #5 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Elizabeth Township</b>		
Work with utility companies to clear vegetation around power and communications lines.	In Progress/ Not Yet Complete	—
<b>Ephrata Borough</b>		
Protect Electric Substation #31 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Ephrata Boro WWTP #1 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Ephrata EMS to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Ephrata Borough Sewer Authority WWTP to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #176 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #177 to the 0.2% annual chance flood level.	No Progress/Unknown	—



Description	Status	Review Comments
Protect Wastewater Pump #77 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #4 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Ephrata Township</b>		
Improve drainage system at the intersection of Frysville Road and Newswanger Road.	Completed	Installed larger stormwater pipes to reduce flooding of the roadway
Protect the Ephrata Boro WWTP #2 to the 0.2% annual chance flood level.	Discontinued	Owned and operated by Ephrata Borough. Not a concern of the Township.
Protect Wastewater Pump #120 to the 0.2% annual chance flood level.	Discontinued	Owned and operated by Ephrata Borough. Not a concern of the Township.
Protect Wastewater Pump #123 to the 0.2% annual chance flood level.	Discontinued	Owned and operated by Ephrata Borough. Not a concern of the Township.
Protect Wastewater Pump #9 to the 0.2% annual chance flood level.	Discontinued	Owned and operated by Ephrata Borough. Not a concern of the Township.
<b>Lancaster City</b>		
Improve drainage on New Holland Avenue under the railroad overpass.	Completed	—
Improve drainage on North Plum Street under the railroad overpass.	Continuous	—
Improve drainage on Wabank Road 70 feet west of Hershey Avenue.	Completed	—
Protect Potable Pump #79 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Potable Pump #98 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Tank #7 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Lancaster City Conestoga Filter Plant to the 0.2% annual chance flood level.	Continuous	Added generator
Flood proofing Stevens Avenue Sewage Pumping Station—Provide additional flood proofing to sewage pumping station.	Completed	—
Flood proofing of Conestoga Gardens Sewage Pumping Station—Provide additional flood proofing to sewage pumping station.	Completed	—
Flood proofing Susquehanna Sewage Pumping Station—Provide additional flood proofing to sewage pumping station.	Completed	—
<b>Lancaster Township</b>		
Protect the Lancaster City Advanced WWTP to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #136 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #148 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #168 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #169 to the 0.2% annual chance flood level.	No Progress/Unknown	—



Description	Status	Review Comments
<b>Leacock Township</b>		
Protect Wastewater Pump #27 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
<b>Lititz Borough</b>		
Protect the Warwick EMS facility to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #72 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #74 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #75 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Manheim Borough</b>		
Protect Electric Substation #42 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Potable Pump #101 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Manheim FD station to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #200 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #57 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #58 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Manheim Township</b>		
Protect District Justice Office 13 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Protect Wastewater Pump #143 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Protect Wastewater Pump #167 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
West Roseville Road Bridge Demolition—Demolish and remove the West Roseville Road Bridge spanning the Little Conestoga Creek. Removal of an unsafe structure and obstruction in the floodway.	In Progress/ Not Yet Complete	—
Work with PENNDOT to redesign the interchange at US-30 and US-222.	In Progress/ Not Yet Complete	—
<b>Manor Township</b>		
Protect Electric Substation #6 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Protect the Millersville Borough WWTP to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.
Protect the Millersville WWTP to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.
Protect Wastewater Pump #140 to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.
Protect Wastewater Pump #141 to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.



Description	Status	Review Comments
Protect Wastewater Pump #150 to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.
Protect Wastewater Pump #162 to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.
Protect Wastewater Pump #165 to the 0.2% annual chance flood level.	Discontinued	Millersville Borough issue; does not apply to the Township. Remove Action.
<b>Marietta Borough</b>		
Protect the Marietta Borough Building to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Marietta Donegal Sewage Treatment Plant to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Marietta Fire Department station to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Marietta-East Donegal Joint Authority WWTP to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the Susquehanna Valley EMS facility to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #53 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Millersville Borough</b>		
Improve drainage along Oak Ridge Drive.	Completed	—
Improve drainage at Barbara Street and East Cottage Avenue.	Completed	—
Protect Wastewater Pump #179 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
<b>Mount Joy Borough</b>		
Conduct a detailed flood study of the Little Chiques Creek.	In Progress/ Not Yet Complete	—
Improve stormwater management capacity of Staufer Court and the outfall into the Little Chiques Creek.	Discontinued	—
Improve stormwater management capacity under PA-230.	Discontinued	—
Modifications to the Borough Stormwater Detention Basin—increasing the volume of the basin by increasing the height of the berms and/or increasing the footprint of the basin and replacing a 45’ long drainage swale with a pipe to prohibit stormwater from flowing over the swale berm.	In Progress/ Not Yet Complete	—
<b>Mount Joy Township</b>		
Protect Wastewater Pump #84 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Raise Koser Road at the approach to the bridge over Conewago Creek.	No Progress/Unknown	—
Raise Prospect Road at the approach to the bridge over Conewago Creek.	In Progress/ Not Yet Complete	—
<b>Paradise Township</b>		
Protect the Paradise Township Sewer Authority WWTP to the 0.2% annual chance flood level.	Continuous	—
Protect Wastewater Pump #89 to the 0.2% annual chance flood level.	Continuous	—
Protect Wastewater Pump #91 to the 0.2% annual chance flood level.	Continuous	—
<b>Penn Township</b>		



Description	Status	Review Comments
Clear obstructions from the stormwater management system near the intersection of Fruitville Pike/New Charlotte Street and Main Street (PA-72).	No Progress/Unknown	—
Protect the Manheim Borough Authority WWTP to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #199 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Well #39 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Update stormwater management regulations to make them more restrictive for new development.	In Progress/ Not Yet Complete	—
Upgrade stormwater management infrastructure along White Oak Road south of Hamaker Road.	No Progress/Unknown	—
Upgrade stormwater management infrastructure at the intersection of Stiegel Valley Road and White Oak Road.	No Progress/Unknown	—
<b>Providence Township</b>		
Protect the Quarryville Boro WWTP to the 0.2% annual chance flood level.	Continuous	—
<b>Rapho Township</b>		
Protect Wastewater Pump #55 to the 0.2% annual chance flood level.	No Progress/Unknown	—
Regularly clear obstructions from waterways.	No Progress/Unknown	—
<b>Reamstown Borough</b>		
Replace the Stony Run culvert under Bunker Hill Road with one with a larger opening.	No Progress/Unknown	Reamstown Borough is an unincorporated area in East Cocalico Township. This action is reassigned to East Cocalico Township
Replace the Stony Run culvert under West Church Street with one with a larger opening.	No Progress/Unknown	Reamstown Borough is an unincorporated area in East Cocalico Township. This action is reassigned to East Cocalico Township
<b>Sadsbury Township</b>		
Mt. Vernon Road Runoff Retention Basins—Create two retention basins, redirect catch basin pipes, install a storm drain line, and extend approximately 1/3 mile to relieve runoff into the Christiana Borough watershed.	No Progress/Unknown	—
<b>Strasburg Borough</b>		
Improve stormwater infrastructure in the Borough’s Historic District.	Continuous	—
Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>Upper Leacock Township</b>		
Install drainage ditches along Creek Hill Road at Hartman Station Road to reduce soil runoff onto the roadway.	Discontinued	—



Description	Status	Review Comments
<b>Warwick Township</b>		
Protect Wastewater Pump #67 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	Have completed floodplain mitigation projects, as well as stream improvement projects to reduce the impact of severe storm events
Protect Well #35 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	Have completed floodplain mitigation projects, as well as stream improvement projects to reduce the impact of severe storm events
Replace the Lititz Run culvert under Lititz Run Road with one with a larger opening.	In Progress/ Not Yet Complete	Lining existing pipes for better flow of water through the pipes (not replacing the culvert)
<b>West Cocalico Township</b>		
Expand intersection of Sandy Hill Road and Hillside Road.	No Progress/Unknown	—
Improve drainage at the culvert at Sportsman Road east of Hickory Road.	No Progress/Unknown	—
Increase length of Hackman Road bridge to provide more water to flow underneath it.	No Progress/Unknown	—
Increase length of Hickory Road bridge to provide more water to flow underneath it.	No Progress/Unknown	—
Increase length of Indiantown Road bridge to provide more water to flow underneath it.	No Progress/Unknown	—
Install backup power generators at two potable water wells.	No Progress/Unknown	—
Install stormwater management infrastructure along Blue Lake Road to prevent downhill flooding.	No Progress/Unknown	—
Install stormwater management infrastructure along Girl Scout Road to prevent downhill flooding.	No Progress/Unknown	—
Install stormwater management infrastructure along Mountain Road to prevent downhill flooding.	No Progress/Unknown	—
Install stormwater management infrastructure along Netzley Road to prevent downhill flooding.	No Progress/Unknown	—
Install stormwater management infrastructure along Sandy Hill Road to prevent downhill flooding.	No Progress/Unknown	—
Install stormwater management infrastructure along Strickler Road to prevent downhill flooding.	No Progress/Unknown	—
Install stormwater management infrastructure along White Hall Road to prevent downhill flooding.	No Progress/Unknown	—
Relocate the Wastewater Treatment Plant to a location outside the floodplain.	No Progress/Unknown	—
Renovate the stormwater management system in Reinholds.	No Progress/Unknown	—
Upgrade and clear obstructions in the drainage system at the Cocalico Creek at Hickory Road.	No Progress/Unknown	—
Upgrade the bridge on Sportsman Road over the Cocalico Creek to allow more water to flow underneath it.	No Progress/Unknown	—
Upgrade the drainage system at the Cocalico Creek at Pineview Drive and elevate the bridge approach.	No Progress/Unknown	—



Description	Status	Review Comments
<b>West Donegal Township</b>		
Protect the Elizabethtown Regional Sewer Authority WWTP to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #197 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>West Earl Township</b>		
Protect the West Earl Township Sewer Authority WWTP to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect the West Earl Township Water Authority facility to the 0.2% annual chance flood level.	No Progress/Unknown	—
Protect Wastewater Pump #184 to the 0.2% annual chance flood level.	No Progress/Unknown	—
<b>West Hempfield Township</b>		
Protect Wastewater Pump #134 to the 0.2% annual chance flood level.	Continuous	—
Protect Wastewater Pump #149 to the 0.2% annual chance flood level.	Continuous	—
<b>West Lampeter Township</b>		
Improve drainage along Eckman Road.	In Progress/ Not Yet Complete	—
Improve stormwater management along Gypsy Hill Road, including installing a culvert to discharge water away from homes.	Completed	—
Improve stormwater management along Hollinger Road.	In Progress/ Not Yet Complete	—
McFalls Property Stormwater Management—reclaim the area as a stream.	In Progress/ Not Yet Complete	—
Protect Potable Pump #100 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Protect Potable Pump #61 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Protect Wastewater Pump #21 to the 0.2% annual chance flood level.	In Progress/ Not Yet Complete	—
Retention Pond—Construct retention ponds to protect properties along Hollinger Road.	In Progress/ Not Yet Complete	—

“—” indicates no comments given



## 6.2 MITIGATION GOALS AND OBJECTIVES

### 6.2.1 2025 Mitigation Goals

The Steering Committee reviewed the 2019 HMP goals to determine their continuing applicability and decided to update them for the 2025 HMP. The updated goals and objectives were distributed to the Planning Team at the Mitigation Solutions Workshop. The Planning Team reviewed and approved the updated goals as follows, with italicizes indicating where any changes were made to the previous HMP actions:

- **Goal 1:** Prevent injury/death and damage from natural and human-made hazards in Lancaster County.
- **Goal 2:** Protect the citizens of Lancaster County as well as public and private property from the impacts of natural and human-caused hazards.
- **Goal 3:** Improve emergency services and capabilities in Lancaster County to protect citizens from natural and human-caused hazards.
- **Goal 4:** Increase public education and awareness of existing and potential *natural and human-made* hazards in Lancaster County.
- **Goal 5:** *Reduce the risk of natural and human-caused hazards for socially vulnerable populations.*
- **Goal 6:** *Address long-term vulnerabilities from High Hazard Dams.*

The 2025 Lancaster County HMP goals are in line with the goals of Pennsylvania’s 2023 HMP. They embody the overarching needs and concerns of the county and participating municipalities, and address both natural and non-natural hazard risk reduction.

### 6.2.2 2025 Mitigation Objectives

The Steering Committee reviewed the objectives from the 2019 HMP update and updated them to reflect changes in county priorities and capabilities. The updated HMP goals were considered in developing the new objectives. The updated objectives reflect the results of the risk assessment in more specific terms. They address the potential impacts that can be mitigated for the identified hazards, as well as existing limitations in available data and information. Table 6-1 summarizes the evaluation of all goals and objectives from the 2019 HMP. The new objectives for 2025 are as follows, with italicizes indicating where any changes were made to the previous HMP actions:

- **Goal 1—Prevent injury/death and damage from natural and human-caused hazards in Lancaster County.**
  - Objective 1.1—Develop regulations limiting development in hazard-prone areas.
  - Objective 1.2—Direct growth in designated growth areas away from hazard-prone areas and maintain natural hazard buffers in the County.
  - Objective 1.3—Lessen impacts on natural resources from natural and human-caused hazards.
- **Goal 2—Protect the citizens of Lancaster County as well as public and private property from the impacts of natural and human-caused hazards.**
  - Objective 2.1—Protect existing structures, including critical facilities, from damage that can be caused by hazards.
  - Objective 2.2—Acquire, relocate, elevate, and/or retrofit structures, including repetitive loss properties and severe repetitive loss properties, located in hazard areas.
  - Objective 2.3—Improve and maintain stormwater management systems to reduce backup and flooding.
  - Objective 2.4—Protect the health of County residents from disease and apply lessons learned from recent pandemics.



- **Goal 3—Improve emergency services and capabilities in Lancaster County to protect citizens from natural and human-caused hazards.**
  - Objective 3.1—Improve coordination and communication between departments.
  - Objective 3.2—Ensure adequate training and resources for those involved in emergency response, services, relief, or hazard mitigation.
  - Objective 3.3—Ensure adequacy of equipment and technology.
- **Goal 4—Increase public education and awareness of existing and potential natural and human-caused hazards in Lancaster County.**
  - Objective 4.1—Develop public education and outreach programs on hazards and hazard mitigation.
  - Objective 4.2—Educate property owners in hazard risk areas regarding their risks and the precautions they can take.
  - Objective 4.3—Encourage residents to implement hazard mitigation and preparedness measures on their properties.
  - Objective 4.4—Encourage homeowners, renters, and businesses to insure their properties against all hazards, including flood coverage under the National Flood Insurance Program (NFIP).
  - Objective 4.5—Encourage local participation in the Community Rating System (CRS) Program.
- **Goal 5—Reduce the risk of natural hazards for socially vulnerable populations.**
  - *Objective 5.1—Encourage the establishment of policies to help ensure the prioritization and implementation of mitigation actions and/or projects designed to benefit socially vulnerable populations and underserved communities.*
- **Goal 6—Address long-term vulnerabilities from high hazard dams.**
  - *Objective 6.1—Ensure that dam infrastructure is maintained.*
  - *Objective 6.2—Support the identification and access to funding to repair, rehabilitate, or replace dams.*

### 6.3 IDENTIFICATION AND ANALYSIS OF MITIGATION TECHNIQUES

Mitigation actions were identified based on the risk assessment, mitigation goals and objectives, existing policies, and input from the Planning Team and planning partners. The County and its municipalities developed updated mitigation strategies that include activities covering the range of mitigation action types described in FEMA planning guidance, “Local Mitigation Planning Handbook”. Mitigation action types listed in the FEMA guidance include the following (FEMA 2023):

- **Local Plans and Regulations**—These actions include government authorities, policies, or codes that influence the way land and buildings are being developed and built.
- **Structure and Infrastructure Projects**—These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. These actions could apply to public or private structures as well as community lifelines and other critical facilities. This type of action also involves projects to build structures that reduce the impact of hazards.
- **Natural Systems Protection**—These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.
- **Education and Awareness Programs**—These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as NFIP and CRS, StormReady (NOAA), and Firewise (National Fire Protection Association) Communities.



The participants of the Mitigation Strategy Workshop and the Steering Committee identified actions that relate to the techniques listed above. Table 6-3 identifies which mitigation techniques are applicable for the hazards included in the 2025 HMP. In some cases, the mitigation techniques identified for a particular hazard reflect ongoing mitigation capabilities, not specific projects included in the updated HMP.

Table 6-3. Mitigation Technique Matrix

Hazard	Local Plans and Regulations	Structure and Infrastructure Projects	Natural Systems Protection	Education and Awareness Programs
Cyber Incidents	X	X		X
Dam Failure	X	X	X	X
Drought	X	X		X
Earthquake	X	X		X
Environmental Hazards—Gas and Liquid Pipelines	X			X
Environmental Hazards—Hazardous Materials Releases	X	X	X	X
Flood, Flash Flood, Ice Jam	X	X	X	X
Hailstorm	X	X		X
Invasive Species	X		X	X
Landslide	X			X
Nuclear Incident	X			X
Pandemic and Infectious Disease	X			X
Radon Exposure	X			X
Subsidence, Sinkhole	X	X		X
Substance Use Disorder and Mental Health	X	X		X
Terrorism	X	X		X
Tornado, Windstorm	X	X		X
Transportation Accident	X	X		X
Utility Interruption	X	X	X	X
Wildfire	X	X	X	X
Winter Storm	X	X		X

## 6.4 MITIGATION ACTION PLAN

### 6.4.1 2025 Mitigation Initiatives

Representatives from the county and all participating municipalities selected mitigation strategies and initiatives to pursue until the next plan update. This includes some actions identified during the 2019 update that are still relevant or in progress. Table 6-4 summarizes the updated mitigation strategies identified by the county and all municipalities, including the following information:

- Mitigation actions for individual and multiple hazards
- Mitigation action type
- Department or agency primarily responsible for project initiation and/or implementation
- Estimated cost for the mitigation action and identification of known or potential sources of funding
- Implementation schedule
- Implementation priority



The updated mitigation actions were documented using the Mitigation Action Worksheet distributed at the Mitigation Solution Workshop (see Appendix G and Appendix H). Specific mitigation actions were identified to prevent future losses. Current funding is not identified for all these actions at present, but potential funding sources (see Section 5) are indicated to support future implementation.

Because of the limited information available for addressing the County's long-term vulnerability to pandemic and infectious disease, the mitigation strategy includes few actions that specifically address that hazard. The county will continue to research long-term solutions to the risk from pandemic and infectious disease as part of the annual review process. Many preparedness actions can be identified for addressing that hazard.

The county and municipalities have limited resources to take on new responsibilities or projects. The implementation of these mitigation actions is dependent on the approval of the local elected governing body and the ability of the jurisdiction to obtain funding from local or outside sources.

The Steering Committee prioritized proposed mitigation actions during the Mitigation Action Worksheet documentation process. In general, mitigation actions ranked as highest priorities should be addressed first within each jurisdiction, depending upon funding. However, medium- or low priority mitigation actions will be considered for implementation as funding becomes available. Therefore, the ranking levels should be considered as a preliminary ranking, which will evolve based on prevailing priorities and discretion of local governments, the public, the Pennsylvania Emergency Management Agency (PEMA), and FEMA as the plan update is implemented.



**Table 6-4. Hazard Mitigation Strategy**

Note: Some of the identified mitigation actions in Table 6-4 are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new hazard events and changes in county or municipal priorities. Actions that have been carried over from the 2019 version of the HMP may have been reworded and given a new initiative designation to conform to current needs and procedures. The countywide actions apply to the county as an entity and participating municipalities. For most countywide actions, the action applies to all participating municipalities. See Appendix H for action worksheets that specify to which municipalities other countywide actions apply.

Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
<b>Lancaster County</b>												
LC-1	Acquire properties in hazard areas, notably those in the 1 percent annual chance floodplain, to convert them to open space.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	Municipa 1 EMCs	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP	Long	Medium	SIP
LC-2	Educate residents in flood-prone areas about the benefits of purchasing flood insurance.	N/A	Flood, Flash Flood, and Ice Jams	4	LCEMD	Municipa 1 FPAs	Low	Low	Operating Budget	Short	Low	EAP
LC-3	Elevate structures at risk of flooding.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	Municipa 1 EMCs	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP	Short	Medium	SIP
LC-4	Acquire repetitive loss properties to convert them to open space.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	Municipa 1 EMCs	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP	Long	Medium	SIP
LC-5	Remove any dilapidated or structurally unsound dams that pose a flooding threat to the community.	Existing	Dam Failure	2	LCEMD	DPW, Municipa 1 EMCs, PA DEP Dam Safety	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
LC-6	Work with hazardous materials facilities in the floodplain to floodproof structures up to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	DPW, Municipa 1 EMCs	High	Low	Operating Budget; LEPC	Short	Medium	SIP
LC-7	Work with the Lancaster Conservancy to provide information at the Welsh Mountain	N/A	Wildfire	4	LCEMD	Municipa 1 EMCs	Medium	Low	Operating Budget	Short	Low	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Nature Preserve regarding the potential for wildfires and how visitors can prevent them.											
LC-8	Nissley Acres Floodwater Storage Area—Create a floodwater storage area to assist in reducing flood levels in the Nissley Acres development and a downstream residential area in Ephrata Township that is also prone to flooding. The location of the storage area would be on Borough-owned property so it would not require acquisition of land.	New	Flood, Flash Flood, and Ice Jams	2	LCEMD	DPW, Municipal EMCs	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
LC-9	Work with the railroad and property owners to provide a wider buffer between the tracks and vegetation.	N/A	Wildfire	4	LCEMD	Railroad, Municipal EMCs	High	Medium	Operating Budget	Short	Low	EAP
LC-10	Protect the structures in Chickie’s Park to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	DPW, Municipal EMCs, LCEMD	High	Medium	FEMA HMPG, PDM; Operating Budget	Short	Medium	SIP
LC-11	Work with PPL to protect the Conestoga KV Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	Municipal EMCs	High	High	Operating Budget	Short	Medium	SIP
LC-12	Work with the Safe Harbor Water Power Corporation to protect their facilities to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	Municipal EMCs, Safe Harbor Water Power Corporation	High	High	Operating Budget	Short	Medium	SIP
LC-13	Work with PPL to protect the Holtwood facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	LCEMD	Municipal EMCs	High	High	Operating Budget	Short	Medium	SIP
LC-14	Develop a hazard information page on the County website, and link from each municipality’s website.	N/A	All hazards	4	LCEMD	Municipal EMCs	Low	Low	Operating Budget	Short	Medium	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LC-15	Develop informational workshops on hazard risks and hazard mitigation for property owners in high-risk areas.	N/A	All hazards	4	LCEMD	Municipal EMCs, Floodplain Administrators	Low	Low	Operating Budget	Short	Medium	EAP
LC-16	Increase the frequency of environmental and risk assessments to better determine where land should or should not be developed.	N/A	All natural hazards	2, 3	LCPD	LCPC	Medium	Medium	Operating Budget	Short	Medium	LPR
LC-17	Increase support capabilities, better facility evacuation plans, and long-term placement plans.	N/A	Utility interruption	3	LCEMD	LCPD	Medium	Low	Operating Budget	Short	High	LPR
LC-18	Increase training and exercises available to water and wastewater authorities.	N/A	Flooding, Flash Flooding, Ice Jam; Dam Failure	3	LCEMD	Municipal Water and Sewerage Authorities	Medium	Low	Operating Budget	Short	Medium	EAP
LC-19	Obtain and implement updated flood gauge information into flood inundation mapping to better notify and predict flood hazard areas before flooding occurs. Improving flood forecasting technology to identify new areas for flood mitigation projects.	N/A	Flooding, Flash Flooding, Ice Jam; Dam Failure	2, 3	LCEMD	NWS, USGS	Medium	Low	Operating Budget	Short	Medium	LPR
LC-20	Improve access control and physical security at county owned and rented properties	Existing	Cyber Incident, Terrorism	3	LCEMD	LCPD	Medium	Medium	Operating Budget, HSGP	Short	Medium	SIP
LC-21	Build and foster relationships with community leaders within Lancaster County.	N/A	All hazards	3	LCEMD	Municipalities	Medium	Low	Operating Budget	Short	High	EAP
LC-22	Research options for modern transportation for emergency workers/plain community farmers to limit exposure time.	New	Nuclear Incident; Terrorism; Environmental Hazards	3	LCEMD	LCPD	Low	Low	Operating Budget	Short	Low	LPR
LC-23	Encourage shelter planning at the local levels and continued training and communication with	N/A	All hazards	3	LCEMD	ARC, PEMA,	Medium	Low	Operating Budget	Short	High	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	local Red Cross chapter and PA Department of Human Services.					PADHS, Municipal OEMs						
LC-24	Expand the use of translation services in the County to improve and build relationships with diverse community groups.	Existing	All hazards	3	LCEMD	LCPD	Medium	Low	Operating Budget	Short	High	EAP
LC-25	Better facilitate cultural integration into planning and exercises.	N/A	All hazards	3	LCEMD	LCPD	Medium	Low	Operating Budget	Short	High	LPR
LC-26	Work with the county CISO and Public Safety Technology staff to develop redundancies for 9-1-1 communications infrastructure and emergency management operation capabilities.	Existing	Cyber Incidents; Terrorism; Utility Interruption	3	LCEMD	CISO, IT	Medium	Low	Operating Budget, EMPG	Short	High	SIP
LC-27	Build and foster relationships between the County Commissioners office, the County Communications Director and local news media. Increase awareness and training to manage mis information in all forms that have the potential to result in civil unrest.	Existing	All hazards	3	LCEMD	County Commissioners, County Communications	High	Low	Operating Budget	Short	High	EAP
LC-28	Update urban and village growth area boundaries for Future Land Use and Transportation Map which will improve land use patterns and help to better manage stormwater runoff.	Existing	Flooding, Flash Flooding, Ice Jam; Dam Failure	2, 3	LCPD	LCPC	Medium	Low	Operating Budget	Short	Medium	LPR
LC-29	Draft regional comprehensive plans which may lead to improved growth management and opens space, natural land, and agricultural land preservation	New	Flooding, Flash Flooding, Ice Jam; Dam Failure	2, 3	LCPD	Municipalities	Medium	Low	Operating Budget	Short	Medium	LPR
LC-30	Update the Countywide Act 167 Stormwater Management Plan to encourage regional approaches to stormwater management and flood mitigation and encourage creative and innovative approaches, including regional stormwater facilities, floodplain restoration and	Existing	Flooding, Flash Flooding, Ice Jam; Dam Failure	3	LCPD	LCPC	Medium	Low	Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	wetland creation, critical aquifer recharge areas, and increased tree canopy.											
LC-31	As part of Phase 2 of the Act 167 Plan, have the County and municipalities adopt a new model stormwater ordinance for consistency throughout entire watersheds, and across boundaries.	Existing	Flooding, Flash Flooding, Ice Jam; Dam Failure	3	LCPD	Municipalities	Medium	Low	Operating Budget	Short	Medium	LPR
LC-32	Whenever a capital improvement, transportation, or land development project is undertaken, look for ways to stack benefits, e.g. when replacing or repairing bridges/culverts look for opportunities for streambank restoration, improved channel design and floodplain management. When doing road projects, look for ways to incorporate green infrastructure.	New	Flooding, Flash Flooding, Ice Jam; Dam Failure; Transportation Accidents	2	LCPD	LCPC	Medium	Low	Operating Budget	Long	Medium	LPR
LC-33	Engage in coordinated removal of legacy sediments before dam is removed and utilize floodplain restoration to stabilize and restore the stream/creek and ecosystem.	Existing	Flooding, Flash Flooding, Ice Jam; Dam Failure	6	LCEMD	LCPD	Medium	Medium	Operating Budget, BRIC, HHPD	Long	Low	NPR
LC-34	Enhance public outreach and education capabilities by providing updated preparedness, prevention, and mitigation materials at publicly available locations. Provide these materials in multiple languages which are prominent in Lancaster County.	Existing	All hazards	4, 5	LCEMD	LCPD	High	Low	Operating Budget	Short	High	EAP
LC-35	There is an insufficient amount of data surrounding dam inundation and the resulting flooding within the County. The County will conduct dam inundation modeling in high-risk areas, prioritizing those dams and their downstream areas that are classified as a high or significant hazard.	Existing	Flooding, Flash Flooding, Ice Jam; Dam Failure	1, 2, 6	LCEMD	LCPD	High	High	Operating Budget, HMGP, BRIC, HHPD	Short	High	LPR
LC-36	Establish working relationships with PA DEP's Dam Safety Program leaders and the public and private dam owners in the county. Include these	Existing	Dam Failure	3, 6	LCEMD	Municipal EMCs	High	Low	Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	groups and individuals as stakeholders in the next HMP update.											
LC-37	The County will encourage local jurisdictions, during future reviews and revisions of local codes and ordinances, to integrate hazard mitigation principles and use available tools and resources from FEMA and other sources to integrate climate adaptation planning, to strengthen their regulatory capabilities and set higher standards to reduce hazard risk.	New	Dam Failure; Earthquake; Flood, Flash Flood, and Ice Jams; Hailstorm; Tornado, Windstorm; Wildfire; Winter Storm	1, 2, 3, 5	LCPD	LCPC	High	Low	Operating Budget	Short	High	LPR
<b>Akron Borough</b>												
AkB-1	Protect Wastewater Pump #126 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
AkB-2	Upgrade sewer infrastructure in the Heritage Development to prevent stormwater infiltration.	Existing	Flood, Flash Flood, and Ice Jams; Utility Interruption	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	Medium	SIP
AkB-3	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Borough employees to work remotely if needed.	Both	Cyber Incidents, Earthquake, Hailstorms, Tornado/Windstorm, Utility Interruption, Wildfire, Winter Storm	2, 3	Borough Administration	Municipal EMC	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	LPR
AkB-4	Many roads in the Borough experience flooding. Redesign areas prone to flooding or seek other feasible flood mitigation measures.	N/A	Flood, Flash Flood, and Ice Jams	2	FPA	Engineer	High	High	FEMA HMGP, BRIC	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
AkB-5	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	N/A	Winter Storm, Transportation Accidents	2, 3	DPW		High	Low	Operating Budget	Short	Medium	LPR
<b>Bart Township</b>												
BaT-1	Protect Jackson's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
BaT-2	Protect Willow Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
<b>Brecknock Township</b>												
BrkT-1	Protect the Northern Lancaster County Authority facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Public Works Director	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
BrkT-2	Protect Well #7 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
BrkT-3	Protect Good's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
BrkT-4	Protect Oberholtzer's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
BrkT-5	Protect Red Run Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
<b>Caernarvon Township</b>												
CaeT-1	Hammertown Road Bridge - Address flood problem at the bridge at 141 Hammertown Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
CaeT-2	Turkey Hill Road Culvert - Upgrade the culvert at 2051 Turkey Hill Road with one with a higher capacity.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
CaeT-3	Protect Conestoga Dam to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
CaeT-4	Protect Pool Forge Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
CaeT-5	Protect Shearer's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
CaeT-6	Protect Weaver's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
CaeT-7	Protect Willima Witman House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									PA DCED FMP; HPF			
CaeT-8	The Fire Company, Township Building, and Township Garage do not have back-up generators to maintain continuity of operations during an emergency event. The Public Works Superintendent will work alongside the jurisdictional engineer to identify the necessary capacity for each emergency generator. Once identified, Public Works will have the emergency generators installed at each facility. Public Works will be responsible for maintaining the emergency generator.	Existing	Cyber Incidents, Earthquake, Tornado/Wind Storm, Utility Interruption, Winter Storm	2	DPW	Fire Company, Township Administration, Engineer	High	High	FEMA HMGP, BRIC; USDA Community Facilities Grant Program; Annual Budget	Short	High	SIP
CaeT-9	Boot Jack Road Culvert - Upgrade the culvert on Boot Jack Road with one with a higher capacity.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
CaeT-10	Invest in cyber insurance for the Township.	N/A	Cyber Incidents	3	Township Administration		Medium	Medium	Operating Budget	Short	Medium	LPR
CaeT-11	Research, and potentially invest, in Savvy Citizen, a mass notification and alert system.	N/A	All hazards	3	Municipal EMC	Township Administration	Medium	Medium	Operating Budget	Short	Medium	LPR
CaeT-12	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	N/A	All hazards	4, 5	Municipal EMC		Medium	Low	Operating Budget	Short	High	EAP
CaeT-13	Evaluate the need for snow fences along Township and State roads to prevent blowing and drifting snow from impacting travelers.	Existing	Winter Storm, Transportation Accidents	1, 2	DPW	Municipal EMC	Medium	Medium	Operating Budget	Short	Low	LPR

**Clay Township**



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ClyT-1	Protect Clay Roller Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ClyT-2	Protect Snyder Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ClyT-3	Protect Lincoln Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ClyT-4	Protect Middle Creek Dam to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ClyT-5	Protect Hiram Erb House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ClyT-6	The Municipal Engineer will work with the Pennsylvania Game Commission to complete an engineering study of Middle Creek Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Game Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Pennsylvania Game Commission	County Engineer, County EMA, PADEP, Municipal Engineer	High	High	FEMA BRIC, HHPD	Short	Medium	SIP
<b>Colerain Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ColT-1	Protect White Rock Forge Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ColT-2	There are several culverts in the Township which are undersized or deteriorating. The Township will apply for various grants to address these culverts.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
ColT-3	Reinforce or replace the Wesley Road Bridge.	Existing	Flood, Flash Flood, and Ice Jams; Transportation Accident	2	DPW		High	High	FEMA BRIC, HMGP; Operating Budget	Long	Low	SIP
ColT-4	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	N/A	All hazards	4, 5	Municipal EMC		Medium	Low	Operating Budget	Short	High	EAP
<b>Columbia Borough</b>												
ColB-1	Install a backup generator that can power the entire Municipal Building.	Existing	Utility Interruption	2	DPW	Municipal EMC	High	Medium	FEMA HMPG, PDM; RACP	Short	High	SIP
ColB-2	Protect Robert Barber House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ColB-3	Protect Old Columbia-Wrightsville Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ColB-4	During future updates of Borough ordinances, regulations, plans, codes, and other planning and regulatory capabilities, the Borough will integrate hazard mitigation principles.	Existing	All hazards	3	Borough Administration	Municipal EMC	Medium	Low	Operating Budget	Short	High	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ColB-5	Install a backup generator that can power each school district assembly area.	Existing	Utility Interruption	2	DPW	Municipal EMC	High	Medium	FEMA HMPG, BRIC; RACP; Annual Budget	Short	High	SIP
ColB-6	Seek funding opportunities to train staff and community leaders on how to apply for grants, general emergency resources, and where equipment can be purchased from.	N/A	All hazards	3	Municipal EMC	Borough Administration	High	High	HSPG; EMPG; Annual Budget	Short	High	EAP
ColB-7	Several areas throughout the Borough have a lack of proper drainage during heavy rain. Investigate feasible, cost-effective flood mitigation options, including stormwater runoff systems.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
ColB-8	Pursue funding to support the elevation or acquisition of private residences which have flooded repetitively.	Existing	Flood, Flash Flood, and Ice Jams	2	FPA	Municipal EMC	High	High	FEMA HMGP, BRIC, FMA; Homeowners; Annual Budget	Short	Low	SIP
ColB-9	Perform a geological study of the bedrock within the Borough to assess and identify areas which are susceptible to sinkholes.	Existing	Subsidence, Sinkhole	2	Engineer	DPW	High	Medium	FEMA BRIC; Annual Budget	Short	Medium	LPR
ColB-10	Identify and advertise warming and cooling shelters.	Existing	Winter Storm	2, 3, 4, 5	Municipal EMC	Borough Administration	High	Low	Annual Budget	Short	Low	LPR
ColB-11	Initiate a campaign to encourage Borough residents to sign up for public safety alerts.	N/A	All hazards	3	Municipal EMC	Borough Administration	High	Low	Annual Budget	Short	Medium	EAP
ColB-12	Purchase needed emergency equipment.	N/A	All hazards	3	Municipal EMC	Borough Administration	High	High	HSPG; EMPG; Annual Budget	Short	Medium	LPR
<b>Conestoga Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ConT-1	Protect the Big and Little Indian Rock to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ConT-2	Protect the Colemanville Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP	Short	High	SIP
ConT-3	Protect the Conestoga Canal Lock to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ConT-4	Protect the Safe Harbor Iron Works Site to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ConT-5	Protect the Rock Hill Tavern to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ConT-6	Protect the Daniel and Elizabeth Good Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ConT-7	Protect the Benjamin and Susanna Old Slaymaker Lodge/Yordy to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ConT-8	Assess flood damage on Stone Hill Road, Green Hill Road, and Boy Scout Road and identify feasible, cost-effective measures to improve conditions. Develop a long-term plan for erosions following heavy rain storms along the identified roadways.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	FPA, Municipal EMC	High	High	FEMA HMPG, BRIC; PA DCED FMP	Short	Medium	SIP
<b>Conoy Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
CnyT-1	Protect the Brenneman Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
<b>Denver Borough</b>												
DenB-1	Denver Beer Distributor Relocation - The Denver Beer Distributor is located at 4 Main Street, Denver, PA, in adjacent to the Cocalico Creek. During heavy rain and storm events, the business has faced repetitive loss due to flooding and is looking to relocate outside of this flood-prone area and to another location on Main Street in Denver Borough.	Existing	Flood, Flash Flood, and Ice Jams	2	Municipal EMC	Denver Beer Distributor	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP	Short	Low	SIP
DenB-2	Protect Filtration #3 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; User Fees	Short	High	SIP
DenB-3	Protect the Eberly Dam to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP	Short	High	SIP
DenB-4	Protect the Henry Schein Facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP	Short	High	SIP
DenB-5	Protect the Kalas Manufacturing Facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP	Short	High	SIP
DenB-6	Protect Ryder Transportation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC, FMA; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
DenB-7	Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	N/A	All hazards	3	Municipal EMC	Borough Administration, FD, PD, EMS	High	Medium	EMPG; HSGP; Annual Budget	Short	Medium	EAP
DenB-8	Identify capacity and needs for emergency generators at the Municipal Building, Public Works, and Well #4. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Annual Budget	Short	High	SIP
DenB-9	Install a lining or excavate and replace metal stormwater pipes in the Snyder Acres Development and where applicable elsewhere in the Borough. These deteriorating pipes have caused roadway damages, sinkholes, and property issues in the Borough.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP
DenB-10	Perform streambank restoration activities and riparian buffer improvements in Denver Memorial Park.	N/A	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Medium	NSP
DenB-11	Work with PennDOT to replace the existing Weaver Road Bridge.	Existing	Flood, Flash Flood, and Ice Jams	2	PennDOT	DPW	High	High	PennDOT; FEMA BRIC; Operating Budget	Short	Medium	SIP
DenB-12	Develop partnerships with County, State, and Non-profit partners to ensure resources and connections are made to quickly mobilize in the event of a large-scale event or incident.	N/A	All hazards	3	Municipal EMC	Borough Administration	High	Low	Operating Budget	Short	High	EAP
DenB-13	Educate residential and commercial property owners updated concerning hazards and potential resources to meet any challenges. A focus area will be the property owners along	N/A	All hazards	4, 5	Municipal EMC	FPA	High	Low	FEMA HMPG, BRIC; Operating Budget	Short	Medium	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Denver Memorial Park, Little Cocalico Creek, and Cocalico Creek.											
DenB-14	Address feasibility of water system connection with neighboring public water systems to reduce burdens in the event of a drought or utility outage.	Existing	Drought, Winter Storm, Utility Interruption	2	DPW	Utility companies; neighboring municipalities	Medium	Medium	Utility Companies; Operating Budget	Short	Low	LPR
DenB-15	Investigate proactive actions to address infiltration and inflow areas in the sewer system to mitigate potential issues.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Utility companies	Medium	Medium	Utility Companies; Operating Budget	Short	Low	LPR
<b>Drumore Township</b>												
DruT-1	Protect the Muddy Run Power Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; User Fees	Short	High	SIP
DruT-2	Protect the Muddy Run Dam to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP	Short	High	SIP
DruT-3	Protect the Drumore Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
<b>Earl Township</b>												
EarlT-1	Relocate businesses along US-322 west of Martindale Road.	Existing	Flood, Flash Flood, and Ice Jams	2	Board of Supervisors		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EarIT-2	Protect the Conestoga Bridge No. 5 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
EarIT-3	Protect the Conestoga Creek Bridge No. 6 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
EarIT-4	Protect the White Oak Ice Co. to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; User Fees	Short	High	SIP
EarIT-5	Protect the Adam Schreiner House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
EarIT-6	The Township will update or create a dam failure response plan as part of the emergency management plans. This plan will outline clear evacuation procedures and flood zone mapping. To enhance response capabilities, training for staff on dam breach protocols and public education on emergency evacuation routes will be implemented.	New	Dam Failure; Flood, Flash Flood, and Ice Jams	3, 6	Municipal EMC	FPA, Dam Owners	Medium	Low	FEMA HMGP, BRIC; Operating Budget	Short	Medium	LPR
EarIT-7	The Township will develop a drought emergency response plan that includes water rationing protocols and prioritizing water distribution to critical infrastructure. Staff training will focus on water conservation practices and emergency water distribution techniques.	New	Drought	3	Municipal EMC	Utility Providers	Medium	Low	FEMA HMGP, BRIC; Operating Budget	Short	Medium	LPR
EarIT-8	The Township will integrate earthquake preparedness into the emergency management plan and provide training for staff to handle post-earthquake situations, such as search and rescue operations and medical triage. The community will be educated on how to prepare their homes and businesses for earthquakes.	Existing	Earthquake	3	Municipal EMC		Medium	Low	FEMA HMGP, BRIC; Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EarIT-9	The township office manager and roadmaster will coordinate with the township engineer to assess the power needs of each building to determine the appropriate generator size. The generator will be installed at the Township and Road Maintenance buildings. The Road Maintenance Department will be responsible for the ongoing maintenance and testing of the generators, ensuring they are fully operational when needed.	Existing	Utility Interruption, Flood/Flash Flood/Ice Jams, Cyber Incidents, Tornado/Windstorm, Hailstorms, Transportation Accidents, Terrorism, Hazardous Materials Releases	2	Township Manager	DPW	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	High	SIP
EarIT-10	The Township will work with an engineer to address both the flooding along Mill Road and the overall stormwater management issues. As part of this solution, the culvert along Mill Road will be replaced with a larger and more efficient box culvert to accommodate increased water flow and prevent future blockages or overflow. This will stabilize the streambank adjacent to Mill Road to prevent further erosion caused by high water levels during storms. Improvements to drainage in the adjacent agricultural pasture will also be made to reduce runoff into the road. To address the larger issue, stormwater conveyance will be enhanced from existing outfalls beneath Mill Road to the stream, improving the overall drainage capacity of the area and reducing the risk of flooding. Future improvements will include the road being repaved and its stormwater infrastructure will be upgraded to ensure it can handle future stormwater runoff more effectively, mitigating flooding in the long term.	Existing	Flood/Flash Flood/Ice Jams, Winter Storm, Subsidence/Sinkholes	2	Engineer	DPW, FPA	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EarIT-11	The Township will develop a Repetitive Loss Mitigation Plan. The plan will include an analysis of each affected property, considering factors such as flood history, the cost of repairs, potential elevation or buyout options, and the long-term impacts of mitigation. Based on this analysis, the Township will identify high-priority properties for elevation or buyout through FEMA’s Hazard Mitigation Assistance (HMA) programs. For properties that are suitable for elevation, the Township will work with property owners and engineers to develop elevation plans to raise structures above flood levels. For properties that are prone to frequent flooding and cannot be effectively elevated, the Township will pursue buyouts, enabling property owners to relocate to safer areas, with the added benefit of reducing the risk of future flood claims.	Both	Flood/Flash Flood/Ice Jams, Winter Storm	2, 3	FPA	Municipal EMC, Planning Board	High	Medium	FEMA HMGP, BRIC, FMA; Operating Budget	Short	Low	LPR
EarIT-12	The Township will evaluate options for elevating or floodproofing critical buildings to prevent damage during floods. Infrastructure such as water treatment plants, and sewer systems will be hardened with flood barriers and fire-resistant materials, especially in areas prone to wildfires and flooding. Additionally, key transportation routes will be upgraded with improved drainage systems to ensure accessibility during emergencies. Backup power systems, such as generators, will be installed to maintain service during utility interruptions. Collaboration with utility companies will also focus on improving gas pipeline safety to prevent damage during extreme weather or seismic events. These measures will enhance the resilience of the Township’s infrastructure, ensuring that essential services continue before, during, and after hazard events.	Existing	Flood, Flash Flood, and Ice Jams; Wildfire; Utility Interruption	2	FPA	Municipal EMC, Planning Board	High	High	FEMA HMGP, BRIC, FMA; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EarIT-13	To better protect socially vulnerable populations, including the Amish community, the Township will implement tailored mitigation actions. These include developing outreach programs to communicate hazard preparedness through trusted community leaders, focusing on pandemic prevention, substance use disorder support, and invasive species management. Mobile vaccination clinics and health outreach teams will provide essential services to those with limited access to healthcare, particularly during pandemics. The Township will collaborate with local addiction treatment centers to offer mobile support for substance use disorder, and work with agricultural groups to manage invasive species. Additionally, a community-based transportation network will ensure that vulnerable populations can access medical care and emergency services during disasters. These actions will improve resilience and ensure that socially vulnerable groups are better protected from future hazards like pandemics, substance use, and invasive species, while also fostering greater community support and inclusion in disaster preparedness and recovery planning.	N/A	Pandemic and Infectious Disease; Substance use disorder; Invasive Species; Flood, Flash Flood, and Ice Jams	4, 5	Municipal EMC	Local Community Groups	High	Low	FEMA HMGP; Operating Budget	Short	High	EAP
EarIT-14	The Township will develop outreach projects that target both the Amish community and the general public. For the Amish population, outreach will be conducted through community meetings, printed materials, and collaboration with local community leaders to ensure culturally relevant information is shared. These efforts will help increase awareness of local hazards, emergency procedures, and available resources in a way that aligns with their communication preferences.	N/A	All hazards	4, 5	Municipal EMC	Local Community Groups	High	Low	FEMA HMGP; Operating Budget	Short	High	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	<p>For the general public, the Township will launch a series of community-wide education campaigns focused on general preparedness, mitigation actions, and available assistance programs. These campaigns will utilize flyers, brochures, public service announcements, and town hall meetings to disseminate critical information. Additionally, the Township will offer workshops on disaster preparedness and emergency response. Local businesses, schools, and community centers will also serve as distribution points for these materials, ensuring broad access.</p> <p>These outreach projects will ensure that all residents, including those from underserved populations, receive the necessary information to stay informed, prepared, and resilient in the face of future hazards.</p>											
EarIT-15	<p>The nuclear incident response plan will be updated to include evacuation routes, shelter-in-place procedures, radiation exposure protocols, and the acquisition of radiation detection equipment and protective gear. Staff will be trained on radiation response and conduct public education on nuclear safety. For gas and liquid pipelines, the Township collaborate with operators to enhance safety inspections, leak detection, and evacuation procedures, alongside providing staff training. Finally, the wildfire response plan will focus on creating firebreaks, improving evacuation routes, while training staff in wildfire suppression and emergency response. These actions will significantly improve the community's preparedness and ability to respond effectively to these hazards.</p>	N/A	Nuclear Incident, Gas and Liquid Pipelines, Radon Exposure, Wildfire	1, 2, 3	Municipal EMC	FD, PD, EMS	High	Medium	HSGP; EMPG; HMEP; Operating Budget	Short	Medium	LPR
<b>East Cocalico Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ECT-1	Protect the District Justice Office 1 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ECT-2	Protect the Reamstown EMS facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ECT-3	Protect Well #8 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
ECT-4	Replace the Dogwood Drive bridge over Fry's Run with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ECT-5	Replace the Miller Road bridge over the Little Cocalico Creek with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ECT-6	Replace the Reinholds Road bridge over Fry's Run with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ECT-7	Replace the Smokestown Road bridge over Fry's Run with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ECT-8	Replace the Stony Run culvert under Hill Road with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
ECT-9	Replace the White Oak Road bridge over Fry's Run with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ECT-10	Protect the Bucher's Mill Covered Bridge facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ECT-11	Protect the Leshner Knitting Mill facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF	Short	High	SIP
ECT-12	Invest in cyber insurance for the Township.	N/A	Cyber Incidents	3	Township Administration		Medium	Medium	Operating Budget	Short	Medium	LPR
ECT-13	Identify capacity and needs for emergency generators at the Public Works facility. Apply for grants and appropriate funding where possible. After purchase, install, and maintain the generator. Identify additional critical facilities in the Township in need of back-up power to maintain operations.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Annual Budget	Short	High	SIP
ECT-14	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents.	N/A	All hazards	4, 5	Municipal EMC		Medium	Low	Operating Budget	Short	High	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ECT-15	Identify and address undersized or deteriorating culverts throughout the Township.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Medium	SIP
ECT-16	The Township will pursue funding support to have a forester assess trees, complete deed searches to verify Township right of way in targeted areas, and then have the tree removal completed by qualified personnel. Implement, review, and enforce municipal policies and programs to prevent trees from threatening lives and impacting power availability/interruption in conjunction with property owners and utility companies.	N/A	Utility Interruption	2	DPW	Utility Companies, Property Owners	Medium	Medium	Operating Budget; Utility Companies	Short	Low	NSP
ECT-17	Plant native vegetation and plants to combat invasive species and potential hinder wildfire fuel.	N/A	Invasive Species, Wildfire	2	DPW		Medium	Low	Operating Budget	Short	Low	NSP
ECT-18	Encourage property owners living in older housing units to install a radon detector.	Existing	Radon Exposure	1, 2	Municipal EMC	FD	Medium	Low	Operating Budget	Short	Low	EAP
ECT-19	Review and revise, where applicable, existing codes, policies and regulations pertaining to land development to restrict development in hazard areas including, but not limited to, geology connected to sinkholes, flood-prone locations, wildfire interfaces, and steep slopes.	Existing	All natural hazards	2, 3	Township Administration	FPA, Municipal EMC	Medium	Low	Operating Budget	Short	Medium	LPR
<b>East Donegal Township</b>												
EDT-1	Protect the Share's Mill Complex to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EDT-2	Protect AT&T Cable Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EDT-3	Protect Well #33 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EDT-4	Protect Well #79 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EDT-5	Protect Donegal Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EDT-6	Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	N/A	All hazards	3	Municipal EMC	Township Administration, FD, PD, EMS	High	Medium	EMPG; HSGP; Annual Budget	Short	Medium	EAP
EDT-7	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	N/A	All hazards	4, 5	Municipal EMC	Township Administration	High	Low	FEMA HMPG, BRIC; Annual Budget	Short	High	EAP
<b>East Earl Township – Non-Participating Jurisdiction</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EET-1	Shirks Run Diversion - Work with landowners to reduce the possibility of flooding damage in an area east of Shirks Run at the Route 322 and Route 23 intersection.	Existing	Flood, Flash Flood, and Ice Jams	2	Emergency EMC	PA DEP	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
EET-2	Work with PENNDOT to realign and install a traffic light at the intersection of US-322 and PA-897.	Existing	Transportation Accident	2	DPW	PENNDOT	Medium	High	Operating Budget	Short	High	SIP
EET-3	Work with PENNDOT to realign the intersection of Routes 23 and 897.	Existing	Transportation Accident	2	DPW	PENNDOT	Medium	High	Operating Budget	Short	High	SIP
EET-4	Protect Conestoga Bridge No. 4 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-5	Protect the Elliot Tract House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-6	Protect the Frogtown/Goodville Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-7	Protect the Roller Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EET-8	Protect the Christian Weaver House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-9	Protect the Francis Weaver House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-10	Protect the Henry Martin House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-11	Protect the Oberholtzer Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EET-12	The Municipal Engineer will work with Jacob and Evelyn King to complete an engineering study of New Holland Reservoir. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Jacob and Evelyn King will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Jacob and Evelyn King	County Engineer, County EMA, PADEP, Municipal Engineer	High	High	FEMA BRIC, HHPD	Short	Medium	SIP

East Hempfield Township





Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EHT-1	Culvert Replacement - Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run. Replace old and undersized culverts along the Swarr Run located at Church Street, Snapper Dam Road, and Nolt Road. The three roads are subject to frequent flooding.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP	Short	Medium	SIP
EHT-2	Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
EHT-3	Replace old and undersized culverts along the Swarr Run located at Church St.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
EHT-4	Replace old and undersized culverts along the Swarr Run located at Nolt Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
EHT-5	Replace old and undersized culverts along the Swarr Run located at Snapper Dam Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
EHT-6	Protect Brubaker Run Detention to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
EHT-7	Protect Chickies Roller Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EHT-8	Protect Landis Mill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EHT-9	Protect Benjamin Musser House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EHT-10	Protect Shenk House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
<b>East Lampeter Township</b>												
ELT-1	Backup generator – Purchase 10 more generators for use along Route 30 and Route 340 to make them functional emergency routes.	New	Transportation Accident; Utility Interruption	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM; Capital Improvement Budget; RACP	Long	Medium	SIP
ELT-2	Backup generator – Install backup generators in two fire stations that are not yet equipped with backup power.	New	Utility Interruption	2	DPW	Municipal EMCs	High	Medium	FEMA HMPG, PDM; RACP	Long	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ELT-3	Identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents along Millcross Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Low	Low	Operating Budget	Long	Low	SIP
ELT-4	Improve the design of the intersections at Oakview, Rte. 462, and Millstream along Rte. 30.	Existing	Transportation Accident	2	DPW	PENNDOT, LC MPO	High	High	TIP; PENNDOT	Long	Low	SIP
ELT-5	Install stormwater management infrastructure at Gibson's Park at Nolt Mill.	New	Flood, Flash Flood, and Ice Jams	2	Parks and Recreation	DPW	Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Long	Medium	SIP
ELT-6	Investigate retrofitting or other flood hazard mitigation measure for Oaks 1 Pump Station.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	Medium	Operating Budget	Long	High	SIP
ELT-7	Investigate retrofitting or other flood hazard mitigation measure for properties along Hale Drive.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	Medium	Operating Budget	Long	Medium	SIP
ELT-8	Investigate retrofitting or other flood hazard mitigation measure for properties along the south side of Millstream Road between Gridley and Strasburg Pike.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	Medium	Operating Budget	Long	Medium	SIP
ELT-9	Investigate the removal of dam structures at Flory Park.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	2	Parks and Recreation	DPW, DEP, DCED, Mill Creek Association, and Property Owners	Medium	Medium	PA DEP	Long	Medium	SIP
ELT-10	Investigate the removal of dam structures at Gibson's Park at Nolt Mill.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	2	Parks and Recreation	DPW, DEP, DCED, Mill	Medium	Medium	PA DEP	Long	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
						Creek Association, and Property Owners						
ELT-11	Protect Lancaster Mennonite High School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM; Operating Budget	Long	High	SIP
ELT-12	Protect Wastewater Pump #97 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Long	High	SIP
ELT-13	Protect Wastewater Pump #98 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Long	High	SIP
ELT-14	Upgrade stormwater management at Flory Park.	Existing	Flood, Flash Flood, and Ice Jams	2	Parks and Recreation	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ELT-15	Upgrade stormwater management at Greenland near Flory Park entrance.	Existing	Flood, Flash Flood, and Ice Jams	2	Parks and Recreation	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ELT-16	Upgrade stormwater management at North Cherry Lane.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP;	Long	Low	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ELT-17	Upgrade stormwater management at Susan Avenue.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ELT-18	Upgrade stormwater management at the northeast side properties along Strasburg Pike.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ELT-19	Upgrade the stormwater management system along Greenfield Road at Amtrak.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ELT-20	Upgrade the stormwater management system at Soudersburg Road at the pump station.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
ELT-21	Protect Binkley or Graff Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ELT-22	Protect Donnelley Financial Solutions to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ELT-23	Protect Engineered Valves, LLC to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP
ELT-24	Protect Gibbons Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ELT-25	Protect J. Walter Miller Company to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ELT-26	Protect J.L. Clark, LLC to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP
ELT-27	Protect Lancaster Terminal to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP
ELT-28	Protect Shober's Paper Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ELT-29	Protect USPS Postal Service Lancaster to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP
ELT-30	Protect Willow Hill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ELT-31	Identify, design, and install stormwater management initiatives to reduce potential flood effects, particularly on Millcross Road, North Cherry Lane, Susan Avenue, Strasburg Pike, and Soudersburg Road.	New	Flood, Flash Flood, and Ice Jams	2	DPW	Engineer	High	High	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
ELT-32	Work with PA DEP and local partners to determine the cost benefit analysis of removal of the dams at Gibbons Park, Nolt Mill, and Flory Park.	Existing	Flood, Flash Flood, and Ice Jams; Dam Failure	6	DPW	Engineer	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
ELT-33	Investigate possibilities to reduce stormwater flow into the Oaks 1 Pump Station and potential periodic shut downs of the sewer pump station due to excessive stormwater flow.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Engineer	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
<b>East Petersburg Borough</b>												
EPB-1	Protect Filtration #5 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									DCED FMP; User Fees			
EPB-2	Develop minimum training requirements for EOC Staffing.	New	All hazards	3	Municipal EMC		Medium	Low	EMPG; Annual Budget	Short	Medium	LPR
EPB-3	Develop plans to host an exercise to address training deficits.	New	All hazards	3	Municipal EMC		Medium	Low	EMPG; Annual Budget	Short	Medium	LPR
EPB-4	Create and develop annexes to the Borough's EOP (i.e. debris management) in conjunction with the Borough Staff, public works.	New	All hazards	3	Municipal EMC	Borough Administration, DPW	Medium	Low	EMPG; Annual Budget	Short	Medium	LPR
EPB-5	Identify capacity and needs for emergency generators and transfer switches at the DPW Maintenance Shop and City Interconnect. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Annual Budget	Short	High	SIP
EPB-6	Increase pipe capacity at Outfall OFA000101 discharge on Graystone Road.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	Medium	Medium	FEMA HMPG, BRIC; Annual Budget	Short	Medium	SIP
EPB-7	Install fencing and perimeter cameras to provide more security at the Borough's Water facility.	Existing	Cyber Incident; Utility Interruption	2, 3	Facility manager		Medium	Medium	FEMA BRIC; Annual Budget	Short	Medium	SIP
EPB-8	In tandem with County officials, explore options for an alternate means for communication in an emergency. Social media is the primary use of communication.	N/A	All hazards	3, 4, 5	Municipal EMC	Borough Administration	Medium	Low	Annual Budget	Short	Medium	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EPB-9	Connect with facilities that host children during the day and work to develop plans and build resources for the families in case of any hazard.	N/A	All hazards	4, 5	Municipal EMC		Medium	Low	Annual Budget	Short	Medium	LPR
EPB-10	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	N/A	All hazards	4, 5	Municipal EMC	Borough Administration	High	Low	FEMA HMPG, BRIC; Annual Budget	Short	High	EAP
<b>Eden Township</b>												
EdT-1	Protect Pennsylvania Railroad Tunnel to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EdT-2	Move the existing EOC (489 Stony Hill Road) to the new state-of-the-art municipal building. The new building will feature an Emergency Operations Center (EOC), a backup generator, and incorporate comprehensive upgrades, including ADA-compliant accessibility, advanced electrical and HVAC systems, and cutting-edge technology infrastructure. Additionally, the project will integrate sustainable stormwater management solutions, such as a green parking lot and vegetated bioswales, to reduce runoff and support environmental sustainability.	New	All hazards	2, 3	Municipal EMC	Township Administration	High	High	HSGP; EOC Grant; Operating Budget	Short	High	SIP
EdT-3	In partnership with local fire chiefs, establish a comprehensive burn ordinance aimed at preventing and controlling air and water pollution. The ordinance will also grant the Township the authority to implement temporary	New	Wildfire	2, 3	Municipal EMC	Fire Chief, Township Administration	High	Low	Operating Budget	Short	Low	LPR



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	burn bans during red flag warnings and other high-risk wildfire conditions.											
EdT-4	Coordinate with PennDOT to replace an old, inadequate drainpipe that runs underneath May Post Office Road at the intersection of Eden Road. The existing pipe contributes to water backups and flooding.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	PennDOT	High	Medium	PennDOT; FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
EdT-5	Pave/Reprofile Eden Road from Groff Road to May Post Office Road (approximately .8 miles). These roads, which face impacts from severe weather, would be utilized should an evacuation be necessary due to an event at the Peach Bottom Power Plant.	Existing	Flood/Flash Flood/Ice Jams, Hailstorms, Tornado/Windstorm, Winter Storm, Nuclear Incidents, Transportation Accident	2	DPW	PennDOT	High	Medium	PennDOT; FEMA HMGP, BRIC; Operating Budget	Short	Medium	SIP
EdT-6	Arrange and conduct a complimentary Cybersecurity and Infrastructure Security Agency (CISA) evaluation for Township IT systems to identify vulnerabilities and enhance resilience against cyber threats, safeguarding critical infrastructure and sensitive data.	Existing	Cyber Incidents	3	Municipal EMC	IT	Medium	Low	FEMA BRIC; Operating Budget	Short	Medium	LPR
EdT-7	Coordinate with Lancaster Clean Water Partners to reduce the amount of nitrogen, phosphorus, and sediment in Eden Township waterways that are a part of the Chesapeake Bay Watershed.	N/A	Hazardous Materials Releases	2	Engineer	Lancaster Clean Water Partners	Medium	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Low	NSP
EdT-8	Develop informational outreach initiatives to promote participation in and enhance recruitment for Bart FD and Quarryville FD	N/A	All hazards	3	Bart FD, Quarryville FD		High	Low	Annual Budget	Short	Medium	EAP
EdT-9	Purchase and install a radar-equipped speed sign in targeted areas to mitigate the risk of speeding and enhance road safety	New	Transportation Accidents	3	PD	DPW	Medium	Medium	Operating Budget	Short	Low	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EdT-10	Develop informational outreach initiatives on hazard risks and hazard mitigation for residents. A significant portion of the township population (48%) is Amish, who may have limited access to traditional hazard risk information, leaving them vulnerable to disasters. Informational outreach initiatives are needed to raise awareness about hazard risks and mitigation strategies to better protect all residents, especially those in underserved communities.	N/A	All hazards	4, 5	Municipal EMC	Township Administration	High	Low	FEMA HMPG, BRIC; Annual Budget	Short	High	EAP
<b>Elizabeth Township</b>												
ElizT-1	Work with utility companies to clear vegetation around power and communications lines.	Existing	Utility Interruption	4	DPW		Medium	Low	Operating Budget	Short	Medium	LPR
ElizT-2	Protect Grube, Martin and Eliza Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ElizT-3	Protect Hammer Creek Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ElizT-4	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	N/A	Flood, Flash Flood, and Ice Jams	3	Municipal EMC	PD, FD	Medium	Low	Operating Budget	Short	Low	EAP
ElizT-5	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	Existing	All hazards	3	Municipal EMC	County	Medium	Low	Operating Budget	Short	Medium	EAP
ElizT-6	The Municipal Engineer will work with the Pennsylvania Fish and Boat Commission to complete an engineering study of Speedwell Forge Dam. The Township will also request	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Pennsylvania Fish and Boat	County Engineer, County EMA,	High	High	FEMA BRIC, HHPD	Short	Medium	SIP



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	information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Fish and Boat Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.				Commission	PADEP, Municipal Engineer						
<b>Elizabethtown Borough</b>												
ElizB-1	Protect Reservoir #6 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ElizB-2	The Municipal Engineer will work with the Elizabethtown College to complete an engineering study of Lake Placida Dam. The Borough will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Borough and the Elizabethtown College will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Elizabethtown College	County Engineer, County EMA, PADEP, Municipal Engineer	High	High	FEMA BRIC, HHPD	Short	Medium	SIP
<b>Ephrata Borough</b>												
EphB-1	Protect Electric Substation #31 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EphB-2	Protect Ephrata Boro WWTP #1 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									DCED FMP; Sewer Fees			
EphB-3	Protect Ephrata EMS to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM; Operating Budget	Short	High	SIP
EphB-4	Protect the Ephrata Borough Sewer Authority WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
EphB-5	Protect Wastewater Pump #176 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
EphB-6	Protect Wastewater Pump #177 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
EphB-7	Protect Wastewater Pump #77 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
EphB-8	Protect Well #4 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EphB-9	Protect Keller's Mill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EphB-10	Protect Reservoir #11 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EphB-11	Protect Terre Hill Composites, Inc. to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EphB-12	Protect Wastewater Pump #120 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
EphB-13	Protect Daniel Bauman House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphB-14	Protect Ephrata EMS to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP
EphB-15	Protect Well #44 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
EphB-16	Protect Family Medicine of Ephrata to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
EphB-17	Protect Wellspan Family Medicine to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
EphB-18	Protect Dunkelberger Osteopath, LTD to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Ephrata Township</b>												
EphT-1	Improve drainage system at the intersection of Frysville Road and Newswanger Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
EphT-2	Protect the Ludwig Bloom House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-3	Protect Bushongsor Shreiner's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-4	Protect Cocalico Creek Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
EphT-5	Protect Jacob Keller Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-6	Protect Samuel Keller House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-7	Protect Keller's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-8	Protect Peter and Catherine Reyer Farmhouse to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-9	Protect Hinkle Tavern, Winters Hotel to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
EphT-10	Protect Landis House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
<b>Fulton Township</b>												
Ful-1	Protect Peach Bottom Marina to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Lancaster City</b>												
LancC-1	Protect Potable Pump #79 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-2	Protect Potable Pump #98 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-3	Protect Tank #7 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-4	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-5	Protect Engle Printing and Publishing to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-6	Protect High Steel Service Center to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									DCED FMP; User Fees			
LancC-7	Protect Kurtz's Mill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-8	Protect Pennsylvania Railroad Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-9	Protect Lancaster City Conestoga Filter Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-10	Protect Lancaster City Water to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-11	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LancC-12	Establish a floodplain management team to assist the FPA in NFIP administration, ordinance updates, staff training, and other needs.	N/A	Flood, Flash Flood, and Ice Jams	3	FPA	City Administration	Medium	Low	Operating Budget	Short	Medium	LPR
LancC-13	Conduct a facilities condition assessment to ensure green infrastructure practices are functioning as designed. Specific attention to elevated risk of sinkhole formation.	Existing	Subsidence, Sinkhole; Flood, Flash Flood, and Ice Jams	3	Engineer	Municipal EMC	Medium	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Low	LPR



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LancC-14	Identify capacity and needs an emergency generator at the Lancaster Advanced Wastewater Treatment Plant (AWWTP). Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW, facility manager	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
LancC-15	Although there has been no known issues reported since maintenance work completed in 2024, evaluate the Plum Street Railroad Underpass (CSS conveyance issue/ Manheim Township MS4 runoff to City's CSS) through the use of engineering investigations and infrastructure updates.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	Amtrak, Manheim Township	Medium	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Long	Medium	SIP
LancC-16	There are pipe restrictions at Fairview Avenue/New Danville Pike/Prince Street (CSO Outfall 002). Conduct additional investigations, engineering, infrastructure upgrades. Potential partnerships with Lancaster Township. Water Street Sewer Separation Phases 2-3 need final designs and construction funds, will help alleviate restrictions.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW, Lancaster Township	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
LancC-17	There is a bottleneck at the CSS at North Broad/Lehigh Avenue. The City's Broad St Disconnection project is in preliminary design now to provide stormwater storage capacity through an existing stormwater storage bed that can receive over 9 acres of existing impervious and partially bypass CSS. Seek additional funding if needed.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
LancC-18	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Steel Way/Manheim Pike (MS4 conveyance bottleneck and outfall restriction).	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; PA DCED FMP;	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
LancC-19	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Hershey Avenue/Wabank Road (MS4 conveyance restriction at outfall).	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
LancC-20	At the Lancaster Advanced Wastewater Treatment Plant (AWWTP) there is a conveyance bottleneck due to headwall at unnamed tributary to the Conestoga River and the capacity of the 78" diameter wastewater plant outfall (discharge) pipe. Investigate sources of funding to resolve problem.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW, Facility Manager	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget; User fees	Short	Medium	SIP
LancC-21	Develop a repetitive loss mitigation plan to fully analyze the long-term impacts of mitigation, especially in the areas along Conestoga River in Conestoga Heights and Engleside neighborhoods.	New	Flood, Flash Flood, and Ice Jams	3	FPA	Municipal EMC	Medium	Low	Operating Budget	Short	Low	LPR
LancC-22	Add new Susquehanna Water Raw Water and Finished Water Transmission Mains to harden infrastructure and decrease the risk to utility interruptions.	Existing	Utility Interruption	2	Engineer	DPW, Facility Manager	Medium	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget; User fees	Short	Medium	SIP
LancC-23	Add new Water Transmission Main from the Susquehanna River to the Conestoga Water Treatment Plant to harden infrastructure and decrease the risk to utility interruptions.	Existing	Utility Interruption, Drought	2	Engineer	DPW, Facility Manager	Medium	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget; User fees	Short	Medium	SIP
LancC-24	Identify community-based points of distribution with trusted partners, utilizing the CDC's Social Vulnerability Index, census data, and other	New	Pandemic and	3	Municipal EMC	County Health	Medium	Low	Operating Budget	Short	Medium	LPR



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	planning tools to ensure accessible and equitable service delivery locations.		Infectious Disease									
LancC-25	Increase planning efforts to ensure medically appropriate accommodations for people with substance use disorder to have access to medically assisted treatment and medications mitigate health risks and aid people experiencing withdrawal. Coordinate cooperation agreements with LEMSA and LGH Street Medicine.	N/A	Substance Use Disorder	1, 2	Municipal EMC	LEMSA, LGH Street Medicine	Medium	Low	Operating Budget	Short	Medium	LPR
LancC-26	Provide radon testing and mitigation through Healthy Homes Program to low- to moderate-income households most at risk. All City-funded housing rehabilitation projects will be tested for radon levels as part of the environmental review.	New	Radon Exposure	1, 2	Municipal EMC	Healthy Homes Program Facilitator	Medium	Low	Operating Budget	Short	Low	LPR
LancC-27	Improve interagency communications to readily share up-to-date information with public safety/first responders. Ensure access and protocols for laboratory testing of illicit drug samples.	New	Substance Use Disorder	3	Municipal EMC	FD, PD, EMS	Medium	Low	Operating Budget	Short	Medium	EAP
LancC-28	Continue implementing public emergency alert system. Develop interdepartmental workgroup to facilitate informed communications about hazardous substances, level of exposure, risks, and what residents should do to remain safe. Develop other protocols as needed to assess individuals that have been exposed.	Existing	Hazardous Materials Releases	3	Municipal EMC	City Departments	Medium	Low	Operating Budget	Short	Medium	LPR
LancC-29	Develop a communications plan to inform residents about air quality impacts. Facilitate the provision of respiratory filters/masks to vulnerable populations during activities that increase exposure (i.e. travel to appointments/services, etc.)	New	Wildfire	3	Municipal EMC	County Health	Medium	Low	Operating Budget	Short	Low	LPR
LancC-30	Partner with Penn State Extension and other agencies to determine appropriate interventions that promote environmental health. Develop	N/A	Invasive Species	3, 4, 5	Municipal EMC	Penn State Extension	Medium	Low	Operating Budget	Short	Low	LPR



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	communication plans to disseminate guidance to the public.					, County Health						
LancC-31	Establish a Long-Term Control Plan to address Combined Sewer Overflows (CSOs) in the wastewater conveyance system. These systems may need to have sewer separated expanded treatment, or increased storage capacity.	New	Utility Interruption	3	FPA	Utility Authorities	Medium	Low	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget; User fees	Short	Medium	LPR
<b>Lancaster Township</b>												
LancT-1	Protect the Lancaster City Advanced WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
LancT-2	Protect Wastewater Pump #136 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
LancT-3	Protect Wastewater Pump #148 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
LancT-4	Protect Wastewater Pump #168 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LancT-5	Protect Wastewater Pump #169 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
LancT-6	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
LancT-7	Protect Jacob Miller House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
LancT-8	Protect Witmer's Tavern to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
LancT-9	Protect Conrad Miller House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
<b>Leacock Township</b>												
LeaT-1	Protect Wastewater Pump #27 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP



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LeaT-2	Protect Leaman's Place Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
LeaT-3	Protect Mill Creek Flour Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; HPF; Operating Budget	Short	High	SIP
LeaT-4	Protect North American Pipe Corporation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
LeaT-5	Protect Spread Eagle Tavern to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
LeaT-6	Develop and implement a proactive multi-dimensional training program including representatives from the Township, DPW, Fire Department, Police Department, and EMS	N/A	All hazards	3	Municipal EMC	Township Administration, DPW, FD, PD, EMS	High	Medium	EMPG; HSGP; Annual Budget	Short	Medium	EAP
LeaT-7	Identify capacity and needs for emergency generators and transfer switches at the pump stations throughout the Township. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LeaT-8	Develop, apply, and maintain a Smart911 Notification System	N/A	All hazards	3	Municipal EMC		High	Medium	EMPG; HSGP; Annual Budget	Short	Medium	EAP
<b>Lititz Borough</b>												
LitB-1	Protect the Warwick EMS facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipal EMC	High	High	FEMA HMPG, PDM; Operating Budget	Short	High	SIP
LitB-2	Protect Wastewater Pump #72 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
LitB-3	Protect Well #74 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LitB-4	Protect Well #75 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
LitB-5	Protect Versatek to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
LitB-6	Protect Woodstream Corporation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
LitB-7	Protect LG Health Cedar to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
LitB-8	Protect Lititz Academy of Music to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
LitB-9	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
LitB-10	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	N/A	Flood, Flash Flood, and Ice Jams	3	Municipal EMC	PD, FD	Medium	Low	Operating Budget	Short	Low	EAP
LitB-11	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	Existing	All hazards	3	Municipal EMC	County	Medium	Low	Operating Budget	Short	Medium	EAP
<b>Little Britain Township</b>												
LitT-1	Protect Abbotts Creamery to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
LitT-2	Protect Pine Grove Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
LitT-3	Protect Octoraro Treatment Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Manheim Borough</b>												
Manh B-1	Protect Electric Substation #42 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
Manh B-2	Protect Potable Pump #101 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
Manh B-3	Protect the Manheim FD station to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM; Operating Budget	Short	High	SIP
Manh B-4	Protect Wastewater Pump #200 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
Manh B-5	Protect Well #57 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
Manh B-6	Protect Well #58 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
Manh B-7	Protect Shearer's Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	High	SIP
Manh B-8	Protect F L Smidth, Inc. to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC, FMA; Operating Budget	Short	High	SIP
Manh B-9	Protect Manheim Borough 2W Polling Station to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC, FMA; Operating Budget	Short	High	SIP
Manh B-10	Develop a Repetitive Loss Mitigation Plan to address the broader impacts of mitigation efforts and ensure sustainable long-term solutions.	New	Flood/Flash Flood/Ice Jams	2, 3	FPA	Municipal EMC	Medium	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Low	LPR
Manh B-11	Mitigate flood risks on Mill Street and surrounding neighborhoods through a comprehensive strategy incorporating property acquisition, elevation projects, and infrastructure upgrades.	Existing	Flood/Flash Flood/Ice Jams	2	FPA	Municipal EMC	High	High	FEMA HMPG, BRIC, FMA; Operating Budget	Short	Low	EAP
Manh B-12	Critical facilities and infrastructure including Potable Pump #101, the Manheim Fire Department Station, and key roadways, are vulnerable to flooding. To enhance community resilience, implement targeted mitigation measures, including elevating critical facilities and roadways, floodproofing essential infrastructure, and upgrading stormwater management systems.	Existing	Flood/Flash Flood/Ice Jams	2	Engineer	DPW, FPA	High	High	FEMA HMPG, BRIC, FMA; Operating Budget	Short	Medium	SIP
Manh B-13	Implement accessible educational programs, inclusive communication channels, and neighborhood support networks to address the	New	All hazards	4, 5	Municipal EMC	Borough Departme	High	Medium	FEMA HMPG;	Short	High	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	unique needs of socially vulnerable populations during hazard events. Provide tailored resources such as emergency kits, transportation, and shelters, and involve representatives from these groups in mitigation planning to ensure their needs are prioritized. This approach fosters equity and resilience while reducing the impacts of disasters on underserved populations.					nts; Non-profits			Operating Budget			
Manh B-14	Develop and implement a comprehensive Public Education and Outreach Program to address awareness gaps, promote hazard preparedness, and improve community engagement. This program will include workshops, information dissemination via multiple platforms, and outreach campaigns tailored to local hazard risks. These efforts will empower residents to take proactive steps to protect themselves and their properties during hazard events.	New	All hazards	4, 5	Municipal EMC	FD, DPW	High	Medium	FEMA HMPG; Operating Budget	Short	High	EAP
Manh B-15	Develop a Substantial Damage Management Plan, following the six-step process outlined in the 2021 "Developing a Substantial Damage Management Plan" guide. This plan will establish clear responsibilities for determining substantial damage, assessing market value, and managing permit approvals after disaster events. By implementing this plan, Manheim will enhance its capacity to enforce NFIP regulations, improve disaster recovery processes, and ensure compliance with local floodplain requirements, ultimately strengthening community resilience against flooding.	New	Dam Failure, Earthquake, Flood/Flash Flood/Ice Jams, Hailstorms, Subsidence/Sinkholes, Tornado/Windstorm, Wildfire, Winter Storm	2, 3	DPW	Engineer, FPA	High	Medium	Operating Budget	Short	Medium	LPR
<b>Manheim Township</b>												
ManhT-1	Protect District Justice Office 13 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Capital Improvement Budget			
ManhT-2	Protect Wastewater Pump #143 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
ManhT-3	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
ManhT-4	Protect Wastewater Pump #167 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
ManhT-5	West Roseville Road Bridge Demolition - Demolish and remove the West Roseville Road Bridge spanning the Little Conestoga Creek. Removal of an unsafe structure and obstruction in the floodway.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	High	SIP
ManhT-6	Work with PENNDOT to redesign the interchange at US-30 and US-222.	Existing	Transportation Accident	2	DPW	PENNDOT	Medium	High	Operating Budget	Short	Low	SIP
ManhT-7	Protect Brubaker House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ManhT-8	Protect Buckbee Hearing Aid Center to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ManhT-9	Protect Hunsecker's Mill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-10	Protect Iron Stone Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-11	Protect Flory's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-12	Protect Landis Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-13	Protect Mount Joy Hatchery to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ManhT-14	Protect Philip Rudisil House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ManhT-15	Protect John Brubaker Barn to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-16	Protect M. Groff House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-17	Protect Christian L. Hunsecker House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-18	Protect Samuel Hunsicker House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-19	Protect Oregon (Withers) Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-20	Protect Rudisill Family Cemetery to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ManhT-21	Protect Abraham Shenk House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-22	Protect Christian Zook House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManhT-23	The Township will update its comprehensive plan. Ensure that the local comprehensive plan incorporates hazard mitigation techniques through a courtesy review or draft plans by the County Planning Department.	Existing	All hazards	2, 3	Planning Board	Township Administration, County Planning	Medium	Low	Operating Budget	Short	Medium	LPR
ManhT-24	Evaluate the culverts in the Township for capacity and deterioration. Address issues or replace the culverts as necessary.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Engineer	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP
ManhT-25	The Municipal Engineer will work to complete an engineering study of Manheim Township Detention Basin No 2. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Manheim Township	County Engineer, County EMA, PADEP, Municipal Engineer	High	High	FEMA BRIC, HHPD	Short	Medium	SIP
<b>Manor Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ManT-1	Protect Electric Substation #6 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
ManT-2	Protect Bender's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-3	Protect Blue Rock Ferry Site to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-4	Protect Charlestown Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ManT-5	Protect Martin Chartier Commemorative Marker to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-6	Protect Frantz Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	High	SIP
ManT-7	Protect Christian and Susanna Herr Barn and House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ManT-8	Protect Abraham Landis House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-9	Protect Maple Grove Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-10	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-11	Protect Stoneroad's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-12	Protect Washington Boro Methodist Episcopal Church to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-13	Protect Jacob Witmer Sr. Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ManT-14	Protect Amtrak/Conestoga Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ManT-15	Protect J.S. Bear Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-16	Protect PPL Conestoga Kv Substation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ManT-17	Protect Windom Mill Complex to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ManT-18	Staff within Manor Township could benefit from additional emergency management meetings and training to ensure emergency management concepts are practiced and understood.	Existing	All Hazards	3, 4	EMC		High	Low	Operating Budget, EMPG	Short	High	LPR
ManT-19	Flooding occurs in the Township along the Susquehanna River. Improved flood water management system must be installed to reduce risk and impacts.	Existing	Flood, Flash Flood, and Ice Jams	1, 2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
ManT-20	Flooding occurs in the Township along the Conestoga River. Improved flood control	Existing	Flood, Flash Flood, and Ice Jams	1, 2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; PA DCED	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	system must be installed to reduce risk and impacts.								FMP; Operating Budget			
<b>Marietta Borough</b>												
MarB-1	Protect the Marietta Borough Building to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM; Operating Budget	Short	High	SIP
MarB-2	Protect the Marietta Donegal Sewage Treatment Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
MarB-3	Protect the Marietta Fire Department station to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM; Operating Budget	Short	High	SIP
MarB-4	Protect the Marietta-East Donegal Joint Authority WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
MarB-5	Protect the Susquehanna Valley EMS facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM; Operating Budget	Short	High	SIP
MarB-6	Protect Wastewater Pump #53 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MarB-7	Protect Joseph Bucher House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarB-8	Protect Donegal Furnace Ruins to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarB-9	Protect, B.F. Heistand and Co. Saw Mill Site to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarB-10	Protect Marietta Furnace No. 1 Ruins to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarB-11	Protect Vesta Furnace Site Complex to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarB-12	Protect Penn State Life Lion EMS to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Martic Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MarT-1	Protect Baumgardener's Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarT-2	Protect Colemanville Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarT-3	Protect Duncan Island to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarT-4	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
MarT-5	Protect Henry Hess House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MarT-6	Protect Holtwood Power Plant to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
MarT-7	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	Existing	Flood, Flash Flood, and Ice Jams	3	Township Administration	FPA	Medium	Low	Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MarT-8	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
MarT-9	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP
MarT-10	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	N/A	Flood, Flash Flood, and Ice Jams	2, 4	FPA	Municipal EMC	Medium	Low	Operating Budget	Short	Medium	EAP
MarT-11	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	N/A	All hazards	4, 5	Municipal EMC	local NGOs, churches, and other community locations	Medium	Low	Operating Budget	Short	High	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MarT-12	<p>The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas:</p> <ol style="list-style-type: none"> <li>Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property.</li> <li>Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate.</li> <li>Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.</li> <li>Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.</li> </ol>	N/A	Wildfire	2, 3, 4	Municipal EMC	DPW, Township Administration	Medium	Low	Operating Budget	Short	Medium	EAP
MarT-13	<p>The Township will conduct research into other avenues for water supplies and will consider the following strategies:</p> <ol style="list-style-type: none"> <li>Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement.</li> <li>Promoting the protection of watersheds and ensuring sustainable groundwater extraction.</li> <li>Empower the community with the knowledge and skills to manage their water resources by providing educational programs on</li> </ol>	N/A	Drought, Utility Interruption, Wildfire	2, 3	Township Administration	Engineer, DPW, FPA	Medium	Low	Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	<p>how to improve their current water management practices and become more sustainable.</p> <p>4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts.</p> <p>5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.</p>											
MarT-14	The Township will engage with the Lancaster Conservancy to hold discussions on joint responsibility and assistance with the increase in call volumes, which has resulted in an up-tick of emergency responses on land owned by the Lancaster Conservancy. These discussions will lead to the writing and adoption of a Memorandum of Agreement or Memorandum of Understanding between the two entities which will outline the roles and responsibilities of each.	N/A	Flood/Flash Flood/Ice Jams, Hailstorms, Tornado/Windstorm, Winter Storm	3	Municipal EMC	Lancaster Conservancy	Medium	Low	Operating Budget	Short	Medium	LPR
MarT-15	The Municipal Engineer will work with the Pennsylvania Power and Light Company to complete an engineering study of Holtwood SES Ash Basin No 2. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Power and Light Company will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Pennsylvania Power and Light Company	County Engineer, County EMA, PADEP, Municipal Engineer	High	High	FEMA BRIC, HHPD	Short	Medium	SIP
<b>Millersville Borough</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MillB-1	Protect Wastewater Pump #179 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
MillB-2	Identify capacity and needs for an emergency generator and transfer switch at the Fire Station. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW, Fire Department	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
MillB-3	There is a large number of students and staff in the Borough at both Penn Manor High School and Millersville University, which are both critical facilities. The Borough will work with the School District and University to evaluate and develop evacuation and communication plans.	Existing	All Hazards	1, 3, 4, 5	Borough OEM	Penn Manor School District, Millersville University	High	Medium	Borough Budget; School District Budget; University Budget	Short	Medium	LPR
MillB-4	There is a large number of students in the Borough at both Penn Manor High School and Millersville University. It is likely these students experience mental health issues. The Borough will work with the School District and University to create plans with internal and external agencies to identify solutions on how to assist impacted students.	Existing	Substance Use Disorder and Mental Health	1, 3, 4, 5	Borough OEM	Penn Manor School District, Millersville University	High	Medium	Borough Budget; School District Budget; University Budget	Short	Low	LPR
<b>Mount Joy Borough</b>												
MJB-1	Conduct a detailed flood study of the Little Chiques Creek.	N/A	Flood, Flash Flood, and Ice Jams	1	Municipal FPA	Municipal EMCs	Low	Medium	FEMA RiskMap; Private Developers	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MJB-2	Modifications to the Borough Stormwater Detention Basin - increasing the volume of the basin by increasing the height of the berms and/or increasing the footprint of the basin and replacing a 45' long drainage swale with a pipe to prohibit stormwater from flowing over the swale berm.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
MJB-3	The Borough Public Works has identified old and aging stormwater management systems that have issues and is prepared to make upgrades or cleanouts if funding is available. This would include replacing terracotta storm water pipes to prevent ruptures and cleaning out existing pipes.	Existing	Flood, Flash Flood, and Ice Jam	2	DPW	Borough Engineer	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-4	Construct a Flood Wall around the Waste Water Treatment Plant to prevent flood waters from Little Chiques Creek from encroaching on the plant and causing a shutdown.	Existing	Flood, Flash Flood, and Ice Jam; Utility Interruption	2	Borough Engineer	DPW	High	High	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget; User Fees	Short	Low	SIP
MJB-5	Install lining of sewer mains and maintenance holes to prevent inflow and infiltration of stormwater system wide	Existing	Flood, Flash Flood, and Ice Jam	2	DPW	Borough Engineer	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-6	Design and construct a flood wall around the Waste Water Treatment Plant to prevent shutdown from flood waters of the Little Chiques Creek.	Both	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MJB-7	Replace aging terracotta sewer mains throughout the system to prevent ruptures during flooding events.	Existing	Flood, Flash Flood, and Ice Jam	2	DPW	Borough Engineer	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-8	Reconstruct drinking water wells by installing casing to a lower depth to prevent stormwater infiltration.	Existing	Flood, Flash Flood, and Ice Jam	2	DPW	Borough Engineer	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-9	Construct or enhance Flood Doors/Barriers on well houses and sewage pump stations to keep out flood water so the facility remains functional during flooding events.	Both	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-10	Replace/Rehabilitate water filters to handle infiltrated storm water.	Existing	Flood, Flash Flood, and Ice Jam	2	DPW	Borough Engineer	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-11	Streambank Restoration Project for the Little Chiques Creek Park. This is a 2.5-million-dollar project. Once completed it will address both flooding in the park and along some of the houses in the general area as well as stop the erosion of the streambanks.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MJB-12	Increase the Stormwater Capacity to the outfall to the Little Chiques and Donegal Creek's watershed system wide.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-13	Replace aging and failing corrugated metal storm pipe throughout the borough.	Existing	Flood, Flash Flood, and Ice Jam	2	DPW	Borough Engineer	High	Medium	FEMA HMPG, BRIC, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-14	Improve and Upgrade the Locust Lane Storm Water Management Basin. Repair existing sink holes in the basing and increase function and capacity of the basin.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-15	Improve and Upgrade the Pink Alley Storm Water Management Basin	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-16	Construct a new Stormwater Management Facility to prevent flooding of the Manheim St area.	New	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MJB-17	Improve Stormwater management capacity in problem areas of the system.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-18	Improve and Upgrade the Stormwater Management piping under the Amtrak railroad lines and pipes that drain into the Amtrak railroad cut in the borough.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-19	Repair and prevent erosion from stormwater near the Barbara St Bridge spanning the Amtrak railroad cut.	Existing	Flood, Flash Flood, and Ice Jam	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
MJB-20	Purchase two mobile generator units to power sewer or water facilities in the event of major power loss to maintain service to the borough.	New	Flood, Flash Flood, and Ice Jam; Utility Interruption	2	Borough Engineer	DPW	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	High	SIP
<b>Mount Joy Township</b>												
MJT-1	Protect Wastewater Pump #84 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MJT-2	Raise Koser Road at the approach to the bridge over Conewago Creek.	Existing	Flood, Flash Flood, and Ice Jams	2	Township Public Works	N/A	High	\$10,000	General Fund/ Liquid Fuels	Short	Low	SIP
MJT-3	Raise Prospect Road at the approach to the bridge over Conewago Creek.	Existing	Flood, Flash Flood, and Ice Jams	2	Township Public Works	N/A	High	\$10,000	General Fund/ Liquid Fuels	Short	Low	SIP
MJT-4	Protect Martin Nissley House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa 1 EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MJT-5	Protect Risser's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa 1 EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
MJT-6	Investigate and implement additional security measures on the municipal complex.	N/A	Terrorism	2, 3	Municipal EMC		Medium	Medium	HSGP; Operating Budget	Short	Medium	SIP
MJT-7	Provide active shooter training to municipal staff.	N/A	Terrorism	3	Municipal EMC		Medium	Medium	HSGP; EMPG; Operating Budget	Short	Low	EAP
MJT-8	Reassess snow evacuation routes and prepare better graphics and communication materials to the public and first responders.	N/A	Winter Storm	3, 4, 5	DPW	PD, Municipa 1 EMC, FD, EMS	Medium	Low	Operating Budget	Short	Low	EAP
MJT-9	Consolidate all winter weather resources at the municipal complex via a master planning process and construction. This will improve response time and efficiency in responding to forecasted and emergency winter weather events.	Existing	Winter Storm	3	DPW	PD, Municipa 1 EMC, FD, EMS	Medium	Low	Operating Budget	Short	Low	LPR
<b>Mountville Borough</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
MVB-1	Work with EMC and borough manager/mayor to orient the new EMC to current projects and status of emergency items.	N/A	All hazards	3	Borough Manager	Mayor, Municipal EMC	High	Low	Operating Budget	Short	Medium	EAP
MVB-2	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	N/A	All hazards	4, 5	Municipal EMC		Medium	Low	Operating Budget	Short	High	EAP
<b>Paradise Township</b>												
ParT-1	Protect the Paradise Township Sewer Authority WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
ParT-2	Protect Wastewater Pump #89 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
ParT-3	Protect Wastewater Pump #91 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
ParT-4	Protect Black Horse Amish Parochial School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ParT-5	Protect the Sign of the Buck to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
ParT-6	Protect Eshelman Run Amish School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ParT-7	Protect Jacob Eshleman II House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ParT-8	Protect Leaman Place Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ParT-9	Protect Osceola Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ParT-10	Protect LeFever Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
<b>Penn Township</b>												
PennT-1	Clear obstructions from the stormwater management system near the intersection of Fruitville Pike/New Charlotte Street and Main Street (PA-72).	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	PENNDOT	Medium	Medium	Operating Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
PennT-2	Protect the Manheim Borough Authority WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
PennT-3	Protect Wastewater Pump #199 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
PennT-4	Protect Well #39 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
PennT-5	Update stormwater management regulations to make them more restrictive for new development.	New	Flood, Flash Flood, and Ice Jams	1	Board of Supervisors	FPA	Medium	Low	Operating Budget	Short	Medium	LPR
PennT-6	Upgrade stormwater management infrastructure along White Oak Road south of Hamaker Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
PennT-7	Upgrade stormwater management infrastructure at the intersection of Stiegel Valley Road and White Oak Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
PennT-8	Protect Ferrellgas to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
<b>Pequea Township</b>												
Peq-1	Protect Baumgardner's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
Peq-2	Protect Daniel Good House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
Peq-3	Protect Abraham and Sarah Hess Barn to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
Peq-4	Protect A.B. Mylin House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
Peq-5	Protect Pequea Valley Hotel to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
Peq-6	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	Existing	Flood, Flash Flood, and Ice Jams	3	Township Administration	FPA	Medium	Low	Operating Budget	Short	Medium	LPR
Peq-7	Identify capacity and needs for an emergency generator and transfer switch at the Township	Existing	Flood, Flash Flood, and	2	Engineer	DPW	High	High	FEMA HMPG, BRIC;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.		Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident						RACP; Operating Budget			
Peq-8	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP
Peq-9	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	N/A	Flood, Flash Flood, and Ice Jams	2, 4	FPA	Municipal EMC	Medium	Low	Operating Budget	Short	Medium	EAP
Peq-10	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	N/A	All hazards	4, 5	Municipal EMC	local NGOs, churches, and other community locations	Medium	Low	Operating Budget	Short	High	EAP
Peq-11	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas:	N/A	Wildfire	2, 3, 4	Municipal EMC	DPW, Township Administration	Medium	Low	Operating Budget	Short	Medium	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	<ol style="list-style-type: none"> <li>1. Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property.</li> <li>2. Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate.</li> <li>3. Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.</li> <li>4. Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.</li> </ol>											
Peq-12	<p>The Township will conduct research into other avenues for water supplies and will consider the following strategies:</p> <ol style="list-style-type: none"> <li>1. Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement.</li> <li>2. Promoting the protection of watersheds and ensuring sustainable groundwater extraction.</li> <li>3. Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices and become more sustainable.</li> </ol>	N/A	Drought, Utility Interruption, Wildfire	2, 3	Township Administration	Engineer, DPW, FPA	Medium	Low	Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	<p>4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts.</p> <p>5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.</p>											
<b>Quarryville Borough</b>												
QVB-1	The Municipal Building, a critical facility, houses the Borough Administrative Offices, Police Department, and Public Works Department. The building has no back-up power in order to support continuity of operations in the event of an emergency. An engineer scoped that the building would require a 102-kW generator, priced at \$55,000.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
QVB-2	The culvert located on Broad Street at the intersection of Second Street is deteriorating due to heavy rains and erosion. The culvert, and guiderail which protects it, must be improved. An engineer estimated the cost of this project would be \$425,000.	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; Multimodal Transportation Fund; Operating Budget	Short	Medium	SIP
<b>Rapho Township</b>												
RapT-1	Protect Wastewater Pump #55 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
RapT-2	Regularly clear obstructions from waterways.	N/A	Flood, Flash Flood, and Ice Jams	1	DPW		High	Low	Operating Budget	Short	Low	NSP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
RapT-3	Protect Kauffman's Distillery Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
RapT-4	Protect Peter and Elisabeth Lindemuth House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
RapT-5	Protect Pfoutz Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
RapT-6	Protect Peter and Mary Risser House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
RapT-7	Protect Schenck's Mill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
RapT-8	Protect Seigrist's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP

**Sadsbury Township**



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
SadT-1	Mt. Vernon Road Runoff Retention Basins - Create two retention basins, redirect catch basin pipes, install a storm drain line, and extend approximately 1/3 mile to relieve runoff into the Christiana Borough watershed.	New	Flood, Flash Flood, and Ice Jams	2	DPW	Municipa 1 EMCs	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
SadT-2	Protect Forge Ruins to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa 1 EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
SadT-3	Protect Mercer's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa 1 EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
SadT-4	Protect Sadsbury Twp Detention Pond 1 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa 1 EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
SadT-5	Protect Woolen Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa 1 EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
SadT-6	Create a shoulder to catch water runoff. This runoff will be released into a culvert instead of puddling along Creek and Noble Roads. Work performed by Township Public Works Department.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Engineer	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
SadT-7	Restore RT 41 Williams Run dam to its normal operating conditions by repairing damage to the pipe and dam embankment during dry conditions. A DEP Permit has been received. The Township will work with the company Land Studies to be sure the project is completed in a timely manner and in compliance with all agencies.	Existing	Flood, Flash Flood, and Ice Jam; Dam Failure	6	Engineer	DPW; Dam Owner	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; Operating Budget	Short	Medium	SIP
<b>Salisbury Township</b>												
SalT-1	Protect Meadow Springs Amish School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
SalT-2	Protect Millwood Kennel to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
SalT-3	Protect New Miltown Roller Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
SalT-4	Protect Verdant Valley Amish School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Strasburg Borough</b>												
StrasB-1	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
<b>Strasburg Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
StrasT-1	Protect Bowman's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
StrasT-2	Protect Herr's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
StrasT-3	Protect Lefever Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
StrasT-4	Protect Lime Valley Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
StrasT-5	Protect Neff's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
StrasT-6	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Upper Leacock Township</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ULT-1	Protect Bushong Mill and House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ULT-2	Protect Pinetown Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ULT-3	Protect Stauffer's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
ULT-4	Protect Worley and Obetz, Inc. to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ULT-5	Protect Center Square Amish School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
ULT-6	Protect H & E Sheibly House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
<b>Warwick Township</b>												
WarT-1	Protect Wastewater Pump #67 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									DCED FMP, Sewer Grant; Sewer Fees			
WarT-2	Protect Well #35 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
WarT-3	Replace the Lititz Run culvert under Lititz Run Road with one with a larger opening.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	High	SIP
WarT-4	Protect Lititz Grist Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WarT-5	Protect Erb's Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WarT-6	Protect Hess Lower to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WarT-7	Protect Rothsville Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WarT-8	Protect Marathon Gas Station to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WarT-9	Protect Zook's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WarT-10	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	DPW	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
WarT-11	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	N/A	Flood, Flash Flood, and Ice Jams	3	Municipal EMC	PD, FD	Medium	Low	Operating Budget	Short	Low	EAP
WarT-12	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	Existing	All hazards	3	Municipal EMC	County	Medium	Low	Operating Budget	Short	Medium	EAP
<b>West Cocalico Township</b>												
WCT-1	Expand intersection of Sandy Hill Road and Hillside Road.	Existing	Environmental Hazards; Transportation Accidents	2	DPW		Low	High	Capital Improvement Budget	Short	Medium	SIP
WCT-2	Improve drainage at the culvert at Sportsman Road east of Hickory Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP;	Short	Low	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Capital Improvement Budget			
WCT-3	Increase length of Hackman Road bridge to provide more water to flow underneath it.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
WCT-4	Increase length of Hickory Road bridge to provide more water to flow underneath it.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
WCT-5	Increase length of Indiantown Road bridge to provide more water to flow underneath it.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
WCT-6	Install backup power generators at two potable water wells.	Existing	Utility Interruption	2	DPW		High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Water Fees; RACP	Short	High	SIP
WCT-7	Install stormwater management infrastructure along Blue Lake Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WCT-8	Install stormwater management infrastructure along Girl Scout Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
WCT-9	Install stormwater management infrastructure along Mountain Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
WCT-10	Install stormwater management infrastructure along Netzley Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
WCT-11	Install stormwater management infrastructure along Sandy Hill Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
WCT-12	Install stormwater management infrastructure along Strickler Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WCT-13	Install stormwater management infrastructure along White Hall Road to prevent downhill flooding.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Medium	SIP
WCT-14	Relocate the Wastewater Treatment Plant to a location outside the floodplain.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	Medium	SIP
WCT-15	Renovate the stormwater management system in Reinholds.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	Municipal EMC	Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
WCT-16	Upgrade and clear obstructions in the drainage system at the Cocalico Creek at Hickory Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	Operating Budget	Short	Low	SIP
WCT-17	Upgrade the bridge on Sportsman Road over the Cocalico Creek to allow more water to flow underneath it.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Low	SIP
WCT-18	Upgrade the drainage system at the Cocalico Creek at Pineview Drive and elevate the bridge approach.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		High	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
WCT-19	Protect Binkley's Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									FMP; HPF; Operating Budget			
WCT-20	Protect Windstream Reinholds Central Office to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WCT-21	The Municipal Engineer will work with Randy Shirk to complete an engineering study of Barnett Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Randy Shirk will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Existing	Dam Failure; Flood, Flash Flood, and Ice Jams	6	Randy Shirk	County Engineer, County EMA, PADEP, Municipal Engineer	High	High	FEMA BRIC, HHPD	Short	Medium	SIP
<b>West Donegal Township</b>												
WDT-1	Protect the Elizabethtown Regional Sewer Authority WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
WDT-2	Protect Wastewater Pump #197 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
WDT-3	The culvert on Miller Road near the Elizabethtown Regional Sewer Authority needs to be evaluated and improved as it may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address	Existing	Flood, Flash Flood, and Ice Jams	2	Engineer	DPW	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.											
<b>West Earl Township</b>												
WET-1	Protect the West Earl Township Sewer Authority WWTP to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipa l EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
WET-2	Protect the West Earl Township Water Authority facility to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipa l EMC	High	High	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
WET-3	Protect Wastewater Pump #184 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipa l EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
WET-4	Protect Bitzer's Mill Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa l EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WET-5	Protect Cooper Shop at Brownstown Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipa l EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WET-6	Protect Eberlys Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WET-7	Protect Riverview School to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WET-8	Protect Widow Wenger's House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WET-9	Protect American LaFrance, LLC to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WET-10	Protect Jacob Wolf House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WET-11	Protect Martin-Bitzer House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WET-12	Protect Marx and Fronic Groff Farmstead to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WET-13	Protect Samuel Good House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WET-14	Protect Smeal LTC, LLC. to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WET-15	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Township employees to work remotely if needed.	Both	Cyber Incidents, Earthquake, Hailstorms, Tornado/Windstorm, Utility Interruption, Wildfire, Winter Storm	2	Township Administration	Municipal EMC	High	Medium	FEMA HMGP, BRIC; Operating Budget	Short	Medium	LPR
WET-16	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	N/A	Winter Storm, Transportation Accidents	3	DPW		High	Low	Operating Budget	Short	Medium	LPR
WET-17	Evaluate flood mitigation measures, including property acquisitions and flood walls, at the trailer park to reduce, or remove, the risk of flooding.	Existing	Flood, Flash Flood, and Ice Jams	2	FPA	Municipal EMC	High	High	FEMA HMPG, BRIC, FMA; PA DCED FMP; Operating Budget	Short	Medium	SIP
<b>West Hempfield Township</b>												
WHT-1	Protect Chickies Lock to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF;	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Operating Budget			
WHT-2	Protect Forrey's Mill Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WHT-3	Protect S.S. Haldeman Mansion site to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WHT-4	Protect Lancaster Area Sewer Auth - Farmdale Pump Station to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget; Sewer Grant; Sewer Fees	Short	High	SIP
WHT-5	Protect Pedant-Grube Farmhouse (Garber Farm) to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WHT-6	Protect Columbia Water Co Chickies Well to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WHT-7	Protect Henry Clay Furnace Ruins to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WHT-8	Protect Chickies Silica Stone Crusher to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WHT-9	Work with EMC and Township manager/mayor to orient the new EMC to current projects and status of emergency items.	N/A	All hazards	3	Township Manager	Mayor, Municipal EMC	High	Low	Operating Budget	Short	Medium	EAP
WHT-10	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	N/A	All hazards	4	Municipal EMC		Medium	Low	Operating Budget	Short	High	EAP
<b>West Lampeter Township</b>												
WLT-1	Improve drainage along Eckman Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
WLT-2	Improve stormwater management along Gypsy Hill Road, including installing a culvert to discharge water away from homes.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	\$30,000	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP
WLT-3	Improve stormwater management along Hollinger Road.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; Capital Improvement Budget	Short	Low	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WLT-4	McFalls Property Stormwater Management - reclaim the area as a stream.	Existing	Flood, Flash Flood, and Ice Jams	2	DPW	FPA, Municipal EMC	High	\$500K	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Long	Medium	SIP
WLT-5	Protect Potable Pump #100 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
WLT-6	Protect Potable Pump #61 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP; User Fees	Short	High	SIP
WLT-7	Protect Wastewater Pump #21 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, PDM, FMA; PA DCED FMP, Sewer Grant; Sewer Fees	Short	High	SIP
WLT-8	Retention Pond - Construct retention ponds to protect properties along Hollinger Road.	New	Flood, Flash Flood, and Ice Jams	2	DPW		Medium	High	FEMA HMPG, PDM, FMA; PA DCED FMP; Operating Budget	Short	Low	SIP
WLT-9	Protect Colonial Metals Company to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
WLT-10	Protect Extrusion Division to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WLT-11	Protect Herr or Graff House and Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WLT-12	Protect George and Susanna Lefevre Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WLT-13	Protect Lime Valley Covered Bridge to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WLT-14	Protect Mill Creek Bridge #8 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WLT-15	Protect Eckman Mill to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WLT-16	Protect Reservoir #17 to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
WLT-17	Protect Henry K. Stoner House to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; PA DCED FMP; HPF; Operating Budget	Short	High	SIP
WLT-18	Protect Mill Creek Pump Station to the 0.2% annual chance flood level.	Existing	Flood, Flash Flood, and Ice Jams	2	Facility Owner	FPA, Municipal EMC	High	Medium	FEMA HMPG, BRIC; Operating Budget	Short	High	SIP
<b>Bainbridge Water Authority</b>												
BWA-1	Update the Authority's emergency response plan.	Existing	All hazards	3	Facility Owner	Office Manager	High	Low	Operating Budget	Short	Medium	LPR
BWA-2	Explore the needs to purchase and install a three-phased emergency generator.	Existing	Flood, Flash Flood, and Ice Jams; Tornado/Windstorm; Utility Interruption; Winter Storm; Cyber Incident	2	Engineer	Office Manager	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
BWA-3	Institute mandate for employees driving company vehicles to supply proof of insurance.	N/A	Transportation Accident	2	Facility Owner	Office Manager	Medium	Low	Operating Budget	Short	Low	LPR
BWA-4	Investigate new platforms of communication to support public outreach. Additionally, identify and advertise methods of communication for the public to contact the Authority.	N/A	Terrorism; Cyber Incidents; Utility Interruption	4	Office Manager		Medium	Low	Operating Budget	Short	Medium	LPR
<b>Cocalico School District</b>												
CSD-1	Work with local experts to develop training opportunities for staff that align with the district's EOP.	Existing	Earthquake; Hailstorms; Tornado/Windstorm; Utility	4, 5	Assistant to the Superintendent	Superintendent, County EM	High	Low	Operating Budget	Short	High	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
			Interruption; Wildfire; Winter Storm; Flood, Flash Flood, Ice Jam									
CSD-2	Work with emergency management to secure supplies as necessary if a prolonged stay is required due to an inability to relocate to another site with better/more equipped resources and facilities.	New	Earthquake; Hailstorms; Tornado/Windstorm; Utility Interruption; Wildfire; Winter Storm; Flood, Flash Flood, Ice Jam	3, 4, 5	Assistant to the Superintendent	Superintendent, County EM	High	Medium	Operating Budget, County Budget	Short	High	LPR
<b>Columbia Borough School District</b>												
CBSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Superintendent	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>Conestoga Valley School District</b>												
CVSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Superintendent	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>East Cocalico Township Water and Sewer Authority</b>												



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ECTA-1	Most ECTA customer meters are read on a quarterly basis using drive-by “radio read” technology. A fixed-base metering system with remote read technology would create a more efficient reading and notification system in which ECTA would have real-time notification of excess water use or meter failure that would increase the speed at which ECTA can respond. The response would include faster customer communication and enforcement during severe drought or other water shortage emergency. Cost = \$1,300,000, including installation, for ECTA’s full system. ECTA plans to begin replacements, as needed, in a phased approach in 2025.	Existing	Drought; Utility Interruption	2	Facility Owner		High	High	FEMA BRIC; Operating Budget	Long	Medium	SIP
ECTA-2	Purchase of an additional backup power source would give ECTA the capability to power two groundwater wells and the ability to better meet demand, in the event of a widespread power outage. A generator meeting the following specifications would be appropriately sized to power any well in ECTA’s system: <ul style="list-style-type: none"> <li>• 3-phase</li> <li>• 208/480 V</li> <li>• 110 kW</li> <li>• 300A/150A</li> </ul> Based on a recent purchase of similar scope, cost = \$100,000, including trailer to mobilize the generator.	Existing	Tornado, Windstorm; Utility Interruption; Winter Storm; Hailstorms	2	Facility Owner		High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
ECTA-3	ECTA neighbors three other municipal water systems. An emergency interconnect with any of these three systems, would provide ECTA the ability to continue serving its customers while working towards bringing a well source back online. Cost = \$1,000,000.	Existing	Earthquake; Hazardous Materials Release; Subsidence, Sinkhole; Utility Interruption	2	Facility Owner	Neighboring Utility Authorities	High	High	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
ECTA-4	If a groundwater well is classified as GUDI, a treatment upgrade is required including more advanced filtering and disinfection. Most of ECTA's well sources would also require facility expansion to make room for the upgraded treatment. Cost would be dependent on the source well capacity, but a recent comparable upgrade is estimated at \$3,000,000.	Existing	Subsidence, Sinkhole	2	Facility Owner		High	High	FEMA HMPG, BRIC; Operating Budget	Short	Medium	SIP
<b>Elizabethtown Area School District</b>												
ETAS D-1	Searching the student management system for the past three school years, student discipline for illicit substance/vaping violations is on the rise. Over the past two years the School District has called 911 three times for students experiencing medical issues suspected to be caused due to vaping illicit substances. Install vape detectors in the High School and Middle School sixteen restrooms. With a cost of about \$4000 per unit, the total cost would be about \$64,000.	Existing	Substance Abuse Disorder and Mental Illness	4, 5	Superintendent	Maintenance Staff	High	Medium	SAMHSA; USDHHS Grants; Operating Budget	Short	Low	SIP
<b>Ephrata Area School District</b>												
EASD-1	Students are experiencing higher levels of mental illness in the community. The School District will contribute to address mental health concerns by increasing support through reporting systems, school counseling availability, family referral to outside support, and access to outside counseling during school hours and on school property.	N/A	Substance Abuse Disorder and Mental Illness	4, 5	School District Counseling	Superintendent	High	Low	Operating Budget	Short	Medium	LPR
EASD-2	With the ongoing and anticipate increase in cyber incidents, including data infiltration, data corruption, and ransomware, the District week seek various methods to improve and update its technology security through network segmentation, multi0factor authorization, limited account privileges, and remote data back-ups.	Existing	Cyber Incident	2	IT	Superintendent	High	Medium	FEMA BRIC; CISA; HSGP; Operating Budget	Short	Medium	LPR



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
<b>Hempfield School District</b>												
HSD-1	Ensure runoff during construction at the High School at the Landisville Campus is monitored to reduce water runoff issues, including erosion. Locations which could be impacted include the high school campus, nearby parking lots, and the baseball fields.	Both	Flood, Flash Flood, Ice Jam	2	Safety and Security Supervisor	Superintendent	Medium	Low	Operating Budget	Short	Medium	SIP
HSD-2	Evaluate if the high school and administrative buildings need protective measures to reduce flooding impacts. Once evaluated, implement the identified measure(s).	Existing	Flood, Flash Flood, Ice Jam	2	Safety and Security Supervisor	Superintendent	Medium	Medium	Operating Budget; FEMA HMA	Short	Medium	SIP
<b>Lampeter-Strasburg School District</b>												
LSSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Superintendent	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>Lancaster Area Sewer Authority</b>												
LASA-1	The Emergency Response Plan is in need of an update. The previous edition of the plan was completed in 2020, and the format is outdated. Assess whether LASA has the capabilities to complete this plan update on its own. If not, research various funding streams, including the BRIC, HMGP, EMPG, and HSPG grants to provide assistance in completing and update of the Emergency Response Plan.	Existing	All hazards	3	Executive Director	Safety Officer	Medium	Medium	FEMA BRIC, HMGP, EMPG; CISA; HSGP; Operating Budget	Short	Medium	LPR
LASA-2	LASA will work with its engineers (internal or contracted) to determine the required load capacity of an emergency generator for its administrative building, located at 130 Centerville Road, Lancaster PA 17603. Once determined, LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical facility	Existing	Cyber Incidents, Drought, Earthquake, Hailstorms, Terrorism, Tornado and Windstorm,	2	Engineers	Executive Director	Medium	Medium	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	can maintain its operations should an emergency or incident occur.		Utility Interruption, Wildfire, Winter Storm									
LASA-3	LASA has completed a study to identify the required load capacity of a generator to be installed at the pump station located at 2705 Charlestown Road, Lancaster PA 17603. LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical piece of infrastructure maintains operability should an emergency or incident occur.	Existing	Cyber Incidents, Drought, Earthquake, Hailstorms, Terrorism, Tornado and Windstorm, Utility Interruption, Wildfire, Winter Storm	2	Engineers	Executive Director	Medium	Medium	FEMA HMPG, BRIC; RACP; Operating Budget	Short	High	SIP
LASA-4	LASA will work with engineers, internal or contracted, to assess the feasibility of elevating or relocating it various pump stations from flood-prone locations. These pump stations frequently experience flooding conditions from the many waterways and waterbodies in Lancaster County. Elevating or relocating the pump stations will mitigate flood risk and prevent the utility from being interrupted. The identified pumpstations are located at: <ul style="list-style-type: none"> <li>Blue Rock 1-324 Blue Rock Rd. Washington Boro PA 17582</li> <li>Holland Hills- 204 Donnerville Rd Lancaster PA 17603</li> <li>Silver Spring- 830 Silver Spring Rd Silver Spring PA 17575</li> <li>Elizabeth Street- 8 Elizabeth St, Washington Boro PA 17582</li> <li>River Road-1850 Water Street Washington Boro PA 17582</li> <li>Eden Road- 1891 Eden Rd, Lancaster PA 17601</li> </ul>	Existing	Flood/Flash Flood/Ice Jams, Utility Interruption	2	Engineers	Executive Director	High	High	FEMA HMPG, BRIC; RACP; Operating Budget	Short	Medium	SIP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
	<ul style="list-style-type: none"> <li>Pleasure Road- 1401 Pleasure Rd Lancaster PA 17601</li> </ul>											
LASA-5	LASA has not created a professional-styled video for outreach, recruitment, and highlighting the organization’s mission and operations. LASA is committed to superior wastewater management to protect the community, public health, and the environment. Its goals align with environmental protection and stewardship. The creation of this video will educate viewers on how LASA assists in mitigation efforts through its wastewater management practices. LASA will research professional film companies to assist in the production of a video dedicated to conducting outreach, recruitment, and highlighting the organization’s mission and operations.	N/A	Flood/Flash Flood/Ice Jams, Utility Interruption	4	Executive Director	Outreach Team	High	Low	Operating Budget	Short	High	EAP
<b>Lancaster County Conservation District</b>												
LCCD-1	The district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4	Director	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>Lancaster School District</b>												
LSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Superintendent	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>Lancaster-Lebanon Intermediate Unit</b>												
LLIU-1	The agency will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4	Administrator	County EM, Local EM	High	Low	Operating Budget, County Budget, Local	Short	High	EAP



Initiative <sup>a</sup>	Mitigation Action	New or Existing <sup>b</sup>	Hazards Mitigated	Goals Met	Lead Agency	Support Agencies	Estimated Benefits	Estimated Cost	Sources of Funding	Timeline	Priority	Mitigation Category
									Jurisdiction Budget			
<b>Penn Manor School District</b>												
PMSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Superintendent	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>Solanco School District</b>												
SSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Superintendent	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP
<b>Warwick School District</b>												
WSD-1	Sinkholes have previously formed within the grounds of the Warwick School District. Continue monitoring the property owned by the School District for any signs of sinkhole formation or activity.	Existing	Subsidence, Sinkhole	2	Maintenance		Medium	Low	Operating Budget	Short	Low	LPR
<b>Well Span Health</b>												
WSH-1	The system will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	N/A	All Hazards	4, 5	Director	County EM, Local EM	High	Low	Operating Budget, County Budget, Local Jurisdiction Budget	Short	High	EAP



- a. The letters associated with the action number indicate the lead agency (i.e., county or municipality)
- b. Does this mitigation action reduce the effects of hazards on new and/or existing buildings and/or infrastructure? Not applicable (N/A) is inserted if this does not apply.

**Costs:** These rough estimates should be used where actual project costs cannot reasonably be established at this time:

- Low = < \$10,000
- Medium = \$10,000 to \$100,000
- High = > \$100,000

**Timeline:**

- Short Term = 1 to 5 years
- Long Term = 5 years or greater.

**Funding Sources:**

DOF = Depending on funding  
 EMA = Emergency Management Agency  
 EMS = Emergency Medical Services  
 FEMA = Federal Emergency Management Agency

FPA = Floodplain Administrator  
 HMGP = Hazard Mitigation Grant Program  
 PA DEP = Pennsylvania Department of Environmental Protection

PDM = Pre-Disaster Mitigation Program  
 PEMA = Pennsylvania Emergency Management Agency  
 WWTP = Wastewater Treatment Plant

**Mitigation Category:**

- Education and Awareness Programs (EAP)—Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady and Firewise Communities.
- Local Plans and Regulations (LPR)—Actions include government authorities, policies, or codes that influence the way land and buildings are being developed and built.
- Natural Systems Protection (NSP)—Actions that minimize damage and losses, and also preserve or restore the functions of natural systems.
- Structure and Infrastructure Project (SIP)—Actions that involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct structures to reduce the impact of hazards.



### 6.4.2 Mitigation Strategy Prioritization and Implementation

Prioritizing mitigation actions to emphasize the extent to which benefits are maximized allows jurisdictions to select the most cost-effective actions for implementation first, not only to use resources efficiently, but also to make a realistic start toward mitigating risks. Mitigation benefits are defined as future losses that would be eliminated and/or reduced by implementing the proposed project. Mitigated losses include physical damage to structures and infrastructure, loss of service or function, and emergency management costs. Particularly for physical mitigation projects, jurisdictions are encouraged to estimate project costs to compare to the anticipated benefits. Where exact project costs and benefits are not available, ranges are identified (high, medium, low), allowing a qualitative evaluation of project cost-effectiveness.

PEMA has developed a mitigation actions evaluation and prioritization process to provide a consistent, uniform approach for jurisdictions to consider the best mitigation strategies for their communities (PEMA 2020). Jurisdictions evaluate feasibility of mitigation actions using the following evaluation criteria:

- **Life Safety**—The extent to which a mitigation action will protect individuals from being injured or killed by a hazard.
- **Property Protection**—The extent to which an action will protect property, including homes, businesses, and critical infrastructure.
- **Technical**—Whether an action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts.
- **Political**—The opinions of community and state political leadership about issues regarding the environment, economic development, safety, and emergency management, as they relate to political support for mitigation activities and programs.
- **Legal**—Whether a jurisdiction has the legal authority to implement the action, or whether the jurisdiction must pass new laws or regulations. Local governments operate under enabling legislation that gives them the power to engage in different activities. Jurisdictions should identify the unit of government undertaking the mitigation action and include an analysis of the inter-relationships between local, regional, state, and federal governments. Legal authority is likely to have a significant role later in the process when the jurisdiction determines the ways in which mitigation activities can best be carried out and the extent to which mitigation policies and programs can be enforced.
- **Environmental**—Impact on the environment in keeping with public desire for sustainable and environmentally healthy communities. Many statutory considerations, such as the National Environmental Policy Act (NEPA), are relevant when using federal funds. Jurisdictions need to evaluate the potential negative consequences of mitigation actions on environmental assets such as threatened and endangered species, wetlands, and other protected natural resources.
- **Social**—Public support for the overall implementation strategy and specific mitigation actions. Planning Partners should determine if a mitigation action will have a beneficial or negative effect on a particular segment of the population, particularly socially vulnerable and historically disadvantaged communities.
- **Administrative**—The anticipated staffing, funding, and maintenance requirements for the mitigation action and whether the jurisdiction has the personnel and administrative capabilities necessary to implement the action or requires outside help.
- **Local Champion**—The availability of an individual who will lead the implementation of a project, particularly a complex project.
- **Other Community Objectives**—The extent to which implementing the mitigation action supports other community objectives, such as increasing parks and recreation space, enhancing quality of life, and spurring economic development.

Table 6-5 shows the feasibility evaluation for each identified mitigation action. The feasibility or effectiveness of each action, related to each of the above criteria, is indicated with a “+” (highly effective or feasible), “N” (neutral or not applicable), or “-” (ineffective or not feasible). All actions were deemed feasible.



Table 6-5. Evaluation of Mitigation Actions

Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LC-1	Acquire properties in hazard areas, notably those in the 1 percent annual chance floodplain, to convert them to open space.	N	+	+	+	N	N	+	+	N	+	6 (+) 4 (N) 0 (-)
LC-2	Educate residents in flood-prone areas about the benefits of purchasing flood insurance.	N	N	+	+	+	N	N	N	N	+	4 (+) 6 (N) 0 (-)
LC-3	Elevate structures at risk of flooding.	+	+	+	+	+	N	N	N	N	N	5 (+) 5 (N) 0 (-)
LC-4	Acquire repetitive loss properties to convert them to open space.	N	+	+	+	N	N	N	+	N	+	5 (+) 5 (N) 0 (-)
LC-5	Remove any dilapidated or structurally unsound dams that pose a flooding threat to the community.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LC-6	Work with hazardous materials facilities in the floodplain to floodproof structures up to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
LC-7	Work with the Lancaster Conservancy to provide information at the Welsh Mountain Nature Preserve regarding the potential for wildfires and how visitors can prevent them.	N	N	+	+	+	N	+	+	N	+	6 (+) 4 (N) 0 (-)
LC-8	Nissley Acres Floodwater Storage Area—Create a floodwater storage area to assist in reducing flood levels in the Nissley Acres development and a downstream residential area in Ephrata Township that is also prone to flooding. The location of the storage area would be on Borough-owned property so it would not require acquisition of land.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
LC-9	Work with the railroad and property owners to provide a wider buffer between the tracks and vegetation.	N	N	+	+	N	N	N	+	N	+	4 (+) 6 (N) 0 (-)
LC-10	Protect the structures in Chickie’s Park to the 0.2% annual chance flood level.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LC-11	Work with PPL to protect the Conestoga KV Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
LC-12	Work with the Safe Harbor Water Power Corporation to protect their facilities to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
LC-13	Work with PPL to protect the Holtwood facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
LC-14	Develop a hazard information page on the County website, and link from each municipality's website.	N	N	+	+	+	N	N	N	N	+	4 (+) 6 (N) 0 (-)
LC-15	Develop informational workshops on hazard risks and hazard mitigation for property owners in high-risk areas.	+	N	+	+	+	N	N	N	N	+	5 (+) 5 (N) 0 (-)
LC-16	Increase the frequency of environmental and risk assessments to better determine where land should or should not be developed.	+	N	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
LC-17	Increase support capabilities, better facility evacuation plans, and long-term placement plans.	+	N	+	+	+	N	N	+	N	+	6 (+) 4 (N) 0 (-)
LC-18	Increase training and exercises available to water and wastewater authorities.	+	N	+	+	N	N	+	N	N	N	4 (+) 6 (N) 0 (-)
LC-19	Obtain and implement updated flood gauge information into flood inundation mapping to better notify and predict flood hazard areas before flooding occurs. Improving flood forecasting technology to identify new areas for flood mitigation projects.	+	+	+	+	N	+	N	N	N	N	5 (+) 5 (N) 0 (-)
LC-20	Improve access control and physical security at county owned and rented properties	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LC-21	Build and foster relationships with community leaders within Lancaster County.	N	N	+	+	+	N	+	+	+	+	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
LC-22	Research options for modern transportation for emergency workers/plain community farmers to limit exposure time.	+	N	+	N	N	N	+	+	N	N	4 (+) 6 (N) 0 (-)
LC-23	Encourage shelter planning at the local levels and continued training and communication with local Red Cross chapter and PA Department of Human Services.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LC-24	Expand the use of translation services in the County to improve and build relationships with diverse community groups.	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
LC-25	Better facilitate cultural integration into planning and exercises.	+	+	+	+	+	N	+	+	+	+	9 (+) 1 (N) 0 (-)
LC-26	Work with the county CISO and Public Safety Technology staff to develop redundancies for 9-1-1 communications infrastructure and emergency management operation capabilities.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LC-27	Build and foster relationships between the County Commissioners office, the County Communications Director and local news media. Increase awareness and training to manage mis information in all forms that have the potential to result in civil unrest.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LC-28	Update urban and village growth area boundaries for Future Land Use and Transportation Map which will improve land use patterns and help to better manage stormwater runoff.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
LC-29	Draft regional comprehensive plans which may lead to improved growth management and opens space, natural land, and agricultural land preservation	N	+	+	N	+	+	+	+	N	+	7 (+) 3 (N) 0 (-)
LC-30	Update the Countywide Act 167 Stormwater Management Plan to encourage regional approaches to stormwater management and flood mitigation and encourage creative and innovative approaches, including regional stormwater facilities, floodplain restoration and wetland creation, critical aquifer recharge areas, and increased tree canopy.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
LC-31	As part of Phase 2 of the Act 167 Plan, have the County and municipalities adopt a new model stormwater ordinance for consistency throughout entire watersheds, and across boundaries.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LC-32	Whenever a capital improvement, transportation, or land development project is undertaken, look for ways to stack benefits, e.g. when replacing or repairing bridges/culverts look for opportunities for streambank restoration, improved channel design and floodplain management. When doing road projects, look for ways to incorporate green infrastructure.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
LC-33	Engage in coordinated removal of legacy sediments before dam is removed and utilize floodplain restoration to stabilize and restore the stream/creek and ecosystem.	N	+	+	N	N	+	+	N	N	+	5 (+) 5 (N) 0 (-)
LC-34	Enhance public outreach and education capabilities by providing updated preparedness, prevention, and mitigation materials at publicly available locations. Provide these materials in multiple languages which are prominent in Lancaster County.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LC-35	There is an insufficient amount of data surrounding dam inundation and the resulting flooding within the County. The County will conduct dam inundation modeling in high-risk areas, prioritizing those dams and their downstream areas that are classified as a high or significant hazard.	+	+	+	+	+	+	+	+	N	+	9 (+) 1 (N) 0 (-)
LC-36	Establish working relationships with PA DEP's Dam Safety Program leaders and the public and private dam owners in the county. Include these groups and individuals as stakeholders in the next HMP update.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
LC-37	The County will encourage local jurisdictions, during future reviews and revisions of local codes and ordinances, to integrate hazard mitigation principles and use available tools and resources from FEMA and other sources to integrate climate adaptation planning, to strengthen their regulatory capabilities and set higher standards to reduce hazard risk.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
AkB-1	Protect Wastewater Pump #126 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
AkB-2	Upgrade sewer infrastructure in the Heritage Development to prevent stormwater infiltration.	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
AkB-3	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Borough employees to work remotely if needed.	N	N	+	+	+	N	N	N	+	+	5 (+) 5 (N) 0 (-)
AkB-4	Many roads in the Borough experience flooding. Redesign areas prone to flooding or seek other feasible flood mitigation measures.	+	+	+	+	N	+	+	N	N	+	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
AkB-5	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	+	+	+	+	N	N	N	+	N	N	5 (+) 5 (N) 0 (-)
BaT-1	Protect Jackson's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BaT-2	Protect Willow Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BrkT-1	Protect the Northern Lancaster County Authority facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BrkT-2	Protect Well #7 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BrkT-3	Protect Good's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BrkT-4	Protect Oberholtzer's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BrkT-5	Protect Red Run Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CaeT-1	Hammertown Road Bridge - Address flood problem at the bridge at 141 Hammertown Road.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
CaeT-2	Turkey Hill Road Culvert - Upgrade the culvert at 2051 Turkey Hill Road with one with a higher capacity.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
CaeT-3	Protect Conestoga Dam to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
CaeT-4	Protect Pool Forge Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CaeT-5	Protect Shearer's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CaeT-6	Protect Weaver's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CaeT-7	Protect Willima Witman House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CaeT-8	The Fire Company, Township Building, and Township Garage do not have back-up generators to maintain continuity of operations during an emergency event. The Public Works Superintendent will work alongside the jurisdictional engineer to identify the necessary capacity for each emergency generator. Once identified, Public Works will have the emergency generators installed at each facility. Public Works will be responsible for maintaining the emergency generator.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
CaeT-9	Boot Jack Road Culvert - Upgrade the culvert on Boot Jack Road with one with a higher capacity.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
CaeT-10	Invest in cyber insurance for the Township.	N	+	+	+	+	N	N	+	N	+	6 (+) 4 (N) 0 (-)
CaeT-11	Research, and potentially invest, in Savvy Citizen, a mass notification and alert system.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
CaeT-12	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
CaeT-13	Evaluate the need for snow fences along Township and State roads to prevent blowing and drifting snow from impacting travelers.	+	+	+	N	N	N	+	+	N	N	5 (+) 5 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
ClyT-1	Protect Clay Roller Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ClyT-2	Protect Snyder Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ClyT-3	Protect Lincoln Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ClyT-4	Protect Middle Creek Dam to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ClyT-5	Protect Hiram Erb House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ClyT-6	The Municipal Engineer will work with the Pennsylvania Game Commission to complete an engineering study of Middle Creek Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Game Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	+	+	+	+	+	N	N	+	N	N	6 (+) 4 (N) 0 (-)
ColT-1	Protect White Rock Forge Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ColT-2	There are several culverts in the Township which are undersized or deteriorating. The Township will apply for various grants to address these culverts.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
ColT-3	Reinforce or replace the Wesley Road Bridge.	N	+	+	+	N	N	+	N	N	N	4 (+) 6 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ColT-4	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ColB-1	Install a backup generator that can power the entire Municipal Building.	N	+	+	+	+	N	+	N	N	+	6 (+) 4 (N) 0 (-)
ColB-2	Protect Robert Barber House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ColB-3	Protect Old Columbia-Wrightsville Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ColB-4	During future updates of Borough ordinances, regulations, plans, codes, and other planning and regulatory capabilities, the Borough will integrate hazard mitigation principles.	N	N	+	+	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
ColB-5	Install a backup generator that can power each school district assembly area.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
ColB-6	Seek funding opportunities to train staff and community leaders on how to apply for grants, general emergency resources, and where equipment can be purchased from.	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
ColB-7	Several areas throughout the Borough have a lack of proper drainage during heavy rain. Investigate feasible, cost-effective flood mitigation options, including stormwater runoff systems.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
ColB-8	Pursue funding to support the elevation or acquisition of private residences which have flooded repetitively.	+	+	+	N	N	+	N	N	N	N	4 (+) 6 (N) 0 (-)
ColB-9	Perform a geological study of the bedrock within the Borough to assess and identify areas which are susceptible to sinkholes.	+	+	+	+	N	+	N	N	N	N	5 (+) 5 (N) 0 (-)
ColB-10	Identify and advertise warming and cooling shelters.	+	N	+	+	+	N	+	N	N	N	6 (+) 4 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
ColB-11	Initiate a campaign to encourage Borough residents to sign up for public safety alerts.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ColB-12	Purchase needed emergency equipment.	+	+	+	+	N	N	N	+	N	+	6 (+) 4 (N) 0 (-)
ConT-1	Protect the Big and Little Indian Rock to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-2	Protect the Colemanville Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-3	Protect the Conestoga Canal Lock to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-4	Protect the Safe Harbor Iron Works Site to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-5	Protect the Rock Hill Tavern to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-6	Protect the Daniel and Elizabeth Good Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-7	Protect the Benjamin and Susanna Old Slaymaker Lodge/Yordy to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ConT-8	Assess flood damage on Stone Hill Road, Green Hill Road, and Boy Scout Road and identify feasible, cost-effective measures to improve conditions. Develop a long-term plan for erosions following heavy rain storms along the identified roadways.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
CnyT-1	Protect the Brenneman Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
DenB-1	Denver Beer Distributor Relocation - The Denver Beer Distributor is located at 4 Main Street, Denver, PA, in adjacent to the Cocalico Creek. During heavy rain and storm events, the business has faced repetitive loss due to flooding and is looking to relocate outside of this flood-prone area and to another location on Main Street in Denver Borough.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DenB-2	Protect Filtration #3 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-3	Protect the Eberly Dam to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-4	Protect the Henry Schein Facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-5	Protect the Kalas Manufacturing Facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-6	Protect Ryder Transportation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-7	Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
DenB-8	Identify capacity and needs for emergency generators at the Municipal Building, Public Works, and Well #4. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
DenB-9	Install a lining or excavate and replace metal stormwater pipes in the Snyder Acres Development and where applicable elsewhere in the Borough. These deteriorating pipes have caused roadway damages, sinkholes, and property issues in the Borough.	N	+	+	+	N	+	+	N	N	N	5 (+) 5 (N) 0 (-)
DenB-10	Perform streambank restoration activities and riparian buffer improvements in Denver Memorial Park.	N	+	+	+	N	+	+	N	N	+	6 (+) 4 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
DenB-11	Work with PennDOT to replace the existing Weaver Road Bridge.	N	+	+	+	N	N	+	+	N	N	5 (+) 5 (N) 0 (-)
DenB-12	Develop partnerships with County, State, and Non-profit partners to ensure resources and connections are made to quickly mobilize in the event of a large-scale event or incident.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-13	Educate residential and commercial property owners updated concerning hazards and potential resources to meet any challenges. A focus area will be the property owners along Denver Memorial Park, Little Cocalico Creek, and Cocalico Creek.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DenB-14	Address feasibility of water system connection with neighboring public water systems to reduce burdens in the event of a drought or utility outage.	N	+	+	+		N	+		N	+	5 (+) 5 (N) 0 (-)
DenB-15	Investigate proactive actions to address infiltration and inflow areas in the sewer system to mitigate potential issues.	N	+	+	N	N	+	N	N	N	+	4 (+) 6 (N) 0 (-)
DruT-1	Protect the Muddy Run Power Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DruT-2	Protect the Muddy Run Dam to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
DruT-3	Protect the Drumore Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EarIT-1	Relocate businesses along US-322 west of Martindale Road.	N	+	+	+	N	N	+	+	N	N	5 (+) 5 (N) 0 (-)
EarIT-2	Protect the Conestoga Bridge No. 5 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EarIT-3	Protect the Conestoga Creek Bridge No. 6 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
EarlT-4	Protect the White Oak Ice Co. to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EarlT-5	Protect the Adam Schreiner House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EarlT-6	The Township will update or create a dam failure response plan as part of the emergency management plans. This plan will outline clear evacuation procedures and flood zone mapping. To enhance response capabilities, training for staff on dam breach protocols and public education on emergency evacuation routes will be implemented.	+	+	+	+	N	+	+	+	N	N	7 (+) 3 (N) 0 (-)
EarlT-7	The Township will develop a drought emergency response plan that includes water rationing protocols and prioritizing water distribution to critical infrastructure. Staff training will focus on water conservation practices and emergency water distribution techniques.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
EarlT-8	The Township will integrate earthquake preparedness into the emergency management plan and provide training for staff to handle post-earthquake situations, such as search and rescue operations and medical triage. The community will be educated on how to prepare their homes and businesses for earthquakes.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EarlT-9	The township office manager and roadmaster will coordinate with the township engineer to assess the power needs of each building to determine the appropriate generator size. The generator will be installed at the Township and Road Maintenance buildings. The Road Maintenance Department will be responsible for the ongoing maintenance and testing of the generators, ensuring they are fully operational when needed.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
EarlT-10	The Township will work with an engineer to address both the flooding along Mill Road and the overall stormwater management issues. As part of this solution, the culvert along Mill Road will be replaced with a larger and more efficient box culvert to accommodate increased water flow and prevent future blockages or overflow. This will stabilize the streambank adjacent to Mill Road to prevent further erosion caused by high water levels during storms. Improvements to drainage in the adjacent agricultural pasture will also be made to reduce runoff into the road. To address the larger issue, stormwater conveyance will be enhanced from existing outfalls beneath Mill Road to the stream, improving the overall drainage capacity of the area and reducing the risk of flooding. Future improvements will include the road being repaved and its stormwater infrastructure will be	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
	upgraded to ensure it can handle future stormwater runoff more effectively, mitigating flooding in the long term.											
EarlT-11	The Township will develop a Repetitive Loss Mitigation Plan. The plan will include an analysis of each affected property, considering factors such as flood history, the cost of repairs, potential elevation or buyout options, and the long-term impacts of mitigation. Based on this analysis, the Township will identify high-priority properties for elevation or buyout through FEMA’s Hazard Mitigation Assistance (HMA) programs. For properties that are suitable for elevation, the Township will work with property owners and engineers to develop elevation plans to raise structures above flood levels. For properties that are prone to frequent flooding and cannot be effectively elevated, the Township will pursue buyouts, enabling property owners to relocate to safer areas, with the added benefit of reducing the risk of future flood claims.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EarlT-12	The Township will evaluate options for elevating or floodproofing critical buildings to prevent damage during floods. Infrastructure such as water treatment plants, and sewer systems will be hardened with flood barriers and fire-resistant materials, especially in areas prone to wildfires and flooding. Additionally, key transportation routes will be upgraded with improved drainage systems to ensure accessibility during emergencies. Backup power systems, such as generators, will be installed to maintain service during utility interruptions. Collaboration with utility companies will also focus on improving gas pipeline safety to prevent damage during extreme weather or seismic events. These measures will enhance the resilience of the Township’s infrastructure, ensuring that essential services continue before, during, and after hazard events.	N	+	+	+	N	N	+	+	N	N	5 (+) 5 (N) 0 (-)
EarlT-13	To better protect socially vulnerable populations, including the Amish community, the Township will implement tailored mitigation actions. These include developing outreach programs to communicate hazard preparedness through trusted community leaders, focusing on pandemic prevention, substance use disorder support, and invasive species management. Mobile vaccination clinics and health outreach teams will provide essential services to those with limited access to healthcare, particularly during pandemics. The Township will collaborate with local addiction treatment centers to offer mobile support for substance use disorder, and work with agricultural groups to manage invasive species. Additionally, a community-based transportation network will ensure that vulnerable populations can access medical care and emergency services during disasters. These actions will improve resilience and ensure that socially vulnerable groups are better protected from future hazards like pandemics, substance use, and invasive species, while also fostering greater community support and inclusion in disaster preparedness and recovery planning.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
EarlT-14	The Township will develop outreach projects that target both the Amish community and the general public. For the Amish population, outreach will be conducted through community meetings, printed	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
	materials, and collaboration with local community leaders to ensure culturally relevant information is shared. These efforts will help increase awareness of local hazards, emergency procedures, and available resources in a way that aligns with their communication preferences.											0 (-)
EarlT-15	The nuclear incident response plan will be updated to include evacuation routes, shelter-in-place procedures, radiation exposure protocols, and the acquisition of radiation detection equipment and protective gear. Staff will be trained on radiation response and conduct public education on nuclear safety. For gas and liquid pipelines, the Township collaborate with operators to enhance safety inspections, leak detection, and evacuation procedures, alongside providing staff training. Finally, the wildfire response plan will focus on creating firebreaks, improving evacuation routes, while training staff in wildfire suppression and emergency response. These actions will significantly improve the community's preparedness and ability to respond effectively to these hazards.	+	+	+	+	N	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ECT-1	Protect the District Justice Office 1 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ECT-2	Protect the Reamstown EMS facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ECT-3	Protect Well #8 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ECT-4	Replace the Dogwood Drive bridge over Fry's Run with one with a larger opening.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ECT-5	Replace the Miller Road bridge over the Little Cocalico Creek with one with a larger opening.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ECT-6	Replace the Reinholds Road bridge over Fry's Run with one with a larger opening.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ECT-7	Replace the Smokestown Road bridge over Fry's Run with one with a larger opening.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ECT-8	Replace the Stony Run culvert under Hill Road with one with a larger opening.	N	+	+	+	+	N	+	+	N	N	6 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												4 (N) 0 (-)
ECT-9	Replace the White Oak Road bridge over Fry's Run with one with a larger opening.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ECT-10	Protect the Bucher's Mill Covered Bridge facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ECT-11	Protect the Leshner Knitting Mill facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ECT-12	Invest in cyber insurance for the Township.	N	+	+	+	+	N	N	+	N	+	6 (+) 4 (N) 0 (-)
ECT-13	Identify capacity and needs for emergency generators at the Public Works facility. Apply for grants and appropriate funding where possible. After purchase, install, and maintain the generator. Identify additional critical facilities in the Township in need of back-up power to maintain operations.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
ECT-14	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ECT-15	Identify and address undersized or deteriorating culverts throughout the Township.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
ECT-16	The Township will pursue funding support to have a forester assess trees, complete deed searches to verify Township right of way in targeted areas, and then have the tree removal completed by qualified personnel. Implement, review, and enforce municipal policies and programs to prevent trees from threatening lives and impacting power availability/interruption in conjunction with property owners and utility companies.	N	+	+	N	N	+	+	N	N	+	5 (+) 5 (N) 0 (-)
ECT-17	Plant native vegetation and plants to combat invasive species and potential hinder wildfire fuel.	N	N	+	N	N	+	+	+	N	+	5 (+) 5 (N) 0 (-)



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ECT-18	Encourage property owners living in older housing units to install a radon detector.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ECT-19	Review and revise, where applicable, existing codes, policies and regulations pertaining to land development to restrict development in hazard areas including, but not limited to, geology connected to sinkholes, flood-prone locations, wildfire interfaces, and steep slopes.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
EDT-1	Protect the Share's Mill Complex to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EDT-2	Protect AT&T Cable Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EDT-3	Protect Well #33 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EDT-4	Protect Well #79 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EDT-5	Protect Donegal Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EDT-6	Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
EDT-7	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
EET-1	Shirks Run Diversion - Work with landowners to reduce the possibility of flooding damage in an area east of Shirks Run at the Route 322 and Route 23 intersection.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EET-2	Work with PENNDOT to realign and install a traffic light at the intersection of US-322 and PA-897.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
EET-3	Work with PENNDOT to realign the intersection of Routes 23 and 897.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
EET-4	Protect Conestoga Bridge No. 4 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-5	Protect the Elliot Tract House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-6	Protect the Frogtown/Goodville Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-7	Protect the Roller Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-8	Protect the Christian Weaver House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-9	Protect the Francis Weaver House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-10	Protect the Henry Martin House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-11	Protect the Oberholtzer Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EET-12	The Municipal Engineer will work with Jacob and Evelyn King to complete an engineering study of New Holland Reservoir. The Township will also request information and input from its Road	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
	department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Jacob and Evelyn King will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.											0 (-)
EHT-1	Culvert Replacement - Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run. Replace old and undersized culverts along the Swarr Run located at Church Street, Snapper Dam Road, and Nolt Road. The three roads are subject to frequent flooding.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EHT-2	Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
EHT-3	Replace old and undersized culverts along the Swarr Run located at Church St.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EHT-4	Replace old and undersized culverts along the Swarr Run located at Nolt Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EHT-5	Replace old and undersized culverts along the Swarr Run located at Snapper Dam Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EHT-6	Protect Brubaker Run Detention to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EHT-7	Protect Chickies Roller Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EHT-8	Protect Landis Mill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EHT-9	Protect Benjamin Musser House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EHT-10	Protect Shenk House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-1	Backup generator – Purchase 10 more generators for use along Route 30 and Route 340 to make them functional emergency routes.	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ELT-2	Backup generator – Install backup generators in two fire stations that are not yet equipped with backup power.	+	+	+	+	+	N	+	N	N	+	7 (+) 3 (N) 0 (-)
ELT-3	Identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents along Millcross Road.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ELT-4	Improve the design of the intersections at Oakview, Rte. 462, and Millstream along Rte. 30.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-5	Install stormwater management infrastructure at Gibson’s Park at Nolt Mill.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ELT-6	Investigate retrofitting or other flood hazard mitigation measure for Oaks 1 Pump Station.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-7	Investigate retrofitting or other flood hazard mitigation measure for properties along Hale Drive.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ELT-8	Investigate retrofitting or other flood hazard mitigation measure for properties along the south side of Millstream Road between Gridley and Strasburg Pike.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-9	Investigate the removal of dam structures at Flory Park.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ELT-10	Investigate the removal of dam structures at Gibson’s Park at Nolt Mill.	N	+	+	+	+	N	+	+	N	+	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
ELT-11	Protect Lancaster Mennonite High School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-12	Protect Wastewater Pump #97 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-13	Protect Wastewater Pump #98 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-14	Upgrade stormwater management at Flory Park.	N	+	+	+	+	N	+	N	N	+	6 (+) 4 (N) 0 (-)
ELT-15	Upgrade stormwater management at Greenland near Flory Park entrance.	N	+	+	+	+	N	+	N	N	+	6 (+) 4 (N) 0 (-)
ELT-16	Upgrade stormwater management at North Cherry Lane.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ELT-17	Upgrade stormwater management at Susan Avenue.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ELT-18	Upgrade stormwater management at the northeast side properties along Strasburg Pike.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ELT-19	Upgrade the stormwater management system along Greenfield Road at Amtrak.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
ELT-20	Upgrade the stormwater management system at Soudersburg Road at the pump station.	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
ELT-21	Protect Binkley or Graff Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



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												3 (N) 0 (-)
ELT-22	Protect Donnelley Financial Solutions to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-23	Protect Engineered Valves, LLC to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-24	Protect Gibbons Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-25	Protect J. Walter Miller Company to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-26	Protect J.L. Clark, LLC to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-27	Protect Lancaster Terminal to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-28	Protect Shober's Paper Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-29	Protect USPS Postal Service Lancaster to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-30	Protect Willow Hill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ELT-31	Identify, design, and install stormwater management initiatives to reduce potential flood effects, particularly on Millcross Road, North Cherry Lane, Susan Avenue, Strasburg Pike, and Soudersburg Road.	N	+	+	+	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)



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ELT-32	Work with PA DEP and local partners to determine the cost benefit analysis of removal of the dams at Gibbons Park, Nolt Mill, and Flory Park.	N	+	+	+	+	+	+	N	N	N	_ (+) _ (N) _ (-)
ELT-33	Investigate possibilities to reduce stormwater flow into the Oaks 1 Pump Station and potential periodic shut downs of the sewer pump station due to excessive stormwater flow.	N	+	+	+	N	+	+	+	N	N	_ (+) _ (N) _ (-)
EPB-1	Protect Filtration #5 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EPB-2	Develop minimum training requirements for EOC Staffing.	N	N	+	+	+	N	+	+	+	N	6 (+) 4 (N) 0 (-)
EPB-3	Develop plans to host an exercise to address training deficits.	N	N	+	+	+	N	+	+	+	N	6 (+) 4 (N) 0 (-)
EPB-4	Create and develop annexes to the Borough’s EOP (i.e. debris management) in conjunction with the Borough Staff, public works.	+	+	+	+	+	N	+	+	+	N	8 (+) 2 (N) 0 (-)
EPB-5	Identify capacity and needs for emergency generators and transfer switches at the DPW Maintenance Shop and City Interconnect. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
EPB-6	Increase pipe capacity at Outfall OFA000101 discharge on Graystone Road.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
EPB-7	Install fencing and perimeter cameras to provide more security at the Borough’s Water facility.	N	+	+	+	+	N	N	+	+	N	6 (+) 4 (N) 0 (-)
EPB-8	In tandem with County officials, explore options for an alternate means for communication in an emergency. Social media is the primary use of communication.	+	+	+	+	+	N	+	+	N	+	8 (+) 2 (N) 0 (-)
EPB-9	Connect with facilities that host children during the day and work to develop plans and build resources for the families in case of any hazard.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N)



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												0 (-)
EPB-10	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
EdT-1	Protect Pennsylvania Railroad Tunnel to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EdT-2	Move the existing EOC (489 Stony Hill Road) to the new state-of-the-art municipal building. The new building will feature an Emergency Operations Center (EOC), a backup generator, and incorporate comprehensive upgrades, including ADA-compliant accessibility, advanced electrical and HVAC systems, and cutting-edge technology infrastructure. Additionally, the project will integrate sustainable stormwater management solutions, such as a green parking lot and vegetated bioswales, to reduce runoff and support environmental sustainability.	N	+	+	+	+	N	+	+	+	+	8 (+) 2 (N) 0 (-)
EdT-3	In partnership with local fire chiefs, establish a comprehensive burn ordinance aimed at preventing and controlling air and water pollution. The ordinance will also grant the Township the authority to implement temporary burn bans during red flag warnings and other high-risk wildfire conditions.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
EdT-4	Coordinate with PennDOT to replace an old, inadequate drainpipe that runs underneath May Post Office Road at the intersection of Eden Road. The existing pipe contributes to water backups and flooding.	N	+	+	+	N	+	+	+	N	N	6 (+) 4 (N) 0 (-)
EdT-5	Pave/Reprofile Eden Road from Groff Road to May Post Office Road (approximately .8 miles). These roads, which face impacts from severe weather, would be utilized should an evacuation be necessary due to an event at the Peach Bottom Power Plant.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EdT-6	Arrange and conduct a complimentary Cybersecurity and Infrastructure Security Agency (CISA) evaluation for Township IT systems to identify vulnerabilities and enhance resilience against cyber threats, safeguarding critical infrastructure and sensitive data.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
EdT-7	Coordinate with Lancaster Clean Water Partners to reduce the amount of nitrogen, phosphorus, and sediment in Eden Township waterways that are a part of the Chesapeake Bay Watershed.	N	N	+	+	+	+	+	+		+	7 (+) 3 (N) 0 (-)
EdT-8	Develop informational outreach initiatives to promote participation in and enhance recruitment for Bart FD and Quarryville FD	N	N	+	+	+			+	+	N	5 (+) 5 (N) 0 (-)



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EdT-9	Purchase and install a radar-equipped speed sign in targeted areas to mitigate the risk of speeding and enhance road safety	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
EdT-10	Develop informational outreach initiatives on hazard risks and hazard mitigation for residents. A significant portion of the township population (48%) is Amish, who may have limited access to traditional hazard risk information, leaving them vulnerable to disasters. Informational outreach initiatives are needed to raise awareness about hazard risks and mitigation strategies to better protect all residents, especially those in underserved communities.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ElizT-1	Work with utility companies to clear vegetation around power and communications lines.	N	+	+	+	+	N	N	N	N	+	5 (+) 5 (N) 0 (-)
ElizT-2	Protect Grube, Martin and Eliza Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ElizT-3	Protect Hammer Creek Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ElizT-4	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	+	N	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
ElizT-5	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ElizT-6	The Municipal Engineer will work with the Pennsylvania Fish and Boat Commission to complete an engineering study of Speedwell Forge Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Fish and Boat Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	+	+	+	+	+	N	N	+	N	N	6 (+) 4 (N) 0 (-)
ElizB-1	Protect Reservoir #6 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ElizB-2	The Municipal Engineer will work with the Elizabethtown College to complete an engineering study of Lake Placida Dam. The Borough will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Borough and the Elizabethtown College will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	+	+	+	+	+	N	N	+	N	N	6 (+) 4 (N) 0 (-)
EphB-1	Protect Electric Substation #31 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-2	Protect Ephrata Boro WWTP #1 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-3	Protect Ephrata EMS to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-4	Protect the Ephrata Borough Sewer Authority WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-5	Protect Wastewater Pump #176 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-6	Protect Wastewater Pump #177 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-7	Protect Wastewater Pump #77 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-8	Protect Well #4 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-9	Protect Keller's Mill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
EphB-10	Protect Reservoir #11 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-11	Protect Terre Hill Composites, Inc. to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-12	Protect Wastewater Pump #120 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-13	Protect Daniel Bauman House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-14	Protect Ephrata EMS to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-15	Protect Well #44 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-16	Protect Family Medicine of Ephrata to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-17	Protect Wellspan Family Medicine to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphB-18	Protect Dunkelberger Osteopath, LTD to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-1	Improve drainage system at the intersection of Frysville Road and Newswanger Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
EphT-2	Protect the Ludwig Bloom House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
EphT-3	Protect Bushongsor Shreiner's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-4	Protect Cocalico Creek Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-5	Protect Jacob Keller Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-6	Protect Samuel Keller House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-7	Protect Keller's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-8	Protect Peter and Catherine Reyer Farmhouse to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-9	Protect Hinkle Tavern, Winters Hotel to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
EphT-10	Protect Landis House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Ful-1	Protect Peach Bottom Marina to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-1	Protect Potable Pump #79 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-2	Protect Potable Pump #98 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
LancC-3	Protect Tank #7 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-4	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-5	Protect Engle Printing and Publishing to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-6	Protect High Steel Service Center to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-7	Protect Kurtz's Mill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-8	Protect Pennsylvania Railroad Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-9	Protect Lancaster City Conestoga Filter Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-10	Protect Lancaster City Water to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-11	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-12	Establish a floodplain management team to assist the FPA in NFIP administration, ordinance updates, staff training, and other needs.	N	+	+	+	+	N	N	+	+	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LancC-13	Conduct a facilities condition assessment to ensure green infrastructure practices are functioning as designed. Specific attention to elevated risk of sinkhole formation.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
LancC-14	Identify capacity and needs an emergency generator at the Lancaster Advanced Wastewater Treatment Plant (AWWTP). Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LancC-15	Although there has been no known issues reported since maintenance work completed in 2024, evaluate the Plum Street Railroad Underpass (CSS conveyance issue/ Manheim Township MS4 runoff to City's CSS) through the use of engineering investigations and infrastructure updates.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-16	There are pipe restrictions at Fairview Avenue/New Danville Pike/Prince Street (CSO Outfall 002). Conduct additional investigations, engineering, infrastructure upgrades. Potential partnerships with Lancaster Township. Water Street Sewer Separation Phases 2-3 need final designs and construction funds, will help alleviate restrictions.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-17	There is a bottleneck at the CSS at North Broad/Lehigh Avenue. The City's Broad St Disconnection project is in preliminary design now to provide stormwater storage capacity through an existing stormwater storage bed that can receive over 9 acres of existing impervious and partially bypass CSS. Seek additional funding if needed.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-18	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Steel Way/Manheim Pike (MS4 conveyance bottleneck and outfall restriction).	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-19	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Hershey Avenue/Wabank Road (MS4 conveyance restriction at outfall).	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-20	At the Lancaster Advanced Wastewater Treatment Plant (AWWTP) there is a conveyance bottleneck due to headwall at unnamed tributary to the Conestoga River and the capacity of the 78" diameter wastewater plant outfall (discharge) pipe. Investigate sources of funding to resolve problem.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-21	Develop a repetitive loss mitigation plan to fully analyze the long-term impacts of mitigation, especially in the areas along Conestoga River in Conestoga Heights and Engleside neighborhoods.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-22	Add new Susquehanna Water Raw Water and Finished Water Transmission Mains to harden infrastructure and decrease the risk to utility interruptions.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LancC-23	Add new Water Transmission Main from the Susquehanna River to the Conestoga Water Treatment Plant to harden infrastructure and decrease the risk to utility interruptions.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-24	Identify community-based points of distribution with trusted partners, utilizing the CDC’s Social Vulnerability Index, census data, and other planning tools to ensure accessible and equitable service delivery locations.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
LancC-25	Increase planning efforts to ensure medically appropriate accommodations for people with substance use disorder to have access to medically assisted treatment and medications mitigate health risks and aid people experiencing withdrawal. Coordinate cooperation agreements with LEMSA and LGH Street Medicine.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
LancC-26	Provide radon testing and mitigation through Healthy Homes Program to low- to moderate-income households most at risk. All City-funded housing rehabilitation projects will be tested for radon levels as part of the environmental review.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
LancC-27	Improve interagency communications to readily share up-to-date information with public safety/first responders. Ensure access and protocols for laboratory testing of illicit drug samples.	+	N	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LancC-28	Continue implementing public emergency alert system. Develop interdepartmental workgroup to facilitate informed communications about hazardous substances, level of exposure, risks, and what residents should do to remain safe. Develop other protocols as needed to assess individuals that have been exposed.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LancC-29	Develop a communications plan to inform residents about air quality impacts. Facilitate the provision of respiratory filters/masks to vulnerable populations during activities that increase exposure (i.e. travel to appointments/services, etc.)	+	N	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-30	Partner with Penn State Extension and other agencies to determine appropriate interventions that promote environmental health. Develop communication plans to disseminate guidance to the public.	+	N	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
LancC-31	Establish a Long-Term Control Plan to address Combined Sewer Overflows (CSOs) in the wastewater conveyance system. These systems may need to have sewer separated expanded treatment, or increased storage capacity.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
LancT-1	Protect the Lancaster City Advanced WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LancT-2	Protect Wastewater Pump #136 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-3	Protect Wastewater Pump #148 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-4	Protect Wastewater Pump #168 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-5	Protect Wastewater Pump #169 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-6	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-7	Protect Jacob Miller House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-8	Protect Witmer's Tavern to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LancT-9	Protect Conrad Miller House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LeaT-1	Protect Wastewater Pump #27 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LeaT-2	Protect Leaman's Place Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LeaT-3	Protect Mill Creek Flour Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
LeaT-4	Protect North American Pipe Corporation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LeaT-5	Protect Spread Eagle Tavern to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LeaT-6	Develop and implement a proactive multi-dimensional training program including representatives from the Township, DPW, Fire Department, Police Department, and EMS	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
LeaT-7	Identify capacity and needs for emergency generators and transfer switches at the pump stations throughout the Township. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LeaT-8	Develop, apply, and maintain a Smart911 Notification System	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LitB-1	Protect the Warwick EMS facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-2	Protect Wastewater Pump #72 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-3	Protect Well #74 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-4	Protect Well #75 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-5	Protect Versatek to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-6	Protect Woodstream Corporation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



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												3 (N) 0 (-)
LitB-7	Protect LG Health Cedar to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-8	Protect Lititz Academy of Music to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitB-9	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LitB-10	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	+	N	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
LitB-11	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LitT-1	Protect Abbotts Creamery to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitT-2	Protect Pine Grove Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LitT-3	Protect Octoraro Treatment Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-1	Protect Electric Substation #42 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-2	Protect Potable Pump #101 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ManhB-3	Protect the Manheim FD station to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-4	Protect Wastewater Pump #200 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-5	Protect Well #57 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-6	Protect Well #58 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-7	Protect Shearer's Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-8	Protect F L Smidth, Inc. to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-9	Protect Manheim Borough 2W Polling Station to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-10	Develop a Repetitive Loss Mitigation Plan to address the broader impacts of mitigation efforts and ensure sustainable long-term solutions.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
ManhB-11	Mitigate flood risks on Mill Street and surrounding neighborhoods through a comprehensive strategy incorporating property acquisition, elevation projects, and infrastructure upgrades.	+	+	+	+	N	+	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhB-12	Critical facilities and infrastructure including Potable Pump #101, the Manheim Fire Department Station, and key roadways, are vulnerable to flooding. To enhance community resilience, implement targeted mitigation measures, including elevating critical facilities and roadways, floodproofing essential infrastructure, and upgrading stormwater management systems.	N	+	+	+	+	N	N	+	N	+	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ManhB-13	Implement accessible educational programs, inclusive communication channels, and neighborhood support networks to address the unique needs of socially vulnerable populations during hazard events. Provide tailored resources such as emergency kits, transportation, and shelters, and involve representatives from these groups in mitigation planning to ensure their needs are prioritized. This approach fosters equity and resilience while reducing the impacts of disasters on underserved populations.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ManhB-14	Develop and implement a comprehensive Public Education and Outreach Program to address awareness gaps, promote hazard preparedness, and improve community engagement. This program will include workshops, information dissemination via multiple platforms, and outreach campaigns tailored to local hazard risks. These efforts will empower residents to take proactive steps to protect themselves and their properties during hazard events.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
ManhB-15	Develop a Substantial Damage Management Plan, following the six-step process outlined in the 2021 "Developing a Substantial Damage Management Plan" guide. This plan will establish clear responsibilities for determining substantial damage, assessing market value, and managing permit approvals after disaster events. By implementing this plan, Manheim will enhance its capacity to enforce NFIP regulations, improve disaster recovery processes, and ensure compliance with local floodplain requirements, ultimately strengthening community resilience against flooding.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ManhT-1	Protect District Justice Office 13 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-2	Protect Wastewater Pump #143 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-3	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-4	Protect Wastewater Pump #167 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-5	West Roseville Road Bridge Demolition - Demolish and remove the West Roseville Road Bridge spanning the Little Conestoga Creek. Removal of an unsafe structure and obstruction in the floodway.	N	+	+	+	+	N	+	N	N	+	6 (+) 4 (N) 0 (-)
ManhT-6	Work with PENNDOT to redesign the interchange at US-30 and US-222.	+	+	+	+	+	N	+	+	N	+	8 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												2 (N) 0 (-)
ManhT-7	Protect Brubaker House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-8	Protect Buckbee Hearing Aid Center to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-9	Protect Hunsecker's Mill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-10	Protect Iron Stone Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-11	Protect Flory's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-12	Protect Landis Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-13	Protect Mount Joy Hatchery to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-14	Protect Philip Rudisil House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-15	Protect John Brubaker Barn to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-16	Protect M. Groff House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ManhT-17	Protect Christian L. Hunsecker House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-18	Protect Samuel Hunsicker House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-19	Protect Oregon (Withers) Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-20	Protect Rudisill Family Cemetery to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-21	Protect Abraham Shenk House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-22	Protect Christian Zook House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-23	The Township will update its comprehensive plan. Ensure that the local comprehensive plan incorporates hazard mitigation techniques through a courtesy review or draft plans by the County Planning Department.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
ManhT-24	Evaluate the culverts in the Township for capacity and deterioration. Address issues or replace the culverts as necessary.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
ManhT-25	The Municipal Engineer will work to complete an engineering study of Manheim Township Detention Basin No 2. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	+	+	+	+	+	N	N	+	N	N	6 (+) 4 (N) 0 (-)
ManT-1	Protect Electric Substation #6 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
ManT-2	Protect Bender's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-3	Protect Blue Rock Ferry Site to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-4	Protect Charlestown Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-5	Protect Martin Chartier Commemorative Marker to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-6	Protect Frantz Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-7	Protect Christian and Susanna Herr Barn and House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-8	Protect Abraham Landis House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-9	Protect Maple Grove Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-10	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-11	Protect Stoneroad's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-12	Protect Washington Boro Methodist Episcopal Church to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
ManT-13	Protect Jacob Witmer Sr. Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-14	Protect Amtrak/Conestoga Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-15	Protect J.S. Bear Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-16	Protect PPL Conestoga Kv Substation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-17	Protect Windom Mill Complex to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-18	Staff within Manor Township could benefit from additional emergency management meetings and training to ensure emergency management concepts are practiced and understood.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ManT-19	Flooding occurs in the Township along the Susquehanna River. Improved flood water management system must be installed to reduce risk and impacts.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
ManT-20	Flooding occurs in the Township along the Conestoga River. Improved flood control system must be installed to reduce risk and impacts.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MarB-1	Protect the Marietta Borough Building to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-2	Protect the Marietta Donegal Sewage Treatment Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-3	Protect the Marietta Fire Department station to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
MarB-4	Protect the Marietta-East Donegal Joint Authority WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-5	Protect the Susquehanna Valley EMS facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-6	Protect Wastewater Pump #53 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-7	Protect Joseph Bucher House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-8	Protect Donegal Furnace Ruins to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-9	Protect, B.F. Heistand and Co. Saw Mill Site to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-10	Protect Marietta Furnace No. 1 Ruins to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-11	Protect Vesta Furnace Site Complex to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarB-12	Protect Penn State Life Lion EMS to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-1	Protect Baumgardener's Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
MarT-2	Protect Colemanville Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-3	Protect Duncan Island to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-4	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-5	Protect Henry Hess House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-6	Protect Holtwood Power Plant to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-7	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	N	N	+	+	+	N	N	+	+	+	6 (+) 4 (N) 0 (-)
MarT-8	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
MarT-9	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
MarT-10	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MarT-11	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
MarT-12	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas: 1. Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property. 2. Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate. 3. Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. 4. Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.	+	+	+	+	+	+	+	+	N	+	9 (+) 1 (N) 0 (-)
MarT-13	The Township will conduct research into other avenues for water supplies and will consider the following strategies: 1. Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement. 2. Promoting the protection of watersheds and ensuring sustainable groundwater extraction. 3. Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices ad become more sustainable. 4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts. 5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MarT-14	The Township will engage with the Lancaster Conservancy to hold discussions on joint responsibility and assistance with the increase in call volumes, which has resulted in an up-tick of emergency responses on land owned by the Lancaster Conservancy. These discussions will lead to the writing and adoption of a Memorandum of Agreement or Memorandum of Understanding between the two entities which will outline the roles and responsibilities of each.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
MarT-15	The Municipal Engineer will work with the Pennsylvania Power and Light Company to complete an engineering study of Holtwood SES Ash Basin No 2. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of	+	+	+	+	+	N	N	+	N	N	6 (+) 4 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
	safety and length of useful life, the Township and the Pennsylvania Power and Light Company will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.											
MillB-1	Protect Wastewater Pump #179 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MillB-2	Identify capacity and needs for an emergency generator and transfer switch at the Fire Station. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
MillB-3	There is a large number of students and staff in the Borough at both Penn Manor High School and Millersville University, which are both critical facilities. The Borough will work with the School District and University to evaluate and develop evacuation and communication plans.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
MillB-4	There is a large number of students in the Borough at both Penn Manor High School and Millersville University. It is likely these students experience mental health issues. The Borough will work with the School District and University to create plans with internal and external agencies to identify solutions on how to assist impacted students.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
MJB-1	Conduct a detailed flood study of the Little Chiques Creek.	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
MJB-2	Modifications to the Borough Stormwater Detention Basin - increasing the volume of the basin by increasing the height of the berms and/or increasing the footprint of the basin and replacing a 45' long drainage swale with a pipe to prohibit stormwater from flowing over the swale berm.	N	+	+	N	+	N	N	+	+	N	5 (+) 5 (N) 0 (-)
MJB-3	The Borough Public Works has identified old and aging stormwater management systems that have issues and is prepared to make upgrades or cleanouts if funding is available. This would include replacing terracotta storm water pipes to prevent ruptures and cleaning out existing pipes.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
MJB-4	Construct a Flood Wall around the Waste Water Treatment Plant to prevent flood waters from Little Chiques Creek from encroaching on the plant and causing a shutdown.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
MJB-5	Install lining of sewer mains and maintenance holes to prevent inflow and infiltration of stormwater system wide	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-6	Design and construct a flood wall around the Waste Water Treatment Plant to prevent shutdown from flood waters of the Little Chiques Creek.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
MJB-7	Replace aging terracotta sewer mains throughout the system to prevent ruptures during flooding events.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-8	Reconstruct drinking water wells by installing casing to a lower depth to prevent stormwater infiltration.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-9	Construct or enhance Flood Doors/Barriers on well houses and sewage pump stations to keep out flood water so the facility remains functional during flooding events.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-10	Replace/Rehabilitate water filters to handle infiltrated storm water.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-11	Streambank Restoration Project for the Little Chiques Creek Park. This is a 2.5-million-dollar project. Once completed it will address both flooding in the park and along some of the houses in the general area as well as stop the erosion of the streambanks.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MJB-12	Increase the Stormwater Capacity to the outfall to the Little Chiques and Donegal Creek’s watershed system wide.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-13	Replace aging and failing corrugated metal storm pipe throughout the borough.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MJB-14	Improve and Upgrade the Locust Lane Storm Water Management Basin. Repair existing sink holes in the basing and increase function and capacity of the basin.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MJB-15	Improve and Upgrade the Pink Alley Storm Water Management Basin	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MJB-16	Construct a new Stormwater Management Facility to prevent flooding of the Manheim St area.	+	+	+	+	+	N	+	N	N	N	6 (+) 4 (N) 0 (-)
MJB-17	Improve Stormwater management capacity in problem areas of the system.	+	+	+	+	+	+	+	+	N	N	8 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												2 (N) 0 (-)
MJB-18	Improve and Upgrade the Stormwater Management piping under the Amtrak railroad lines and pipes that drain into the Amtrak railroad cut in the borough.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MJB-19	Repair and prevent erosion from stormwater near the Barbara St Bridge spanning the Amtrak railroad cut.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)
MJB-20	Purchase two mobile generator units to power sewer or water facilities in the event of major power loss to maintain service to the borough.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
MJT-1	Protect Wastewater Pump #84 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MJT-2	Raise Koser Road at the approach to the bridge over Conewago Creek.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
MJT-3	Raise Prospect Road at the approach to the bridge over Conewago Creek.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
MJT-4	Protect Martin Nissley House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MJT-5	Protect Risser's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
MJT-6	Investigate and implement additional security measures on the municipal complex.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
MJT-7	Provide active shooter training to municipal staff.	+	N	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
MJT-8	Reassess snow evacuation routes and prepare better graphics and communication materials to the public and first responders.	+	+	+	+	N	N	+	+	N	N	6 (+) 4 (N) 0 (-)
MJT-9	Consolidate all winter weather resources at the municipal complex via a master planning process and construction. This will improve response time and efficiency in responding to forecasted and emergency winter weather events.	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
MVB-1	Work with EMC and borough manager/mayor to orient the new EMC to current projects and status of emergency items.	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
MVB-2	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ParT-1	Protect the Paradise Township Sewer Authority WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-2	Protect Wastewater Pump #89 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-3	Protect Wastewater Pump #91 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-4	Protect Black Horse Amish Parochial School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-5	Protect the Sign of the Buck to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-6	Protect Eshelman Run Amish School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-7	Protect Jacob Eshleman II House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
ParT-8	Protect Leaman Place Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-9	Protect Osceola Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ParT-10	Protect LeFever Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennT-1	Clear obstructions from the stormwater management system near the intersection of Fruitville Pike/New Charlotte Street and Main Street (PA-72).	N	+	+	+	+	+	+	N	N	+	7 (+) 3 (N) 0 (-)
PennT-2	Protect the Manheim Borough Authority WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennT-3	Protect Wastewater Pump #199 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennT-4	Protect Well #39 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
PennT-5	Update stormwater management regulations to make them more restrictive for new development.	N	N	+	+	N	+	N	+	+	+	6 (+) 4 (N) 0 (-)
PennT-6	Upgrade stormwater management infrastructure along White Oak Road south of Hamaker Road.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
PennT-7	Upgrade stormwater management infrastructure at the intersection of Stiegel Valley Road and White Oak Road.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
PennT-8	Protect Ferrellgas to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
Peq-1	Protect Baumgardner's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Peq-2	Protect Daniel Good House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Peq-3	Protect Abraham and Sarah Hess Barn to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Peq-4	Protect A.B. Mylin House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Peq-5	Protect Pequea Valley Hotel to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
Peq-6	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	N	N	+	+	+	N	N	+	+	+	6 (+) 4 (N) 0 (-)
Peq-7	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
Peq-8	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
Peq-9	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	+	+	+	+	+	+	+	+	N	N	8 (+) 2 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
Peq-10	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	+	N	+	+	+	N	+	+	N	+	7 (+) 3 (N) 0 (-)
Peq-11	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas: 1. Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property. 2. Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate. 3. Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. 4. Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.	+	+	+	+	+	+	+	+	N	+	9 (+) 1 (N) 0 (-)
Peq-12	The Township will conduct research into other avenues for water supplies and will consider the following strategies: 1. Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement. 2. Promoting the protection of watersheds and ensuring sustainable groundwater extraction. 3. Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices and become more sustainable. 4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts. 5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
QVB-1	The Municipal Building, a critical facility, houses the Borough Administrative Offices, Police Department, and Public Works Department. The building has no back-up power in order to support continuity of operations in the event of an emergency. An engineer scoped that the building would require a 102-kW generator, priced at \$55,000.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
QVB-2	The culvert located on Broad Street at the intersection of Second Street is deteriorating due to heavy rains and erosion. The culvert, and guiderail which protects it, must be improved. An engineer estimated the cost of this project would be \$425,000.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
RapT-1	Protect Wastewater Pump #55 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
RapT-2	Regularly clear obstructions from waterways.	N	N	+	+	+	+	N	N	N	+	5 (+) 5 (N) 0 (-)
RapT-3	Protect Kauffman's Distillery Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
RapT-4	Protect Peter and Elisabeth Lindemuth House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
RapT-5	Protect Pfoutz Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
RapT-6	Protect Peter and Mary Risser House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
RapT-7	Protect Schenck's Mill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
RapT-8	Protect Seigris's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SadT-1	Mt. Vernon Road Runoff Retention Basins - Create two retention basins, redirect catch basin pipes, install a storm drain line, and extend approximately 1/3 mile to relieve runoff into the Christiana Borough watershed.	N	+	+	+	+	N	N	+	N	+	6 (+) 4 (N) 0 (-)
SadT-2	Protect Forge Ruins to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
SadT-3	Protect Mercer's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SadT-4	Protect Sadsbury Twp Detention Pond 1 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SadT-5	Protect Woolen Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SadT-6	Create a shoulder to catch water runoff. This runoff will be released into a culvert instead of puddling along Creek and Noble Roads. Work performed by Township Public Works Department.	N	+	+	+	N	N	+	+	N	N	5 (+) 5 (N) 0 (-)
SadT-7	Restore RT 41 Williams Run dam to its normal operating conditions by repairing damage to the pipe and dam embankment during dry conditions. A DEP Permit has been received. The Township will work with the company Land Studies to be sure the project is completed in a timely manner and in compliance with all agencies.	N	+	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
SalT-1	Protect Meadow Springs Amish School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SalT-2	Protect Millwood Kennel to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SalT-3	Protect New Miltown Roller Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
SalT-4	Protect Verdant Valley Amish School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
StrasB-1	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
StrasT-1	Protect Bowman's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
StrasT-2	Protect Herr's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
StrasT-3	Protect Lefever Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
StrasT-4	Protect Lime Valley Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
StrasT-5	Protect Neff's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
StrasT-6	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ULT-1	Protect Bushong Mill and House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ULT-2	Protect Pinetown Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ULT-3	Protect Stauffer's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ULT-4	Protect Worley and Obetz, Inc. to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
ULT-5	Protect Center Square Amish School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
ULT-6	Protect H & E Sheibly House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-1	Protect Wastewater Pump #67 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-2	Protect Well #35 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-3	Replace the Lititz Run culvert under Lititz Run Road with one with a larger opening.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WarT-4	Protect Lititz Grist Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-5	Protect Erb's Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-6	Protect Hess Lower to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-7	Protect Rothsville Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-8	Protect Marathon Gas Station to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WarT-9	Protect Zook's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
WarT-10	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
WarT-11	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	+	N	+	+	+	+	N	+	N	N	6 (+) 4 (N) 0 (-)
WarT-12	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WCT-1	Expand intersection of Sandy Hill Road and Hillside Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WCT-2	Improve drainage at the culvert at Sportsman Road east of Hickory Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WCT-3	Increase length of Hackman Road bridge to provide more water to flow underneath it.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
WCT-4	Increase length of Hickory Road bridge to provide more water to flow underneath it.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
WCT-5	Increase length of Indiantown Road bridge to provide more water to flow underneath it.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
WCT-6	Install backup power generators at two potable water wells.	+	+	+	+	+	N	N	+	N	+	7 (+) 3 (N) 0 (-)
WCT-7	Install stormwater management infrastructure along Blue Lake Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-8	Install stormwater management infrastructure along Girl Scout Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
WCT-9	Install stormwater management infrastructure along Mountain Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-10	Install stormwater management infrastructure along Netzley Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-11	Install stormwater management infrastructure along Sandy Hill Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-12	Install stormwater management infrastructure along Strickler Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-13	Install stormwater management infrastructure along White Hall Road to prevent downhill flooding.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-14	Relocate the Wastewater Treatment Plant to a location outside the floodplain.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-15	Renovate the stormwater management system in Reinholds.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WCT-16	Upgrade and clear obstructions in the drainage system at the Cocalico Creek at Hickory Road.	N	+	+	+	+	+	+	N	N	N	6 (+) 4 (N) 0 (-)
WCT-17	Upgrade the bridge on Sportsman Road over the Cocalico Creek to allow more water to flow underneath it.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
WCT-18	Upgrade the drainage system at the Cocalico Creek at Pineview Drive and elevate the bridge approach.	N	+	+	+	+	N	+	N	N	N	5 (+) 5 (N) 0 (-)
WCT-19	Protect Binkley's Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
WCT-20	Protect Windstream Reinholds Central Office to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WCT-21	The Municipal Engineer will work with Randy Shirk to complete an engineering study of Barnett Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Randy Shirk will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	+	+	+	+	+	N	N	+	N	N	6 (+) 4 (N) 0 (-)
WDT-1	Protect the Elizabethtown Regional Sewer Authority WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WDT-2	Protect Wastewater Pump #197 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WDT-3	The culvert on Miller Road near the Elizabethtown Regional Sewer Authority needs to be evaluated and improved as it may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	N	+	+	N	+	+	N	+	N	N	5 (+) 5 (N) 0 (-)
WET-1	Protect the West Earl Township Sewer Authority WWTP to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-2	Protect the West Earl Township Water Authority facility to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-3	Protect Wastewater Pump #184 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-4	Protect Bitzer's Mill Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



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												0 (-)
WET-5	Protect Cooper Shop at Brownstown Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-6	Protect Eberlys Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-7	Protect Riverview School to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-8	Protect Widow Wenger's House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-9	Protect American LaFrance, LLC to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-10	Protect Jacob Wolf House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-11	Protect Martin-Bitzer House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-12	Protect Marx and Fronic Groff Farmstead to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-13	Protect Samuel Good House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WET-14	Protect Smeal LTC, LLC. to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
WET-15	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Township employees to work remotely if needed.	N	N	+	+	+	N	N	N	+	+	5 (+) 5 (N) 0 (-)
WET-16	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	+	+	+	+	N	N	N	+	N	N	5 (+) 5 (N) 0 (-)
WET-17	Evaluate flood mitigation measures, including property acquisitions and flood walls, at the trailer park to reduce, or remove, the risk of flooding.	+	+	+	+	N	+	+	N	N	+	7 (+) 3 (N) 0 (-)
WHT-1	Protect Chickies Lock to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-2	Protect Forrey's Mill Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-3	Protect S.S. Haldeman Mansion site to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-4	Protect Lancaster Area Sewer Auth - Farmdale Pump Station to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-5	Protect Pedant-Grube Farmhouse (Garber Farm) to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-6	Protect Columbia Water Co Chickies Well to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-7	Protect Henry Clay Furnace Ruins to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WHT-8	Protect Chickies Silica Stone Crusher to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N)



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												0 (-)
WHT-9	Work with EMC and Township manager/mayor to orient the new EMC to current projects and status of emergency items.	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
WHT-10	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WLT-1	Improve drainage along Eckman Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WLT-2	Improve stormwater management along Gypsy Hill Road, including installing a culvert to discharge water away from homes.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WLT-3	Improve stormwater management along Hollinger Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WLT-4	McFalls Property Stormwater Management - reclaim the area as a stream.	N	+	+	+	+	+	+	N	+	+	8 (+) 2 (N) 0 (-)
WLT-5	Protect Potable Pump #100 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-6	Protect Potable Pump #61 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-7	Protect Wastewater Pump #21 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-8	Retention Pond - Construct retention ponds to protect properties along Hollinger Road.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WLT-9	Protect Colonial Metals Company to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												3 (N) 0 (-)
WLT-10	Protect Extrusion Division to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-11	Protect Herr or Graff House and Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-12	Protect George and Susanna Lefevre Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-13	Protect Lime Valley Covered Bridge to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-14	Protect Mill Creek Bridge #8 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-15	Protect Eckman Mill to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-16	Protect Reservoir #17 to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-17	Protect Henry K. Stoner House to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
WLT-18	Protect Mill Creek Pump Station to the 0.2% annual chance flood level.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
BWA-1	Update the Authority's emergency response plan.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
BWA-2	Explore the needs to purchase and install a three-phased emergency generator.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
BWA-3	Institute mandate for employees driving company vehicles to supply proof of insurance.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
BWA-4	Investigate new platforms of communication to support public outreach. Additionally, identify and advertise methods of communication for the public to contact the Authority.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
CSD-1	Work with local experts to develop training opportunities for staff that align with the district’s EOP.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
CSD-2	Work with emergency management to secure supplies as necessary if a prolonged stay is required due to an inability to relocate to another site with better/more equipped resources and facilities.	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
CBSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
CVSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
ECTA-1	Most ECTA customer meters are read on a quarterly basis using drive-by “radio read” technology. A fixed-base metering system with remote read technology would create a more efficient reading and notification system in which ECTA would have real-time notification of excess water use or meter failure that would increase the speed at which ECTA can respond. The response would include faster customer communication and enforcement during severe drought or other water shortage emergency. Cost = \$1,300,000, including installation, for ECTA’s full system. ECTA plans to begin replacements, as needed, in a phased approach in 2025.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
ECTA-2	Purchase of an additional backup power source would give ECTA the capability to power two groundwater wells and the ability to better meet demand, in the event of a widespread power outage. A generator meeting the following specifications would be appropriately sized to power any well in ECTA’s system: • 3-phase	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
	<ul style="list-style-type: none"> <li>• 208/480 V</li> <li>• 110 kW</li> <li>• 300A/150A</li> </ul> Based on a recent purchase of similar scope, cost = \$100,000, including trailer to mobilize the generator.											
ECTA-3	ECTA neighbors three other municipal water systems. An emergency interconnect with any of these three systems, would provide ECTA the ability to continue serving its customers while working towards bringing a well source back online. Cost = \$1,000,000.	N	N	+	+	+	N	+	+	N	N	5 (+) 5 (N) 0 (-)
ECTA-4	If a groundwater well is classified as GUDI, a treatment upgrade is required including more advanced filtering and disinfection. Most of ECTA’s well sources would also require facility expansion to make room for the upgraded treatment. Cost would be dependent on the source well capacity, but a recent comparable upgrade is estimated at \$3,000,000.	N	+	+	+	+	+	+	+	N	N	7 (+) 3 (N) 0 (-)
ETASD-1	Searching the student management system for the past three school years, student discipline for illicit substance/vaping violations is on the rise. Over the past two years the School District has called 911 three times for students experiencing medical issues suspected to be caused due to vaping illicit substances. Install vape detectors in the High School and Middle School sixteen restrooms. With a cost of about \$4000 per unit, the total cost would be about \$64,000.	+	N	+	+	+	N	+	+	+	+	8 (+) 2 (N) 0 (-)
EASD-1	Students are experiencing higher levels of mental illness in the community. The School District will contribute to address mental health concerns by increasing support through reporting systems, school counseling availability, family referral to outside support, and access to outside counseling during school hours and on school property.	+	N	+	+	+	N	+	+	+	+	8 (+) 2 (N) 0 (-)
EASD-2	With the ongoing and anticipate increase in cyber incidents, including data infiltration, data corruption, and ransomware, the District week seek various methods to improve and update its technology security through network segmentation, multi-factor authorization, limited account privileges, and remote data back-ups.	N	+	+	+	+	N	N	+	N	+	6 (+) 4 (N) 0 (-)
HSD-1	Ensure runoff during construction at the High School at the Landisville Campus is monitored to reduce water runoff issues, including erosion. Locations which could be impacted include the high school campus, nearby parking lots, and the baseball fields.	+	+	+	+	+	+	N	+	N	N	7 (+) 3 (N) 0 (-)
HSD-2	Evaluate if the high school and administrative buildings need protective measures to reduce flooding impacts. Once evaluated, implement the identified measure(s).	+	+	+	+	+	N	+	+	N	N	7 (+) 3 (N) 0 (-)
LSSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
												0 (-)
LASA-1	The Emergency Response Plan is in need of an update. The previous edition of the plan was completed in 2020, and the format is outdated. Assess whether LASA has the capabilities to complete this plan update on its own. If not, research various funding streams, including the BRIC, HMGP, EMPG, and HSPG grants to provide assistance in completing and update of the Emergency Response Plan.	N	N	+	+	+	N	+	+	+	N	6 (+) 4 (N) 0 (-)
LASA-2	LASA will work with its engineers (internal or contracted) to determine the required load capacity of an emergency generator for its administrative building, located at 130 Centerville Road, Lancaster PA 17603. Once determined, LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical facility can maintain its operations should an emergency or incident occur.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LASA-3	LASA has completed a study to identify the required load capacity of a generator to be installed at the pump station located at 2705 Charlestown Road, Lancaster PA 17603. LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical piece of infrastructure maintains operability should an emergency or incident occur.	N	+	+	+	+	N	N	+	N	N	5 (+) 5 (N) 0 (-)
LASA-4	LASA will work with engineers, internal or contracted, to assess the feasibility of elevating or relocating it various pump stations from flood-prone locations. These pump stations frequently experience flooding conditions from the many waterways and waterbodies in Lancaster County. Elevating or relocating the pump stations will mitigate flood risk and prevent the utility from being interrupted. The identified pumpstations are located at: <ul style="list-style-type: none"> <li>• Blue Rock 1-324 Blue Rock Rd. Washington Boro PA 17582</li> <li>• Holland Hills- 204 Donnerville Rd Lancaster PA 17603</li> <li>• Silver Spring- 830 Silver Spring Rd Silver Spring PA 17575</li> <li>• Elizabeth Street- 8 Elizabeth St, Washington Boro PA 17582</li> <li>• River Road-1850 Water Street Washington Boro PA 17582</li> <li>• Eden Road- 1891 Eden Rd, Lancaster PA 17601</li> <li>• Pleasure Road- 1401 Pleasure Rd Lancaster PA 17601</li> </ul>	+	+	+	+	+	+	+	N	N	+	8 (+) 2 (N) 0 (-)
LASA-5	LASA has not created a professional-styled video for outreach, recruitment, and highlighting the organization’s mission and operations. LASA is committed to superior wastewater management to protect the community, public health, and the environment. Its goals align with environmental protection and stewardship. The creation of this video will educate viewers on how LASA assists in mitigation efforts through its wastewater management practices. LASA will research professional film companies to assist in the production of a video dedicated to conducting outreach, recruitment, and highlighting the organization’s mission and operations.	+	N	+	+	+	N	+	+	+	N	7 (+) 3 (N) 0 (-)



Initiative	Mitigation Action	Life Safety	Property Protection	Technical	Political	Legal	Environmental	Social	Administrative	Local Champion	Other Community Objectives	Total Score
LCCD-1	The district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
LLIU-1	The agency will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
PMSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
SSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WSD-1	Sinkholes have previously formed within the grounds of the Warwick School District. Continue monitoring the property owned by the School District for any signs of sinkhole formation or activity.	N	+	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)
WSH-1	The system will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	+	N	+	+	+	N	+	+	N	N	6 (+) 4 (N) 0 (-)



### 6.4.3 Prioritization of Mitigation Actions

Actions that are deemed feasible (i.e., receive a positive feasibility evaluation score) were prioritized using the following criteria (PEMA 2020):

- Effectiveness (20% of score)—The extent to which the action reduces the vulnerability of people and property
- Efficiency (30% of score)—The extent to which time, effort, and cost is well used as a means of reducing vulnerability. This criterion assesses the benefits of the action versus the cost of the action’s implementation
- Multi-Hazard Mitigation (20% of score)—Whether the action reduces vulnerability for more than one hazard
- Addresses High-Risk Hazard (15% of score)—Whether the action reduces vulnerability for people and property from a hazards identified as high-risk
- Addresses Critical Communications/Critical Infrastructure (15% of score)—Whether the action pertains to the maintenance of critical functions and structures such as transportation, supply chain management, data circuits, etc.

Scores for each criterion range from 0 to 3. Those scores are weighted based on the percentages listed above and then summed. The total is the action’s priority score, which also ranges from 0 to 3. An action’s priority is then determined using the following scale (PEMA 2020):

- Low priority = 0 – 1.8
- Medium priority = 1.9 – 2.4
- High priority = 2.5 – 3

Table 6-6 shows the prioritization scores for the identified feasible mitigation actions. Municipal officials reviewed and updated the prioritization values based on local needs. High priority and medium priority mitigation actions are recommended for implementation before low priority actions; however, based on county and municipal-specific needs, cost estimation, and available funding, some low priority mitigation actions may be addressed first.



Table 6-6. Prioritization Scoring of Mitigation Actions

Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LC-1	Acquire properties in hazard areas, notably those in the 1 percent annual chance floodplain, to convert them to open space.	2	3	1	3	0	2.0
LC-2	Educate residents in flood-prone areas about the benefits of purchasing flood insurance.	1	3	1	3	0	1.8
LC-3	Elevate structures at risk of flooding.	2	3	1	3	0	2.0
LC-4	Acquire repetitive loss properties to convert them to open space.	2	3	1	3	0	2.0
LC-5	Remove any dilapidated or structurally unsound dams that pose a flooding threat to the community.	2	1	1	1	1	1.2
LC-6	Work with hazardous materials facilities in the floodplain to floodproof structures up to the 0.2% annual chance flood level.	3	3	1	3	1	2.3
LC-7	Work with the Lancaster Conservancy to provide information at the Welsh Mountain Nature Preserve regarding the potential for wildfires and how visitors can prevent them.	2	2	1	2	0	1.5
LC-8	Nissley Acres Floodwater Storage Area—Create a floodwater storage area to assist in reducing flood levels in the Nissley Acres development and a downstream residential area in Ephrata Township that is also prone to flooding. The location of the storage area would be on Borough-owned property so it would not require acquisition of land.	3	2	1	3	0	1.9
LC-9	Work with the railroad and property owners to provide a wider buffer between the tracks and vegetation.	1	1	1	2	3	1.5
LC-10	Protect the structures in Chickie’s Park to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
LC-11	Work with PPL to protect the Conestoga KV Substation to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
LC-12	Work with the Safe Harbor Water Power Corporation to protect their facilities to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
LC-13	Work with PPL to protect the Holtwood facility to the 0.2% annual chance flood level.	3	2	1	3	3	2.3
LC-14	Develop a hazard information page on the County website, and link from each municipality’s website.	1	2	3	3	2	2.2
LC-15	Develop informational workshops on hazard risks and hazard mitigation for property owners in high-risk areas.	2	2	3	3	0	2.1
LC-16	Increase the frequency of environmental and risk assessments to better determine where land should or should not be developed.	3	2	3	3	0	2.3
LC-17	Increase support capabilities, better facility evacuation plans, and long-term placement plans.	3	3	3	3	0	2.6
LC-18	Increase training and exercises available to water and wastewater authorities.	3	2	1	3	1	2.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LC-19	Obtain and implement updated flood gauge information into flood inundation mapping to better notify and predict flood hazard areas before flooding occurs. Improving flood forecasting technology to identify new areas for flood mitigation projects.	3	3	1	3	0	2.2
LC-20	Improve access control and physical security at county owned and rented properties	2	3	2	2	1	2.2
LC-21	Build and foster relationships with community leaders within Lancaster County.	3	3	3	3	1	2.7
LC-22	Research options for modern transportation for emergency workers/plain community farmers to limit exposure time.	2	2	2	0	1	1.6
LC-23	Encourage shelter planning at the local levels and continued training and communication with local Red Cross chapter and PA Department of Human Services.	3	2	3	3	2	2.6
LC-24	Expand the use of translation services in the County to improve and build relationships with diverse community groups.	3	3	3	3	1	2.7
LC-25	Better facilitate cultural integration into planning and exercises.	3	3	3	3	1	2.7
LC-26	Work with the county CISO and Public Safety Technology staff to develop redundancies for 9-1-1 communications infrastructure and emergency management operation capabilities.	3	3	2	2	2	2.5
LC-27	Build and foster relationships between the County Commissioners office, the County Communications Director and local news media. Increase awareness and training to manage mis information in all forms that have the potential to result in civil unrest.	3	3	3	3	2	2.9
LC-28	Update urban and village growth area boundaries for Future Land Use and Transportation Map which will improve land use patterns and help to better manage stormwater runoff.	2	3	2	2	1	2.2
LC-29	Draft regional comprehensive plans which may lead to improved growth management and opens space, natural land, and agricultural land preservation	3	3	2	2	0	2.2
LC-30	Update the Countywide Act 167 Stormwater Management Plan to encourage regional approaches to stormwater management and flood mitigation and encourage creative and innovative approaches, including regional stormwater facilities, floodplain restoration and wetland creation, critical aquifer recharge areas, and increased tree canopy.	3	3	2	2	0	2.2
LC-31	As part of Phase 2 of the Act 167 Plan, have the County and municipalities adopt a new model stormwater ordinance for consistency throughout entire watersheds, and across boundaries.	3	3	2	2	0	2.2
LC-32	Whenever a capital improvement, transportation, or land development project is undertaken, look for ways to stack benefits, e.g. when replacing or repairing bridges/culverts look for opportunities for streambank	2	2	2	2	1	1.9



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	restoration, improved channel design and floodplain management. When doing road projects, look for ways to incorporate green infrastructure.						
LC-33	Engage in coordinated removal of legacy sediments before dam is removed and utilize floodplain restoration to stabilize and restore the stream/creek and ecosystem.	2	2	2	1	0	1.6
LC-34	Enhance public outreach and education capabilities by providing updated preparedness, prevention, and mitigation materials at publicly available locations. Provide these materials in multiple languages which are prominent in Lancaster County.	3	3	3	3	0	2.6
LC-35	There is an insufficient amount of data surrounding dam inundation and the resulting flooding within the County. The County will conduct dam inundation modeling in high-risk areas, prioritizing those dams and their downstream areas that are classified as a high or significant hazard.	3	3	3	3	2	2.9
LC-36	Establish working relationships with PA DEP's Dam Safety Program leaders and the public and private dam owners in the county. Include these groups and individuals as stakeholders in the next HMP update.	3	3	0	1	3	2.1
LC-37	The County will encourage local jurisdictions, during future reviews and revisions of local codes and ordinances, to integrate hazard mitigation principles and use available tools and resources from FEMA and other sources to integrate climate adaptation planning, to strengthen their regulatory capabilities and set higher standards to reduce hazard risk.	3	3	3	2	2	2.7
AkB-1	Protect Wastewater Pump #126 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
AkB-2	Upgrade sewer infrastructure in the Heritage Development to prevent stormwater infiltration.	2	2	2	3	1	2.0
AkB-3	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Borough employees to work remotely if needed.	3	2	3	2	2	2.4
AkB-4	Many roads in the Borough experience flooding. Redesign areas prone to flooding or seek other feasible flood mitigation measures.	3	3	1	1	1	2.0
AkB-5	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	3	3	2	1	1	2.2
BaT-1	Protect Jackson's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
BaT-2	Protect Willow Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
BrkT-1	Protect the Northern Lancaster County Authority facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
BrkT-2	Protect Well #7 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
BrkT-3	Protect Good's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
BrkT-4	Protect Oberholtzer's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
BrkT-5	Protect Red Run Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
CaeT-1	Hammertown Road Bridge - Address flood problem at the bridge at 141 Hammertown Road.	2	2	1	3	1	1.8
CaeT-2	Turkey Hill Road Culvert - Upgrade the culvert at 2051 Turkey Hill Road with one with a higher capacity.	2	2	1	3	1	1.8
CaeT-3	Protect Conestoga Dam to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
CaeT-4	Protect Pool Forge Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
CaeT-5	Protect Shearer's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
CaeT-6	Protect Weaver's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
CaeT-7	Protect Willima Witman House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
CaeT-8	The Fire Company, Township Building, and Township Garage do not have back-up generators to maintain continuity of operations during an emergency event. The Public Works Superintendent will work alongside the jurisdictional engineer to identify the necessary capacity for each emergency generator. Once identified, Public Works will have the emergency generators installed at each facility. Public Works will be responsible for maintaining the emergency generator.	3	2	3	3	3	2.7
CaeT-9	Boot Jack Road Culvert - Upgrade the culvert on Boot Jack Road with one with a higher capacity.	2	2	1	3	1	1.8
CaeT-10	Invest in cyber insurance for the Township.	3	2	1	2	1	1.9
CaeT-11	Research, and potentially invest, in Savvy Citizen, a mass notification and alert system.	2	2	3	3	1	2.2
CaeT-12	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	3	3	3	3	0	3.0
CaeT-13	Evaluate the need for snow fences along Township and State roads to prevent blowing and drifting snow from impacting travelers.	2	2	1	1	1	1.5
ClyT-1	Protect Clay Roller Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ClyT-2	Protect Snyder Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ClyT-3	Protect Lincoln Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ClyT-4	Protect Middle Creek Dam to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ClyT-5	Protect Hiram Erb House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ClyT-6	The Municipal Engineer will work with the Pennsylvania Game Commission to complete an engineering study of Middle Creek Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Game Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	3	2	2	2	3	2.4
ColT-1	Protect White Rock Forge Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ColT-2	There are several culverts in the Township which are undersized or deteriorating. The Township will apply for various grants to address these culverts.	3	3	1	2	2	2.3
ColT-3	Reinforce or replace the Wesley Road Bridge.	3	1	1	1	1	1.4
ColT-4	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	3	3	3	3	0	3.0
ColB-1	Install a backup generator that can power the entire Municipal Building.	3	2	3	3	3	2.7
ColB-2	Protect Robert Barber House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ColB-3	Protect Old Columbia-Wrightsville Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ColB-4	During future updates of Borough ordinances, regulations, plans, codes, and other planning and regulatory capabilities, the Borough will integrate hazard mitigation principles.	3	3	3	3	2	2.9
ColB-5	Install a backup generator that can power each school district assembly area.	3	2	3	3	3	2.7
ColB-6	Seek funding opportunities to train staff and community leaders on how to apply for grants, general emergency resources, and where equipment can be purchased from.	3	3	3	3	1	2.7
ColB-7	Several areas throughout the Borough have a lack of proper drainage during heavy rain. Investigate feasible, cost-effective flood mitigation options, including stormwater runoff systems.	3	3	1	1	2	2.2
ColB-8	Pursue funding to support the elevation or acquisition of private residencies which have flooded repetitively.	3	2	1	1	0	1.6
ColB-9	Perform a geological study of the bedrock within the Borough to assess and identify areas which are susceptible to sinkholes.	3	3	1	1	1	2.0
ColB-10	Identify and advertise warming and cooling shelters.	3	2	1	0	2	1.7
ColB-11	Initiate a campaign to encourage Borough residents to sign up for public safety alerts.	2	2	3	3	1	2.2
ColB-12	Purchase needed emergency equipment.	3	1	3	3	0	2.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ConT-1	Protect the Big and Little Indian Rock to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-2	Protect the Colemanville Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-3	Protect the Conestoga Canal Lock to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-4	Protect the Safe Harbor Iron Works Site to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-5	Protect the Rock Hill Tavern to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-6	Protect the Daniel and Elizabeth Good Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-7	Protect the Benjamin and Susanna Old Slaymaker Lodge/Yordy to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ConT-8	Assess flood damage on Stone Hill Road, Green Hill Road, and Boy Scout Road and identify feasible, cost-effective measures to improve conditions. Develop a long-term plan for erosions following heavy rain storms along the identified roadways.	3	3	1	1	1	2.0
CnyT-1	Protect the Brenneman Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DenB-1	Denver Beer Distributor Relocation - The Denver Beer Distributor is located at 4 Main Street, Denver, PA, in adjacent to the Cocalico Creek. During heavy rain and storm events, the business has faced repetitive loss due to flooding and is looking to relocate outside of this flood-prone area and to another location on Main Street in Denver Borough.	3	1	1	3	1	1.7
DenB-2	Protect Filtration #3 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DenB-3	Protect the Eberly Dam to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DenB-4	Protect the Henry Schein Facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DenB-5	Protect the Kalas Manufacturing Facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DenB-6	Protect Ryder Transportation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DenB-7	Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	2	2	3	2	1	2.1
DenB-8	Identify capacity and needs for emergency generators at the Municipal Building, Public Works, and Well #4. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
DenB-9	Install a lining or excavate and replace metal stormwater pipes in the Snyder Acres Development and where applicable elsewhere in the Borough. These deteriorating pipes have caused roadway damages, sinkholes, and property issues in the Borough.	3	3	1	1	2	2.2



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
DenB-10	Perform streambank restoration activities and riparian buffer improvements in Denver Memorial Park.	3	3	1	1	0	1.9
DenB-11	Work with PennDOT to replace the existing Weaver Road Bridge.	2	3	1	1	2	2.0
DenB-12	Develop partnerships with County, State, and Non-profit partners to ensure resources and connections are made to quickly mobilize in the event of a large-scale event or incident.	3	3	3	3	1	2.7
DenB-13	Educate residential and commercial property owners updated concerning hazards and potential resources to meet any challenges. A focus area will be the property owners along Denver Memorial Park, Little Cocalico Creek, and Cocalico Creek.	2	3	3	3	0	2.4
DenB-14	Address feasibility of water system connection with neighboring public water systems to reduce burdens in the event of a drought or utility outage.	2	2	1	1	1	1.5
DenB-15	Investigate proactive actions to address infiltration and inflow areas in the sewer system to mitigate potential issues.	3	2	1	1	1	1.7
DruT-1	Protect the Muddy Run Power Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DruT-2	Protect the Muddy Run Dam to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
DruT-3	Protect the Drumore Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EarIT-1	Relocate businesses along US-322 west of Martindale Road.	3	3	1	3	3	2.6
EarIT-2	Protect the Conestoga Bridge No. 5 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EarIT-3	Protect the Conestoga Creek Bridge No. 6 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EarIT-4	Protect the White Oak Ice Co. to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EarIT-5	Protect the Adam Schreiner House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EarIT-6	The Township will update or create a dam failure response plan as part of the emergency management plans. This plan will outline clear evacuation procedures and flood zone mapping. To enhance response capabilities, training for staff on dam breach protocols and public education on emergency evacuation routes will be implemented.	3	3	2	1	1	2.2
EarIT-7	The Township will develop a drought emergency response plan that includes water rationing protocols and prioritizing water distribution to critical infrastructure. Staff training will focus on water conservation practices and emergency water distribution techniques.	3	3	1	0	1	1.9
EarIT-8	The Township will integrate earthquake preparedness into the emergency management plan and provide training for staff to handle post-earthquake situations, such as search and rescue operations and medical triage. The community will be educated on how to prepare their homes and businesses for earthquakes.	3	3	1	0	1	1.9



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
EarlT-9	The township office manager and roadmaster will coordinate with the township engineer to assess the power needs of each building to determine the appropriate generator size. The generator will be installed at the Township and Road Maintenance buildings. The Road Maintenance Department will be responsible for the ongoing maintenance and testing of the generators, ensuring they are fully operational when needed.	3	2	3	3	3	2.7
EarlT-10	The Township will work with an engineer to address both the flooding along Mill Road and the overall stormwater management issues. As part of this solution, the culvert along Mill Road will be replaced with a larger and more efficient box culvert to accommodate increased water flow and prevent future blockages or overflow. This will stabilize the streambank adjacent to Mill Road to prevent further erosion caused by high water levels during storms. Improvements to drainage in the adjacent agricultural pasture will also be made to reduce runoff into the road. To address the larger issue, stormwater conveyance will be enhanced from existing outfalls beneath Mill Road to the stream, improving the overall drainage capacity of the area and reducing the risk of flooding. Future improvements will include the road being repaved and its stormwater infrastructure will be upgraded to ensure it can handle future stormwater runoff more effectively, mitigating flooding in the long term.	3	3	1	2	2	2.3
EarlT-11	The Township will develop a Repetitive Loss Mitigation Plan. The plan will include an analysis of each affected property, considering factors such as flood history, the cost of repairs, potential elevation or buyout options, and the long-term impacts of mitigation. Based on this analysis, the Township will identify high-priority properties for elevation or buyout through FEMA’s Hazard Mitigation Assistance (HMA) programs. For properties that are suitable for elevation, the Township will work with property owners and engineers to develop elevation plans to raise structures above flood levels. For properties that are prone to frequent flooding and cannot be effectively elevated, the Township will pursue buyouts, enabling property owners to relocate to safer areas, with the added benefit of reducing the risk of future flood claims.	2	2	1	2	1	1.7
EarlT-12	The Township will evaluate options for elevating or floodproofing critical buildings to prevent damage during floods. Infrastructure such as water treatment plants, and sewer systems will be hardened with flood barriers and fire-resistant materials, especially in areas prone to wildfires and flooding. Additionally, key transportation routes will be upgraded with improved drainage systems to ensure accessibility during emergencies. Backup power systems, such as generators, will be installed to maintain service during utility interruptions. Collaboration with utility companies will also focus on improving gas pipeline safety to prevent damage during extreme weather or seismic events. These measures will enhance the resilience of the Township’s infrastructure, ensuring that essential services continue before, during, and after hazard events.	3	2	3	3	3	2.7
EarlT-13	To better protect socially vulnerable populations, including the Amish community, the Township will implement tailored mitigation actions. These include developing outreach programs to communicate	3	3	3	3	0	3.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	hazard preparedness through trusted community leaders, focusing on pandemic prevention, substance use disorder support, and invasive species management. Mobile vaccination clinics and health outreach teams will provide essential services to those with limited access to healthcare, particularly during pandemics. The Township will collaborate with local addiction treatment centers to offer mobile support for substance use disorder, and work with agricultural groups to manage invasive species. Additionally, a community-based transportation network will ensure that vulnerable populations can access medical care and emergency services during disasters. These actions will improve resilience and ensure that socially vulnerable groups are better protected from future hazards like pandemics, substance use, and invasive species, while also fostering greater community support and inclusion in disaster preparedness and recovery planning.						
EarIT-14	The Township will develop outreach projects that target both the Amish community and the general public. For the Amish population, outreach will be conducted through community meetings, printed materials, and collaboration with local community leaders to ensure culturally relevant information is shared. These efforts will help increase awareness of local hazards, emergency procedures, and available resources in a way that aligns with their communication preferences.	3	3	3	3	0	3.0
EarIT-15	The nuclear incident response plan will be updated to include evacuation routes, shelter-in-place procedures, radiation exposure protocols, and the acquisition of radiation detection equipment and protective gear. Staff will be trained on radiation response and conduct public education on nuclear safety. For gas and liquid pipelines, the Township collaborate with operators to enhance safety inspections, leak detection, and evacuation procedures, alongside providing staff training. Finally, the wildfire response plan will focus on creating firebreaks, improving evacuation routes, while training staff in wildfire suppression and emergency response. These actions will significantly improve the community’s preparedness and ability to respond effectively to these hazards.	3	3	3	0	1	2.3
ECT-1	Protect the District Justice Office 1 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ECT-2	Protect the Reamstown EMS facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ECT-3	Protect Well #8 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ECT-4	Replace the Dogwood Drive bridge over Fry's Run with one with a larger opening.	2	2	1	3	1	1.8
ECT-5	Replace the Miller Road bridge over the Little Cocalico Creek with one with a larger opening.	2	2	1	3	1	1.8
ECT-6	Replace the Reinholds Road bridge over Fry's Run with one with a larger opening.	2	2	1	3	1	1.8
ECT-7	Replace the Smokestown Road bridge over Fry's Run with one with a larger opening.	2	2	1	3	1	1.8
ECT-8	Replace the Stony Run culvert under Hill Road with one with a larger opening.	2	2	1	3	1	1.8



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ECT-9	Replace the White Oak Road bridge over Fry's Run with one with a larger opening.	2	2	1	3	1	1.8
ECT-10	Protect the Bucher's Mill Covered Bridge facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ECT-11	Protect the Leshar Knitting Mill facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ECT-12	Invest in cyber insurance for the Township.	3	2	1	2	1	1.9
ECT-13	Identify capacity and needs for emergency generators at the Public Works facility. Apply for grants and appropriate funding where possible. After purchase, install, and maintain the generator. Identify additional critical facilities in the Township in need of back-up power to maintain operations.	3	2	3	3	3	2.7
ECT-14	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents.	3	3	3	3	0	3.0
ECT-15	Identify and address undersized or deteriorating culverts throughout the Township.	3	3	1	2	2	2.3
ECT-16	The Township will pursue funding support to have a forester assess trees, complete deed searches to verify Township right of way in targeted areas, and then have the tree removal completed by qualified personnel. Implement, review, and enforce municipal policies and programs to prevent trees from threatening lives and impacting power availability/interruption in conjunction with property owners and utility companies.	3	2	1	1	0	1.6
ECT-17	Plant native vegetation and plants to combat invasive species and potential hinder wildfire fuel.	3	2	1	0	0	1.4
ECT-18	Encourage property owners living in older housing units to install a radon detector.	2	2	1	1	1	1.5
ECT-19	Review and revise, where applicable, existing codes, policies and regulations pertaining to land development to restrict development in hazard areas including, but not limited to, geology connected to sinkholes, flood-prone locations, wildfire interfaces, and steep slopes.	3	3	2	1	1	2.2
EDT-1	Protect the Share's Mill Complex to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EDT-2	Protect AT&T Cable Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EDT-3	Protect Well #33 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EDT-4	Protect Well #79 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EDT-5	Protect Donegal Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EDT-6	Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	2	2	3	2	1	2.1
EDT-7	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as	3	3	3	3	0	3.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.						
EET-1	Shirks Run Diversion - Work with landowners to reduce the possibility of flooding damage in an area east of Shirks Run at the Route 322 and Route 23 intersection.	2	1	1	3	0	1.4
EET-2	Work with PENNDOT to realign and install a traffic light at the intersection of US-322 and PA-897.	3	3	1	2	3	2.5
EET-3	Work with PENNDOT to realign the intersection of Routes 23 and 897.	3	3	1	2	3	2.5
EET-4	Protect Conestoga Bridge No. 4 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-5	Protect the Elliot Tract House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-6	Protect the Frogtown/Goodville Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-7	Protect the Roller Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-8	Protect the Christian Weaver House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-9	Protect the Francis Weaver House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-10	Protect the Henry Martin House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-11	Protect the Oberholtzer Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EET-12	The Municipal Engineer will work with Jacob and Evelyn King to complete an engineering study of New Holland Reservoir. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Jacob and Evelyn King will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	3	2	2	2	3	2.4
EHT-1	Culvert Replacement - Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run. Replace old and undersized culverts along the Swarr Run located at Church Street, Snapper Dam Road, and Nolt Road. The three roads are subject to frequent flooding.	2	2	1	3	3	2.1
EHT-2	Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run.	3	1	1	3	1	1.7
EHT-3	Replace old and undersized culverts along the Swarr Run located at Church St.	2	2	1	3	1	1.8
EHT-4	Replace old and undersized culverts along the Swarr Run located at Nolt Road.	2	2	1	3	1	1.8
EHT-5	Replace old and undersized culverts along the Swarr Run located at Snapper Dam Road.	2	2	1	3	1	1.8





Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
EHT-6	Protect Brubaker Run Detention to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EHT-7	Protect Chickies Roller Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EHT-8	Protect Landis Mill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EHT-9	Protect Benjamin Musser House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EHT-10	Protect Shenk House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-1	Backup generator – Purchase 10 more generators for use along Route 30 and Route 340 to make them functional emergency routes.	2	2	2	3	3	2.1
ELT-2	Backup generator – Install backup generators in two fire stations that are not yet equipped with backup power.	2	2	1	3	3	2.1
ELT-3	Identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents along Millcross Road.	2	2	1	3	1	1.8
ELT-4	Improve the design of the intersections at Oakview, Rte. 462, and Millstream along Rte. 30.	2	2	1	2	1	1.7
ELT-5	Install stormwater management infrastructure at Gibson’s Park at Nolt Mill.	2	3	1	3	1	2.1
ELT-6	Investigate retrofitting or other flood hazard mitigation measure for Oaks 1 Pump Station.	3	3	1	3	2	2.5
ELT-7	Investigate retrofitting or other flood hazard mitigation measure for properties along Hale Drive.	3	2	1	3	0	1.9
ELT-8	Investigate retrofitting or other flood hazard mitigation measure for properties along the south side of Millstream Road between Gridley and Strasburg Pike.	3	2	1	3	0	1.9
ELT-9	Investigate the removal of dam structures at Flory Park.	3	1	2	3	2	2.1
ELT-10	Investigate the removal of dam structures at Gibson’s Park at Nolt Mill.	3	1	2	3	2	2.1
ELT-11	Protect Lancaster Mennonite High School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-12	Protect Wastewater Pump #97 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-13	Protect Wastewater Pump #98 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-14	Upgrade stormwater management at Flory Park.	2	1	1	3	1	1.5
ELT-15	Upgrade stormwater management at Greenland near Flory Park entrance.	2	1	1	3	1	1.5
ELT-16	Upgrade stormwater management at North Cherry Lane.	2	2	1	3	1	1.8
ELT-17	Upgrade stormwater management at Susan Avenue.	2	2	1	3	1	1.8
ELT-18	Upgrade stormwater management at the northeast side properties along Strasburg Pike.	2	2	1	3	1	1.8



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ELT-19	Upgrade the stormwater management system along Greenfield Road at Amtrak.	2	2	1	3	1	1.8
ELT-20	Upgrade the stormwater management system at Soudersburg Road at the pump station.	2	2	1	3	1	1.8
ELT-21	Protect Binkley or Graff Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-22	Protect Donnelley Financial Solutions to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-23	Protect Engineered Valves, LLC to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-24	Protect Gibbons Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-25	Protect J. Walter Miller Company to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-26	Protect J.L. Clark, LLC to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-27	Protect Lancaster Terminal to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-28	Protect Shober's Paper Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-29	Protect USPS Postal Service Lancaster to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-30	Protect Willow Hill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ELT-31	Identify, design, and install stormwater management initiatives to reduce potential flood effects, particularly on Millcross Road, North Cherry Lane, Susan Avenue, Strasburg Pike, and Soudersburg Road.	3	3	1	1	2	2.2
ELT-32	Work with PA DEP and local partners to determine the cost benefit analysis of removal of the dams at Gibbons Park, Nolt Mill, and Flory Park.	3	3	1	1	2	2.2
ELT-33	Investigate possibilities to reduce stormwater flow into the Oaks 1 Pump Station and potential periodic shut downs of the sewer pump station due to excessive stormwater flow.	3	3	1	1	2	2.2
EPB-1	Protect Filtration #5 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EPB-2	Develop minimum training requirements for EOC Staffing.	2	2	3	2	1	2.1
EPB-3	Develop plans to host an exercise to address training deficits.	2	2	3	2	1	2.1
EPB-4	Create and develop annexes to the Borough's EOP (i.e. debris management) in conjunction with the Borough Staff, public works.	3	2	3	2	1	2.3
EPB-5	Identify capacity and needs for emergency generators and transfer switches at the DPW Maintenance Shop and City Interconnect. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
EPB-6	Increase pipe capacity at Outfall OFA000101 discharge on Graystone Road.	2	2	1	3	3	2.1



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EPB-7	Install fencing and perimeter cameras to provide more security at the Borough’s Water facility.	3	2	1	2	2	2.0
EPB-8	In tandem with County officials, explore options for an alternate means for communication in an emergency. Social media is the primary use of communication.	2	2	3	3	1	2.2
EPB-9	Connect with facilities that host children during the day and work to develop plans and build resources for the families in case of any hazard.	2	2	3	2	1	2.1
EPB-10	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	3	3	3	3	0	3.0
EdT-1	Protect Pennsylvania Railroad Tunnel to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EdT-2	Move the existing EOC (489 Stony Hill Road) to the new state-of-the-art municipal building. The new building will feature an Emergency Operations Center (EOC), a backup generator, and incorporate comprehensive upgrades, including ADA-compliant accessibility, advanced electrical and HVAC systems, and cutting-edge technology infrastructure. Additionally, the project will integrate sustainable stormwater management solutions, such as a green parking lot and vegetated bioswales, to reduce runoff and support environmental sustainability.	3	2	3	3	3	2.7
EdT-3	In partnership with local fire chiefs, establish a comprehensive burn ordinance aimed at preventing and controlling air and water pollution. The ordinance will also grant the Township the authority to implement temporary burn bans during red flag warnings and other high-risk wildfire conditions.	3	3	1	0	0	1.7
EdT-4	Coordinate with PennDOT to replace an old, inadequate drainpipe that runs underneath May Post Office Road at the intersection of Eden Road. The existing pipe contributes to water backups and flooding.	3	2	1	1	2	1.9
EdT-5	Pave/Reprofile Eden Road from Groff Road to May Post Office Road (approximately .8 miles). These roads, which face impacts from severe weather, would be utilized should an evacuation be necessary due to an event at the Peach Bottom Power Plant.	2	2	3	2	1	2.1
EdT-6	Arrange and conduct a complimentary Cybersecurity and Infrastructure Security Agency (CISA) evaluation for Township IT systems to identify vulnerabilities and enhance resilience against cyber threats, safeguarding critical infrastructure and sensitive data.	3	2	1	2	1	1.9
EdT-7	Coordinate with Lancaster Clean Water Partners to reduce the amount of nitrogen, phosphorus, and sediment in Eden Township waterways that are a part of the Chesapeake Bay Watershed.	3	3	1	0	0	1.7
EdT-8	Develop informational outreach initiatives to promote participation in and enhance recruitment for Bart FD and Quarryville FD	2	3	3	2	0	2.2



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
EdT-9	Purchase and install a radar-equipped speed sign in targeted areas to mitigate the risk of speeding and enhance road safety	2	3	1	1	1	1.8
EdT-10	Develop informational outreach initiatives on hazard risks and hazard mitigation for residents. A significant portion of the township population (48%) is Amish, who may have limited access to traditional hazard risk information, leaving them vulnerable to disasters. Informational outreach initiatives are needed to raise awareness about hazard risks and mitigation strategies to better protect all residents, especially those in underserved communities.	3	3	3	3	0	3.0
ElizT-1	Work with utility companies to clear vegetation around power and communications lines.	2	3	1	3	3	2.4
ElizT-2	Protect Grube, Martin and Eliza Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ElizT-3	Protect Hammer Creek Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ElizT-4	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	2	2	1	1	0	1.4
ElizT-5	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	2	2	3	3	1	2.2
ElizT-6	The Municipal Engineer will work with the Pennsylvania Fish and Boat Commission to complete an engineering study of Speedwell Forge Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Fish and Boat Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	3	2	2	2	3	2.4
ElizB-1	Protect Reservoir #6 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ElizB-2	The Municipal Engineer will work with the Elizabethtown College to complete an engineering study of Lake Placida Dam. The Borough will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Borough and the Elizabethtown College will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	3	2	2	2	3	2.4
EphB-1	Protect Electric Substation #31 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-2	Protect Ephrata Boro WWTP #1 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-3	Protect Ephrata EMS to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
EphB-4	Protect the Ephrata Borough Sewer Authority WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-5	Protect Wastewater Pump #176 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-6	Protect Wastewater Pump #177 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-7	Protect Wastewater Pump #77 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-8	Protect Well #4 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-9	Protect Keller's Mill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-10	Protect Reservoir #11 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-11	Protect Terre Hill Composites, Inc. to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-12	Protect Wastewater Pump #120 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-13	Protect Daniel Bauman House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-14	Protect Ephrata EMS to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-15	Protect Well #44 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-16	Protect Family Medicine of Ephrata to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-17	Protect Wellspan Family Medicine to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphB-18	Protect Dunkelberger Osteopath, LTD to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-1	Improve drainage system at the intersection of Frysville Road and Newswanger Road.	2	2	1	3	1	1.8
EphT-2	Protect the Ludwig Bloom House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-3	Protect Bushongsor Shreiner's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-4	Protect Cocalico Creek Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-5	Protect Jacob Keller Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-6	Protect Samuel Keller House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-7	Protect Keller's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-8	Protect Peter and Catherine Reyer Farmhouse to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-9	Protect Hinkle Tavern, Winters Hotel to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
EphT-10	Protect Landis House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Ful-1	Protect Peach Bottom Marina to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LancC-1	Protect Potable Pump #79 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-2	Protect Potable Pump #98 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-3	Protect Tank #7 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-4	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-5	Protect Engle Printing and Publishing to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-6	Protect High Steel Service Center to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-7	Protect Kurtz's Mill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-8	Protect Pennsylvania Railroad Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-9	Protect Lancaster City Conestoga Filter Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-10	Protect Lancaster City Water to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-11	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancC-12	Establish a floodplain management team to assist the FPA in NFIP administration, ordinance updates, staff training, and other needs.	3	3	1	1	0	1.9
LancC-13	Conduct a facilities condition assessment to ensure green infrastructure practices are functioning as designed. Specific attention to elevated risk of sinkhole formation.	2	3	1	1	1	1.8
LancC-14	Identify capacity and needs an emergency generator at the Lancaster Advanced Wastewater Treatment Plant (AWWTP). Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
LancC-15	Although there has been no known issues reported since maintenance work completed in 2024, evaluate the Plum Street Railroad Underpass (CSS conveyance issue/ Manheim Township MS4 runoff to City's CSS) through the use of engineering investigations and infrastructure updates.	3	2	1	1	2	1.9
LancC-16	There are pipe restrictions at Fairview Avenue/New Danville Pike/Prince Street (CSO Outfall 002). Conduct additional investigations, engineering, infrastructure upgrades. Potential partnerships with Lancaster Township. Water Street Sewer Separation Phases 2-3 need final designs and construction funds, will help alleviate restrictions.	3	2	1	1	2	1.9
LancC-17	There is a bottleneck at the CSS at North Broad/Lehigh Avenue. The City's Broad St Disconnection project is in preliminary design now to provide stormwater storage capacity through an existing stormwater storage bed that can receive over 9 acres of existing impervious and partially bypass CSS. Seek additional funding if needed.	3	2	1	1	2	1.9



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LancC-18	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Steel Way/Manheim Pike (MS4 conveyance bottleneck and outfall restriction).	3	2	1	1	2	1.9
LancC-19	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Hershey Avenue/Wabank Road (MS4 conveyance restriction at outfall).	3	2	1	1	2	1.9
LancC-20	At the Lancaster Advanced Wastewater Treatment Plant (AWWTP) there is a conveyance bottleneck due to headwall at unnamed tributary to the Conestoga River and the capacity of the 78" diameter wastewater plant outfall (discharge) pipe. Investigate sources of funding to resolve problem.	3	2	1	1	2	1.9
LancC-21	Develop a repetitive loss mitigation plan to fully analyze the long-term impacts of mitigation, especially in the areas along Conestoga River in Conestoga Heights and Engleside neighborhoods.	2	2	1	2	1	1.7
LancC-22	Add new Susquehanna Water Raw Water and Finished Water Transmission Mains to harden infrastructure and decrease the risk to utility interruptions.	3	3	1	1	2	2.2
LancC-23	Add new Water Transmission Main from the Susquehanna River to the Conestoga Water Treatment Plant to harden infrastructure and decrease the risk to utility interruptions.	3	3	2	1	2	2.4
LancC-24	Identify community-based points of distribution with trusted partners, utilizing the CDC's Social Vulnerability Index, census data, and other planning tools to ensure accessible and equitable service delivery locations.	3	3	1	0	2	2.0
LancC-25	Increase planning efforts to ensure medically appropriate accommodations for people with substance use disorder to have access to medically assisted treatment and medications mitigate health risks and aid people experiencing withdrawal. Coordinate cooperation agreements with LEMSA and LGH Street Medicine.	3	3	1	0	1	1.9
LancC-26	Provide radon testing and mitigation through Healthy Homes Program to low- to moderate-income households most at risk. All City-funded housing rehabilitation projects will be tested for radon levels as part of the environmental review.	2	2	1	2	1	1.7
LancC-27	Improve interagency communications to readily share up-to-date information with public safety/first responders. Ensure access and protocols for laboratory testing of illicit drug samples.	3	3	1	0	2	2.0
LancC-28	Continue implementing public emergency alert system. Develop interdepartmental workgroup to facilitate informed communications about hazardous substances, level of exposure, risks, and what residents should do to remain safe. Develop other protocols as needed to assess individuals that have been exposed.	3	3	1	0	1	1.9
LancC-29	Develop a communications plan to inform residents about air quality impacts. Facilitate the provision of respiratory filters/masks to vulnerable populations during activities that increase exposure (i.e. travel to appointments/services, etc.)	2	3	1	0	1	1.7



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LancC-30	Partner with Penn State Extension and other agencies to determine appropriate interventions that promote environmental health. Develop communication plans to disseminate guidance to the public.	2	3	1	0	0	1.5
LancC-31	Establish a Long-Term Control Plan to address Combined Sewer Overflows (CSOs) in the wastewater conveyance system. These systems may need to have sewer separated expanded treatment, or increased storage capacity.	3	2	1	1	2	1.9
LancT-1	Protect the Lancaster City Advanced WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-2	Protect Wastewater Pump #136 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-3	Protect Wastewater Pump #148 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-4	Protect Wastewater Pump #168 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-5	Protect Wastewater Pump #169 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-6	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-7	Protect Jacob Miller House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-8	Protect Witmer's Tavern to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LancT-9	Protect Conrad Miller House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LeaT-1	Protect Wastewater Pump #27 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LeaT-2	Protect Leaman's Place Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LeaT-3	Protect Mill Creek Flour Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LeaT-4	Protect North American Pipe Corporation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LeaT-5	Protect Spread Eagle Tavern to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LeaT-6	Develop and implement a proactive multi-dimensional training program including representatives from the Township, DPW, Fire Department, Police Department, and EMS	2	2	3	2	1	2.1
LeaT-7	Identify capacity and needs for emergency generators and transfer switches at the pump stations throughout the Township. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
LeaT-8	Develop, apply, and maintain a Smart911 Notification System	2	2	3	3	1	2.2
LitB-1	Protect the Warwick EMS facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-2	Protect Wastewater Pump #72 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LitB-3	Protect Well #74 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-4	Protect Well #75 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-5	Protect Versatek to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-6	Protect Woodstream Corporation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-7	Protect LG Health Cedar to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-8	Protect Lititz Academy of Music to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitB-9	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
LitB-10	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	1.4	1.4	1.4	1.4	1.4	1.4
LitB-11	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	2	2	3	3	1	2.2
LitT-1	Protect Abbotts Creamery to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitT-2	Protect Pine Grove Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
LitT-3	Protect Octoraro Treatment Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-1	Protect Electric Substation #42 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-2	Protect Potable Pump #101 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-3	Protect the Manheim FD station to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-4	Protect Wastewater Pump #200 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-5	Protect Well #57 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-6	Protect Well #58 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-7	Protect Shearer's Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-8	Protect F L Smidth, Inc. to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-9	Protect Manheim Borough 2W Polling Station to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhB-10	Develop a Repetitive Loss Mitigation Plan to address the broader impacts of mitigation efforts and ensure sustainable long-term solutions.	2	2	1	2	1	1.7



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ManhB-11	Mitigate flood risks on Mill Street and surrounding neighborhoods through a comprehensive strategy incorporating property acquisition, elevation projects, and infrastructure upgrades.	2	2	1	2	0	1.5
ManhB-12	Critical facilities and infrastructure including Potable Pump #101, the Manheim Fire Department Station, and key roadways, are vulnerable to flooding. To enhance community resilience, implement targeted mitigation measures, including elevating critical facilities and roadways, floodproofing essential infrastructure, and upgrading stormwater management systems.	3	2	1	1	3	2.0
ManhB-13	Implement accessible educational programs, inclusive communication channels, and neighborhood support networks to address the unique needs of socially vulnerable populations during hazard events. Provide tailored resources such as emergency kits, transportation, and shelters, and involve representatives from these groups in mitigation planning to ensure their needs are prioritized. This approach fosters equity and resilience while reducing the impacts of disasters on underserved populations.	3	3	3	3	0	3.0
ManhB14	Develop and implement a comprehensive Public Education and Outreach Program to address awareness gaps, promote hazard preparedness, and improve community engagement. This program will include workshops, information dissemination via multiple platforms, and outreach campaigns tailored to local hazard risks. These efforts will empower residents to take proactive steps to protect themselves and their properties during hazard events.	3	3	3	3	0	3.0
ManhB15	Develop a Substantial Damage Management Plan, following the six-step process outlined in the 2021 "Developing a Substantial Damage Management Plan" guide. This plan will establish clear responsibilities for determining substantial damage, assessing market value, and managing permit approvals after disaster events. By implementing this plan, Manheim will enhance its capacity to enforce NFIP regulations, improve disaster recovery processes, and ensure compliance with local floodplain requirements, ultimately strengthening community resilience against flooding.	2	3	3	2	1	2.4
ManhT-1	Protect District Justice Office 13 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-2	Protect Wastewater Pump #143 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-3	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-4	Protect Wastewater Pump #167 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-5	West Roseville Road Bridge Demolition - Demolish and remove the West Roseville Road Bridge spanning the Little Conestoga Creek. Removal of an unsafe structure and obstruction in the floodway.	2	2	1	3	1	1.8
ManhT-6	Work with PENNDOT to redesign the interchange at US-30 and US-222.	3	3	1	2	3	2.5
ManhT-7	Protect Brubaker House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ManhT-8	Protect Buckbee Hearing Aid Center to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-9	Protect Hunsecker's Mill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-10	Protect Iron Stone Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-11	Protect Flory's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-12	Protect Landis Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-13	Protect Mount Joy Hatchery to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-14	Protect Philip Rudisil House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-15	Protect John Brubaker Barn to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-16	Protect M. Groff House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-17	Protect Christian L. Hunsecker House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-18	Protect Samuel Hunsicker House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-19	Protect Oregon (Withers) Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-20	Protect Rudisill Family Cemetery to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-21	Protect Abraham Shenk House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-22	Protect Christian Zook House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManhT-23	The Township will update its comprehensive plan. Ensure that the local comprehensive plan incorporates hazard mitigation techniques through a courtesy review or draft plans by the County Planning Department.	2	3	3	2	1	2.4
ManhT-24	Evaluate the culverts in the Township for capacity and deterioration. Address issues or replace the culverts as necessary.	3	3	1	2	2	2.3
ManhT-25	The Municipal Engineer will work to complete an engineering study of Manheim Township Detention Basin No 2. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	3	2	2	2	3	2.4
ManT-1	Protect Electric Substation #6 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-2	Protect Bender's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-3	Protect Blue Rock Ferry Site to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
ManT-4	Protect Charlestown Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-5	Protect Martin Chartier Commemorative Marker to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-6	Protect Frantz Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-7	Protect Christian and Susanna Herr Barn and House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-8	Protect Abraham Landis House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-9	Protect Maple Grove Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-10	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-11	Protect Stonerod's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-12	Protect Washington Boro Methodist Episcopal Church to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-13	Protect Jacob Witmer Sr. Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-14	Protect Amtrak/Conestoga Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-15	Protect J.S. Bear Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-16	Protect PPL Conestoga Kv Substation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-17	Protect Windom Mill Complex to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ManT-18	Staff within Manor Township could benefit from additional emergency management meetings and training to ensure emergency management concepts are practiced and understood.	3	3	3	3	2	2.8
ManT-19	Flooding occurs in the Township along the Susquehanna River. Improved flood water management system must be installed to reduce risk and impacts.	2	2	1	3	2	2
ManT-20	Flooding occurs in the Township along the Conestoga River. Improved flood control system must be installed to reduce risk and impacts.	2	2	1	3	2	2
MarB-1	Protect the Marietta Borough Building to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-2	Protect the Marietta Donegal Sewage Treatment Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-3	Protect the Marietta Fire Department station to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-4	Protect the Marietta-East Donegal Joint Authority WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-5	Protect the Susquehanna Valley EMS facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-6	Protect Wastewater Pump #53 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-7	Protect Joseph Bucher House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
MarB-8	Protect Donegal Furnace Ruins to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-9	Protect, B.F. Heistand and Co. Saw Mill Site to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-10	Protect Marietta Furnace No. 1 Ruins to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-11	Protect Vesta Furnace Site Complex to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarB-12	Protect Penn State Life Lion EMS to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-1	Protect Baumgardener's Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-2	Protect Colemanville Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-3	Protect Duncan Island to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-4	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-5	Protect Henry Hess House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-6	Protect Holtwood Power Plant to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MarT-7	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	3	3	1	1	0	1.9
MarT-8	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
MarT-9	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	3	3	1	2	2	2.3
MarT-10	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	3	3	1	1	0	1.9
MarT-11	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	3	3	3	3	0	3.0
MarT-12	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas:	3	3	1	0	2	2.0



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	<ol style="list-style-type: none"> <li>Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property.</li> <li>Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate.</li> <li>Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses.</li> <li>Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.</li> </ol>						
MarT-13	<p>The Township will conduct research into other avenues for water supplies and will consider the following strategies:</p> <ol style="list-style-type: none"> <li>Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement.</li> <li>Promoting the protection of watersheds and ensuring sustainable groundwater extraction.</li> <li>Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices and become more sustainable.</li> <li>Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts.</li> <li>Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.</li> </ol>	3	3	1	1	2	2.2
MarT-14	<p>The Township will engage with the Lancaster Conservancy to hold discussions on joint responsibility and assistance with the increase in call volumes, which has resulted in an up-tick of emergency responses on land owned by the Lancaster Conservancy. These discussions will lead to the writing and adoption of a Memorandum of Agreement or Memorandum of Understanding between the two entities which will outline the roles and responsibilities of each.</p>	3	2	2	1	1	1.9
MarT-15	<p>The Municipal Engineer will work with the Pennsylvania Power and Light Company to complete an engineering study of Holtwood SES Ash Basin No 2. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Power and Light Company will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.</p>	3	2	2	2	3	2.4
MillB-1	<p>Protect Wastewater Pump #179 to the 0.2% annual chance flood level.</p>	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
MillB-2	Identify capacity and needs for an emergency generator and transfer switch at the Fire Station. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.8
MillB-3	There is a large number of students and staff in the Borough at both Penn Manor High School and Millersville University, which are both critical facilities. The Borough will work with the School District and University to evaluate and develop evacuation and communication plans.	2	2	3	3	2	2.4
MillB-4	There is a large number of students in the Borough at both Penn Manor High School and Millersville University. It is likely these students experience mental health issues. The Borough will work with the School District and University to create plans with internal and external agencies to identify solutions on how to assist impacted students.	2	2	1	1	2	1.6
MJB-1	Conduct a detailed flood study of the Little Chiques Creek.	2	3	1	3	0	2.0
MJB-2	Modifications to the Borough Stormwater Detention Basin - increasing the volume of the basin by increasing the height of the berms and/or increasing the footprint of the basin and replacing a 45' long drainage swale with a pipe to prohibit stormwater from flowing over the swale berm.	1	1	1	3	2	1.5
MJB-3	The Borough Public Works has identified old and aging stormwater management systems that have issues and is prepared to make upgrades or cleanouts if funding is available. This would include replacing terracotta storm water pipes to prevent ruptures and cleaning out existing pipes.	3	3	1	2	2	2.3
MJB-4	Construct a Flood Wall around the Waste Water Treatment Plant to prevent flood waters from Little Chiques Creek from encroaching on the plant and causing a shutdown.	2	2	1	2	2	1.8
MJB-5	Install lining of sewer mains and maintenance holes to prevent inflow and infiltration of stormwater system wide	2	2	1	2	3	2
MJB-6	Design and construct a flood wall around the Waste Water Treatment Plant to prevent shutdown from flood waters of the Little Chiques Creek.	2	2	1	2	3	2
MJB-7	Replace aging terracotta sewer mains throughout the system to prevent ruptures during flooding events.	2	2	1	2	3	2
MJB-8	Reconstruct drinking water wells by installing casing to a lower depth to prevent stormwater infiltration.	2	2	1	2	3	2
MJB-9	Construct or enhance Flood Doors/Barriers on well houses and sewage pump stations to keep out flood water so the facility remains functional during flooding events.	2	2	1	2	3	2
MJB-10	Replace/Rehabilitate water filters to handle infiltrated storm water.	2	2	1	2	3	2
MJB-11	Streambank Restoration Project for the Little Chiques Creek Park. This is a 2.5-million-dollar project. Once completed it will address both flooding in the park and along some of the houses in the general area as well as stop the erosion of the streambanks.	2	2	1	2	3	2



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
MJB-12	Increase the Stormwater Capacity to the outfall to the Little Chiques and Donegal Creek’s watershed system wide.	2	2	1	2	3	2
MJB-13	Replace aging and failing corrugated metal storm pipe throughout the borough.	2	2	1	2	3	2
MJB-14	Improve and Upgrade the Locust Lane Storm Water Management Basin. Repair existing sink holes in the basing and increase function and capacity of the basin.	2	2	1	2	3	2
MJB-15	Improve and Upgrade the Pink Alley Storm Water Management Basin	2	2	1	2	3	2
MJB-16	Construct a new Stormwater Management Facility to prevent flooding of the Manheim St area.	2	2	1	2	3	2
MJB-17	Improve Stormwater management capacity in problem areas of the system.	2	2	1	2	3	2
MJB-18	Improve and Upgrade the Stormwater Management piping under the Amtrak railroad lines and pipes that drain into the Amtrak railroad cut in the borough.	2	2	1	2	3	2
MJB-19	Repair and prevent erosion from stormwater near the Barbara St Bridge spanning the Amtrak railroad cut.	2	2	1	2	3	2
MJB-20	Purchase two mobile generator units to power sewer or water facilities in the event of major power loss to maintain service to the borough.	3	2	3	3	3	2.8
MJT-1	Protect Wastewater Pump #84 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MJT-2	Raise Koser Road at the approach to the bridge over Conewago Creek.	2	2	1	3	1	1.8
MJT-3	Raise Prospect Road at the approach to the bridge over Conewago Creek.	2	2	1	3	1	1.8
MJT-4	Protect Martin Nissley House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MJT-5	Protect Risser’s Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
MJT-6	Investigate and implement additional security measures on the municipal complex.	3	3	1	0	2	2.0
MJT-7	Provide active shooter training to municipal staff.	3	2	1	0	1	1.6
MJT-8	Reassess snow evacuation routes and prepare better graphics and communication materials to the public and first responders.	2	2	1	0	1	1.4
MJT-9	Consolidate all winter weather resources at the municipal complex via a master planning process and construction. This will improve response time and efficiency in responding to forecasted and emergency winter weather events.	2	3	1	0	1	1.7
MVB-1	Work with EMC and borough manager/mayor to orient the new EMC to current projects and status of emergency items.	2	2	3	3	0	2.1



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
MVB-2	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	3	3	3	3	0	3.0
ParT-1	Protect the Paradise Township Sewer Authority WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-2	Protect Wastewater Pump #89 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-3	Protect Wastewater Pump #91 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-4	Protect Black Horse Amish Parochial School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-5	Protect the Sign of the Buck to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-6	Protect Eshelman Run Amish School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-7	Protect Jacob Eshleman II House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-8	Protect Leaman Place Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-9	Protect Osceola Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ParT-10	Protect LeFever Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PennT-1	Clear obstructions from the stormwater management system near the intersection of Fruitville Pike/New Charlotte Street and Main Street (PA-72).	3	2	1	3	2	2.2
PennT-2	Protect the Manheim Borough Authority WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PennT-3	Protect Wastewater Pump #199 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PennT-4	Protect Well #39 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
PennT-5	Update stormwater management regulations to make them more restrictive for new development.	2	3	1	3	0	2.0
PennT-6	Upgrade stormwater management infrastructure along White Oak Road south of Hamaker Road.	2	2	1	3	1	1.8
PennT-7	Upgrade stormwater management infrastructure at the intersection of Stiegel Valley Road and White Oak Road.	2	2	1	3	1	1.8
PennT-8	Protect Ferrellgas to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Peq-1	Protect Baumgardner's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Peq-2	Protect Daniel Good House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Peq-3	Protect Abraham and Sarah Hess Barn to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Peq-4	Protect A.B. Mylin House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
Peq-5	Protect Pequea Valley Hotel to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
Peq-6	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	3	3	1	1	0	1.9
Peq-7	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
Peq-8	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	3	3	1	2	2	2.3
Peq-9	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	3	3	1	1	0	1.9
Peq-10	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	3	3	3	3	0	3.0
Peq-11	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas: 1. Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property. 2. Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate. 3. Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. 4. Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.	3	3	1	0	2	2.0
Peq-12	The Township will conduct research into other avenues for water supplies and will consider the following strategies: 1. Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement. 2. Promoting the protection of watersheds and ensuring sustainable groundwater extraction.	3	3	1	1	2	2.2



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	3. Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices and become more sustainable. 4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts. 5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.						
QVB-1	The Municipal Building, a critical facility, houses the Borough Administrative Offices, Police Department, and Public Works Department. The building has no back-up power in order to support continuity of operations in the event of an emergency. An engineer scoped that the building would require a 102-kW generator, priced at \$55,000.	3	2	3	3	3	2.7
QVB-2	The culvert located on Broad Street at the intersection of Second Street is deteriorating due to heavy rains and erosion. The culvert, and guiderail which protects it, must be improved. An engineer estimated the cost of this project would be \$425,000.	3	3	1	2	2	2.3
RapT-1	Protect Wastewater Pump #55 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
RapT-2	Regularly clear obstructions from waterways.	2	2	1	3	0	1.7
RapT-3	Protect Kauffman's Distillery Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
RapT-4	Protect Peter and Elisabeth Lindemuth House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
RapT-5	Protect Pfoutz Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
RapT-6	Protect Peter and Mary Risser House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
RapT-7	Protect Schenck's Mill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
RapT-8	Protect Seigrist's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SadT-1	Mt. Vernon Road Runoff Retention Basins - Create two retention basins, redirect catch basin pipes, install a storm drain line, and extend approximately 1/3 mile to relieve runoff into the Christiana Borough watershed.	2	2	1	3	1	1.8
SadT-2	Protect Forge Ruins to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SadT-3	Protect Mercer's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SadT-4	Protect Sadsbury Twp Detention Pond 1 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SadT-5	Protect Woolen Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
SadT-6	Create a shoulder to catch water runoff. This runoff will be released into a culvert instead of puddling along Creek and Noble Roads. Work performed by Township Public Works Department.	3	2	1	1	2	1.9
SadT-7	Restore RT 41 Williams Run dam to its normal operating conditions by repairing damage to the pipe and dam embankment during dry conditions. A DEP Permit has been received. The Township will work with the company Land Studies to be sure the project is completed in a timely manner and in compliance with all agencies.	3	3	1	0	2	2.0
SalT-1	Protect Meadow Springs Amish School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SalT-2	Protect Millwood Kennel to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SalT-3	Protect New Miltown Roller Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
SalT-4	Protect Verdant Valley Amish School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasB-1	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasT-1	Protect Bowman's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasT-2	Protect Herr's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasT-3	Protect Lefever Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasT-4	Protect Lime Valley Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasT-5	Protect Neff's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
StrasT-6	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ULT-1	Protect Bushong Mill and House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ULT-2	Protect Pinetown Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ULT-3	Protect Stauffer's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ULT-4	Protect Worley and Obetz, Inc. to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ULT-5	Protect Center Square Amish School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
ULT-6	Protect H & E Sheibly House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-1	Protect Wastewater Pump #67 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-2	Protect Well #35 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-3	Replace the Lititz Run culvert under Lititz Run Road with one with a larger opening.	3	3	1	3	3	2.6
WarT-4	Protect Lititz Grist Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



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WarT-5	Protect Erb's Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-6	Protect Hess Lower to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-7	Protect Rothsville Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-8	Protect Marathon Gas Station to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-9	Protect Zook's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WarT-10	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	3	2	3	3	3	2.7
WarT-11	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	1.4	1.4	1.4	1.4	1.4	1.4
WarT-12	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	2	2	3	3	1	2.2
WCT-1	Expand intersection of Sandy Hill Road and Hillside Road.	2	2	2	3	0	1.9
WCT-2	Improve drainage at the culvert at Sportsman Road east of Hickory Road.	2	2	1	3	1	1.8
WCT-3	Increase length of Hackman Road bridge to provide more water to flow underneath it.	2	2	1	3	1	1.8
WCT-4	Increase length of Hickory Road bridge to provide more water to flow underneath it.	2	2	1	3	1	1.8
WCT-5	Increase length of Indiantown Road bridge to provide more water to flow underneath it.	2	2	1	3	1	1.8
WCT-6	Install backup power generators at two potable water wells.	3	3	1	3	3	2.6
WCT-7	Install stormwater management infrastructure along Blue Lake Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-8	Install stormwater management infrastructure along Girl Scout Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-9	Install stormwater management infrastructure along Mountain Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-10	Install stormwater management infrastructure along Netzley Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-11	Install stormwater management infrastructure along Sandy Hill Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-12	Install stormwater management infrastructure along Strickler Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-13	Install stormwater management infrastructure along White Hall Road to prevent downhill flooding.	3	3	1	3	1	2.3
WCT-14	Relocate the Wastewater Treatment Plant to a location outside the floodplain.	3	2	1	3	3	2.3
WCT-15	Renovate the stormwater management system in Reinholds.	2	2	1	3	0	1.7



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
WCT-16	Upgrade and clear obstructions in the drainage system at the Cocalico Creek at Hickory Road.	2	2	1	3	1	1.8
WCT-17	Upgrade the bridge on Sportsman Road over the Cocalico Creek to allow more water to flow underneath it.	2	2	1	3	1	1.8
WCT-18	Upgrade the drainage system at the Cocalico Creek at Pineview Drive and elevate the bridge approach.	2	2	1	3	1	1.8
WCT-19	Protect Binkley's Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WCT-20	Protect Windstream Reinholds Central Office to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WCT-21	The Municipal Engineer will work with Randy Shirk to complete an engineering study of Barnett Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Randy Shirk will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	3	2	2	2	3	2.4
WDT-1	Protect the Elizabethtown Regional Sewer Authority WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WDT-2	Protect Wastewater Pump #197 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WDT-3	The culvert on Miller Road near the Elizabethtown Regional Sewer Authority needs to be evaluated and improved as it may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	3	3	1	2	2	2.2
WET-1	Protect the West Earl Township Sewer Authority WWTP to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-2	Protect the West Earl Township Water Authority facility to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-3	Protect Wastewater Pump #184 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-4	Protect Bitzer's Mill Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-5	Protect Cooper Shop at Brownstown Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-6	Protect Eberlys Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-7	Protect Riverview School to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-8	Protect Widow Wenger's House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-9	Protect American LaFrance, LLC to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-10	Protect Jacob Wolf House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-11	Protect Martin-Bitzer House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
WET-12	Protect Marx and Fronic Groff Farmstead to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-13	Protect Samuel Good House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-14	Protect Smeal LTC, LLC. to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WET-15	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Township employees to work remotely if needed.	3	2	3	2	2	2.4
WET-16	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	3	3	2	1	1	2.2
WET-17	Evaluate flood mitigation measures, including property acquisitions and flood walls, at the trailer park to reduce, or remove, the risk of flooding.	3	2	1	2	1	1.9
WHT-1	Protect Chickies Lock to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-2	Protect Forrey's Mill Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-3	Protect S.S. Haldeman Mansion site to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-4	Protect Lancaster Area Sewer Auth - Farmdale Pump Station to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-5	Protect Pedant-Grube Farmhouse (Garber Farm) to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-6	Protect Columbia Water Co Chickies Well to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-7	Protect Henry Clay Furnace Ruins to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-8	Protect Chickies Silica Stone Crusher to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WHT-9	Work with EMC and Township manager/mayor to orient the new EMC to current projects and status of emergency items.	2	2	3	3	0	2.1
WHT-10	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	3	3	3	3	0	3.0
WLT-1	Improve drainage along Eckman Road.	2	2	1	3	1	1.8
WLT-2	Improve stormwater management along Gypsy Hill Road, including installing a culvert to discharge water away from homes.	2	2	1	3	1	1.8
WLT-3	Improve stormwater management along Hollinger Road.	2	2	1	3	1	1.8
WLT-4	McFalls Property Stormwater Management - reclaim the area as a stream.	3	2	1	3	0	1.9
WLT-5	Protect Potable Pump #100 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
WLT-6	Protect Potable Pump #61 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-7	Protect Wastewater Pump #21 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-8	Retention Pond - Construct retention ponds to protect properties along Hollinger Road.	2	1	1	3	0	1.4
WLT-9	Protect Colonial Metals Company to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-10	Protect Extrusion Division to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-11	Protect Herr or Graff House and Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-12	Protect George and Susanna Lefevre Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-13	Protect Lime Valley Covered Bridge to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-14	Protect Mill Creek Bridge #8 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-15	Protect Eckman Mill to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-16	Protect Reservoir #17 to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-17	Protect Henry K. Stoner House to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
WLT-18	Protect Mill Creek Pump Station to the 0.2% annual chance flood level.	3	3	1	3	3	2.6
BWA-1	Update the Authority’s emergency response plan.	3	2	3	3	1	2.4
BWA-2	Explore the needs to purchase and install a three-phased emergency generator.	3	2	3	3	3	2.7
BWA-3	Institute mandate for employees driving company vehicles to supply proof of insurance.	2	1	1	2	0	1.2
BWA-4	Investigate new platforms of communication to support public outreach. Additionally, identify and advertise methods of communication for the public to contact the Authority.	3	2	2	2	2	2.2
CSD-1	Work with local experts to develop training opportunities for staff that align with the district’s EOP.	3	3	3	2	3	2.8
CSD-2	Work with emergency management to secure supplies as necessary if a prolonged stay is required due to an inability to relocate to another site with better/more equipped resources and facilities.	3	2	3	2	3	2.5
CBSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
CVSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
ECTA-1	Most ECTA customer meters are read on a quarterly basis using drive-by “radio read” technology. A fixed-base metering system with remote read technology would create a more efficient reading and	3	3	1	1	2	2.2



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
	notification system in which ECTA would have real-time notification of excess water use or meter failure that would increase the speed at which ECTA can respond. The response would include faster customer communication and enforcement during severe drought or other water shortage emergency. Cost = \$1,300,000, including installation, for ECTA’s full system. ECTA plans to begin replacements, as needed, in a phased approach in 2025.						
ECTA-2	Purchase of an additional backup power source would give ECTA the capability to power two groundwater wells and the ability to better meet demand, in the event of a widespread power outage. A generator meeting the following specifications would be appropriately sized to power any well in ECTA’s system: <ul style="list-style-type: none"> <li>• 3-phase</li> <li>• 208/480 V</li> <li>• 110 kW</li> <li>• 300A/150A</li> </ul> Based on a recent purchase of similar scope, cost = \$100,000, including trailer to mobilize the generator.	3	2	3	3	3	2.7
ECTA-3	ECTA neighbors three other municipal water systems. An emergency interconnect with any of these three systems, would provide ECTA the ability to continue serving its customers while working towards bringing a well source back online. Cost = \$1,000,000.	2	2	3	2	2	2.2
ECTA-4	If a groundwater well is classified as GUDI, a treatment upgrade is required including more advanced filtering and disinfection. Most of ECTA’s well sources would also require facility expansion to make room for the upgraded treatment. Cost would be dependent on the source well capacity, but a recent comparable upgrade is estimated at \$3,000,000.	3	2	1	2	2	2.0
ETASD-1	Searching the student management system for the past three school years, student discipline for illicit substance/vaping violations is on the rise. Over the past two years the School District has called 911 three times for students experiencing medical issues suspected to be caused due to vaping illicit substances. Install vape detectors in the High School and Middle School sixteen restrooms. With a cost of about \$4000 per unit, the total cost would be about \$64,000.	2	2	1	0	1	1.4
EASD-1	Students are experiencing higher levels of mental illness in the community. The School District will contribute to address mental health concerns by increasing support through reporting systems, school counseling availability, family referral to outside support, and access to outside counseling during school hours and on school property.	3	3	1	0	1	1.9
EASD-2	With the ongoing and anticipate increase in cyber incidents, including data infiltration, data corruption, and ransomware, the District will seek various methods to improve and update its technology security through network segmentation, multi-factor authorization, limited account privileges, and remote data back-ups.	3	2	1	1	2	1.9



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
HSD-1	Ensure runoff during construction at the High School at the Landisville Campus is monitored to reduce water runoff issues, including erosion. Locations which could be impacted include the high school campus, nearby parking lots, and the baseball fields.	3	3	0	2	3	2.2
HSD-2	Evaluate if the high school and administrative buildings need protective measures to reduce flooding impacts. Once evaluated, implement the identified measure(s).	3	3	0	2	3	2.2
LSSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
LASA-1	The Emergency Response Plan is in need of an update. The previous edition of the plan was completed in 2020, and the format is outdated. Assess whether LASA has the capabilities to complete this plan update on its own. If not, research various funding streams, including the BRIC, HMGP, EMPG, and HSPG grants to provide assistance in completing and update of the Emergency Response Plan.	3	2	3	3	1	2.4
LASA-2	LASA will work with its engineers (internal or contracted) to determine the required load capacity of an emergency generator for its administrative building, located at 130 Centerville Road, Lancaster PA 17603. Once determined, LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical facility can maintain its operations should an emergency or incident occur.	3	2	3	3	3	2.7
LASA-3	LASA has completed a study to identify the required load capacity of a generator to be installed at the pump station located at 2705 Charlestown Road, Lancaster PA 17603. LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical piece of infrastructure maintains operability should an emergency or incident occur.	3	2	3	3	3	2.7
LASA-4	LASA will work with engineers, internal or contracted, to assess the feasibility of elevating or relocating it various pump stations from flood-prone locations. These pump stations frequently experience flooding conditions from the many waterways and waterbodies in Lancaster County. Elevating or relocating the pump stations will mitigate flood risk and prevent the utility from being interrupted. The identified pumpstations are located at: <ul style="list-style-type: none"> <li>• Blue Rock 1-324 Blue Rock Rd. Washington Boro PA 17582</li> <li>• Holland Hills- 204 Donnerville Rd Lancaster PA 17603</li> <li>• Silver Spring- 830 Silver Spring Rd Silver Spring PA 17575</li> <li>• Elizabeth Street- 8 Elizabeth St, Washington Boro PA 17582</li> <li>• River Road-1850 Water Street Washington Boro PA 17582</li> <li>• Eden Road- 1891 Eden Rd, Lancaster PA 17601</li> <li>• Pleasure Road- 1401 Pleasure Rd Lancaster PA 17601</li> </ul>	3	2	1	2	3	2.2



Initiative	Mitigation Action	Effectiveness	Efficiency	Multi-Hazard Mitigation	Addresses High-Risk Hazard	Addresses Critical Communications/ Critical Infrastructure	Priority
LASA-5	LASA has not created a professional-styled video for outreach, recruitment, and highlighting the organization’s mission and operations. LASA is committed to superior wastewater management to protect the community, public health, and the environment. Its goals align with environmental protection and stewardship. The creation of this video will educate viewers on how LASA assists in mitigation efforts through its wastewater management practices. LASA will research professional film companies to assist in the production of a video dedicated to conducting outreach, recruitment, and highlighting the organization’s mission and operations.	3	3	3	3	0	3.0
LCCD-1	The district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
LSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
LLIU-1	The agency will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
PMSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
SSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3
WSD-1	Sinkholes have previously formed within the grounds of the Warwick School District. Continue monitoring the property owned by the School District for any signs of sinkhole formation or activity.	2	2	1	0	1	1.4
WSH-1	The system will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	3	3	3	3	3	3



The actions in Table 6-7 are listed in order of priority. Implementation of any of the actions will have benefits outweighing the costs (i.e., the benefit-cost ratio would be greater than 1).

**Table 6-7. Prioritized Mitigation Actions**

Mitigation Action		Priority
<b>High Priority</b>		
CBSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
CVSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
LSSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
LCCD-1	The district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
LSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
LLIU-1	The agency will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
PMSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
SSD-1	The school district will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
WSH-1	The system will work with county or local officials to ensure staff and employees are educated on hazard types and associated risks.	High
LC-27	Build and foster relationships between the County Commissioners office, the County Communications Director and local news media. Increase awareness and training to manage mis information in all forms that have the potential to result in civil unrest.	High
LC-35	There is an insufficient amount of data surrounding dam inundation and the resulting flooding within the County. The County will conduct dam inundation modeling in high-risk areas, prioritizing those dams and their downstream areas that are classified as a high or significant hazard.	High
ColB-4	During future updates of Borough ordinances, regulations, plans, codes, and other planning and regulatory capabilities, the Borough will integrate hazard mitigation principles.	High
ManT-18	Staff within Manor Township could benefit from additional emergency management meetings and training to ensure emergency management concepts are practiced and understood.	High
MillB-2	Identify capacity and needs for an emergency generator and transfer switch at the Fire Station. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
CSD-1	Work with local experts to develop training opportunities for staff that align with the district's EOP.	High
MJB-20	Purchase two mobile generator units to power sewer or water facilities in the event of major power loss to maintain service to the borough.	High
CaeT-8	The Fire Company, Township Building, and Township Garage do not have back-up generators to maintain continuity of operations during an emergency event. The Public Works Superintendent will work alongside the jurisdictional engineer to identify the necessary capacity for each emergency generator. Once identified, Public Works will have the emergency generators installed at each facility. Public Works will be responsible for maintaining the emergency generator.	High
ColB-1	Install a backup generator that can power the entire Municipal Building.	High
ColB-5	Install a backup generator that can power each school district assembly area.	High
DenB-8	Identify capacity and needs for emergency generators at the Municipal Building, Public Works, and Well #4. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
EarIT-9	The township office manager and roadmaster will coordinate with the township engineer to assess the power needs of each building to determine the appropriate generator size. The generator will be installed at the Township and Road Maintenance buildings. The Road Maintenance Department will be responsible for the ongoing maintenance and testing of the generators, ensuring they are fully operational when needed.	High



Mitigation Action		Priority
EarIT-12	The Township will evaluate options for elevating or floodproofing critical buildings to prevent damage during floods. Infrastructure such as water treatment plants, and sewer systems will be hardened with flood barriers and fire-resistant materials, especially in areas prone to wildfires and flooding. Additionally, key transportation routes will be upgraded with improved drainage systems to ensure accessibility during emergencies. Backup power systems, such as generators, will be installed to maintain service during utility interruptions. Collaboration with utility companies will also focus on improving gas pipeline safety to prevent damage during extreme weather or seismic events. These measures will enhance the resilience of the Township's infrastructure, ensuring that essential services continue before, during, and after hazard events.	High
ECT-13	Identify capacity and needs for emergency generators at the Public Works facility. Apply for grants and appropriate funding where possible. After purchase, install, and maintain the generator. Identify additional critical facilities in the Township in need of back-up power to maintain operations.	High
EPB-5	Identify capacity and needs for emergency generators and transfer switches at the DPW Maintenance Shop and City Interconnect. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
EdT-2	Move the existing EOC (489 Stony Hill Road) to the new state-of-the-art municipal building. The new building will feature an Emergency Operations Center (EOC), a backup generator, and incorporate comprehensive upgrades, including ADA-compliant accessibility, advanced electrical and HVAC systems, and cutting-edge technology infrastructure. Additionally, the project will integrate sustainable stormwater management solutions, such as a green parking lot and vegetated bioswales, to reduce runoff and support environmental sustainability.	High
ElizT-4	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
LancC-14	Identify capacity and needs an emergency generator at the Lancaster Advanced Wastewater Treatment Plant (AAWTP). Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
LeaT-7	Identify capacity and needs for emergency generators and transfer switches at the pump stations throughout the Township. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
LitB-9	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
MarT-8	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
Peq-7	Identify capacity and needs for an emergency generator and transfer switch at the Township Building. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
QVB-1	The Municipal Building, a critical facility, houses the Borough Administrative Offices, Police Department, and Public Works Department. The building has no back-up power in order to support continuity of operations in the event of an emergency. An engineer scoped that the building would require a 102-kW generator, priced at \$55,000.	High
WarT-10	Identify capacity and needs for emergency generators and transfer switches at the Water Treatment Plant and Wastewater Treatment Plant. Apply for grants and appropriate funding where possible. After purchase, install and maintain generators.	High
BWA-2	Explore the needs to purchase and install a three-phased emergency generator.	High
ECTA-2	Purchase of an additional backup power source would give ECTA the capability to power two groundwater wells and the ability to better meet demand, in the event of a widespread power outage. A generator meeting the following specifications would be appropriately sized to power any well in ECTA's system: <ul style="list-style-type: none"> <li>• 3-phase</li> <li>• 208/480 V</li> <li>• 110 kW</li> <li>• 300A/150A</li> </ul>	High



Mitigation Action		Priority
	Based on a recent purchase of similar scope, cost = \$100,000, including trailer to mobilize the generator.	
LASA-2	LASA will work with its engineers (internal or contracted) to determine the required load capacity of an emergency generator for its administrative building, located at 130 Centerville Road, Lancaster PA 17603. Once determined, LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical facility can maintain its operations should an emergency or incident occur.	High
LASA-3	LASA has completed a study to identify the required load capacity of a generator to be installed at the pump station located at 2705 Charlestown Road, Lancaster PA 17603. LASA will install the generator with assistance from a contractor if required. This generator will ensure the critical piece of infrastructure maintains operability should an emergency or incident occur.	High
LC-21	Build and foster relationships with community leaders within Lancaster County.	High
LC-37	The County will encourage local jurisdictions, during future reviews and revisions of local codes and ordinances, to integrate hazard mitigation principles and use available tools and resources from FEMA and other sources to integrate climate adaptation planning, to strengthen their regulatory capabilities and set higher standards to reduce hazard risk.	High
LC-24	Expand the use of translation services in the County to improve and build relationships with diverse community groups.	High
LC-25	Better facilitate cultural integration into planning and exercises.	High
ColB-6	Seek funding opportunities to train staff and community leaders on how to apply for grants, general emergency resources, and where equipment can be purchased from.	High
DenB-12	Develop partnerships with County, State, and Non-profit partners to ensure resources and connections are made to quickly mobilize in the event of a large-scale event or incident.	High
AkB-1	Protect Wastewater Pump #126 to the 0.2% annual chance flood level.	High
BaT-1	Protect Jackson's Mill Covered Bridge to the 0.2% annual chance flood level.	High
BaT-2	Protect Willow Mill to the 0.2% annual chance flood level.	High
BrkT-1	Protect the Northern Lancaster County Authority facility to the 0.2% annual chance flood level.	High
BrkT-2	Protect Well #7 to the 0.2% annual chance flood level.	High
BrkT-3	Protect Good's Mill to the 0.2% annual chance flood level.	High
BrkT-4	Protect Oberholtzer's Mill to the 0.2% annual chance flood level.	High
BrkT-5	Protect Red Run Covered Bridge to the 0.2% annual chance flood level.	High
CaeT-3	Protect Conestoga Dam to the 0.2% annual chance flood level.	High
CaeT-4	Protect Pool Forge Bridge to the 0.2% annual chance flood level.	High
CaeT-5	Protect Shearer's Mill Covered Bridge to the 0.2% annual chance flood level.	High
CaeT-6	Protect Weaver's Mill Covered Bridge to the 0.2% annual chance flood level.	High
CaeT-7	Protect Willima Witman House to the 0.2% annual chance flood level.	High
ClyT-1	Protect Clay Roller Mill to the 0.2% annual chance flood level.	High
ClyT-2	Protect Snyder Mill to the 0.2% annual chance flood level.	High
ClyT-3	Protect Lincoln Mill to the 0.2% annual chance flood level.	High
ClyT-4	Protect Middle Creek Dam to the 0.2% annual chance flood level.	High
ClyT-5	Protect Hiram Erb House to the 0.2% annual chance flood level.	High
ColT-1	Protect White Rock Forge Bridge to the 0.2% annual chance flood level.	High
ColB-2	Protect Robert Barber House to the 0.2% annual chance flood level.	High
ColB-3	Protect Old Columbia-Wrightsville Bridge to the 0.2% annual chance flood level.	High
ConT-1	Protect the Big and Little Indian Rock to the 0.2% annual chance flood level.	High
ConT-2	Protect the Colemanville Bridge to the 0.2% annual chance flood level.	High
ConT-3	Protect the Conestoga Canal Lock to the 0.2% annual chance flood level.	High
ConT-4	Protect the Safe Harbor Iron Works Site to the 0.2% annual chance flood level.	High
ConT-5	Protect the Rock Hill Tavern to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
ConT-6	Protect the Daniel and Elizabeth Good Mill to the 0.2% annual chance flood level.	High
ConT-7	Protect the Benjamin and Susanna Old Slaymaker Lodge/Yordy to the 0.2% annual chance flood level.	High
CnyT-1	Protect the Brenneman Mill to the 0.2% annual chance flood level.	High
DenB-2	Protect Filtration #3 to the 0.2% annual chance flood level.	High
DenB-3	Protect the Eberly Dam to the 0.2% annual chance flood level.	High
DenB-4	Protect the Henry Schein Facility to the 0.2% annual chance flood level.	High
DenB-5	Protect the Kalas Manufacturing Facility to the 0.2% annual chance flood level.	High
DenB-6	Protect Ryder Transportation to the 0.2% annual chance flood level.	High
DruT-1	Protect the Muddy Run Power Plant to the 0.2% annual chance flood level.	High
DruT-2	Protect the Muddy Run Dam to the 0.2% annual chance flood level.	High
DruT-3	Protect the Drumore Mill to the 0.2% annual chance flood level.	High
EarIT-1	Relocate businesses along US-322 west of Martindale Road.	High
EarIT-2	Protect the Conestoga Bridge No. 5 to the 0.2% annual chance flood level.	High
EarIT-3	Protect the Conestoga Creek Bridge No. 6 to the 0.2% annual chance flood level.	High
EarIT-4	Protect the White Oak Ice Co. to the 0.2% annual chance flood level.	High
EarIT-5	Protect the Adam Schreiner House to the 0.2% annual chance flood level.	High
ECT-1	Protect the District Justice Office 1 to the 0.2% annual chance flood level.	High
ECT-2	Protect the Reamstown EMS facility to the 0.2% annual chance flood level.	High
ECT-3	Protect Well #8 to the 0.2% annual chance flood level.	High
ECT-10	Protect the Bucher's Mill Covered Bridge facility to the 0.2% annual chance flood level.	High
ECT-11	Protect the Leshner Knitting Mill facility to the 0.2% annual chance flood level.	High
EDT-1	Protect the Share's Mill Complex to the 0.2% annual chance flood level.	High
EDT-2	Protect AT&T Cable Substation to the 0.2% annual chance flood level.	High
EDT-3	Protect Well #33 to the 0.2% annual chance flood level.	High
EDT-4	Protect Well #79 to the 0.2% annual chance flood level.	High
EDT-5	Protect Donegal Mill to the 0.2% annual chance flood level.	High
EET-4	Protect Conestoga Bridge No. 4 to the 0.2% annual chance flood level.	High
EET-5	Protect the Elliot Tract House to the 0.2% annual chance flood level.	High
EET-6	Protect the Frogtown/Goodville Mill to the 0.2% annual chance flood level.	High
EET-7	Protect the Roller Mill to the 0.2% annual chance flood level.	High
EET-8	Protect the Christian Weaver House to the 0.2% annual chance flood level.	High
EET-9	Protect the Francis Weaver House to the 0.2% annual chance flood level.	High
EET-10	Protect the Henry Martin House to the 0.2% annual chance flood level.	High
EET-11	Protect the Oberholtzer Mill to the 0.2% annual chance flood level.	High
EHT-6	Protect Brubaker Run Detention to the 0.2% annual chance flood level.	High
EHT-7	Protect Chickies Roller Mill to the 0.2% annual chance flood level.	High
EHT-8	Protect Landis Mill Bridge to the 0.2% annual chance flood level.	High
EHT-9	Protect Benjamin Musser House to the 0.2% annual chance flood level.	High
EHT-10	Protect Shenk House to the 0.2% annual chance flood level.	High
ELT-11	Protect Lancaster Mennonite High School to the 0.2% annual chance flood level.	High
ELT-12	Protect Wastewater Pump #97 to the 0.2% annual chance flood level.	High
ELT-13	Protect Wastewater Pump #98 to the 0.2% annual chance flood level.	High
ELT-21	Protect Binkley or Graff Mill to the 0.2% annual chance flood level.	High
ELT-22	Protect Donnelley Financial Solutions to the 0.2% annual chance flood level.	High
ELT-23	Protect Engineered Valves, LLC to the 0.2% annual chance flood level.	High
ELT-24	Protect Gibbons Mill to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
ELT-25	Protect J. Walter Miller Company to the 0.2% annual chance flood level.	High
ELT-26	Protect J.L. Clark, LLC to the 0.2% annual chance flood level.	High
ELT-27	Protect Lancaster Terminal to the 0.2% annual chance flood level.	High
ELT-28	Protect Shober's Paper Mill to the 0.2% annual chance flood level.	High
ELT-29	Protect USPS Postal Service Lancaster to the 0.2% annual chance flood level.	High
ELT-30	Protect Willow Hill Bridge to the 0.2% annual chance flood level.	High
EPB-1	Protect Filtration #5 to the 0.2% annual chance flood level.	High
EdT-1	Protect Pennsylvania Railroad Tunnel to the 0.2% annual chance flood level.	High
ElizT-2	Protect Grube, Martin and Eliza Mill to the 0.2% annual chance flood level.	High
ElizT-3	Protect Hammer Creek Bridge to the 0.2% annual chance flood level.	High
ElizB-1	Protect Reservoir #6 to the 0.2% annual chance flood level.	High
EphB-1	Protect Electric Substation #31 to the 0.2% annual chance flood level.	High
EphB-2	Protect Ephrata Boro WWTP #1 to the 0.2% annual chance flood level.	High
EphB-3	Protect Ephrata EMS to the 0.2% annual chance flood level.	High
EphB-4	Protect the Ephrata Borough Sewer Authority WWTP to the 0.2% annual chance flood level.	High
EphB-5	Protect Wastewater Pump #176 to the 0.2% annual chance flood level.	High
EphB-6	Protect Wastewater Pump #177 to the 0.2% annual chance flood level.	High
EphB-7	Protect Wastewater Pump #77 to the 0.2% annual chance flood level.	High
EphB-8	Protect Well #4 to the 0.2% annual chance flood level.	High
EphB-9	Protect Keller's Mill Bridge to the 0.2% annual chance flood level.	High
EphB-10	Protect Reservoir #11 to the 0.2% annual chance flood level.	High
EphB-11	Protect Terre Hill Composites, Inc. to the 0.2% annual chance flood level.	High
EphB-12	Protect Wastewater Pump #120 to the 0.2% annual chance flood level.	High
EphB-13	Protect Daniel Bauman House to the 0.2% annual chance flood level.	High
EphB-14	Protect Ephrata EMS to the 0.2% annual chance flood level.	High
EphB-15	Protect Well #44 to the 0.2% annual chance flood level.	High
EphB-16	Protect Family Medicine of Ephrata to the 0.2% annual chance flood level.	High
EphB-17	Protect Wellspan Family Medicine to the 0.2% annual chance flood level.	High
EphB-18	Protect Dunkelberger Osteopath, LTD to the 0.2% annual chance flood level.	High
EphT-2	Protect the Ludwig Bloom House to the 0.2% annual chance flood level.	High
EphT-3	Protect Bushongsor Shreiner's Mill to the 0.2% annual chance flood level.	High
EphT-4	Protect Cocalico Creek Bridge to the 0.2% annual chance flood level.	High
EphT-5	Protect Jacob Keller Mill to the 0.2% annual chance flood level.	High
EphT-6	Protect Samuel Keller House to the 0.2% annual chance flood level.	High
EphT-7	Protect Keller's Mill Covered Bridge to the 0.2% annual chance flood level.	High
EphT-8	Protect Peter and Catherine Reyer Farmhouse to the 0.2% annual chance flood level.	High
EphT-9	Protect Hinkle Tavern, Winters Hotel to the 0.2% annual chance flood level.	High
EphT-10	Protect Landis House to the 0.2% annual chance flood level.	High
Ful-1	Protect Peach Bottom Marina to the 0.2% annual chance flood level.	High
LancC-1	Protect Potable Pump #79 to the 0.2% annual chance flood level.	High
LancC-2	Protect Potable Pump #98 to the 0.2% annual chance flood level.	High
LancC-3	Protect Tank #7 to the 0.2% annual chance flood level.	High
LancC-4	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	High
LancC-5	Protect Engle Printing and Publishing to the 0.2% annual chance flood level.	High
LancC-6	Protect High Steel Service Center to the 0.2% annual chance flood level.	High
LancC-7	Protect Kurtz's Mill Bridge to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
LancC-8	Protect Pennsylvania Railroad Bridge to the 0.2% annual chance flood level.	High
LancC-9	Protect Lancaster City Conestoga Filter Plant to the 0.2% annual chance flood level.	High
LancC-10	Protect Lancaster City Water to the 0.2% annual chance flood level.	High
LancC-11	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	High
LancT-1	Protect the Lancaster City Advanced WWTP to the 0.2% annual chance flood level.	High
LancT-2	Protect Wastewater Pump #136 to the 0.2% annual chance flood level.	High
LancT-3	Protect Wastewater Pump #148 to the 0.2% annual chance flood level.	High
LancT-4	Protect Wastewater Pump #168 to the 0.2% annual chance flood level.	High
LancT-5	Protect Wastewater Pump #169 to the 0.2% annual chance flood level.	High
LancT-6	Protect Evoqua Water Technologies LLC to the 0.2% annual chance flood level.	High
LancT-7	Protect Jacob Miller House to the 0.2% annual chance flood level.	High
LancT-8	Protect Witmer's Tavern to the 0.2% annual chance flood level.	High
LancT-9	Protect Conrad Miller House to the 0.2% annual chance flood level.	High
LeaT-1	Protect Wastewater Pump #27 to the 0.2% annual chance flood level.	High
LeaT-2	Protect Leaman's Place Bridge to the 0.2% annual chance flood level.	High
LeaT-3	Protect Mill Creek Flour Mill to the 0.2% annual chance flood level.	High
LeaT-4	Protect North American Pipe Corporation to the 0.2% annual chance flood level.	High
LeaT-5	Protect Spread Eagle Tavern to the 0.2% annual chance flood level.	High
LitB-1	Protect the Warwick EMS facility to the 0.2% annual chance flood level.	High
LitB-2	Protect Wastewater Pump #72 to the 0.2% annual chance flood level.	High
LitB-3	Protect Well #74 to the 0.2% annual chance flood level.	High
LitB-4	Protect Well #75 to the 0.2% annual chance flood level.	High
LitB-5	Protect Versatek to the 0.2% annual chance flood level.	High
LitB-6	Protect Woodstream Corporation to the 0.2% annual chance flood level.	High
LitB-7	Protect LG Health Cedar to the 0.2% annual chance flood level.	High
LitB-8	Protect Lititz Academy of Music to the 0.2% annual chance flood level.	High
LitT-1	Protect Abbotts Creamery to the 0.2% annual chance flood level.	High
LitT-2	Protect Pine Grove Bridge to the 0.2% annual chance flood level.	High
LitT-3	Protect Octoraro Treatment Plant to the 0.2% annual chance flood level.	High
ManhB-1	Protect Electric Substation #42 to the 0.2% annual chance flood level.	High
ManhB-2	Protect Potable Pump #101 to the 0.2% annual chance flood level.	High
ManhB-3	Protect the Manheim FD station to the 0.2% annual chance flood level.	High
ManhB-4	Protect Wastewater Pump #200 to the 0.2% annual chance flood level.	High
ManhB-5	Protect Well #57 to the 0.2% annual chance flood level.	High
ManhB-6	Protect Well #58 to the 0.2% annual chance flood level.	High
ManhB-7	Protect Shearer's Bridge to the 0.2% annual chance flood level.	High
ManhB-8	Protect F L Smidth, Inc. to the 0.2% annual chance flood level.	High
ManhB-9	Protect Manheim Borough 2W Polling Station to the 0.2% annual chance flood level.	High
ManhT-1	Protect District Justice Office 13 to the 0.2% annual chance flood level.	High
ManhT-2	Protect Wastewater Pump #143 to the 0.2% annual chance flood level.	High
ManhT-3	Protect Wastewater Pump #166 to the 0.2% annual chance flood level.	High
ManhT-4	Protect Wastewater Pump #167 to the 0.2% annual chance flood level.	High
ManhT-7	Protect Brubaker House to the 0.2% annual chance flood level.	High
ManhT-8	Protect Buckbee Hearing Aid Center to the 0.2% annual chance flood level.	High
ManhT-9	Protect Hunsecker's Mill Bridge to the 0.2% annual chance flood level.	High
ManhT-10	Protect Iron Stone Mill to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
ManhT-11	Protect Flory's Mill to the 0.2% annual chance flood level.	High
ManhT-12	Protect Landis Mill Covered Bridge to the 0.2% annual chance flood level.	High
ManhT-13	Protect Mount Joy Hatchery to the 0.2% annual chance flood level.	High
ManhT-14	Protect Philip Rudisil House to the 0.2% annual chance flood level.	High
ManhT-15	Protect John Brubaker Barn to the 0.2% annual chance flood level.	High
ManhT-16	Protect M. Groff House to the 0.2% annual chance flood level.	High
ManhT-17	Protect Christian L. Hunsecker House to the 0.2% annual chance flood level.	High
ManhT-18	Protect Samuel Hunsicker House to the 0.2% annual chance flood level.	High
ManhT-19	Protect Oregon (Withers) Mill to the 0.2% annual chance flood level.	High
ManhT-20	Protect Rudisill Family Cemetery to the 0.2% annual chance flood level.	High
ManhT-21	Protect Abraham Shenk House to the 0.2% annual chance flood level.	High
ManhT-22	Protect Christian Zook House to the 0.2% annual chance flood level.	High
ManT-1	Protect Electric Substation #6 to the 0.2% annual chance flood level.	High
ManT-2	Protect Bender's Mill to the 0.2% annual chance flood level.	High
ManT-3	Protect Blue Rock Ferry Site to the 0.2% annual chance flood level.	High
ManT-4	Protect Charlestown Plant to the 0.2% annual chance flood level.	High
ManT-5	Protect Martin Chartier Commemorative Marker to the 0.2% annual chance flood level.	High
ManT-6	Protect Frantz Mill to the 0.2% annual chance flood level.	High
ManT-7	Protect Christian and Susanna Herr Barn and House to the 0.2% annual chance flood level.	High
ManT-8	Protect Abraham Landis House to the 0.2% annual chance flood level.	High
ManT-9	Protect Maple Grove Mill to the 0.2% annual chance flood level.	High
ManT-10	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	High
ManT-11	Protect Stoneroad's Mill to the 0.2% annual chance flood level.	High
ManT-12	Protect Washington Boro Methodist Episcopal Church to the 0.2% annual chance flood level.	High
ManT-13	Protect Jacob Witmer Sr. Mill to the 0.2% annual chance flood level.	High
ManT-14	Protect Amtrak/Conestoga Substation to the 0.2% annual chance flood level.	High
ManT-15	Protect J.S. Bear Mill to the 0.2% annual chance flood level.	High
ManT-16	Protect PPL Conestoga Kv Substation to the 0.2% annual chance flood level.	High
ManT-17	Protect Windom Mill Complex to the 0.2% annual chance flood level.	High
MarB-1	Protect the Marietta Borough Building to the 0.2% annual chance flood level.	High
MarB-2	Protect the Marietta Donegal Sewage Treatment Plant to the 0.2% annual chance flood level.	High
MarB-3	Protect the Marietta Fire Department station to the 0.2% annual chance flood level.	High
MarB-4	Protect the Marietta-East Donegal Joint Authority WWTP to the 0.2% annual chance flood level.	High
MarB-5	Protect the Susquehanna Valley EMS facility to the 0.2% annual chance flood level.	High
MarB-6	Protect Wastewater Pump #53 to the 0.2% annual chance flood level.	High
MarB-7	Protect Joseph Bucher House to the 0.2% annual chance flood level.	High
MarB-8	Protect Donegal Furnace Ruins to the 0.2% annual chance flood level.	High
MarB-9	Protect, B.F. Heistand and Co. Saw Mill Site to the 0.2% annual chance flood level.	High
MarB-10	Protect Marietta Furnace No. 1 Ruins to the 0.2% annual chance flood level.	High
MarB-11	Protect Vesta Furnace Site Complex to the 0.2% annual chance flood level.	High
MarB-12	Protect Penn State Life Lion EMS to the 0.2% annual chance flood level.	High
MarT-1	Protect Baumgardener's Bridge to the 0.2% annual chance flood level.	High
MarT-2	Protect Colemanville Covered Bridge to the 0.2% annual chance flood level.	High
MarT-3	Protect Duncan Island to the 0.2% annual chance flood level.	High
MarT-4	Protect Safe Harbor Water Power Corporation to the 0.2% annual chance flood level.	High
MarT-5	Protect Henry Hess House to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
MarT-6	Protect Holtwood Power Plant to the 0.2% annual chance flood level.	High
MillB-1	Protect Wastewater Pump #179 to the 0.2% annual chance flood level.	High
MJT-1	Protect Wastewater Pump #84 to the 0.2% annual chance flood level.	High
MJT-4	Protect Martin Nissley House to the 0.2% annual chance flood level.	High
MJT-5	Protect Risser's Mill Covered Bridge to the 0.2% annual chance flood level.	High
ParT-1	Protect the Paradise Township Sewer Authority WWTP to the 0.2% annual chance flood level.	High
ParT-2	Protect Wastewater Pump #89 to the 0.2% annual chance flood level.	High
ParT-3	Protect Wastewater Pump #91 to the 0.2% annual chance flood level.	High
ParT-4	Protect Black Horse Amish Parochial School to the 0.2% annual chance flood level.	High
ParT-5	Protect the Sign of the Buck to the 0.2% annual chance flood level.	High
ParT-6	Protect Eshelman Run Amish School to the 0.2% annual chance flood level.	High
ParT-7	Protect Jacob Eshleman II House to the 0.2% annual chance flood level.	High
ParT-8	Protect Leaman Place Covered Bridge to the 0.2% annual chance flood level.	High
ParT-9	Protect Osceola Mill to the 0.2% annual chance flood level.	High
ParT-10	Protect LeFever Mill to the 0.2% annual chance flood level.	High
PennT-2	Protect the Manheim Borough Authority WWTP to the 0.2% annual chance flood level.	High
PennT-3	Protect Wastewater Pump #199 to the 0.2% annual chance flood level.	High
PennT-4	Protect Well #39 to the 0.2% annual chance flood level.	High
PennT-8	Protect Ferrellgas to the 0.2% annual chance flood level.	High
Peq-1	Protect Baumgardner's Mill to the 0.2% annual chance flood level.	High
Peq-2	Protect Daniel Good House to the 0.2% annual chance flood level.	High
Peq-3	Protect Abraham and Sarah Hess Barn to the 0.2% annual chance flood level.	High
Peq-4	Protect A.B. Mylin House to the 0.2% annual chance flood level.	High
Peq-5	Protect Pequea Valley Hotel to the 0.2% annual chance flood level.	High
RapT-1	Protect Wastewater Pump #55 to the 0.2% annual chance flood level.	High
RapT-3	Protect Kauffman's Distillery Bridge to the 0.2% annual chance flood level.	High
RapT-4	Protect Peter and Elisabeth Lindemuth House to the 0.2% annual chance flood level.	High
RapT-5	Protect Pfoutz Mill to the 0.2% annual chance flood level.	High
RapT-6	Protect Peter and Mary Risser House to the 0.2% annual chance flood level.	High
RapT-7	Protect Schenck's Mill Bridge to the 0.2% annual chance flood level.	High
RapT-8	Protect Seigrist's Mill Covered Bridge to the 0.2% annual chance flood level.	High
SadT-2	Protect Forge Ruins to the 0.2% annual chance flood level.	High
SadT-3	Protect Mercer's Mill Covered Bridge to the 0.2% annual chance flood level.	High
SadT-4	Protect Sadsbury Twp Detention Pond 1 to the 0.2% annual chance flood level.	High
SadT-5	Protect Woolen Mill to the 0.2% annual chance flood level.	High
SalT-1	Protect Meadow Springs Amish School to the 0.2% annual chance flood level.	High
SalT-2	Protect Millwood Kennel to the 0.2% annual chance flood level.	High
SalT-3	Protect New Miltown Roller Mill to the 0.2% annual chance flood level.	High
SalT-4	Protect Verdant Valley Amish School to the 0.2% annual chance flood level.	High
StrasB-1	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	High
StrasT-1	Protect Bowman's Mill to the 0.2% annual chance flood level.	High
StrasT-2	Protect Herr's Mill Covered Bridge to the 0.2% annual chance flood level.	High
StrasT-3	Protect Lefever Mill to the 0.2% annual chance flood level.	High
StrasT-4	Protect Lime Valley Bridge to the 0.2% annual chance flood level.	High
StrasT-5	Protect Neff's Mill Covered Bridge to the 0.2% annual chance flood level.	High
StrasT-6	Protect Wastewater Pump #13 to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
ULT-1	Protect Bushong Mill and House to the 0.2% annual chance flood level.	High
ULT-2	Protect Pinetown Covered Bridge to the 0.2% annual chance flood level.	High
ULT-3	Protect Stauffer's Mill to the 0.2% annual chance flood level.	High
ULT-4	Protect Worley and Obetz, Inc. to the 0.2% annual chance flood level.	High
ULT-5	Protect Center Square Amish School to the 0.2% annual chance flood level.	High
ULT-6	Protect H & E Sheibly House to the 0.2% annual chance flood level.	High
WarT-1	Protect Wastewater Pump #67 to the 0.2% annual chance flood level.	High
WarT-2	Protect Well #35 to the 0.2% annual chance flood level.	High
WarT-3	Replace the Lititz Run culvert under Lititz Run Road with one with a larger opening.	High
WarT-4	Protect Lititz Grist Mill to the 0.2% annual chance flood level.	High
WarT-5	Protect Erb's Bridge to the 0.2% annual chance flood level.	High
WarT-6	Protect Hess Lower to the 0.2% annual chance flood level.	High
WarT-7	Protect Rothsville Mill to the 0.2% annual chance flood level.	High
WarT-8	Protect Speedway 6775 to the 0.2% annual chance flood level.	High
WarT-9	Protect Zook's Mill Covered Bridge to the 0.2% annual chance flood level.	High
WCT-6	Install backup power generators at two potable water wells.	High
WCT-19	Protect Binkley's Mill to the 0.2% annual chance flood level.	High
WCT-20	Protect Windstream Reinholds Central Office to the 0.2% annual chance flood level.	High
WDT-1	Protect the Elizabethtown Regional Sewer Authority WWTP to the 0.2% annual chance flood level.	High
WDT-2	Protect Wastewater Pump #197 to the 0.2% annual chance flood level.	High
WET-1	Protect the West Earl Township Sewer Authority WWTP to the 0.2% annual chance flood level.	High
WET-2	Protect the West Earl Township Water Authority facility to the 0.2% annual chance flood level.	High
WET-3	Protect Wastewater Pump #184 to the 0.2% annual chance flood level.	High
WET-4	Protect Bitzer's Mill Bridge to the 0.2% annual chance flood level.	High
WET-5	Protect Cooper Shop at Brownstown Mill to the 0.2% annual chance flood level.	High
WET-6	Protect Eberlys Mill to the 0.2% annual chance flood level.	High
WET-7	Protect Riverview School to the 0.2% annual chance flood level.	High
WET-8	Protect Widow Wenger's House to the 0.2% annual chance flood level.	High
WET-9	Protect American LaFrance, LLC to the 0.2% annual chance flood level.	High
WET-10	Protect Jacob Wolf House to the 0.2% annual chance flood level.	High
WET-11	Protect Martin-Bitzer House to the 0.2% annual chance flood level.	High
WET-12	Protect Marx and Fronic Groff Farmstead to the 0.2% annual chance flood level.	High
WET-13	Protect Samuel Good House to the 0.2% annual chance flood level.	High
WET-14	Protect Smeal LTC, LLC. to the 0.2% annual chance flood level.	High
WHT-1	Protect Chickies Lock to the 0.2% annual chance flood level.	High
WHT-2	Protect Forrey's Mill Covered Bridge to the 0.2% annual chance flood level.	High
WHT-3	Protect S.S. Haldeman Mansion site to the 0.2% annual chance flood level.	High
WHT-4	Protect Lancaster Area Sewer Auth - Farmdale Pump Station to the 0.2% annual chance flood level.	High
WHT-5	Protect Pedant-Grube Farmhouse (Garber Farm) to the 0.2% annual chance flood level.	High
WHT-6	Protect Columbia Water Co Chickies Well to the 0.2% annual chance flood level.	High
WHT-7	Protect Henry Clay Furnace Ruins to the 0.2% annual chance flood level.	High
WHT-8	Protect Chickies Silica Stone Crusher to the 0.2% annual chance flood level.	High
WLT-5	Protect Potable Pump #100 to the 0.2% annual chance flood level.	High
WLT-6	Protect Potable Pump #61 to the 0.2% annual chance flood level.	High
WLT-7	Protect Wastewater Pump #21 to the 0.2% annual chance flood level.	High
WLT-9	Protect Colonial Metals Company to the 0.2% annual chance flood level.	High



Mitigation Action		Priority
WLT-10	Protect Extrusion Division to the 0.2% annual chance flood level.	High
WLT-11	Protect Herr or Graff House and Mill to the 0.2% annual chance flood level.	High
WLT-12	Protect George and Susanna Lefevre Mill to the 0.2% annual chance flood level.	High
WLT-13	Protect Lime Valley Covered Bridge to the 0.2% annual chance flood level.	High
WLT-14	Protect Mill Creek Bridge #8 to the 0.2% annual chance flood level.	High
WLT-15	Protect Eckman Mill to the 0.2% annual chance flood level.	High
WLT-16	Protect Reservoir #17 to the 0.2% annual chance flood level.	High
WLT-17	Protect Henry K. Stoner House to the 0.2% annual chance flood level.	High
WLT-18	Protect Mill Creek Pump Station to the 0.2% annual chance flood level.	High
LC-17	Increase support capabilities, better facility evacuation plans, and long-term placement plans.	High
LC-23	Encourage shelter planning at the local levels and continued training and communication with local Red Cross chapter and PA Department of Human Services.	High
LC-34	Enhance public outreach and education capabilities by providing updated preparedness, prevention, and mitigation materials at publicly available locations. Provide these materials in multiple languages which are prominent in Lancaster County.	High
CaeT-12	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	High
ColT-4	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents, especially those who may not have access to internet and phones.	High
EarIT-13	To better protect socially vulnerable populations, including the Amish community, the Township will implement tailored mitigation actions. These include developing outreach programs to communicate hazard preparedness through trusted community leaders, focusing on pandemic prevention, substance use disorder support, and invasive species management. Mobile vaccination clinics and health outreach teams will provide essential services to those with limited access to healthcare, particularly during pandemics. The Township will collaborate with local addiction treatment centers to offer mobile support for substance use disorder, and work with agricultural groups to manage invasive species. Additionally, a community-based transportation network will ensure that vulnerable populations can access medical care and emergency services during disasters. These actions will improve resilience and ensure that socially vulnerable groups are better protected from future hazards like pandemics, substance use, and invasive species, while also fostering greater community support and inclusion in disaster preparedness and recovery planning.	High
EarIT-14	The Township will develop outreach projects that target both the Amish community and the general public. For the Amish population, outreach will be conducted through community meetings, printed materials, and collaboration with local community leaders to ensure culturally relevant information is shared. These efforts will help increase awareness of local hazards, emergency procedures, and available resources in a way that aligns with their communication preferences.	High
ECT-14	Work to create an outreach program focused on expanding community networks to make the Township population aware of events and incidents.	High
EDT-7	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	High
EPB-10	Produce education and outreach materials for all residents. Share this information via social media, newsletters, brochures, and other methods. Post this information in local gathering locations such as community centers, libraries, and churches. Ensure the materials produced are available in English, Spanish, and other primary spoken languages.	High
EdT-10	Develop informational outreach initiatives on hazard risks and hazard mitigation for residents. A significant portion of the township population (48%) is Amish, who may have limited access to traditional hazard risk information, leaving them vulnerable to disasters. Informational outreach initiatives are needed to raise awareness about hazard risks and mitigation strategies to better protect all residents, especially those in underserved communities.	High



Mitigation Action		Priority
ManhB-13	Implement accessible educational programs, inclusive communication channels, and neighborhood support networks to address the unique needs of socially vulnerable populations during hazard events. Provide tailored resources such as emergency kits, transportation, and shelters, and involve representatives from these groups in mitigation planning to ensure their needs are prioritized. This approach fosters equity and resilience while reducing the impacts of disasters on underserved populations.	High
ManhB-14	Develop and implement a comprehensive Public Education and Outreach Program to address awareness gaps, promote hazard preparedness, and improve community engagement. This program will include workshops, information dissemination via multiple platforms, and outreach campaigns tailored to local hazard risks. These efforts will empower residents to take proactive steps to protect themselves and their properties during hazard events.	High
MarT-11	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	High
MVB-2	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	High
Peq-10	The Township will work with local NGOs, churches, and other community locations to provide information relating to hazard mitigation and preparedness geared toward the readiness of individuals, the community as a whole, and properties.	High
WHT-10	The EMC will work with teams that manage borough social media to include EM and preparedness communications. EMC will assist in community programs and outreach as available.	High
LASA-5	LASA has not created a professional-styled video for outreach, recruitment, and highlighting the organization's mission and operations. LASA is committed to superior wastewater management to protect the community, public health, and the environment. Its goals align with environmental protection and stewardship. The creation of this video will educate viewers on how LASA assists in mitigation efforts through its wastewater management practices. LASA will research professional film companies to assist in the production of a video dedicated to conducting outreach, recruitment, and highlighting the organization's mission and operations.	High
LC-26	Work with the county CISO and Public Safety Technology staff to develop redundancies for 9-1-1 communications infrastructure and emergency management operation capabilities.	High
EET-2	Work with PENNDOT to realign and install a traffic light at the intersection of US-322 and PA-897.	High
EET-3	Work with PENNDOT to realign the intersection of Routes 23 and 897.	High
CSD-2	Work with emergency management to secure supplies as necessary if a prolonged stay is required due to an inability to relocate to another site with better/more equipped resources and facilities.	High
ManhT-6	Work with PENNDOT to redesign the interchange at US-30 and US-222.	High
ELT-6	Investigate retrofitting or other flood hazard mitigation measure for Oaks 1 Pump Station.	High
<b>Medium Priority</b>		
AkB-3	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Borough employees to work remotely if needed.	Medium
WET-15	Identify a suitable location for a back-up Administrative building where continuity of operations can occur should the primary facility become impacted. Identify a plan for Township employees to work remotely if needed.	Medium
BWA-1	Update the Authority's emergency response plan.	Medium
LASA-1	The Emergency Response Plan is in need of an update. The previous edition of the plan was completed in 2020, and the format is outdated. Assess whether LASA has the capabilities to complete this plan update on its own. If not, research various funding streams, including the BRIC, HMGP, EMPG, and HSPG grants to provide assistance in completing and update of the Emergency Response Plan.	Medium
ElizT-1	Work with utility companies to clear vegetation around power and communications lines.	Medium
ClyT-6	The Municipal Engineer will work with the Pennsylvania Game Commission to complete an engineering study of Middle Creek Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life,	Medium



Mitigation Action		Priority
	the Township and the Pennsylvania Game Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	
EET-12	The Municipal Engineer will work with Jacob and Evelyn King to complete an engineering study of New Holland Reservoir. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Jacob and Evelyn King will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Medium
ElizT-7	The Municipal Engineer will work with the Pennsylvania Fish and Boat Commission to complete an engineering study of Speedwell Forge Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Fish and Boat Commission will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Medium
ElizB-2	The Municipal Engineer will work with the Elizabethtown College to complete an engineering study of Lake Placida Dam. The Borough will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Borough and the Elizabethtown College will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Medium
ManhT-25	The Municipal Engineer will work to complete an engineering study of Manheim Township Detention Basin No 2. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Medium
MarT-15	The Municipal Engineer will work with the Pennsylvania Power and Light Company to complete an engineering study of Holtwood SES Ash Basin No 2. The Township will also request information and input from its Road department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and the Pennsylvania Power and Light Company will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Medium
WCT-21	The Municipal Engineer will work with Randy Shirk to complete an engineering study of Barnett Dam. The Township will also request information and input from its Public Works department and the County regarding impacted roadways. If cost-effective mitigation measures or retrofit options are identified that can increase the level of safety and length of useful life, the Township and Randy Shirk will pursue funding support, permit approval from PADEP, and implement the cost-effective measures.	Medium
MillB-3	There is a large number of students and staff in the Borough at both Penn Manor High School and Millersville University, which are both critical facilities. The Borough will work with the School District and University to evaluate and develop evacuation and communication plans.	Medium
DenB-13	Educate residential and commercial property owners updated concerning hazards and potential resources to meet any challenges. A focus area will be the property owners along Denver Memorial Park, Little Cocalico Creek, and Cocalico Creek.	Medium
LancC-23	Add new Water Transmission Main from the Susquehanna River to the Conestoga Water Treatment Plant to harden infrastructure and decrease the risk to utility interruptions.	Medium
ManhB-15	Develop a Substantial Damage Management Plan, following the six-step process outlined in the 2021 "Developing a Substantial Damage Management Plan" guide. This plan will establish clear responsibilities for determining substantial damage, assessing market value, and managing permit approvals after disaster events. By implementing this plan, Manheim will enhance its capacity to enforce NFIP regulations, improve disaster recovery processes, and ensure compliance with local floodplain requirements, ultimately strengthening community resilience against flooding.	Medium
ManhT-23	The Township will update its comprehensive plan. Ensure that the local comprehensive plan incorporates hazard mitigation techniques through a courtesy review or draft plans by the County Planning Department.	Medium
LC-6	Work with hazardous materials facilities in the floodplain to floodproof structures up to the 0.2% annual chance flood level.	Medium
LC-10	Protect the structures in Chickie's Park to the 0.2% annual chance flood level.	Medium



Mitigation Action		Priority
LC-11	Work with PPL to protect the Conestoga KV Substation to the 0.2% annual chance flood level.	Medium
LC-12	Work with the Safe Harbor Water Power Corporation to protect their facilities to the 0.2% annual chance flood level.	Medium
LC-13	Work with PPL to protect the Holtwood facility to the 0.2% annual chance flood level.	Medium
ColT-2	There are several culverts in the Township which are undersized or deteriorating. The Township will apply for various grants to address these culverts.	Medium
EarlT-10	The Township will work with an engineer to address both the flooding along Mill Road and the overall stormwater management issues. As part of this solution, the culvert along Mill Road will be replaced with a larger and more efficient box culvert to accommodate increased water flow and prevent future blockages or overflow. This will stabilize the streambank adjacent to Mill Road to prevent further erosion caused by high water levels during storms. Improvements to drainage in the adjacent agricultural pasture will also be made to reduce runoff into the road. To address the larger issue, stormwater conveyance will be enhanced from existing outfalls beneath Mill Road to the stream, improving the overall drainage capacity of the area and reducing the risk of flooding. Future improvements will include the road being repaved and its stormwater infrastructure will be upgraded to ensure it can handle future stormwater runoff more effectively, mitigating flooding in the long term.	Medium
ECT-15	Identify and address undersized or deteriorating culverts throughout the Township.	Medium
ELT-1	Backup generator – Purchase 10 more generators for use along Route 30 and Route 340 to make them functional emergency routes.	Medium
ManhT-24	Evaluate the culverts in the Township for capacity and deterioration. Address issues or replace the culverts as necessary.	Medium
MarT-9	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	Medium
MJB-3	The Borough Public Works has identified old and aging stormwater management systems that have issues and is prepared to make upgrades or cleanouts if funding is available. This would include replacing terracotta storm water pipes to prevent ruptures and cleaning out existing pipes.	Medium
Peq-8	There are culverts throughout the Township which may be undersized or have failing components which are located underground. When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	Medium
QVB-2	The culvert located on Broad Street at the intersection of Second Street is deteriorating due to heavy rains and erosion. The culvert, and guiderail which protects it, must be improved. An engineer estimated the cost of this project would be \$425,000.	Medium
WCT-7	Install stormwater management infrastructure along Blue Lake Road to prevent downhill flooding.	Medium
WCT-8	Install stormwater management infrastructure along Girl Scout Road to prevent downhill flooding.	Medium
WCT-9	Install stormwater management infrastructure along Mountain Road to prevent downhill flooding.	Medium
WCT-10	Install stormwater management infrastructure along Netzley Road to prevent downhill flooding.	Medium
WCT-11	Install stormwater management infrastructure along Sandy Hill Road to prevent downhill flooding.	Medium
WCT-12	Install stormwater management infrastructure along Strickler Road to prevent downhill flooding.	Medium
WCT-13	Install stormwater management infrastructure along White Hall Road to prevent downhill flooding.	Medium
WCT-14	Relocate the Wastewater Treatment Plant to a location outside the floodplain.	Medium
LC-16	Increase the frequency of environmental and risk assessments to better determine where land should or should not be developed.	Medium
EarlT-15	The nuclear incident response plan will be updated to include evacuation routes, shelter-in-place procedures, radiation exposure protocols, and the acquisition of radiation detection equipment and protective gear. Staff will be trained on radiation response and conduct public education on nuclear safety. For gas and liquid pipelines, the Township collaborate with operators to enhance safety inspections, leak detection, and evacuation procedures, alongside providing staff training. Finally, the wildfire response plan will focus on creating firebreaks, improving evacuation routes, while training	Medium



Mitigation Action		Priority
	staff in wildfire suppression and emergency response. These actions will significantly improve the community's preparedness and ability to respond effectively to these hazards.	
EPB-4	Create and develop annexes to the Borough's EOP (i.e. debris management) in conjunction with the Borough Staff, public works.	Medium
BWA-4	Investigate new platforms of communication to support public outreach. Additionally, identify and advertise methods of communication for the public to contact the Authority.	Medium
ECTA-3	ECTA neighbors three other municipal water systems. An emergency interconnect with any of these three systems, would provide ECTA the ability to continue serving its customers while working towards bringing a well source back online. Cost = \$1,000,000.	Medium
LC-29	Draft regional comprehensive plans which may lead to improved growth management and opens space, natural land, and agricultural land preservation	Medium
LC-30	Update the Countywide Act 167 Stormwater Management Plan to encourage regional approaches to stormwater management and flood mitigation and encourage creative and innovative approaches, including regional stormwater facilities, floodplain restoration and wetland creation, critical aquifer recharge areas, and increased tree canopy.	Medium
LC-31	As part of Phase 2 of the Act 167 Plan, have the County and municipalities adopt a new model stormwater ordinance for consistency throughout entire watersheds, and across boundaries.	Medium
AkB-5	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	Medium
CaeT-11	Research, and potentially invest, in Savvy Citizen, a mass notification and alert system.	Medium
ColB-11	Initiate a campaign to encourage Borough residents to sign up for public safety alerts.	Medium
EarIT-6	The Township will update or create a dam failure response plan as part of the emergency management plans. This plan will outline clear evacuation procedures and flood zone mapping. To enhance response capabilities, training for staff on dam breach protocols and public education on emergency evacuation routes will be implemented.	Medium
ECT-19	Review and revise, where applicable, existing codes, policies and regulations pertaining to land development to restrict development in hazard areas including, but not limited to, geology connected to sinkholes, flood-prone locations, wildfire interfaces, and steep slopes.	Medium
EPB-8	In tandem with County officials, explore options for an alternate means for communication in an emergency. Social media is the primary use of communication.	Medium
EdT-8	Develop informational outreach initiatives to promote participation in and enhance recruitment for Bart FD and Quarryville FD	Medium
ElizT-5	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	Medium
LeaT-8	Develop, apply, and maintain a Smart911 Notification System	Medium
LitB-11	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	Medium
WarT-12	Educate the public on the functionality and use of the Regroup application. Encourage the public to sign up for emergency alerts and notifications.	Medium
WET-16	Road conditions in the winter can be treacherous to drivers. Create a winter road maintenance plan to specify when Public Works should begin road treatments and plowing activities.	Medium
HSD-1	Ensure runoff during construction at the High School at the Landisville Campus is monitored to reduce water runoff issues, including erosion. Locations which could be impacted include the high school campus, nearby parking lots, and the baseball fields.	Medium
HSD-2	Evaluate if the high school and administrative buildings need protective measures to reduce flooding impacts. Once evaluated, implement the identified measure(s).	Medium
LASA-4	LASA will work with engineers, internal or contracted, to assess the feasibility of elevating or relocating it various pump stations from flood-prone locations. These pump stations frequently experience flooding conditions from the many waterways and waterbodies in Lancaster County. Elevating or relocating the pump stations will mitigate flood risk and prevent the utility from being interrupted. The identified pumpstations are located at: <ul style="list-style-type: none"> <li>• Blue Rock 1-324 Blue Rock Rd. Washington Boro PA 17582</li> <li>• Holland Hills- 204 Donnerville Rd Lancaster PA 17603</li> </ul>	Medium



Mitigation Action		Priority
	<ul style="list-style-type: none"> <li>• Silver Spring- 830 Silver Spring Rd Silver Spring PA 17575</li> <li>• Elizabeth Street- 8 Elizabeth St, Washington Boro PA 17582</li> <li>• River Road-1850 Water Street Washington Boro PA 17582</li> <li>• Eden Road- 1891 Eden Rd, Lancaster PA 17601</li> <li>• Pleasure Road- 1401 Pleasure Rd Lancaster PA 17601</li> </ul>	
LC-14	Develop a hazard information page on the County website, and link from each municipality’s website.	Medium
LC-19	Obtain and implement updated flood gauge information into flood inundation mapping to better notify and predict flood hazard areas before flooding occurs. Improving flood forecasting technology to identify new areas for flood mitigation projects.	Medium
LC-20	Improve access control and physical security at county owned and rented properties	Medium
LC-28	Update urban and village growth area boundaries for Future Land Use and Transportation Map which will improve land use patterns and help to better manage stormwater runoff.	Medium
ColB-7	Several areas throughout the Borough have a lack of proper drainage during heavy rain. Investigate feasible, cost-effective flood mitigation options, including stormwater runoff systems.	Medium
DenB-9	Install a lining or excavate and replace metal stormwater pipes in the Snyder Acres Development and where applicable elsewhere in the Borough. These deteriorating pipes have caused roadway damages, sinkholes, and property issues in the Borough.	Medium
ELT-31	Identify, design, and install stormwater management initiatives to reduce potential flood effects, particularly on Millcross Road, North Cherry Lane, Susan Avenue, Strasburg Pike, and Soudersburg Road.	Medium
ELT-32	Work with PA DEP and local partners to determine the cost benefit analysis of removal of the dams at Gibbons Park, Nolt Mill, and Flory Park.	Medium
ELT-33	Investigate possibilities to reduce stormwater flow into the Oaks 1 Pump Station and potential periodic shut downs of the sewer pump station due to excessive stormwater flow.	Medium
LancC-22	Add new Susquehanna Water Raw Water and Finished Water Transmission Mains to harden infrastructure and decrease the risk to utility interruptions.	Medium
MarT-13	<p>The Township will conduct research into other avenues for water supplies and will consider the following strategies:</p> <ol style="list-style-type: none"> <li>1. Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement.</li> <li>2. Promoting the protection of watersheds and ensuring sustainable groundwater extraction.</li> <li>3. Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices ad become more sustainable.</li> <li>4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts.</li> <li>5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.</li> </ol>	Medium
PennT-1	Clear obstructions from the stormwater management system near the intersection of Fruitville Pike/New Charlotte Street and Main Street (PA-72).	Medium
Peq-12	<p>The Township will conduct research into other avenues for water supplies and will consider the following strategies:</p> <ol style="list-style-type: none"> <li>1. Prioritizing investment in water infrastructure by developing and maintaining water harvesting structures, and building new water systems, storage tanks, and treatment facilities while fostering community engagement.</li> <li>2. Promoting the protection of watersheds and ensuring sustainable groundwater extraction.</li> <li>3. Empower the community with the knowledge and skills to manage their water resources by providing educational programs on how to improve their current water management practices ad become more sustainable.</li> <li>4. Enforce standards for water quality, promote efficient water use, and incentivize conservation efforts.</li> <li>5. Leverage technology to improve water management systems, including solar-powered pumps, remote sensing for monitoring water levels, and mobile applications for reporting issues can enhance water access and management.</li> </ol>	Medium
WDT-3	The culvert on Miller Road near the Elizabethtown Regional Sewer Authority needs to be evaluated and improved as it may be undersized or have failing components which are located underground.	Medium



Mitigation Action	Priority
When funding and staffing is available, the Township will address the culvert issues. If possible, the Township will assess the feasibility of hiring external contractors. The Township will continue its assessment of the integrity and replacement schedule of the culverts throughout its jurisdiction.	
ECTA-1 Most ECTA customer meters are read on a quarterly basis using drive-by “radio read” technology. A fixed-base metering system with remote read technology would create a more efficient reading and notification system in which ECTA would have real-time notification of excess water use or meter failure that would increase the speed at which ECTA can respond. The response would include faster customer communication and enforcement during severe drought or other water shortage emergency. Cost = \$1,300,000, including installation, for ECTA’s full system. ECTA plans to begin replacements, as needed, in a phased approach in 2025.	Medium
EHT-1 Culvert Replacement - Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run. Replace old and undersized culverts along the Swarr Run located at Church Street, Snapper Dam Road, and Nolt Road. The three roads are subject to frequent flooding.	Medium
ELT-2 Backup generator – Install backup generators in two fire stations that are not yet equipped with backup power.	Medium
ELT-5 Install stormwater management infrastructure at Gibson’s Park at Nolt Mill.	Medium
EPB-6 Increase pipe capacity at Outfall OFA000101 discharge on Graystone Road.	Medium
DenB-7 Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	Medium
EDT-6 Develop and implement a proactive multi-dimensional training program including representatives from the Borough, Fire Department, Police Department, and EMS	Medium
ELT-9 Investigate the removal of dam structures at Flory Park.	Medium
ELT-10 Investigate the removal of dam structures at Gibson’s Park at Nolt Mill.	Medium
EPB-2 Develop minimum training requirements for EOC Staffing.	Medium
EPB-3 Develop plans to host an exercise to address training deficits.	Medium
EPB-9 Connect with facilities that host children during the day and work to develop plans and build resources for the families in case of any hazard.	Medium
EdT-5 Pave/Reprofile Eden Road from Groff Road to May Post Office Road (approximately .8 miles). These roads, which face impacts from severe weather, would be utilized should an evacuation be necessary due to an event at the Peach Bottom Power Plant.	Medium
LeaT-6 Develop and implement a proactive multi-dimensional training program including representatives from the Township, DPW, Fire Department, Police Department, and EMS	Medium
LC-15 Develop informational workshops on hazard risks and hazard mitigation for property owners in high-risk areas.	Medium
LC-36 Establish working relationships with PA DEP’s Dam Safety Program leaders and the public and private dam owners in the county. Include these groups and individuals as stakeholders in the next HMP update.	Medium
MVB-1 Work with EMC and borough manager/mayor to orient the new EMC to current projects and status of emergency items.	Medium
WHT-9 Work with EMC and Township manager/mayor to orient the new EMC to current projects and status of emergency items.	Medium
LC-18 Increase training and exercises available to water and wastewater authorities.	Medium
EPB-7 Install fencing and perimeter cameras to provide more security at the Borough’s Water facility.	Medium
LancC-24 Identify community-based points of distribution with trusted partners, utilizing the CDC’s Social Vulnerability Index, census data, and other planning tools to ensure accessible and equitable service delivery locations.	Medium
LancC-27 Improve interagency communications to readily share up-to-date information with public safety/first responders. Ensure access and protocols for laboratory testing of illicit drug samples.	Medium
ManhB-12 Critical facilities and infrastructure including Potable Pump #101, the Manheim Fire Department Station, and key roadways, are vulnerable to flooding. To enhance community resilience, implement targeted mitigation measures, including elevating critical facilities and roadways, floodproofing essential infrastructure, and upgrading stormwater management systems.	Medium



Mitigation Action		Priority
MarT-12	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas: 1. Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property. 2. Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate. 3. Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. 4. Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.	Medium
MJT-6	Investigate and implement additional security measures on the municipal complex.	Medium
Peq-11	The Township will take a variety of actions to reduce the risk to the wildfire hazard in the interface and intermix areas: 1. Educate property and business owners how to mitigate risk, including managing vegetation, keeping yards clear, ensuring there is enough boundary between the wooded or forested areas and their property. 2. Ensure Township employees (DPW, Fire Services) maintain the wooded or forested areas by clearing and maintaining ground vegetation and utilizing prescribed burns when and where appropriate. 3. Consider joining the Firewise Program, which teaches people how to adapt to living with wildfire and encourages neighbors to work together and take action now to prevent losses. 4. Write and adopt a Community Wildfire Protection Plan which would provide a framework for mitigating wildland fire impacts throughout the Township.	Medium
SadT-7	Restore RT 41 Williams Run dam to its normal operating conditions by repairing damage to the pipe and dam embankment during dry conditions. A DEP Permit has been received. The Township will work with the company Land Studies to be sure the project is completed in a timely manner and in compliance with all agencies.	Medium
ManT-19	Flooding occurs in the Township along the Susquehanna River. Improved flood water management system must be installed to reduce risk and impacts.	Medium
ManT-20	Flooding occurs in the Township along the Conestoga River. Improved flood control system must be installed to reduce risk and impacts.	Medium
MJB-5	Install lining of sewer mains and maintenance holes to prevent inflow and infiltration of stormwater system wide	Medium
MJB-6	Design and construct a flood wall around the Waste Water Treatment Plant to prevent shutdown from flood waters of the Little Chiques Creek.	Medium
MJB-7	Replace aging terracotta sewer mains throughout the system to prevent ruptures during flooding events.	Medium
MJB-8	Reconstruct drinking water wells by installing casing to a lower depth to prevent stormwater infiltration.	Medium
MJB-9	Construct or enhance Flood Doors/Barriers on well houses and sewage pump stations to keep out flood water so the facility remains functional during flooding events.	Medium
MJB-10	Replace/Rehabilitate water filters to handle infiltrated storm water.	Medium
MJB-11	Streambank Restoration Project for the Little Chiques Creek Park. This is a 2.5-million-dollar project. Once completed it will address both flooding in the park and along some of the houses in the general area as well as stop the erosion of the streambanks.	Medium
MJB-12	Increase the Stormwater Capacity to the outfall to the Little Chiques and Donegal Creek's watershed system wide.	Medium
MJB-13	Replace aging and failing corrugated metal storm pipe throughout the borough.	Medium
MJB-14	Improve and Upgrade the Locust Lane Storm Water Management Basin. Repair existing sink holes in the basing and increase function and capacity of the basin.	Medium
MJB-15	Improve and Upgrade the Pink Alley Storm Water Management Basin	Medium
MJB-16	Construct a new Stormwater Management Facility to prevent flooding of the Manheim St area.	Medium
MJB-17	Improve Stormwater management capacity in problem areas of the system.	Medium
MJB-18	Improve and Upgrade the Stormwater Management piping under the Amtrak railroad lines and pipes that drain into the Amtrak railroad cut in the borough.	Medium



Mitigation Action		Priority
MJB-19	Repair and prevent erosion from stormwater near the Barbara St Bridge spanning the Amtrak railroad cut.	Medium
ECTA-4	If a groundwater well is classified as GUDI, a treatment upgrade is required including more advanced filtering and disinfection. Most of ECTA's well sources would also require facility expansion to make room for the upgraded treatment. Cost would be dependent on the source well capacity, but a recent comparable upgrade is estimated at \$3,000,000.	Medium
AkB-2	Upgrade sewer infrastructure in the Heritage Development to prevent stormwater infiltration.	Medium
AkB-4	Many roads in the Borough experience flooding. Redesign areas prone to flooding or seek other feasible flood mitigation measures.	Medium
ColB-9	Perform a geological study of the bedrock within the Borough to assess and identify areas which are susceptible to sinkholes.	Medium
ConT-8	Assess flood damage on Stone Hill Road, Green Hill Road, and Boy Scout Road and identify feasible, cost-effective measures to improve conditions. Develop a long-term plan for erosions following heavy rain storms along the identified roadways.	Medium
ColB-12	Purchase needed emergency equipment.	Medium
LC-1	Acquire properties in hazard areas, notably those in the 1 percent annual chance floodplain, to convert them to open space.	Medium
LC-3	Elevate structures at risk of flooding.	Medium
LC-4	Acquire repetitive loss properties to convert them to open space.	Medium
DenB-11	Work with PennDOT to replace the existing Weaver Road Bridge.	Medium
MJB-1	Conduct a detailed flood study of the Little Chiques Creek.	Medium
PennT-5	Update stormwater management regulations to make them more restrictive for new development.	Medium
MarT-14	The Township will engage with the Lancaster Conservancy to hold discussions on joint responsibility and assistance with the increase in call volumes, which has resulted in an up-tick of emergency responses on land owned by the Lancaster Conservancy. These discussions will lead to the writing and adoption of a Memorandum of Agreement or Memorandum of Understanding between the two entities which will outline the roles and responsibilities of each.	Medium
LC-8	Nissley Acres Floodwater Storage Area—Create a floodwater storage area to assist in reducing flood levels in the Nissley Acres development and a downstream residential area in Ephrata Township that is also prone to flooding. The location of the storage area would be on Borough-owned property so it would not require acquisition of land.	Medium
CaeT-10	Invest in cyber insurance for the Township.	Medium
ECT-12	Invest in cyber insurance for the Township.	Medium
ELT-7	Investigate retrofitting or other flood hazard mitigation measure for properties along Hale Drive.	Medium
ELT-8	Investigate retrofitting or other flood hazard mitigation measure for properties along the south side of Millstream Road between Gridley and Strasburg Pike.	Medium
EdT-4	Coordinate with PennDOT to replace an old, inadequate drainpipe that runs underneath May Post Office Road at the intersection of Eden Road. The existing pipe contributes to water backups and flooding.	Medium
EdT-6	Arrange and conduct a complimentary Cybersecurity and Infrastructure Security Agency (CISA) evaluation for Township IT systems to identify vulnerabilities and enhance resilience against cyber threats, safeguarding critical infrastructure and sensitive data.	Medium
LancC-15	Although there has been no known issues reported since maintenance work completed in 2024, evaluate the Plum Street Railroad Underpass (CSS conveyance issue/ Manheim Township MS4 runoff to City's CSS) through the use of engineering investigations and infrastructure updates.	Medium
LancC-16	There are pipe restrictions at Fairview Avenue/New Danville Pike/Prince Street (CSO Outfall 002). Conduct additional investigations, engineering, infrastructure upgrades. Potential partnerships with Lancaster Township. Water Street Sewer Separation Phases 2-3 need final designs and construction funds, will help alleviate restrictions.	Medium
LancC-17	There is a bottleneck at the CSS at North Broad/Lehigh Avenue. The City's Broad St Disconnection project is in preliminary design now to provide stormwater storage capacity through an existing stormwater storage bed that can receive over 9 acres of existing impervious and partially bypass CSS. Seek additional funding if needed.	Medium



Mitigation Action		Priority
LancC-18	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Steel Way/Manheim Pike (MS4 conveyance bottleneck and outfall restriction).	Medium
LancC-19	Conduct additional investigations, engineering, gray and green infrastructure upgrades at Hershey Avenue/Wabank Road (MS4 conveyance restriction at outfall).	Medium
LancC-20	At the Lancaster Advanced Wastewater Treatment Plant (AWWTP) there is a conveyance bottleneck due to headwall at unnamed tributary to the Conestoga River and the capacity of the 78" diameter wastewater plant outfall (discharge) pipe. Investigate sources of funding to resolve problem.	Medium
LancC-31	Establish a Long-Term Control Plan to address Combined Sewer Overflows (CSOs) in the wastewater conveyance system. These systems may need to have sewer separated expanded treatment, or increased storage capacity.	Medium
SadT-6	Create a shoulder to catch water runoff. This runoff will be released into a culvert instead of puddling along Creek and Noble Roads. Work performed by Township Public Works Department.	Medium
WET-17	Evaluate flood mitigation measures, including property acquisitions and flood walls, at the trailer park to reduce, or remove, the risk of flooding.	Medium
WLT-4	McFalls Property Stormwater Management - reclaim the area as a stream.	Medium
EASD-2	With the ongoing and anticipate increase in cyber incidents, including data infiltration, data corruption, and ransomware, the District seek various methods to improve and update its technology security through network segmentation, multi-factor authorization, limited account privileges, and remote data back-ups.	Medium
LC-32	Whenever a capital improvement, transportation, or land development project is undertaken, look for ways to stack benefits, e.g. when replacing or repairing bridges/culverts look for opportunities for streambank restoration, improved channel design and floodplain management. When doing road projects, look for ways to incorporate green infrastructure.	Medium
DenB-10	Perform streambank restoration activities and riparian buffer improvements in Denver Memorial Park.	Medium
EarIT-7	The Township will develop a drought emergency response plan that includes water rationing protocols and prioritizing water distribution to critical infrastructure. Staff training will focus on water conservation practices and emergency water distribution techniques.	Medium
EarIT-8	The Township will integrate earthquake preparedness into the emergency management plan and provide training for staff to handle post-earthquake situations, such as search and rescue operations and medical triage. The community will be educated on how to prepare their homes and businesses for earthquakes.	Medium
LancC-12	Establish a floodplain management team to assist the FPA in NFIP administration, ordinance updates, staff training, and other needs.	Medium
LancC-25	Increase planning efforts to ensure medically appropriate accommodations for people with substance use disorder to have access to medically assisted treatment and medications mitigate health risks and aid people experiencing withdrawal. Coordinate cooperation agreements with LEMSA and LGH Street Medicine.	Medium
LancC-28	Continue implementing public emergency alert system. Develop interdepartmental workgroup to facilitate informed communications about hazardous substances, level of exposure, risks, and what residents should do to remain safe. Develop other protocols as needed to assess individuals that have been exposed.	Medium
MarT-7	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	Medium
MarT-10	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	Medium
Peq-6	Amend the Flood Damage Prevention Ordinance to update the title/position held by the Floodplain Administrator.	Medium
Peq-9	The Township will conduct outreach to property owners along the Pequea Creek to identify whether they have incurred property damage from flooding associated with the Pequea Creek. The Township will develop a list of property owners which may be interested in flood mitigation measures, included elevation or acquisition.	Medium
WCT-1	Expand intersection of Sandy Hill Road and Hillside Road.	Medium



Mitigation Action		Priority
EASD-1	Students are experiencing higher levels of mental illness in the community. The School District will contribute to address mental health concerns by increasing support through reporting systems, school counseling availability, family referral to outside support, and access to outside counseling during school hours and on school property.	Medium
<b>Low Priority</b>		
MJB-4	Construct a Flood Wall around the Waste Water Treatment Plant to prevent flood waters from Little Chiques Creek from encroaching on the plant and causing a shutdown.	Low
CaeT-1	Hammertown Road Bridge - Address flood problem at the bridge at 141 Hammertown Road.	Low
CaeT-2	Turkey Hill Road Culvert - Upgrade the culvert at 2051 Turkey Hill Road with one with a higher capacity.	Low
CaeT-9	Boot Jack Road Culvert - Upgrade the culvert on Boot Jack Road with one with a higher capacity.	Low
ECT-4	Replace the Dogwood Drive bridge over Fry's Run with one with a larger opening.	Low
ECT-5	Replace the Miller Road bridge over the Little Cocalico Creek with one with a larger opening.	Low
ECT-6	Replace the Reinholds Road bridge over Fry's Run with one with a larger opening.	Low
ECT-7	Replace the Smokestown Road bridge over Fry's Run with one with a larger opening.	Low
ECT-8	Replace the Stony Run culvert under Hill Road with one with a larger opening.	Low
ECT-9	Replace the White Oak Road bridge over Fry's Run with one with a larger opening.	Low
EHT-3	Replace old and undersized culverts along the Swarr Run located at Church St.	Low
EHT-4	Replace old and undersized culverts along the Swarr Run located at Nolt Road.	Low
EHT-5	Replace old and undersized culverts along the Swarr Run located at Snapper Dam Road.	Low
ELT-3	Identify mitigation or structural projects to reduce vulnerability to stormwater flooding incidents along Millcross Road.	Low
ELT-16	Upgrade stormwater management at North Cherry Lane.	Low
ELT-17	Upgrade stormwater management at Susan Avenue.	Low
ELT-18	Upgrade stormwater management at the northeast side properties along Strasburg Pike.	Low
ELT-19	Upgrade the stormwater management system along Greenfield Road at Amtrak.	Low
ELT-20	Upgrade the stormwater management system at Soudersburg Road at the pump station.	Low
EphT-1	Improve drainage system at the intersection of Frysville Road and Newswanger Road.	Low
ManhT-5	West Roseville Road Bridge Demolition - Demolish and remove the West Roseville Road Bridge spanning the Little Conestoga Creek. Removal of an unsafe structure and obstruction in the floodway.	Low
MJT-2	Raise Koser Road at the approach to the bridge over Conewago Creek.	Low
MJT-3	Raise Prospect Road at the approach to the bridge over Conewago Creek.	Low
PennT-6	Upgrade stormwater management infrastructure along White Oak Road south of Hamaker Road.	Low
PennT-7	Upgrade stormwater management infrastructure at the intersection of Stiegel Valley Road and White Oak Road.	Low
SadT-1	Mt. Vernon Road Runoff Retention Basins - Create two retention basins, redirect catch basin pipes, install a storm drain line, and extend approximately 1/3 mile to relieve runoff into the Christiana Borough watershed.	Low
WCT-2	Improve drainage at the culvert at Sportsman Road east of Hickory Road.	Low
WCT-3	Increase length of Hackman Road bridge to provide more water to flow underneath it.	Low
WCT-4	Increase length of Hickory Road bridge to provide more water to flow underneath it.	Low
WCT-5	Increase length of Indiantown Road bridge to provide more water to flow underneath it.	Low
WCT-16	Upgrade and clear obstructions in the drainage system at the Cocalico Creek at Hickory Road.	Low
WCT-17	Upgrade the bridge on Sportsman Road over the Cocalico Creek to allow more water to flow underneath it.	Low
WCT-18	Upgrade the drainage system at the Cocalico Creek at Pineview Drive and elevate the bridge approach.	Low
WLT-1	Improve drainage along Eckman Road.	Low
WLT-2	Improve stormwater management along Gypsy Hill Road, including installing a culvert to discharge water away from homes.	Low



Mitigation Action		Priority
WLT-3	Improve stormwater management along Hollinger Road.	Low
EdT-9	Purchase and install a radar-equipped speed sign in targeted areas to mitigate the risk of speeding and enhance road safety	Low
LancC-13	Conduct a facilities condition assessment to ensure green infrastructure practices are functioning as designed. Specific attention to elevated risk of sinkhole formation.	Low
LC-2	Educate residents in flood-prone areas about the benefits of purchasing flood insurance.	Low
ColB-10	Identify and advertise warming and cooling shelters.	Low
DenB-1	Denver Beer Distributor Relocation - The Denver Beer Distributor is located at 4 Main Street, Denver, PA, in adjacent to the Cocalico Creek. During heavy rain and storm events, the business has faced repetitive loss due to flooding and is looking to relocate outside of this flood-prone area and to another location on Main Street in Denver Borough.	Low
DenB-15	Investigate proactive actions to address infiltration and inflow areas in the sewer system to mitigate potential issues.	Low
EHT-2	Install detention basins on the Township-owned property next to Four Seasons Golf Course to help reduce flooding through the Swarr Run.	Low
EdT-3	In partnership with local fire chiefs, establish a comprehensive burn ordinance aimed at preventing and controlling air and water pollution. The ordinance will also grant the Township the authority to implement temporary burn bans during red flag warnings and other high-risk wildfire conditions.	Low
EdT-7	Coordinate with Lancaster Clean Water Partners to reduce the amount of nitrogen, phosphorus, and sediment in Eden Township waterways that are a part of the Chesapeake Bay Watershed.	Low
EarIT-11	The Township will develop a Repetitive Loss Mitigation Plan. The plan will include an analysis of each affected property, considering factors such as flood history, the cost of repairs, potential elevation or buyout options, and the long-term impacts of mitigation. Based on this analysis, the Township will identify high-priority properties for elevation or buyout through FEMA's Hazard Mitigation Assistance (HMA) programs. For properties that are suitable for elevation, the Township will work with property owners and engineers to develop elevation plans to raise structures above flood levels. For properties that are prone to frequent flooding and cannot be effectively elevated, the Township will pursue buyouts, enabling property owners to relocate to safer areas, with the added benefit of reducing the risk of future flood claims.	Low
ELT-4	Improve the design of the intersections at Oakview, Rte. 462, and Millstream along Rte. 30.	Low
LancC-21	Develop a repetitive loss mitigation plan to fully analyze the long-term impacts of mitigation, especially in the areas along Conestoga River in Conestoga Heights and Engleside neighborhoods.	Low
LancC-26	Provide radon testing and mitigation through Healthy Homes Program to low- to moderate-income households most at risk. All City-funded housing rehabilitation projects will be tested for radon levels as part of the environmental review.	Low
ManhB-10	Develop a Repetitive Loss Mitigation Plan to address the broader impacts of mitigation efforts and ensure sustainable long-term solutions.	Low
RapT-2	Regularly clear obstructions from waterways.	Low
WCT-15	Renovate the stormwater management system in Reinholds.	Low
LancC-29	Develop a communications plan to inform residents about air quality impacts. Facilitate the provision of respiratory filters/masks to vulnerable populations during activities that increase exposure (i.e. travel to appointments/services, etc.)	Low
MJT-9	Consolidate all winter weather resources at the municipal complex via a master planning process and construction. This will improve response time and efficiency in responding to forecasted and emergency winter weather events.	Low
ColB-8	Pursue funding to support the elevation or acquisition of private residencies which have flooded repetitively.	Low
ECT-16	The Township will pursue funding support to have a forester assess trees, complete deed searches to verify Township right of way in targeted areas, and then have the tree removal completed by qualified personnel. Implement, review, and enforce municipal policies and programs to prevent trees from threatening lives and impacting power availability/interruption in conjunction with property owners and utility companies.	Low
MJT-7	Provide active shooter training to municipal staff.	Low



Mitigation Action		Priority
LC-22	Research options for modern transportation for emergency workers/plain community farmers to limit exposure time.	Low
LC-33	Engage in coordinated removal of legacy sediments before dam is removed and utilize floodplain restoration to stabilize and restore the stream/creek and ecosystem.	Low
MillB-4	There is a large number of students in the Borough at both Penn Manor High School and Millersville University. It is likely these students experience mental health issues. The Borough will work with the School District and University to create plans with internal and external agencies to identify solutions on how to assist impacted students.	Low
LC-7	Work with the Lancaster Conservancy to provide information at the Welsh Mountain Nature Preserve regarding the potential for wildfires and how visitors can prevent them.	Low
ManhB-11	Mitigate flood risks on Mill Street and surrounding neighborhoods through a comprehensive strategy incorporating property acquisition, elevation projects, and infrastructure upgrades.	Low
CaeT-13	Evaluate the need for snow fences along Township and State roads to prevent blowing and drifting snow from impacting travelers.	Low
DenB-14	Address feasibility of water system connection with neighboring public water systems to reduce burdens in the event of a drought or utility outage.	Low
ECT-18	Encourage property owners living in older housing units to install a radon detector.	Low
ELT-14	Upgrade stormwater management at Flory Park.	Low
ELT-15	Upgrade stormwater management at Greenland near Flory Park entrance.	Low
LancC-30	Partner with Penn State Extension and other agencies to determine appropriate interventions that promote environmental health. Develop communication plans to disseminate guidance to the public.	Low
LC-9	Work with the railroad and property owners to provide a wider buffer between the tracks and vegetation.	Low
MJB-2	Modifications to the Borough Stormwater Detention Basin - increasing the volume of the basin by increasing the height of the berms and/or increasing the footprint of the basin and replacing a 45' long drainage swale with a pipe to prohibit stormwater from flowing over the swale berm.	Low
ECT-17	Plant native vegetation and plants to combat invasive species and potential hinder wildfire fuel.	Low
ColT-3	Reinforce or replace the Wesley Road Bridge.	Low
LitB-10	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	Low
WarT-11	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	Low
EET-1	Shirks Run Diversion - Work with landowners to reduce the possibility of flooding damage in an area east of Shirks Run at the Route 322 and Route 23 intersection.	Low
ElizT-5	Ensure that during severe storms conditions are monitored, including roadways, water and flood gauges, and local reports are reviewed.	Low
MJT-8	Reassess snow evacuation routes and prepare better graphics and communication materials to the public and first responders.	Low
WLT-8	Retention Pond - Construct retention ponds to protect properties along Hollinger Road.	Low
ETASD-1	Searching the student management system for the past three school years, student discipline for illicit substance/vaping violations is on the rise. Over the past two years the School District has called 911 three times for students experiencing medical issues suspected to be caused due to vaping illicit substances. Install vape detectors in the High School and Middle School sixteen restrooms. With a cost of about \$4000 per unit, the total cost would be about \$64,000.	Low
WSD-1	Sinkholes have previously formed within the grounds of the Warwick School District. Continue monitoring the property owned by the School District for any signs of sinkhole formation or activity.	Low
BWA-3	Institute mandate for employees driving company vehicles to supply proof of insurance.	Low
LC-5	Remove any dilapidated or structurally unsound dams that pose a flooding threat to the community.	Low

Note: \* Project is currently not eligible for FEMA mitigation funding. The municipality did not participate in the planning process.



*+ Though the formulaic evaluation of this action does not match the listed priority, municipal officials updated the priority based on their mitigation needs.*

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## SECTION 7 PLAN MAINTENANCE PROCEDURES

### 7.1 UPDATE PROCESS SUMMARY

The process of monitoring, evaluating, and updating the HMP is critical to maintaining its value and supporting the success of Lancaster County’s hazard mitigation efforts. Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and supports future resiliency.

The Planning Team reviewed the 2019 plan maintenance procedures and carried them forward to the current HMP update, as described in the sections below. The 2025 plan maintenance procedures also describe the ways in which this plan may be integrated into other planning mechanisms in the county. Throughout the implementation period, the plan will remain available on the Lancaster County Emergency Management Division website (<https://co.lancaster.pa.us/2736/Hazard-Mitigation-Planning>).

### 7.2 MONITORING, EVALUATING, AND UPDATING THE PLAN

The following sections describe the monitoring, evaluating, and updating processes and protocols for the Lancaster County HMP. The Lancaster County HMP Hazard Mitigation Steering Committee will remain intact as the organization responsible for monitoring, evaluating, and updating this plan. The Community Resilience Coordinator and Volunteer Liaison of the Lancaster County Emergency Management Division will serve as HMP Coordinator for the Steering Committee. Each participating jurisdiction is expected to retain a representative to support the jurisdiction’s responsibilities to monitor, evaluate, and update the HMP as identified in this section.

Section 3 lists the current Steering Committee members. As individual commitments change over time, each jurisdiction will be responsible for informing the HMP Coordinator by formal letter of any changes in representation. The HMP Coordinator will strive to ensure that the Steering Committee represents planning partners and stakeholders within the county. The HMP Coordinator will maintain the membership of the Steering Committee on the Lancaster County Emergency Management Division website or in publicly accessible county records.

Five of the 83 identified jurisdictions did not participate in the 2025 HMP update process and are therefore not currently eligible for federal mitigation funding to implement their projects. Each of these municipalities can elect to join the 2025 HMP by working with the Lancaster County HMP Coordinator to complete the following steps:

1. Provide information on the hazards and risks that can affect its operations, residents, businesses, property, and environment
2. Provide information on its capabilities
3. Provide an update on the status of its mitigation actions from the 2019 version of the HMP, if applicable
4. Identify mitigation actions to include in the current HMP
5. Adopt the current HMP by resolution (see Section 8)

Steps 1 to 3 can be accomplished by completing the information gathering worksheets that were used during the planning process. No municipality or district that has already adopted the 2025 HMP will be required to re-adopt the 2025 HMP if the HMP is updated by another municipality’s information.

#### 7.2.1 Monitoring

The Lancaster County Department of Public Safety will be responsible for monitoring progress on and evaluating the effectiveness of the plan and documenting annual progress. Each year, beginning one year after plan approval, Lancaster County and Planning Team representatives will collect and process information from the



departments, agencies, and organizations involved in implementing the mitigation actions listed in Section 6 of this plan.

The Lancaster County Department of Public Safety will develop a survey, to be posted on its website, for the Steering Committee to submit mitigation-related projects in their jurisdiction.

In the first year of the performance period, this will be accomplished using an online performance progress reporting system (the BATool<sup>SM</sup>) that will enable municipal and county representatives to directly access and update the status of each mitigation action, document successes or obstacles to implementation, and add or delete projects. Participating partners will be prompted by the tool to update progress on a quarterly basis, providing an incentive for participants to refresh their mitigation strategies and to continue implementation of projects. By facilitating the sorting and prioritization of projects, this reporting system can support the submittal of an increased number of project grant fund applications.

In addition to progress on the implementation of mitigation actions, including obstacles to implementation, Steering Committee representatives will be expected to document the following, as needed and appropriate:

- Any grant applications filed on behalf of any of the participating jurisdictions
- Hazard events and losses occurring in their jurisdiction
- Additional mitigation actions believed to be appropriate and feasible
- Public and stakeholder input.

Plan monitoring for years 2 through 4 of the plan performance period will be addressed via the BATool<sup>SM</sup> or manually.

## 7.2.2 Evaluating

The evaluation of the HMP is an assessment of whether the planning process and actions have been effective, whether the HMP goals are being achieved, and whether changes are needed. The plan will be evaluated on an annual basis to determine the effectiveness of the programs and to reflect changes that may affect mitigation priorities or available funding.

Information gathered on the status of the HMP, as described in Section 7.2.1, will be discussed and documented at an annual plan review meeting of the Steering Committee. The Lancaster County HMP Coordinator will be responsible for calling and coordinating the progress plan review meeting and assessing progress toward achieving plan goals and objectives. At least one month before the plan review meeting, the HMP Coordinator will advise Steering Committee members of the meeting date, agenda, and expectations of the members. The HMP Coordinator may also distribute additional mitigation surveys and mitigation project opportunity forms for jurisdictions with new information or for those that did not participate in the update process. The meeting will assess whether:

- Goals and objectives address current and expected conditions
- The nature or magnitude of the risks has changed
- The HMP has been implemented into land-use processes at the county and municipal levels
- Current resources are appropriate for implementing the HMP or different or additional resources are now available
- Actions are cost-effective
- Schedules and budgets are feasible
- Implementation problems exist—such as technical, political, legal, or coordination issues with other agencies
- Outcomes have occurred as expected
- Changes in county or municipal resources have impacted plan implementation (for example, funding, personnel, and equipment)



- New agencies, departments, or staff should be included, including other local governments, as defined under 44 Code of Federal Regulations (CFR), Section 201.6
- Documentation has been completed for any hazard events that occurred during the last year

The Lancaster County Department of Public Safety will review mitigation goals, objectives, activities, and projects using the following performance-based indicators:

- Newly created agencies or departments that have authority to implement mitigation actions or are required to meet goals, objectives, and actions
- Project evaluation based on current needs of the mitigation plan
- Project completion regarding progress of proposed or ongoing actions
- Underspending or overspending regarding proposed mitigation action budgets
- Achievement of the goals and objectives
- Resource allocation—Whether resources are required to implement mitigation activities
- Timeframe—Whether proposed schedules are sufficient to address actions
- Budget—Whether budget basis should be changed or is sufficient
- Lead or support agency commitment—Whether there is adequate commitment on the part of lead or support agencies
- Feasibility—Whether certain goals, objectives, or actions prove to be unfeasible

The Lancaster County Department of Public Safety will evaluate the ways other programs and policies have conflicted with or augmented planned or implemented measures, and will identify policies, programs, practices, and procedures that could be modified to accommodate hazard mitigation actions. Other programs and policies can include those that address the following:

- Economic development
- Environmental preservation and permitting
- Historic preservation
- Redevelopment
- Health and/or safety
- Recreation
- Land use and zoning
- Public education and outreach
- Transportation

During the Lancaster County Department of Public Safety and Planning Team meeting, the planning partners will establish a schedule for the development, review, comment, amendment, and submittal of an annual HMP progress report to the State Hazard Mitigation Officer. The Lancaster County HMP Coordinator will be responsible for preparing the annual HMP progress report based on the annual local progress reports provided by each jurisdiction, information presented at the Steering Committee meeting, and other information as appropriate and relevant. These HMP annual county progress reports will provide data for the five-year update of this HMP and will assist in pinpointing implementation challenges. By monitoring the implementation of the plan, the Steering Committee will assess which projects are completed, are no longer feasible, or may require additional funding.

The annual HMP progress report will apply to all planning partners who have provided input and will be developed according to an agreed-upon format. Each planning partner will have adequate allowance for input and comment prior to completion and submission to the State Hazard Mitigation Officer. Each planning partner will be responsible for providing this report to its governing body for review. The HMP Coordinator will ensure that the reports are submitted to the State Hazard Mitigation Officer and FEMA Region 3.

The plan will be evaluated following any major disasters to determine whether the recommended actions remain relevant and appropriate. The risk assessment will also be revisited to determine whether any changes are



necessary based on the pattern of disaster damage or if data listed in Section 4.3 (Hazard Profiles) has been collected to facilitate the risk assessment. Revisiting the risk assessment is an opportunity to increase the community's disaster resistance and build a better and stronger community.

### 7.2.3 Updating

Section 44 CFR 201.6.d.3 requires local jurisdictions to review, revise (as appropriate), and resubmit their hazard mitigation plans for approval to remain eligible for certain federal benefits. The Lancaster County Department of Public Safety will update this plan on a five-year cycle from the date of plan approval.

The Lancaster County HMP Coordinator, with support from the Planning Team, will hold a meeting three years from the date of plan approval to develop and commence with the implementation of a detailed plan update. The HMP Coordinator will invite representatives from the Pennsylvania Emergency Management Agency (PEMA) to this meeting to provide guidance on plan update procedures. This program will, at a minimum, establish the parties responsible for managing and completing the plan update, the features needed to be included in the updated plan, and a detailed timeline to ensure that the update is completed according to regulatory requirements.

At this meeting, the Lancaster County Department of Public Safety will determine the resources needed to complete the update. The Lancaster County HMP Coordinator will be responsible for ensuring that needed resources are secured. The HMP Coordinator will also be responsible for coordinating the plan evaluation portion of the meeting, soliciting and reviewing feedback comments and ensuring their incorporation in the five-year plan update as appropriate. Additional meetings may also be held, as deemed necessary by the Planning Team. These meetings will provide an opportunity for the public to express concerns, opinions, and ideas about the HMP.

## 7.3 CONTINUED PUBLIC INVOLVEMENT

Lancaster County and participating jurisdictions are committed to the continued involvement of the public in the hazard mitigation process. Therefore, the plan will be posted on the HMP website or can be requested via email to [HMP@lancastercountypa.gov](mailto:HMP@lancastercountypa.gov). Lancaster County will make electronic copies of the plan available for local municipalities to provide to the public.

Following each five-year update of the HMP, the updated plan will be distributed for public comment. After all comments are addressed, the HMP will be revised and distributed to all Steering Committee members and the Pennsylvania State Hazard Mitigation Officer.

The Lancaster County HMP Coordinator will be responsible for receiving, tracking, and filing public comments on the HMP. The public will have an opportunity to comment on the plan at the review meeting for the HMP and during the five-year plan update. Lancaster County will maintain an active link on the Lancaster County Emergency Management Division website to collect public comments.

The Lancaster County HMP Coordinator will ensure the following:

- Public comment and input on the HMP (and hazard mitigation in general) will be recorded and addressed, as appropriate.
- An opportunity to comment on the plan will be provided directly on the Lancaster County Emergency Management Division website, and provisions will be made for public comments submitted in writing. All public comments should be addressed to:

Lancaster County Emergency Management Division  
Department of Public Safety  
28 South Charlotte Street  
Manheim, PA 17545  
P.O. Box 219



- The Lancaster County Emergency Management Division website's HMP content will be maintained and updated, as appropriate.
- All public and stakeholder comments received will be documented and maintained.
- Copies of the latest approved plan will be available for review at the Lancaster County Emergency Management Division office, along with instructions to facilitate public input and comment on the plan.
- Public notices, including media releases, will be developed (as appropriate) to inform the public of the availability of the plan, particularly during plan update cycles.
- Public comment and input on the HMP (and hazard mitigation in general) will be recorded and addressed, as appropriate.
- Copies of the latest approved version of the plan will be available for review at municipal buildings along with instructions to facilitate public input and comment on the plan.
- Appropriate links to the Lancaster County website will be maintained. The website will be monitored throughout the course of the HMP update process, and a draft copy of the plan will be posted for public comment. Upon conclusion of the update, appropriate links to the county HMP will be maintained on the website.
- Public notices will be made, as appropriate, to inform the public of the availability of the plan, particularly during plan update cycles.



## **SECTION 8 PLAN ADOPTION**

By adopting the Lancaster County Hazard Mitigation Plan (HMP), jurisdictions demonstrate their commitment to fulfilling the mitigation goals and objectives outlined in the plan. Adoption of the HMP by Lancaster County and each participating jurisdiction legitimizes the HMP and authorizes responsible agencies to execute their responsibilities.

Each participating jurisdiction in Lancaster County will continue with formal adoption proceedings upon review of the HMP by the Pennsylvania Emergency Management Agency (PEMA) as the HMP is reviewed by the Federal Emergency Management Agency (FEMA), or upon conditional approval of the HMP from FEMA (known as Approval Pending Adoption). Conditional approval is provided for jurisdictions that meet all planning requirements except the adoption requirement.

Following adoption or formal action on the HMP, each participating jurisdiction must submit a copy of the resolution or other legal instrument showing formal adoption (acceptance) of the HMP to the Lancaster County Hazard Mitigation Coordinator. Lancaster County will forward the executed resolutions to PEMA, which will subsequently forward the resolutions to FEMA. FEMA will transmit acknowledgement of verification of formal HMP adoption and the official approval of the HMP to the Hazard Mitigation Coordinator. Resolutions reflecting the formal adoption of this HMP by the county and participating jurisdictions are included in Appendix F of this HMP. A sample resolution to be used by the county and its jurisdictions is provided in Appendix F.



## ACRONYMS AND ABBREVIATIONS

This resource identifies acronyms and abbreviations used in or supporting the Lancaster County Hazard Mitigation Plan (HMP). The acronyms and abbreviations listed below are based on documents included in the reference section, with modifications as appropriate to address the Lancaster County-specific identifications and requirements.

<b>%g</b>	Percent acceleration force of gravity
<b>ACS</b>	Auxiliary Communications Service
<b>BFE</b>	Base flood elevation
<b>BRIC</b>	Building Resilient Infrastructure and Communities
<b>CDBG</b>	Community Development Block Grant
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CERT</b>	Community Emergency Response Team
<b>cfs</b>	Cubic feet per second
<b>CFR</b>	Code of Federal Regulations
<b>CRREL</b>	Cold Regions Research and Engineering Laboratory
<b>CRS</b>	Community Rating System
<b>DCED</b>	Pennsylvania Department of Community and Economic Development
<b>DCNR</b>	Pennsylvania Department of Conservation and Natural Resources
<b>DFIRM</b>	Digital Flood Insurance Rate Map
<b>DI</b>	Damage Indicators
<b>DMA 2000</b>	Disaster Mitigation Act of 2000
<b>DOF</b>	Dependent on funding
<b>DOT</b>	Department of Transportation
<b>DR</b>	Disaster Declarations
<b>EAP</b>	Education and Awareness Program
<b>EF Scale</b>	Enhanced Fujita Scale
<b>EM</b>	Emergency management
<b>EMA</b>	Emergency Management Agency
<b>EMC</b>	Emergency Management Coordinator
<b>EMS</b>	Emergency Medical Services
<b>EOC</b>	Emergency Operations Center
<b>EOP</b>	Emergency Operations Plan
<b>EPA</b>	U.S. Environmental Protection Agency
<b>EPZ</b>	Emergency planning zone
<b>ESF</b>	Emergency Support Function



<b>FAA</b>	Federal Aviation Administration
<b>FEMA</b>	Federal Emergency Management Agency
<b>FERC</b>	Federal Energy Regulatory Commission
<b>FIRM</b>	Flood Insurance Rate Map
<b>FIS</b>	Flood Insurance Study
<b>FMA</b>	Flood Mitigation Assistance
<b>g</b>	Gravity
<b>GIS</b>	Geographic Information System
<b>hazmat</b>	Hazardous materials
<b>Hazus</b>	Hazards U.S.
<b>HHPD</b>	High Hazard Potential Dam
<b>HIFLD</b>	Homeland Infrastructure Foundation-Level Data
<b>HMGP</b>	Hazard Mitigation Grant Program
<b>HMP</b>	Hazard Mitigation Plan
<b>HUD</b>	Department of Housing and Urban Development
<b>HVAC</b>	Heating, ventilation, and air conditioning
<b>ILI</b>	Influenza-like illnesses
<b>LCSN</b>	Lamont-Doherty Cooperative Seismographic Network
<b>LCWC</b>	Lancaster County-Wide Communications
<b>LEPC</b>	Local Emergency Planning Committee
<b>LPR</b>	Local Plans and Regulations
<b>LWCF</b>	Land and Water Conservation Fund
<b>MMI</b>	Modified Mercalli Intensity
<b>MPC</b>	Municipal Planning Code
<b>mph</b>	Miles per hour
<b>MRP</b>	Mean return period
<b>N/A</b>	Not applicable
<b>NASA</b>	National Aeronautics and Space Administration
<b>NCEI</b>	National Centers for Environmental Information
<b>NEHRP</b>	National Earthquake Hazard Reduction Program
<b>NESEC</b>	Northeast States Emergency Consortium
<b>NFIP</b>	National Flood Insurance Program
<b>NHTSA</b>	National Highway Traffic Safety Administration
<b>NLCD</b>	National Land Cover Dataset
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NRC</b>	Nuclear Regulatory Commission



<b>NRCC</b>	Northeast Regional Climate Center
<b>NRCS</b>	Natural Resource Conservation Service
<b>NSP</b>	Natural Systems Protection
<b>NSSL</b>	National Severe Storms Library
<b>NTAS</b>	National Terrorism Advisory System
<b>NTSB</b>	National Transit Safety Board
<b>NWS</b>	National Weather Service
<b>PA DEP</b>	Pennsylvania Department of Environmental Protection
<b>pCi/L</b>	picocuries per liter
<b>PDM</b>	Pre-disaster Mitigation Grant Program
<b>PDSI</b>	Palmer Drought Severity Index
<b>PEMA</b>	Pennsylvania Emergency Management Agency
<b>PennDOT</b>	Pennsylvania Department of Transportation
<b>PGA</b>	Peak ground acceleration
<b>PHMSA</b>	Pipeline and Hazardous Materials Safety Administration
<b>ppm</b>	Parts per million
<b>RCV</b>	Replacement cost value
<b>RF</b>	Risk factor
<b>RL</b>	Repetitive loss
<b>RSI</b>	Regional Snowfall Index
<b>SA</b>	Spectral acceleration
<b>SARA</b>	Superfund Amendments and Reauthorization Act
<b>SBA</b>	Small Business Administration
<b>SEVAN</b>	Satellite Emergency Voice Alerting Network
<b>SFHA</b>	Special Flood Hazard Area
<b>SIP</b>	Structure and Infrastructure Project
<b>SRL</b>	Severe repetitive loss
<b>TBD</b>	To be determined
<b>TDD</b>	Telecommunications device for the deaf
<b>TMI</b>	Three Mile Island
<b>TRI</b>	Toxic Release Inventory
<b>USACE</b>	U.S. Army Corps of Engineers
<b>USDA</b>	U.S. Department of Agriculture
<b>USEDA</b>	U.S. Economic Development Administration
<b>USDOT</b>	U.S. Department of Transportation
<b>USGS</b>	U.S. Geological Survey



**WHO** World Health Organization  
**WUI** Wildland urban interface