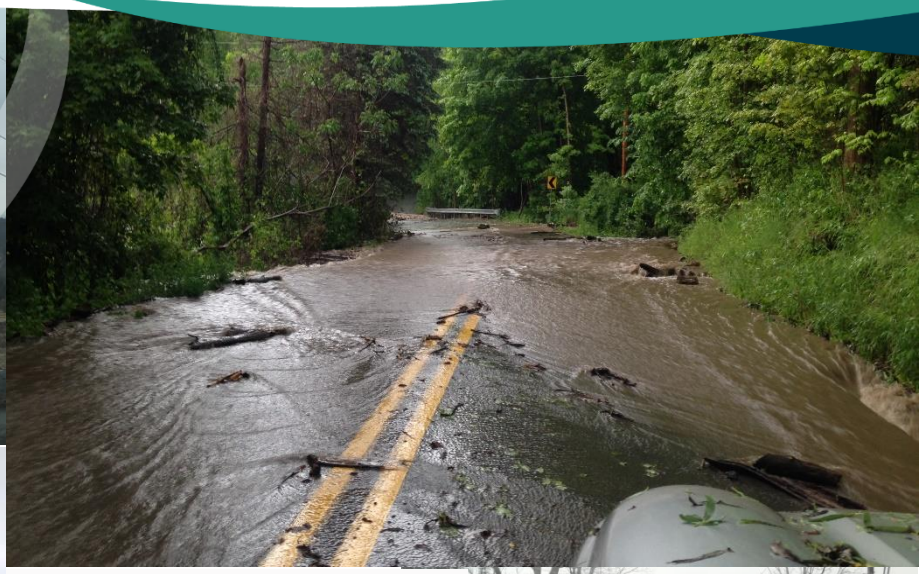


LACKAWANNA COUNTY
EMA
Emergency Management Agency

2021 Hazard Mitigation Plan Update

Lackawanna County, Pennsylvania

VISION
PLANNING & CONSULTING, LLC

LACKAWANNA COUNTY PENNSYLVANIA

January 2021

Hazard Mitigation Plan
Lackawanna County, Pennsylvania

January 2021

Acknowledgements

This Hazard Mitigation Plan was prepared under the guidance of the Lackawanna County Department of Planning and Economic Development, and the Steering Committee, which included the Emergency Management Agency. The members of the Steering Committee are listed in Chapter 3.

Prepared For:
Lackawanna County Department of Planning and Economic Development
123 Wyoming Avenue, Suite 505
Scranton, PA 18503

Prepared By:
Vision Planning and Consulting, LLC.
7560 Morris Street, Unit 1
Fulton, MD 20759
Phone: 240 893 8719
Fax: 888-872-9626
Email: dsrinivasan@vision-pc.net

TABLE OF CONTENTS

List of Figures

List of Tables

1.0 CHAPTER 1 – INTRODUCTION

1.1 Background

Hazard Mitigation is defined by the Federal Emergency Management Agency (FEMA) as "sustained action taken to reduce or eliminate long-term risk to people and property from hazards and their effects". The hazard mitigation planning process involves the coordination of actions taken to reduce injuries, deaths, property damage, economic losses, and degradation of natural resources due to natural and human-caused disasters. Hazard mitigation is considered one of four phases in emergency management activities. This includes:

- Preparedness - activities that involve planning and preparing for when a disaster strikes and include response capability actions to ensure an effective and efficient use of resources and efforts to minimize damage.
- Mitigation - activities that involve actions that reduce or eliminate the probability of an occurrence or reduce the impact of a disaster. The goal of the mitigation phase is to decrease the need for a respective response.
- Response - activities that involve providing emergency assistance to victims and minimizing property loss and can include preliminary or initial damage assessments. The response phase begins during or immediately after the onset of a disaster and informs the recovery process.
- Recovery - activities that include short and long-term activities that help return individuals and communities to normalcy as soon as possible. Recovery actions involve clean-up efforts, temporary housing, and repair or replacement of infrastructure.

The original Hazard Mitigation Plan (HMP) for Lackawanna County was developed in 2009 as a Bi-County Mitigation Plan for Luzerne and Lackawanna Counties and their 76 and 40 municipalities, respectively. The Initial Plan document included the planning process, community profile, hazard identification and analysis, vulnerability assessment, capability assessment, mitigation strategy, and plan maintenance sections. A total of 39 out of the Lackawanna County's 40 municipalities participated in the planning process via questionnaires, meetings, and identification and review of mitigation projects. The 2009 Plan identified the Bi-County region as being susceptible to a range of natural hazards including floods, high wind, winter storms, mine related hazards, and drought. The 2015 Plan Update served as an update to the 2009 Plan and elaborated upon the various hazards and vulnerabilities that had been investigated and mitigation actions were revisited to track progress, and this 2020 Plan Update is an update to the 2015 Update.

1.2 Purpose

The 2020 Plan Update is intended to enable the County and its municipalities to effectively respond to hazards as they occur and reduce the potential risks of these hazards to the health, safety, and welfare of the residents. The overall goal for the Update is to continue to allow Lackawanna County municipalities to be eligible for a range of financial assistance following hazard events.

The 2020 Plan Update consists of a thorough review of the 2015 Plan, which was used as a base document, with each chapter updated as and where necessary. The Plan Update involves the review of data on potential hazards and reprioritization of these hazards in terms of frequency, severity, and impacts. This Plan Update includes a review of the county profile, county and municipal

capabilities, county, and municipal mitigation actions, which were revised, deleted, or modified to address the high priority hazards, and a Plan Maintenance and Monitoring section.

1.3 Scope

In December of 2019, the Lackawanna County Regional Planning Commission contracted with Vision Planning and Consulting (VPC) from Fulton, Maryland to develop the Plan Update in compliance with the requirements of the Disaster Mitigation Act of 2000. This Hazard Mitigation Plan Update was funded by Hazard Mitigation Assistance (HMA) funds from the Federal Emergency Management Agency (FEMA) and administered by the Pennsylvania Emergency Management Agency (PEMA). This Plan Update is a multi-jurisdictional plan that covers Lackawanna County and its 40 municipalities.

It must be noted that future funding for mitigation projects will be contingent upon having each municipality/jurisdiction in Lackawanna County adopt the Plan after the County adopts the Update. Any jurisdiction that does not adopt the 2020 Plan Update will become ineligible for pre- and post-disaster mitigation funds.

Organization of the Plan

The Hazard Mitigation Plan Update comprises 7 chapters. Chapter 1 introduces the plan update process and organization. Chapter 2 provides an overview of the geographic, socio- economic, and demographic characteristics. Chapter 3 discusses the planning process; Chapter 4 comprises the hazard identification and profiling. Chapter 5 contains a capability assessment including a review of existing plans and ordinances from the counties and municipalities Chapter 6 discusses the mitigation strategy including updated mitigation goals and objectives, mitigation actions, and the method for prioritization and implementation of mitigation actions. Chapter 7 outlines how Lackawanna County and its municipalities will implement the Plan once it is adopted and ways to monitor progress and ensure continued public involvement. This Plan Update also includes six supporting appendices.

1.4 Authority and Reference

Authority for this Plan originates from the following federal sources:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended;
- Code of Federal Regulations (CFR), Title 44, Parts 201 and 206; and
- Disaster Mitigation Act of 2000, Public Law 106-390, as amended.

Authority for this Plan originates from the following Commonwealth of Pennsylvania sources:

- Commonwealth of Pennsylvania Standard All-Hazard Mitigation Plan, revised October 2018.

The following Federal Emergency Management Agency (FEMA) guides and reference documents were used to prepare this document:

- FEMA. Local Mitigation Planning Tool and Guide. March 2012.
- FEMA. Local Mitigation Planning Handbook. March 2013.

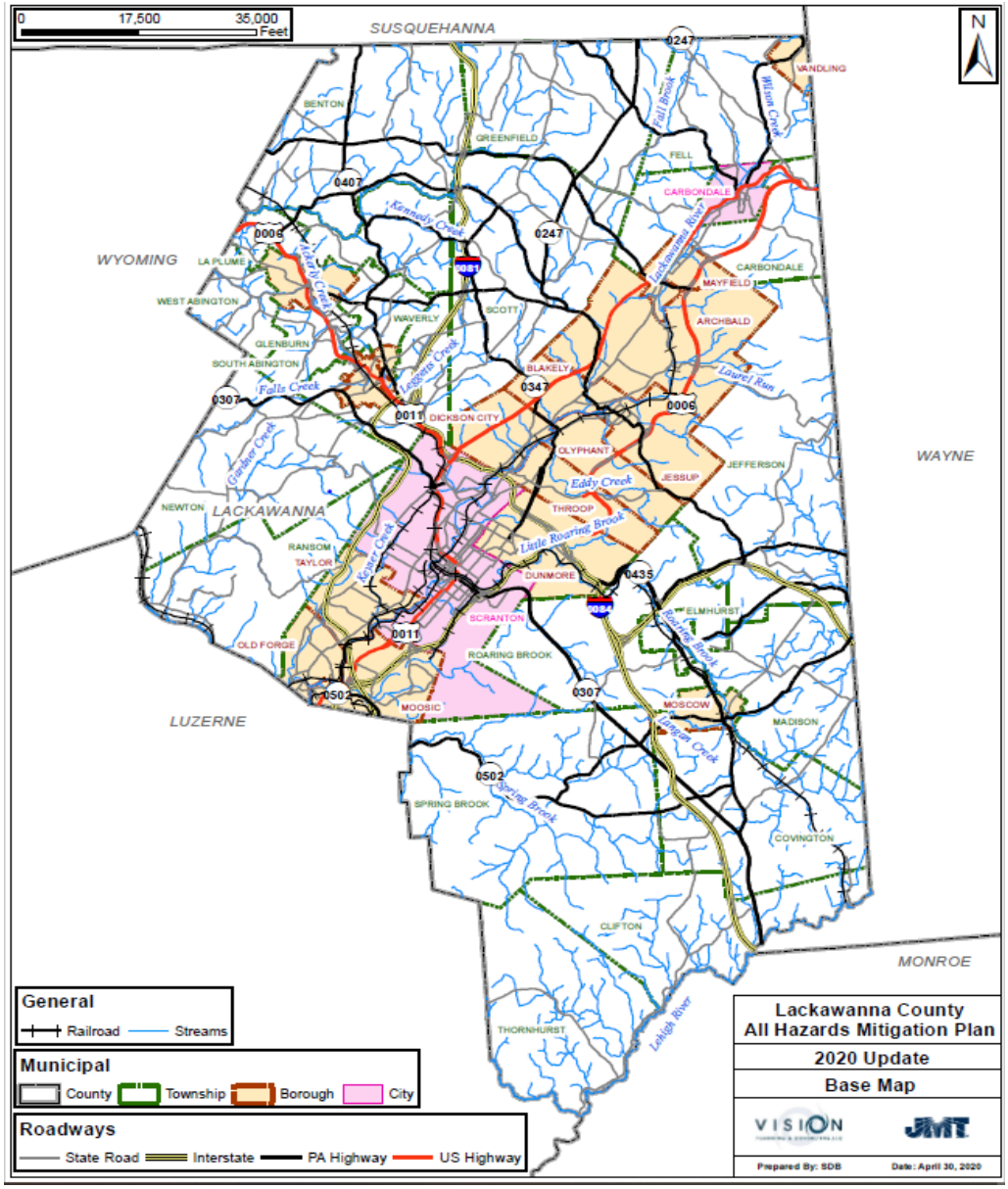
2.0 CHAPTER 2 – COMMUNITY PROFILE

2.1 Geography and Environment

Lackawanna County, an area of approximately 474 square miles, has both urban and rural settings, is located in the northeastern region of Pennsylvania. It comprises 40 municipalities (21 townships, 17 boroughs, and two cities). The City of Scranton is the county seat.

Lackawanna County is bordered by Susquehanna County to the north, Wayne County to the east, Monroe County to the southeast, Luzerne County to the southwest, and Wyoming County to the west (Figure 2.1).

Figure 2.1 Lackawanna County Location Map



2.2 Community Facts

2.2.1 County History

Prior to the County's establishment, members of Delaware Tribe, part of a Native American confederation known as the Six Nations, give the earliest evidence of human dwellers within the county. They built homes along the banks of the nearby Lackawanna River in their town called Capoose, which is situated near present-day Weston Field, in Providence, the oldest section of City of Scranton.[1] In the 1750s the Susquehanna Company was formed in Connecticut in an effort to send explorers to the Lackawanna Valley for mapping purposes and to establish good relations with the Native Americans.[2] The Company then made the land purchase that included the Lackawanna Valley, in 1768.

From 1800 to 1850 Lackawanna County was in the heart of the Northern Anthracite Coal Field, which stretched through 55 miles from southeastern Susquehanna County, through present day Lackawanna, and into Luzerne County. From 1850 to 1880, industry took off with the arrival of the Scranton family, as these new industries attracted more people, effectively altering the valley's rural appearance and showing its regional tie to the anthracite industry.[3] The valley was anchored by two established cities on both ends, Carbondale and Scranton,.[4]

It was in 1878 that Lackawanna County was created from a portion of northern Luzerne County, and Scranton was designated as the county seat, making it Pennsylvania's 67th county, and the last county to be formed in the Commonwealth.[5] Between 1880 and 1920, the city constructed the bulk of its commercial and cultural fabric and installed the first electric streetcar system in the United States, earning it the nickname "The Electric City."[6]

The economic success of the valley started to fade due to The Great Depression and the development of alternative fuel sources. Today diversified and service industries have replaced mining as the basis of Lackawanna County's economy, and industrial and office parks have and are continuing developed throughout the area.[7] The construction of the Governor Robert Casey Highway, and the designation of the Glenmaura Planned Development Zone in Moosic, and several Keystone Opportunity Zones throughout the County have contributed to the county's more recent growth.[8]

2.2.2 Jurisdictions

Lackawanna County is comprised of 40 municipalities, including 21 townships, 17 boroughs, and two cities. Table 2.1 and Figure 2.3 provides the names and locations of municipalities in Lackawanna County.

Table 2.1 Lackawanna County Municipalities

Townships

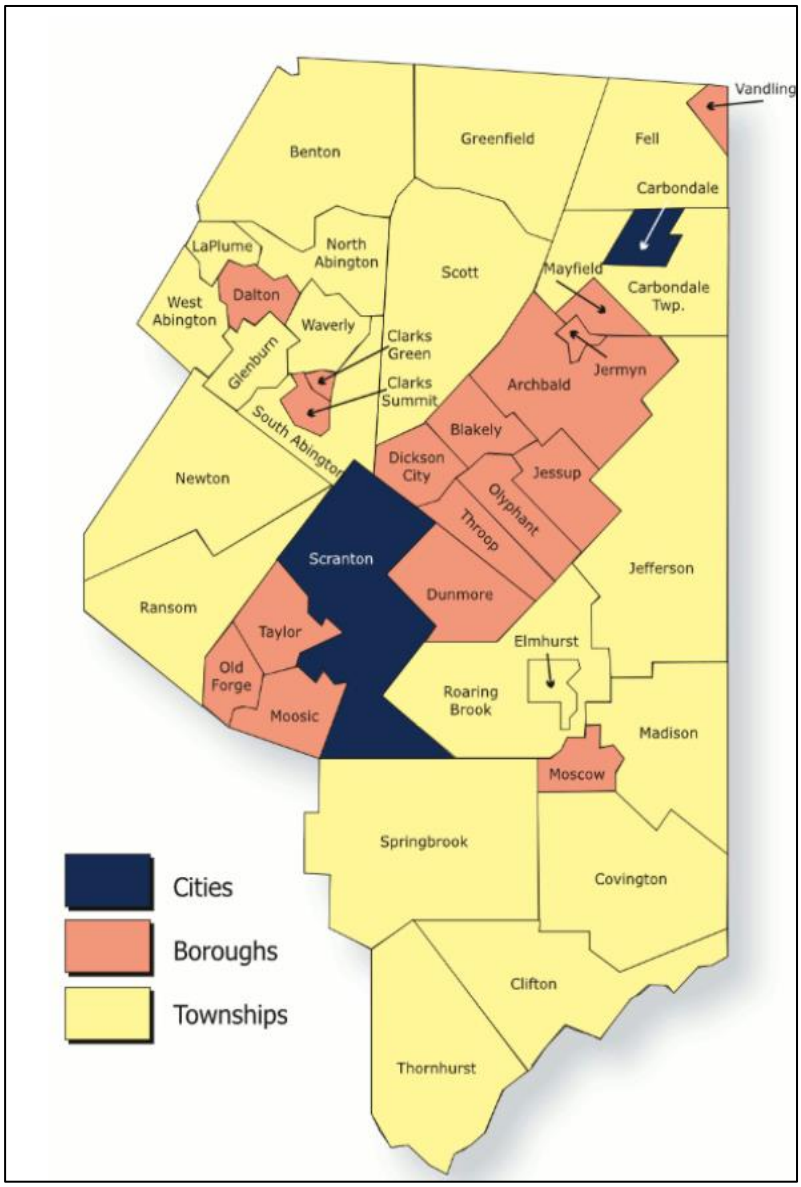
[1] County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.
[2] Ibid.
[3] Ibid.
[4] Ibid.
[5] Ibid.
[6] Ibid.
[7] Ibid.
[8] Ibid.

Benton Township	Carbondale Township
Clifton Township	Covington Township
Elmhurst Township	Fell Township
Glenburn Township	Greenfield Township
Jefferson Township	LaPlume Township
Madison Township	Newton Township
North Abington Township	Ransom Township
Roaring Brook Township	Scott Township
South Abington Township	Spring Brook Township
Thornhurst Township	Waverly Township
West Abington Township	
Boroughs	
Archbald Borough	Blakely Borough
Clarks Green Borough	Clarks Summit Borough
Dalton Borough	Dickson City Borough
Dunmore Borough	Jermyn Borough
Jessup Borough	Mayfield Borough
Moosic Borough	Moscow Borough
Old Forge Borough	Olyphant Borough
Taylor Borough	Throop Borough
Vandling Borough	
Cities	
Carbondale City	Scranton City

The County is traversed by the Lackawanna River, and the County's southern border is flanked by the Lehigh River and Susquehanna River. Several tributaries drain from the Lackawanna River including: Ackerly Creek, Eddy Creek, Fall Brook, Falls Creek, Gardner Creek, Hull Creek, Kennedy Creek, Keyser Creek, Langan Creek, Laurel Run, Leggett's Creek, Little Roaring Brook, Meadow Brook, Mill Creek, Roaring Brook, Spring Brook, Wilson Creek. Topographically the features that stand out the most in Lackawanna County are the two nearly parallel mountain ranges that traverse the county in a southwest to northeast direction, forming the valley area, with the Lackawanna River flowing through the middle of the valley.[9]

[9] Lackawanna County Government, 2020, Quick Facts, available at https://www.lackawannacounty.org/index.php/quick-facts#4..

Figure 2.2 Lackawanna County Municipalities Map



Source: Lackawanna County Government

2.2.3 Climate

Lackawanna County has a mild, temperate climate and experiences an average annual temperature of about 49 degrees Fahrenheit, with an average annual precipitation of approximately 37 inches. During the winter months (December through February), daytime temperatures typically range in the mid-thirties during the day, and from the low-to-high twenties at night. The annual snowfall is approximately 40 inches, which can vary widely from lower to higher elevations. Average summer (June through August) temperatures are in the low 80s. Most rainfall comes in the spring and fall seasons, although the County averages about seven thunderstorms during the summer months.

2.2.4 Physical Features

The County is bordered by the Lehigh River in the Southeast and the Susquehanna River to the west, while the Lackawanna River runs from northeast to southwest through the center of the county. The Lackawanna River runs for about 31 miles in a southwest direction through Lackawanna County and continues for approximately 2.5 miles through Luzerne County before its confluence with the Susquehanna River. The Lehigh River flows in a southwest direction for approximately 14 miles along the southern border of Lackawanna County. [10]

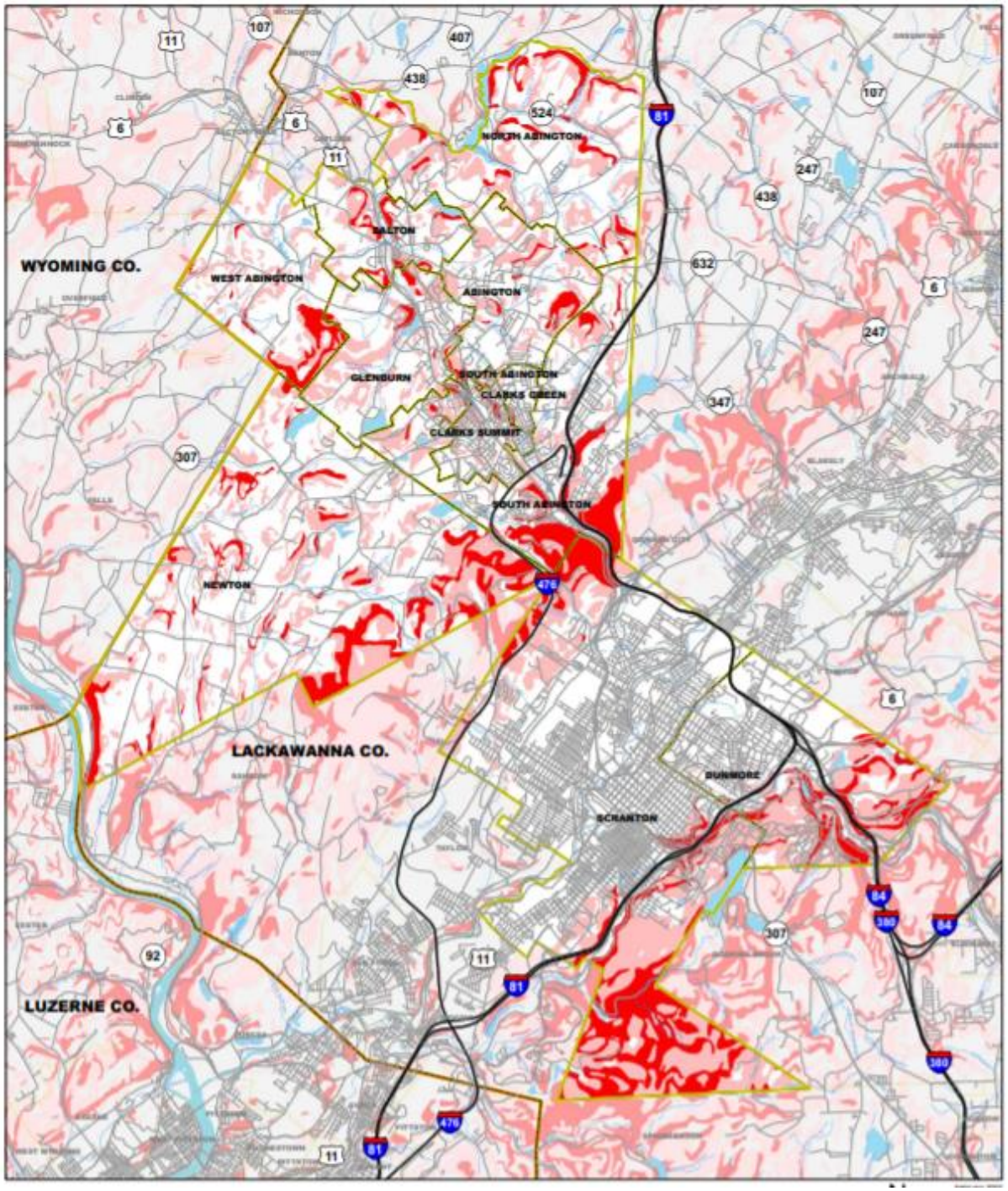
Naturally with a natural river valley running through the center of the County, steep slopes are prevalent in different areas, as shown in Figure 2.4, and provided in the Scranton-Abingtons Planning Association (SAPA) Comprehensive Plan. The range of mountains that form the east boundary of the valley is known as Moosic Mountain, and the western boundary of the valley range is referred to generally as West Mountain. The two mountain ranges naturally trisect the county. Each of these ranges reaches an average height of 2,000 feet above sea level, while the valley floor ranges in elevation from 600 feet in the southwestern section to 1,500 feet in the northeast. Beyond West Mountain in the northwest section of the county, elevations are generally 800 to 2,000 feet. Beyond Moosic Mountain in the southeast section of the county, elevations range from 1,100 to 2,300 feet.[11]

2.2.5 Watersheds

A watershed is an area where all runoff is naturally directed into a particular creek or river. Watersheds are defined by topographic ridge lines, which may be prominent ridges or less notable areas of high ground. The Lackawanna County Conservation District uses a watershed approach to address pollution, including both point and non-point source. In the County, there are nine watershed organizations, identified in Table 2.2.

[10] Lackawanna County Government, 2020, Quick Facts, available at https://www.lackawannacounty.org/index.php/quick-facts#4.
[11] Ibid.

Figure 2.3 Slope in Lackawanna County



Source: Scranton-Abingtons Planning Association Comprehensive Plan

Table 2.2 Active Watershed and Community Associations in Lackawanna County

NEPA Chapter of Trout Unlimited	North Pocono CARE
South Branch Tunkhannock Creek Watershed Coalition	Lackawanna Advocates for Nutrition and Activity
Newton Lake Watershed Association	Lackawanna Valley Conservancy
Moosic Lake Association	Countryside Conservancy
Lackawanna River Corridor Association	

Watersheds and drainage patterns within the county are generally as follows: The Lackawanna River flows through the valley between the two mountains, accounting for the drainage of approximately two-thirds of Lackawanna County.[12] The westerly slopes of the western range (Western Mountain) drain to tributaries of the Susquehanna River, and the easterly slopes (Moosic Mountain) are drained by the Lackawanna and Lehigh Rivers and their associated tributaries.[13]

2.2.6 Employment and Industry Profile

According to the PA Department of Labor and Industry, in 2017 there was a total of 5,743 businesses in the County.[14] Lackawanna County's top major employer is Allied Services Foundation, and major industries include educational services, health care, and social assistance, as well as retail trade, and manufacturing. Table 2.3 identifies the approximate number of establishments by industry.

Table 2.3 Number of Establishments and Employees by Industry[15]

Industry	Number of Establishments	Number of Employees
Agriculture, Forestry, Fishing, Hunting, and Mining	5	10
Mining, Quarrying, and Oil and Gas Extraction	5	37
Utilities	16	613
Construction	441	3,205
Manufacturing	214	9,609
Wholesale Trade	245	4,400
Retail Trade	831	11,949
Transportation and Warehousing	154	4,647
Information	82	2,608
Finance and Insurance	296	4,369
Real Estate, Rental, and Leasing	145	658
Professional, scientific, and Technical Services	470	2,919
Management of Companies and Technical Services	31	1,620
Administrative and Support and Waste Management Services	241	4,270
Educational services	58	6,552
Health Care and Social Assistance	741	20,762

[12] Lackawanna County Conservation District, 2020. Watershed Program, available at http://www.lccd.net/watershed-program/
[13] Ibid.
[14] County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.
[15] United States Census Bureau, 2018, All Sectors: County Business Patterns by Legal Form of Organization and Employment Size Class for U.S., States, and Selected Geographies: 2018, available at: https://data.census.gov/cedsci/table?g=0500000US42069&d=ANN%20Business%20Patterns%20County%20Business%20Patterns&table=CB1800CBP&tid=CBP2018.CB1800CBP&hidePreview=true&lastDisplayedRow=18&t=Business%20and%20Economy%3AEmployment%3AEmployment%20and%20Labor%20Force%20Status%3AIndustry.

Arts, Entertainment, and Recreation	73	5,020
Accommodation and Food Services	587	8,726
Other Services	554	3,573

According to a 2018 profile of Lackawanna County, the County's top employers represent major industries in the County. They include: Allied Services Foundation, PA State Government, Geisinger Community Medical Center, Scranton School District, Lackawanna County, University of Scranton, TMG Health Inc., Federal Government, Wal-Mart Associates Inc., Moses Taylor Hospital. Regional Hospital of Scranton, Cigna Health and Life Insurance Co., Bank of America, Keystone Community Resources Inc., and Marywood University.[16]

2.2.7 Education/Institutions

There are 12 public school districts across Lackawanna County, 10 of which have school buildings in the county. Table 2.4 identifies the public school districts and the public schools within each school district.

Table 2.4 School District and Schools in Lackawanna County[17]

District	Schools
Abington Heights School District	Abington Heights High School Abington Heights Middle School Clarks Summit Elementary School Newton-Ransom Elementary School South Abington Elementary School Waverly Elementary School
Carbondale Area School District	Carbondale Area Elementary School Carbondale Area Jr/Sr High School
Dunmore School District	Dunmore Elementary Center Dunmore Middle School Dunmore High School
Forest City Regional School District (Schools are in Susquehanna County with territory in Lackawanna County)	Forest City Regional Elementary School Forest City Regional High School
Lackawanna Trail School District (Schools are in Wyoming County with territory in Lackawanna County)	Lackawanna Trail Elementary School Lackawanna Trail Junior Senior High School
Lakeland School District	Lakeland Elementary (Mayfield Campus) Lakeland Elementary (Scott Campus) Lakeland Jr-Sr High School
Mid Valley School District	Mid Valley Elementary Center Mid Valley Secondary Center
North Pocono School District	Jefferson Elementary Center Moscow Elementary Center North Pocono Intermediate School

[16] County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.
[17] Lackawanna County Government, 2020, Schools, available at https://www.lackawannacounty.org/index.php/school-map.

District	Schools
	North Pocono Middle School North Pocono High School
Old Forge School District	Old Forge Elementary School Old Forge Junior Senior High School
Riverside School District	Riverside Elementary East Riverside Elementary West Riverside Jr/Sr High School
Scranton School District	George Bancroft Elementary School Isaac Tripp Elementary School John Adams Elementary School John F. Kennedy Elementary School McNichols Educational Plaza Neil Armstrong Elementary School Prescott Elementary School Robert Morris Elementary Sumner Elementary School Whittier Elementary School Willard Elementary School Northeast Scranton Intermediate School South Scranton Intermediate School West Scranton Intermediate School Scranton High School West Scranton High School
Valley View School District	Valley View Elementary School Valley View Middle School Valley View Intermediate School Valley View High School

Within Lackawanna County there are also 12 institutions of higher education. These include:

- The University of Scranton
- Marywood University
- Clarks Summit University
- Luzerne Co Comm college
- Lackawanna College
- Keystone College
- Geisinger Commonwealth School of Medicine
- Johnson College
- Penn State-Scranton
- Fortis Institute
- Penn-Foster Career School/College

In addition to Lackawanna County's educational institutions, Lackawanna County provides free workshops, classes, and seminars designed to help the unemployed successfully re-enter the workforce through PA Career Link.[18]

2.2.8 Transportation

The existing transportation system in Lackawanna County includes all of the physical infrastructure, vehicles, control systems, and facilities that support the movement of people and goods. Highways, streets, railroads, and trails are most recognizable as the primary conduits of travel. Major traffic routes through Lackawanna County include:

- Interstate 81
- Interstate 84
- Interstate 380
- U.S. Business 6
- U.S. 6
- U.S. 11
- PA 106
- PA 107
- PA 171
- PA 247
- PA 307
- PA 347
- PA 348
- PA 407
- PA 435
- PA 438
- PA-476 – PA Northeast Extension
- PA 502
- PA 590
- PA 632
- PA 690
- Central Scranton Expressway

Additionally, The Wilkes-Barre/Scranton International Airport is directed by a Bi-County Board of Directors, consisting of the Lackawanna County Commissioners and Luzerne County Council, and Federal Aviation Committee estimates that 350,000 passengers a year will fly out of Wilkes-Barre/Scranton. The facility is significant in both terms of passengers and dollars as the Pennsylvania Aviation Bureau estimates the airport is worth $138 million a year to the local economy. Seamans Airport is a general aviation public use airport located in Benton Township.

There is approximately 75 miles of railroad in Lackawanna County. Rail service is provided by the owners/operators identified below.

- Canadian Pacific Railway
- Delaware-Lackawanna Railroad Co.
- PA Northeast Regional Rail Authority
- Luzerne County Redevelopment Authority
- Luzerne and Susquehanna Railroad Co.
- Norfolk Southern Railway Co.
- Reading, Blue Mountain and Northern Railroad
- Steamtown National Historic Site (tourist operator)

2.2.9 Utilities

In Lackawanna County, electricity is distributed and generated through PPL Electric Utilities Corporation, Blakely Borough Electric Company, and Olyphant Borough Electric Company. Natural gas is provided through UGI Penn Natural Gas, and water utilities are provided through Pennsylvania American Water Company, and Aqua Pennsylvania. Specific community water suppliers are provided in Table 2.5, while sanitary, sewer, and wastewater authorities are provided in Table 2.6, and telecommunication services in Table 2.7.

[18]Lackawanna County Government, 2020, available at https://www.lackawannacounty.org/pages/education.html

Table 2.5 Community Water Suppliers[19]

Scott Mobile Home Park (MHP)	St. Mary's Villa Nursing Home
Benton Springs MHP	Pocono MHP
Tall Timbers MHP	Madison Estates MHP
Hillside MHP	Greenfield Acres MHP
Sunset MHP	Evergreen MHP
Eagle Lake Community Association	Mt. Laurel MHP
RBE Water Association	Clark Summit State Hospital
Happy Acres Development	Belle Aire Acres
Hi View Terrace MHP	Edgewood MHP
Finch Hill Water System	

Table 2.6 Sanitary, Sewer, and Wastewater Services[20]

Abington Regional Sewer Authority	Lower Lackawanna Valley Sanitary Authority
Benton-Nicholson Joint Sewer Authority	Moscow Borough Sewer Authority
Covington Township Sewer Authority	Pennsylvania American Water Company (former Scranton Sewer Authority)
Dalton Borough Sewer Authority	Roaring Brook Township Sewer Authority
Elmhurst Township Sewer Authority	Scott Township Sewer Authority
Greenfield Township Sewer Authority	Spring Brook Township Sewer Authority
Jefferson Township Sewer Authority	Waverly Township
Lackawanna River Basin Sewer Authority	

Table 2.7 Telecommunications Providers[21]

Adams Cable and Service	Metrocall
AT&T	North-Eastern Telephone
Blue Ridge Cable Communications	One Communications
Comcast	South Canaan Telephone Company
DirecTV	Sprint
Dish Network	T-Mobile
Frontier Communications	Verizon
Level 3 Communications	XO Communications

2.3 Population and Demographics

The demographics of a community – population, racial and age profile, housing, and employment and income statistics – reflect how a community has evolved in the past and has a direct bearing on how and where a community wants to develop in the long-term. Some of Lackawanna County's demographic characteristics have been examined to provide an insight on how the community has changed over time and especially since the last HMP Update in 2015. The past population trends

[19] County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.
[20] Ibid.
[21] County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.

and projections as well as the employment characteristics help us to better understand the socio-economic characteristics that have, and will continue to, shape the future of this County.

In 2010, Lackawanna County's population was 214,437, and estimated to be 211,454 in 2019, indicating a decrease in total population. The estimated number of housing units in 2019 was 100,864. The homeownership rate in 2019 was 65% percent, with the median housing value of these units during this period being $149,700.

Table 2.8 through Table 2.11 provides a breakdown of Lackawanna County's demographic characteristics, including population, race, age, housing, and income statistics.

Table 2.8 Population, Land Area, and Population Density in Lackawanna County

Geographic Area	Census 2010	2015 est.	2019 est.	Land Area (sq. miles)[22]	Density (per sq. mile)[23]
Pennsylvania	12,702,379	--	12,801,989	46,055	286.2
Lackawanna County	214,437	--	211,454	465	465
Municipalities					
Archbald Borough	6,984	6,956	7,030	16.9	416
Benton Township	1,908	1,870	1,857	26	71
Blakely Borough	6,564	6,342	6,210	3.9	1592
Carbondale City	8,891	8,587	8,383	3.2	2620
Carbondale Township	1,115	1,101	1,091	14.3	76
Clarks Green Borough	1,476	1,424	1,394	0.6	2323
Clarks Summit Borough	5,116	4,979	4,865	1.6	3041
Clifton Township	1,480	1,454	1,427	21	68
Covington Township	2,284	2,261	2,271	23.8	95
Dalton Borough	1,234	1,205	1,188	3.3	360
Dickson City Borough	6,070	5,888	5,761	4.7	1226
Dunmore Borough	14,057	13,308	12,954	8.9	1456
Elmhurst Township	894	863	847	2	424
Fell Township	2,178	2,114	2,077	15.5	134
Glenburn Township	1,246	1,224	1,209	5.1	237
Greenfield Township	2,105	2,021	2,018	22.4	90
Jefferson Township	3,731	3,671	3,667	34.7	106
Jermyn Borough	2,169	2,099	2,053	0.8	2566
Jessup Borough	4,676	4,508	4,400	6.8	647
La Plume Township	602	578	566	2.4	236
Madison Township	2,750	2,676	2,645	17.3	153
Mayfield Borough	1,807	1,739	1,695	2.4	706
Moosic Borough	5,719	5,750	5,832	6.7	870
Moscow Borough	2,026	1,959	2,035	2.8	727

[22] County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.
[23] Ibid.

Geographic Area	Census 2010	2015 est.	2019 est.	Land Area (sq. miles)[22]	Density (per sq. mile)[23]
Newton Township	2,846	2,780	2,790	23.1	121
North Abington Township	703	688	691	9.5	73
Old Forge Borough	8,313	8,056	7,894	3.4	2322
Olyphant Borough	5,151	5,112	5,023	5.6	897
Ransom Township	1,420	1,395	1,365	18.4	74
Roaring Brook Township	1,907	1,919	1,981	23.1	86
Scott Township	4,905	4,819	4,747	28.2	168
Scranton City	76,089	77,149	76,653	25.8	2971
South Abington Township	9,073	8,909	8,888	9.3	956
Spring Brook Township	2,768	2,707	2,691	35.6	76
Taylor Borough	6,263	6,049	5,913	5.2	1137
Thornhurst Township	1,085	1,050	1,034	23.6	44
Throop Borough	4,088	3,976	3,896	5.0	779
Vandling Borough	751	722	705	1.3	542
Waverly Township (formerly Abington Township)	1,743	1,706	1,683	4.6	366
West Abington Township	250	249	245	5.5	45

Table 2.9 Lackawanna County Racial Breakdown[24]

Race	% of Total County Population
White	90.4%
Black or African American	4.2%
American Indian or Alaska Native	0.3%
Asian	3.1%
Native Hawaiian and other Pacific Islander	0.1%
Two or More Races	1.9%
Hispanic or Latino	8.4%

Table 2.10 Lackawanna County Population Age Breakdown[25]

Age Category	% of Total Population
Persons Under 5	5.3%
Persons Under 18	20.5%
Persons between 18 and 64	53.9%
Persons 65 years and Over	20.3%

Table 2.11 Lackawanna County Housing Statistics[26]

Housing Categories	County Housing Statistics
Housing Units	99,659

[24]Lackawanna County Government, 2020, Quick Facts, available at https://www.lackawannacounty.org/index.php/quick-facts#4.
[25]Ibid.
[26]https://data.census.gov/cedsci/profile?q=Lackawanna%20County,%20Pennsylvania&g=0500000US42069&tid=ACSDP1Y2018.DP05https://data.census.gov/cedsci/profile?q=Lackawanna%20County,%20Pennsylvania&g=0500000US42069

Owner-Occupied Housing Unit Rate	65%
Median Housing Value (Owner-Occupied)	$149,700
Median Household Income	50,875
Poverty Rate	21.8%

2.4 Land Use and Development

There are ten existing land uses in Lackawanna County, as shown in Figure 2.4.[27] The most dominant land use is agriculture and vacant space, followed by residential. The residential land use is divided into four subcategories; single-family detached dwellings, single family attached dwellings (mostly row houses or "town houses"), multifamily dwellings, and mobile home parks. Commercial uses are comprised of retail and office uses and are primarily concentrated within the core of existing municipalities and along major transportation routes and interchanges. The county also has 16 prominent industrial parks primarily located along the Lackawanna River Valley and along the Interstate-81 corridor. For institutional land uses, the County has 12 public school districts, two public charter school, one secondary career technology school, 21 private schools, along with twelve colleges, universities, and higher institutions, and ten libraries.[28] Other land uses in the County include Transportation and Utilities; Quarry, Mining, or Landfill; Open Space; and Urban Center. Figure 2.5 shows the land uses of within Lackawanna County.

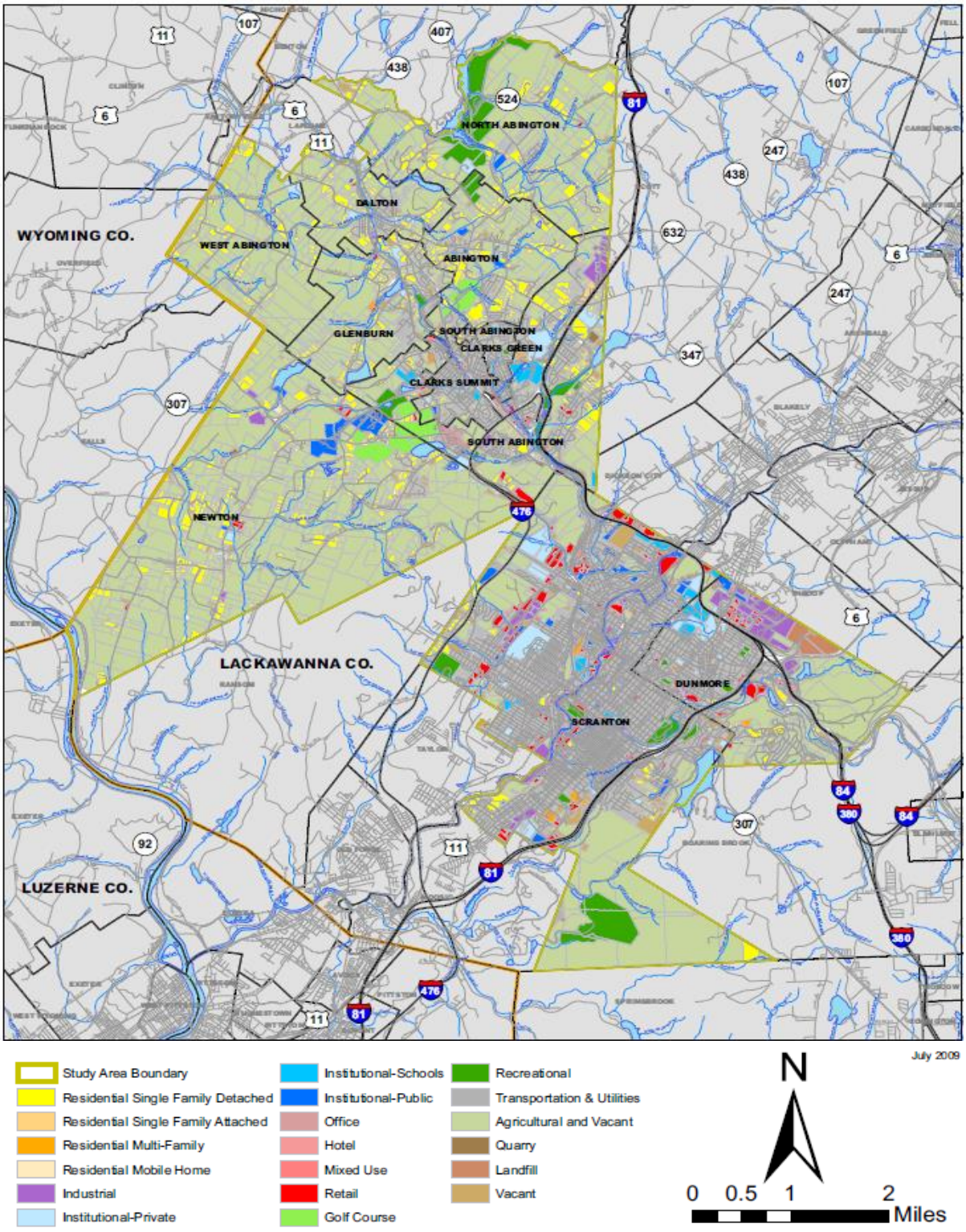
Table 2.12 identifies the land different land uses in the County and breaks them down by total acreage.

Table 2.12 Existing Land Use for Lackawanna County[29]

Land Use	Acreage	% of Total
Agricultural and Vacant	164,254.93	57.5%
Commercial	10,059.12	3.7%
Industrial	2,551.22	0.9%
Institutional	6,220.39	2.2%
Open Space (private)	29,072.33	2.2%
Open Space (protected)	22,500.00	8.1%
Quarry Mine or Landfill	2,615.59	0.9%
Residential	63,224.51	23.8%
Transportation and Utilities	1,740.96	0.6%
Urban Center	176.68	0.1%
TOTAL	279,915.74	100.0%

[27] Lackawanna-Luzerne Metropolitan Planning Association. 2016 Luzerne-Lackawanna Lang Range Transportation Plan, available at http://www.lltsmpo.com/wp-content/uploads/2017/06/2016-02-17-Final-Lackawanna-Luzerne-LRTP.pdf.
[28] Lackawanna-Luzerne Metropolitan Planning Association. 2016 Luzerne-Lackawanna Lang Range Transportation Plan, available at http://www.lltsmpo.com/wp-content/uploads/2017/06/2016-02-17-Final-Lackawanna-Luzerne-LRTP.pdf.
[29] Lackawanna-Luzerne Metropolitan Planning Association. 2016 Luzerne-Lackawanna Lang Range Transportation Plan, available at http://www.lltsmpo.com/wp-content/uploads/2017/06/2016-02-17-Final-Lackawanna-Luzerne-LRTP.pdf.

Figure 2.4 Lackawanna County Land Use Map



Source: Scranton-Abingtons Planning Association Comprehensive Plan

Growth and Development

According to the 2016 Lackawanna-Luzerne Long Range Transportation Plan (LRTP), Between 2009 and 2014, approximately 9,600 acres of land throughout the Lackawanna County had been developed.[30] Of this total, over 65 percent constitutes residential use, nearly 10 percent is commercial use, and roughly 25 percent is industrial, institutional, educational, public municipal and non-municipal, religious and public.[31]

Demand for new residential units in Lackawanna County is primarily being met mostly outside of urban areas, typically on previously-undeveloped lands, which the pattern is largely unplanned, with low density, single family detached units being constructed along existing rural roads or in new subdivisions.[32] In Lackawanna County from 2009 to 2014, roughly 1,000 acres or 10 percent of recently developed lands in the Lackawanna County area became new commercial office, retail, and/or mixed-use development.[33]

There is over 2,300 acres of additional industrial, institutional development was built from 2009 to 2014 in the County, as industrial parks have been developed with site ready lots or "on spec" buildings constructed.[34] Mixed use developments in the area generally include larger residential or industrial sites with complimentary commercial development. The Scranton Lackawanna Building Company plays a large role in proposing mixed use development of restaurants, hotels, and other shops.[35]

2.5 Data Sources and Limitations

The most recent U.S. Census Bureau, 2019 American Community Survey (ACS) 1-year Estimates and the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI) (formerly National Climatic Data Center (NCDC)) Storm Events climate data were used, along with the most recent State Labor statistics. The Lackawanna-Luzerne Regional Plan 2011, the Lackawanna County Long Range Transportation Plan (LRTP) 2016, County Lines: A Profile for Lackawanna County 2018, as well as the Commonwealth of Pennsylvania 2018 State Standard Hazard Mitigation Plan, were also utilized to gather pertinent information and statistics regarding the local County profile.

[30] Lackawanna-Luzerne Long Range Transportation Plan, 2016.
[31] Ibid.
[32] Ibid.
[33] Ibid.
[34] Ibid.
[35] Ibid.

3.0 CHAPTER 3 – PLANNING PROCESS

CFR §201.6(a)(3): Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multijurisdictional plans.

CFR §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

CFR §201.6(c)(1): [The risk assessment shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

FEMA defines hazard mitigation as the effort to reduce loss of life and property by lessening the impact of disasters.[36] A hazard mitigation plan serves as a road map for a community's long-term strategy to reduce disaster losses and break the cycle of repeated destruction from natural disasters. Effective mitigation requires a comprehensive understanding of local risks, a plan on how to address potentially hard choices, and invest in long-term community well-being.[37] The planning process used to update this Lackawanna County HMP involves risk-based decision-making to reduce damage to people, property, infrastructure, and the environment from future disasters.

3.1 Update Process and Participation Summary

The Lackawanna County HMP Update process was conducted over a seven-month period and comprised four main phases: 1) organizing the work group and process; 2) assessing natural hazards, vulnerability, and mitigation capabilities; 3) developing a mitigation plan; and 4) implementing the plan.

While the basic phases were similar to the ones followed in the 2015 Plan, each phase was adjusted slightly to obtain maximum participation from steering committee members, municipalities, and residents. Members of the Steering Committee from the 2015 Planning Process were approached and invited to be on the Committee for the 2020 Plan Update Process in order to ensure continuity as well as to capitalize on their knowledge of the community and familiarity with the update process. As in the original planning process, a Letter of Intent to Participate was mailed to all jurisdictions to inform them of the Plan Update. A municipal workshop was held to maximize participation from all 40 municipalities and to educate them throughout the Plan Update process.

[36] https://www.fema.gov/what-mitigation
[37] Ibid.

Phase 1 – Organize Work Group and Process: The first phase involved reenergizing residents to become interested, involved, and educated in the plan update process. In order to achieve this goal, input was solicited throughout the planning process via three avenues: 1) Steering Committee Meetings; 2) Municipal Workshop; and 3) Public Meeting. Each of these avenues for public involvement served its own purpose and required a different tier of involvement to ensure participation from local, county, state, and regional levels. Each of these will be discussed in detail in the next section of this chapter.

Phase 2 – Assess Hazards, Risks, Vulnerability, and Mitigation Capability: In this step, information on past hazard events that affected Lackawanna County was gathered and specific hazard areas were identified. This step also involved a literature review of publications addressing historical hazard events, an internet search for data related to historic events, and an inventory and review of the existing GIS coverage and other documentation pertinent to the County. The hazard identification included summaries on past occurrences and the probability of future events. The vulnerability analysis identified specific areas, including critical facilities, that were vulnerable to hazards and included estimates of potential losses. Past and future development trends were also analyzed as part of this step. This phase also discussed land uses and development trends in the County and identified high hazard areas that were not suitable for future development.

The Mitigation Capability Assessment was conducted to identify the roles and capabilities of various departments/agencies in the County, areas for coordination and/or improvement; and provide a platform to integrate plans and other documents so recommendations and strategies are not in contradiction with one another. The Assessment also involved a review of sample county and municipal plans and ordinances that addressed or had the potential to address hazard mitigation issues.

Phase 3 – Develop a Mitigation Plan: Based on data from the hazard, vulnerability, and capability assessments, mitigation goals were developed that were aimed at protecting Lackawanna County from long-term vulnerability to the identified hazards. A comprehensive range of mitigation actions and projects to reduce the effects of each hazard, with emphasis on new and existing buildings and infrastructure, was developed in this step.

The Plan explored mitigation actions in the following four categories to attain the goals:

- Plans and Regulations – government authorities, policies, or codes to encourage risk reduction;
- Structure and Infrastructure Projects – modifying old structures/infrastructure or new construction to reduce hazard impacts;
- Natural Systems Protection – Minimizing losses and preserving/restoring the proper function of natural systems; and
- Education and Awareness Programs – Long term problems to inform and educate about hazards and mitigation options, including trainings.

While some mitigation actions are more 'broad' in nature and cover the entire County, others are specific to each municipality. It was ensured that each of the 40 municipalities' actions from 2015 were revisited and that each municipality had at least one or more mitigation actions identified in the plan update, along with a timeline and entity(ies) responsible for implementation.

Phase 4 – Implement the Plan - In the final phase, an action plan was developed that described how the mitigation strategies and activities identified would be prioritized, implemented, funded, and administered by the County and its municipalities. Cost estimates and possible funding sources to implement recommended projects were identified. This phase also included methods to monitor, evaluate, and update the mitigation plan within a five-year cycle as well as recommendations on how to incorporate community participation into the plan maintenance process.

3.2 The Planning Team

A Steering Committee for the Plan Update was formed for the purposes of this planning process. A total of 18 members were invited to serve on the Steering Committee to represent various Lackawanna County departments, outside agencies, local entities, and businesses with a stake in hazard mitigation, the American Red Cross (ARC), regional hospital representatives, conservation associations, and the PEMA. Invitations were also sent to the Planning and Emergency Management departments for each of the neighboring counties, and to school districts in the County. Table 3.1 includes the individuals invited to be a Plan Update Steering Committee and the agencies/organization in which they represented. An attempt was made to retain the members of the 2015 Steering Committee. All meeting invitations were sent to representatives via email and were sent at least two weeks prior to each meeting.

Table 3.1 Plan Update Steering Committee Invitees

Name	Agency
Mary Liz Donato	Lackawanna County Planning Department
Steve Pitoniak	Lackawanna County Planning Department
Don King	City of Scranton
Bernie McGurl	Lackawanna River Conservation Association
Kenneth James	Waverly Township
Jason McLain	Spring Brook Township
Cesare Forconi	Dickson City Borough
Kate Crowley	American Red Cross
Bruce Reddock	Greater Scranton Chamber of Commerce
Robin Sutton	Regional Hospital of Scranton
Steve Jarbola	Geisinger Commonwealth School of Medicine
Richard Barbolish	Lackawanna County Emergency Management Agency
David Johns	Lackawanna County Engineer
John Foley	Lackawanna County Assessor's Office
Larry Lukasik	Lackawanna County Roads and Bridges
Matthew Jones	Lackawanna County Planning Department
Lonell Shelkowski	Pennsylvania Department of Transportation
Frank Summa	GPI
Neighboring Counties	
Craig Rickard	Wayne Co Planning
Steven E. Price	Wayne Co EMA
Robert Templeton	Susquehanna Co Planning
Scott Aylesworth	Susquehanna Co EMA
Lynnelle Farber	Wyoming Co Planning

Eugene Dziak	Wyoming Co EMA
Heath Eddy	Luzerne Co Planning
Lucy Morgan	Luzerne Co EMA
Christine Meinhart-Fritz	Monroe Co Planning
Bruce Henry	Monroe Co EMA
State and Federal EMA	
Mari Radford	FEMA Region 3
Ernie Szabo	PEMA
School Districts	
Abington Heights School District	
Carbondale Area School District	
Dunmore School District	
Forest City Regional School District	
Lackawanna Trail School District	
Lakeland School District	
Mid Valley School District	
North Pocono School District	
Old Forge School District	
Riverside School District	
Scranton School District	
Valley View School District	

3.3 Meetings and Documentation

A kick-off meeting was held between the Consulting team and County Planning officials on December 16, 2019. This meeting officially began the planning process which covered the tasks involved and project schedule, as well as suggestions for Steering Committee members. It is important to note that opportunity for neighboring communities, local and regional agencies to participate in the planning process.

Steering Committee Meetings

The first Steering Committee Meeting was held on February 25th, 2020, at the Lackawanna County Emergency Services Building in Jessup. The following agenda items were covered at this meeting:

- Provide project overview;
- Glean input on various hazards, hazard identification and county hazard rankings;
- Review data from the hazard vulnerability and risk assessment;
- Review and update goals and objectives; and
- Review and determine the status of past county mitigation actions (from the 2015 Plan).

The second Committee meeting was held on June 16th 2020. Due to the COVID-19 Pandemic, this second meeting took place online via Zoom Videoconferencing. The following agenda items were covered at this meeting:

- Progress to date;
- Brief review of past mitigation actions and actions carried forward;
- Develop and finalize new county mitigation actions;
- Identify the implementation strategy for each mitigation action.

Municipality/Stakeholder Meetings

In January 2020, an introduction email was directed to municipal floodplain coordinators and/or hazard mitigation representatives and capabilities for all municipalities in the County explaining the start of the Plan Update process; to discuss the purpose of the capabilities questionnaire and other documents that they would be asked to complete; and to discuss potential municipal workshops.

At least two weeks prior to the first Steering Committee meeting and municipality meeting/workshop, the VPC Team sent four documents that included information to update different plan sections. Each municipality was provided four documents: 1) Municipal Capabilities Questionnaire; 2) Status of Past Municipal Mitigation Actions; 3) Municipal Hazard Identification Areas; and 4) Floodplain Coordinator Questionnaire. Municipalities were encouraged to fill out these documents to the best of their ability prior to the municipal workshop and invited to bring these documents to the municipal workshop for assistance with completing anything that was unable to be completed prior to. Follow-up emails were also sent to encourage municipalities to complete their feedback forms.

Meeting invitations and reminders for the Municipal Mitigation Workshop were sent via email to municipal representatives. The first Municipal Mitigation Workshop was held at the Emergency Management Agency in Jessup on February 25 and February 26. Two opportunities were provided for municipal representatives to attend, the first on the same evening as the first Steering Committee Meeting (2/25/20), and the second on the following morning (2/26/20). This Municipal Mitigation Workshop, facilitated by the Consultants, provided an opportunity for municipal officials to attend and become educated about, and involved in, the plan update, planning process, hazard identification, and vulnerability assessment.

A series of exhibits were developed for the workshop including maps of critical facilities, floodplains, and steep slopes. Attendees were encouraged to have open discussion to indicate any updated or missing data or information. Examples of potential mitigation projects were shared and municipalities were encouraged to recommend additional mitigation projects based on local knowledge and past hazard experiences.

At the workshop, municipal officials:

- Reviewed maps and identified local hazard areas with their municipalities;
- Identified critical facilities within their municipality;
- Completed the Municipalities Capabilities Survey and Floodplain Coordinator National Flood Insurance Program (NFIP) Questionnaire;
- Identified status of past mitigation projects and discussed potential mitigation projects; and
- Discussed future participation opportunities and next steps.

A second round of municipal meetings were also held with municipal representatives via Zoom Videoconferencing. Meeting invitations and reminders for the Municipal Mitigation Workshop were sent via email. The second Municipal Mitigation Workshop was held at the Emergency Management Agency in Jessup on June 16 and June 17. Like the first Municipal Mitigation Workshop, two opportunities were provided for municipal representatives to attend, the first on the same evening as the second Steering Committee Meeting, and the second on the following morning. Unfortunately, due to the Covid-19 Pandemic, an in-person Municipal Mitigation Workshop was not an option, so the Consultants used the virtual meeting to thoroughly explain the development of new municipal mitigation actions. At the meeting, municipal officials:

- Received an update on progress to date;
- Reviewed the past actions that would be carried forward into the 2020 Plan Update;
- Discussed and reviewed examples of potential new mitigation actions and implementation information; and
- Reviewed the criteria for mitigation action prioritization.

3.4 Public and Stakeholder Participation

A Public Meeting was held on July 8th, 2020. Due to the ongoing Covid-19 Pandemic, this public meeting was facilitated through Zoom Videoconferencing. The public meeting was advertised in the local newspaper, The Times Tribune, and on the Lackawanna County Government website, as well as on the County Planning Department's Facebook and Twitter social media pages. A PowerPoint was developed and presented by VPC Consultants. The public was provided an opportunity to:

- Review the results of the updated Hazard Risk and Vulnerability Assessment;
- Review updated goals and objectives;
- Examine options for mitigation actions and projects, and
- Review proposed prioritization criteria for mitigation projects.

Due to the lack of attendance for the virtual public meeting, the meeting presentation was posted again on the on the County Government website, as well as on the Planning Department's Facebook and Twitter social media pages to provide county residents an opportunity to review the planning process and provide comments. Copies of the draft Plan Update were made available on the Lackawanna County Planning Website for a period of two weeks for public comment. Any comments received during the public meeting, that were relevant and feasible, were incorporated into the final version of the Plan Update.

3.5 Multi-Jurisdictional Planning

Table 3.2 provides a synopsis of participation received through from each municipality through the multi-jurisdictional planning process.

Table 3.2 Municipal Participation Summary

Municipality	Communication Established	Attended Municipal Workshop(s)/ Meeting(s)	Municipal Survey Returned	Floodplain Coordinator Questionnaire	Hazard Identification Areas Worksheet	Mitigation Actions Worksheet
Archbald Borough	✓	✓	--	--	✓	--
Benton Township	✓	✓	--	--	--	✓
Blakely Borough	✓	✓	✓	✓	✓	✓
Carbondale City	✓	✓	✓	✓	✓	✓
Carbondale Township	✓	✓	✓		✓	✓
Clarks Green Borough	✓	--	✓	✓	--	✓
Clarks Summit Borough	✓	✓	✓	✓	✓	✓
Clifton Township	✓	✓	--	--	✓	✓

Municipality	Communication Established	Attended Municipal Workshop(s)/ Meeting(s)	Municipal Survey Returned	Floodplain Coordinator Questionnaire	Hazard Identification Areas Worksheet	Mitigation Actions Worksheet
Covington Township	✓	✓	✓	✓	✓	✓
Dalton Borough	✓	✓	✓	✓	✓	✓
Dickson City Borough	✓	✓	✓	✓	✓	✓
Dunmore Borough	✓	--	--	✓	--	✓
Elmhurst Township	✓	✓	--	✓	✓	✓
Fell Township	✓	--	✓	✓	--	--
Glenburn Township	✓	✓	✓	--	--	--
Greenfield Township	✓	✓	✓	--	--	✓
Jefferson Township	✓	✓	✓	✓	✓	✓
Jermyn Borough	✓	✓	✓	✓	✓	✓
Jessup Borough	✓	--	✓	--	--	✓
Laplume Township	✓	✓	--	✓	✓	✓
Madison Township	✓	✓	✓	✓	✓	✓
Mayfield Borough	✓	✓	✓	✓	✓	✓
Moosic Borough	✓	--	✓	✓	--	✓
Moscow Borough	✓	✓	✓	✓	✓	✓
Newton Township	✓	✓	✓	✓	✓	--
North Abington Township	✓	✓	✓	✓	✓	✓
Old Forge Borough	✓	✓	--	--	--	--
Olyphant Borough	✓	✓	✓	--	✓	✓
Ransom Township	✓	✓	✓	✓	✓	✓
Roaring Brook Township	✓	✓	--	✓	✓	✓
Scott Township	✓	--	✓	--	--	✓
Scranton City	✓	✓	✓	✓	--	✓
South Abington Township	✓	✓	✓	✓	✓	✓
Spring Brook Township	✓	✓	✓	✓	✓	✓
Taylor Borough	✓	✓	--	--	✓	✓
Thornhurst Township	✓	✓	✓	✓	✓	✓
Throop Borough	✓	✓	✓	--	✓	✓
Vandling Borough	✓	✓	--	--	--	✓
Waverly Township	✓	--	✓	--	✓	✓

Municipality	Communication Established	Attended Municipal Workshop(s)/ Meeting(s)	Municipal Survey Returned	Floodplain Coordinator Questionnaire	Hazard Identification Areas Worksheet	Mitigation Actions Worksheet
West Abington Township	✓	✓	✓	✓	✓	✓

4.0 CHAPTER 4 – HAZARD IDENTIFICATION AND RISK ASSESSMENT

4.1 Update Process Summary

Multiple sources were referenced to obtain a comprehensive identification of all potential hazards affecting the County. These include the NCEI, United States Geologic Survey (USGS), PA Department of Conservation and Natural Resources (DCNR), PA Department of Environmental Protection (DEP), and the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan* (2018), and the 2013 Pennsylvania All-Hazard Mitigation Planning Standard Operating Guide. For all hazards without readily and freely accessible data, information from the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)* was referred to and included. It is also important to note that in the identification of previous hazard occurrences, data from the NCEI (previously named the NCDC) was utilized where available, while the Standard Operating Guide was utilized for hazard definitions.

4.2 Hazard Identification

4.2.1 Presidential Disaster Declarations

The table below identifies the presidential disaster declarations in Lackawanna County.

Table 4.1 Presidential Disaster Declarations[38]

Presidential Disaster Declarations in Lackawanna County	
Date	Event Type
March 2020	Pandemic
November 2018	Flood
October 2012	Hurricane
September 2011	Flood
February 2007	Severe Storms
June 2006	Severe Storms
September 2005	Hurricane
April 2005	Severe Storms
September 2004	Severe Storms
September 2004	Hurricane
August 2003	Severe Storms
January 1996	Flood
January 1996	Snow
March 1994	Severe Storms
March 1993	Snow
October 1985	Hurricane
October 1976	Flood
July 1976	Flood
September 1975	Flood
June 1972	Flood

[38] Pennsylvania State Standard All Hazards Mitigation Plan, 2018.

January 1959	Flood
August 1956	Severe Storms
May 1956	Severe Storms
March 1956	Flood
August 1955	Flood

4.2.2 Summary of Hazards

The Consultants facilitated a Municipal Mitigation Workshop on February 25 and 26, 2020 to offer municipal representatives the opportunity to review previously identified hazard locations and the impacts to their jurisdiction. Municipal officials marked up maps and noted specific problem areas; the hazards were discussed and confirmed by the Steering Committee. It was determined to include one additional hazard was in this update (Pandemic/Epidemic). As a result, the following hazards were evaluated and examined further as part of this Plan Update:

- Flooding (regional events)
- Winter Weather
- Wind Events
- Flooding (local annual events)
- Hazardous Material Incidents
- Wildfires
- Drought and Crop Failure
- Levee Failure
- Nuclear Release
- Earthquakes
- Land/Mine Subsidence
- Dam Failure
- Landslides
- Radon
- Pandemic/Epidemic

The Risk Assessment, in conjunction with the Capability Assessment in Chapter 5, provides an understanding of the County's vulnerabilities to specific hazards, as well as the level of ability to respond to, or prevent, hazard events. The following list summarizes issues faced by the County and municipalities determined through the HIRA process, community questionnaires, and through discussion with local representatives:

- Frequent Flooding
    - Regional flooding issues associated with the Lackawanna River impacting communities in the River corridor, such as Old Forge Borough, Taylor Borough, Moosic Borough, Scranton City, Throop Borough, Dickson City Borough, Olyphant Borough, Blakely Borough, Jessup Borough, Archbald Borough, Jermyn Borough, Mayfield Township, Carbondale Township, Carbondale City, Fell Township, and Vandling Borough
    - Regional flooding issues associated with Leggett's Creek, a branch of the Lackawanna River, which impacts Scott Township, South Abington Township, West Abington township, Clarks Summit Borough, and Clarks Green Borough.
    - Common concerns among most municipalities are local flooding issues resulting in stream damages, sedimentation, and debris issues, and damaged or undersized culverts and bridges.
    - Multiple municipalities expressed concern about the reduction in stream flood carrying capacity due to sediment and debris build-up.
- Winter Weather
    - Lackawanna County experiences annual winter events that have the potential to disrupt traffic and cause power outages.
- Hazardous Materials Incidents

  - Due to the intensification of industrial activity in the County, and in surrounding counties, including natural gas operations, there has been an increase in the transport of hazardous materials throughout Lackawanna County.
  - There are over 230 listed material storage tanks, 2 Environmental Protection Agency listed high-hazard storage sites, and 60 material storage tanks and/or oil and gas related sites throughout the County.
- Wildfires
  - During the 2015 Plan Update, the Steering Committee expressed concern that new homes, particularly high-value homes, were being constructed in forested areas, increasing the potential for wildfire impacts.
  - The Steering Committee reiterated this concern as part of this Plan Update, and noted that in addition to the aforementioned new developments in potential wildfire hazard areas, ingress and egress to these areas is limited, limiting the ability of first responders to assist during a hazard event.

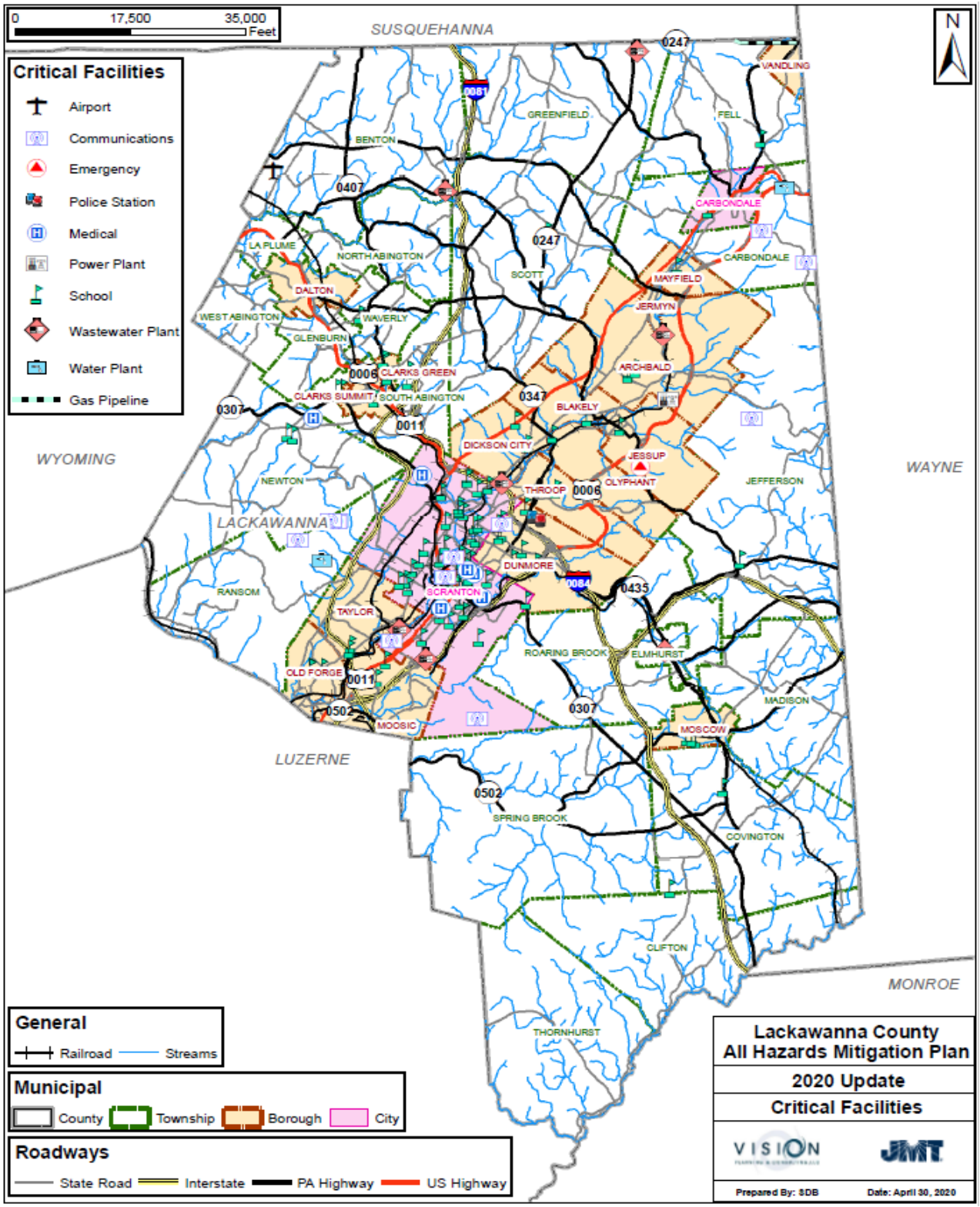
Recognizing the issues provides a vital first step to addressing and preventing future losses from hazards. Chapter 6, Mitigation Strategy, outlines goals, objectives, and specific mitigation actions corresponding to the issues associated with the identified hazards on both a county-wide and local municipal level.

Hazard mapping was performed for spatially specific hazards in the County, such as flooding, wildfires, and hazardous materials releases. The HAZUS-MH scenarios for earthquake and hurricane (wind) were performed at the County level, as they can impact the entirety of the County equally (from a probability of occurrence perspective). Additional mapping was performed that takes into account these hazards (specifically Wind Events) in the Municipal Mapping based on occurrences of hazards identified by each municipality.

Critical Facilities

Critical facilities, as defined by the Governor's Office of Homeland Security, are "those systems and assets, whether physical or virtual, so vital that the incapacity or destruction of such may have a debilitating impact on the security, economy, public health or safety, environment, or any combination of these matters, to any Pennsylvania County." For this Plan Update, critical facilities include: airports, emergency response facilities, government buildings, hazardous storage sites, medical facilities, energy pipelines, power plants, wastewater and water treatment facilities, and schools. Figure 4.1 shows the locations of critical facilities in Lackawanna County

Figure 4.1 Critical Facilities Map



4.3 Hazard Profiles

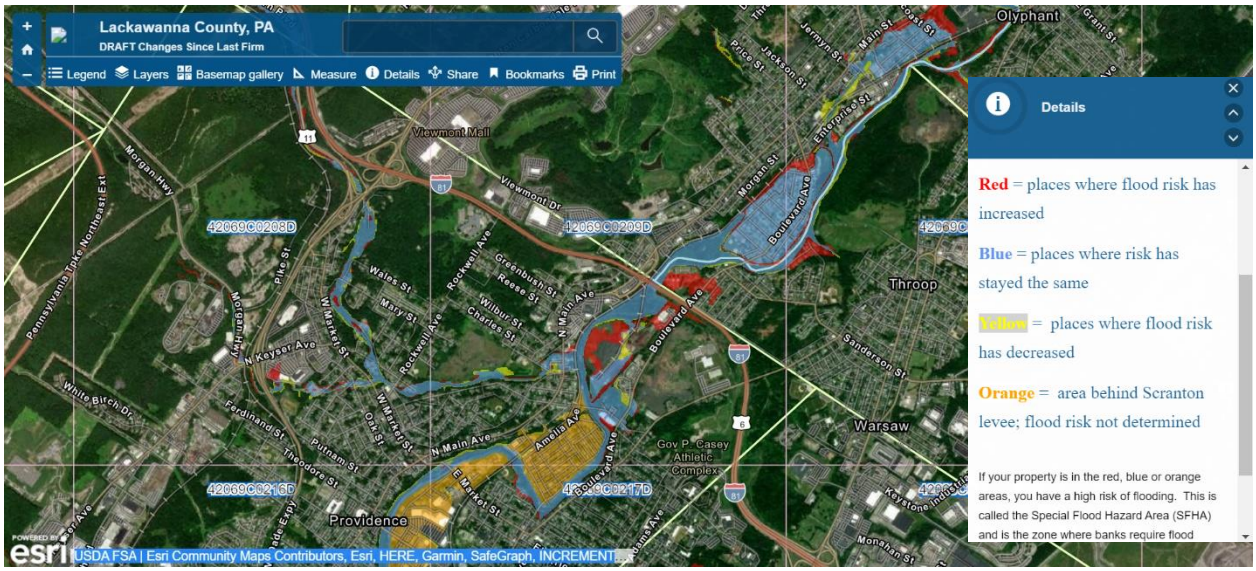
4.3.1 Flooding

Flooding occurs when stream capacities are exceeded due to large volumes of water from precipitation or from winter snow melt which enters streams as surface run-off. Flooding can also occur from undersized culverts, bridges, or storm pipes that cannot accept the increased flow of water during storm events. This causes water to back up behind the structures and overtop the natural stream channel banks in what is referred to as the "backwater effect". Another form of flooding, flash flooding, occurs during a short but intense rainfall event. Although the total amount of precipitation is often much less than standard 24-hour design storm (1-year, 2-year, 5-year, 10-year, 25-year, 50-year, or 100-year) precipitation depths, the precipitation falls in a short time period. This leads to intense surface runoff and stream levels rise quickly in response to the run-off. The effects of flash flooding are exacerbated by increases in impervious surfaces from new developments.

4.3.1.1 Location and Extent

Severe flooding is generally restricted to the 100-year floodplain boundary (2012 FEMA Digital Flood Insurance Rate Map (DFIRM), which is identified on the Flood Hazard Map (provided in Appendix D). The County is essentially comprised of two distinct flood hazard areas; 1) communities within the Lackawanna River flood zone and large stream flood zones, and 2) communities not adjacent to the River or large streams but are impacted by local flooding or flash flooding as described above. The County is currently in the process of assisting municipalities with updates to the FEMA DFIRMs. As a result, effective DFIRMs as of the time of this Plan Update have not been released and are anticipated to become effective in August 2020. In April, 2018, the Lackawanna County Flood Risk Coalition was formed to encourage and assist residents within the County to understand the risk of flooding as part of the ongoing effort to establish the effective DFIRMs since the time the Preliminary DFIRMs were released in 2011. The Coalition has provided a link to the unofficial DFIRM map changes (Figure 4.2), provided by FEMA, highlighting where there will be increases and decreases in the effective floodplains. This interactive mapping may be found here: https://arcg.is/1TP0aK0.

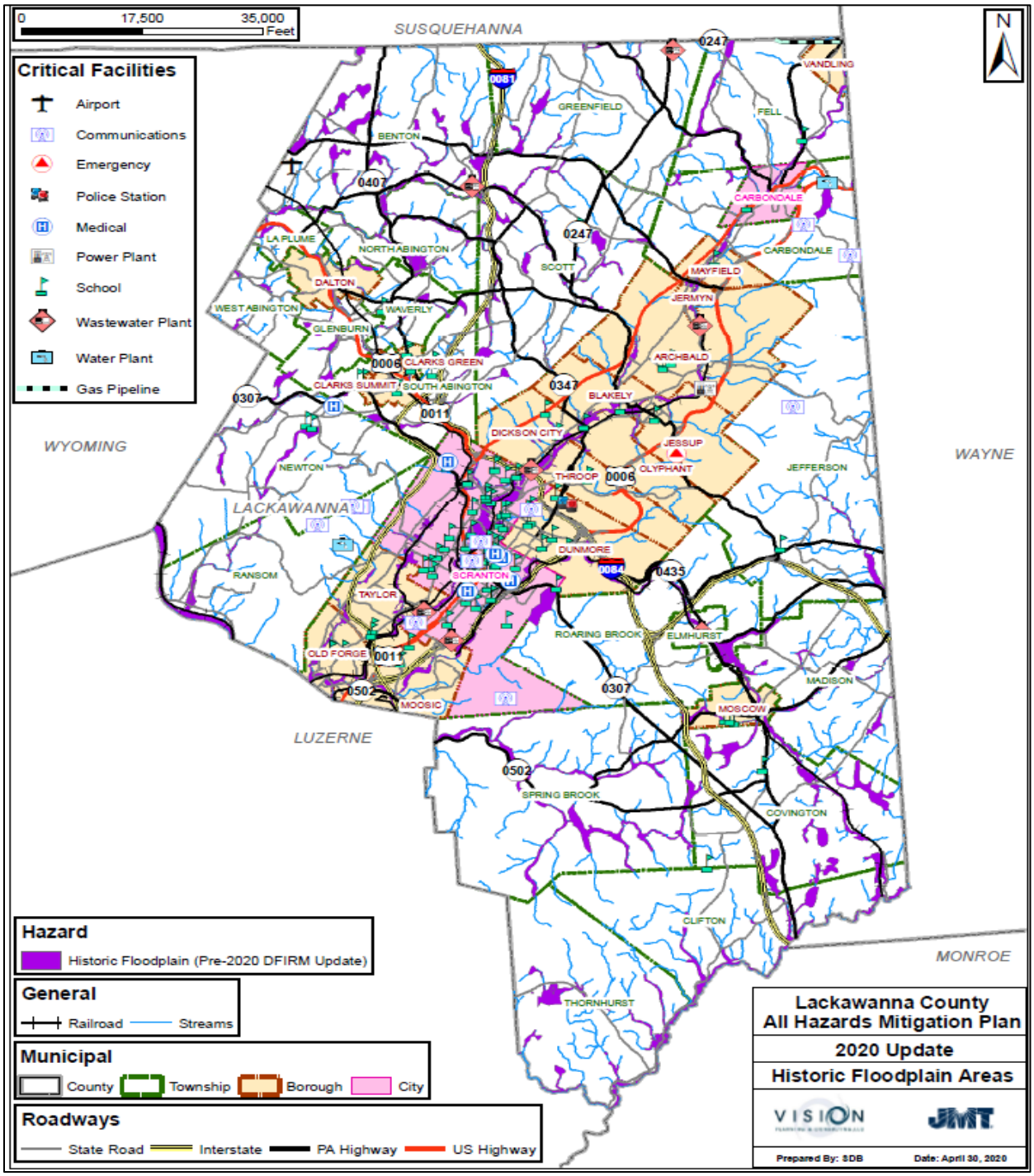
Figure 4.2 Example of DFIRM Map Changes



A map of the flood hazard areas is shown in Figure 4.3, and a corresponding table of number of structures within flood hazard areas per municipality is provided in the Appendix D. The most vulnerable communities are those with population centers located within the "Special Flood Hazard Area", as shown on FEMA DFIRMs. Interactive flood mapping is available at FEMA's Map Service Center: https://msc.fema.gov/portal

Based on the 2009 Plan, 2015 Plan Update, and this Plan Update, several municipalities identified a variety of issues as a result of flooding, including stream damage, roadway and culvert washouts, and flooded homes and businesses. At the February 25 and 26, 2020 Municipal Mitigation Workshop, municipalities were given an opportunity to review problem areas, update accordingly, and provide additional problem areas due to hazard events which have occurred in the past five years. Municipalities continued to identify flood issues as their number one concern. A map of the locations identified by the municipalities and a summary of each problem is provided in the Appendix D.

Figure 4.3 Historic Floodplain Areas in Lackawanna County



4.3.1.2 Range of Magnitude

Table 4.2 describes the range of magnitude for flood events.

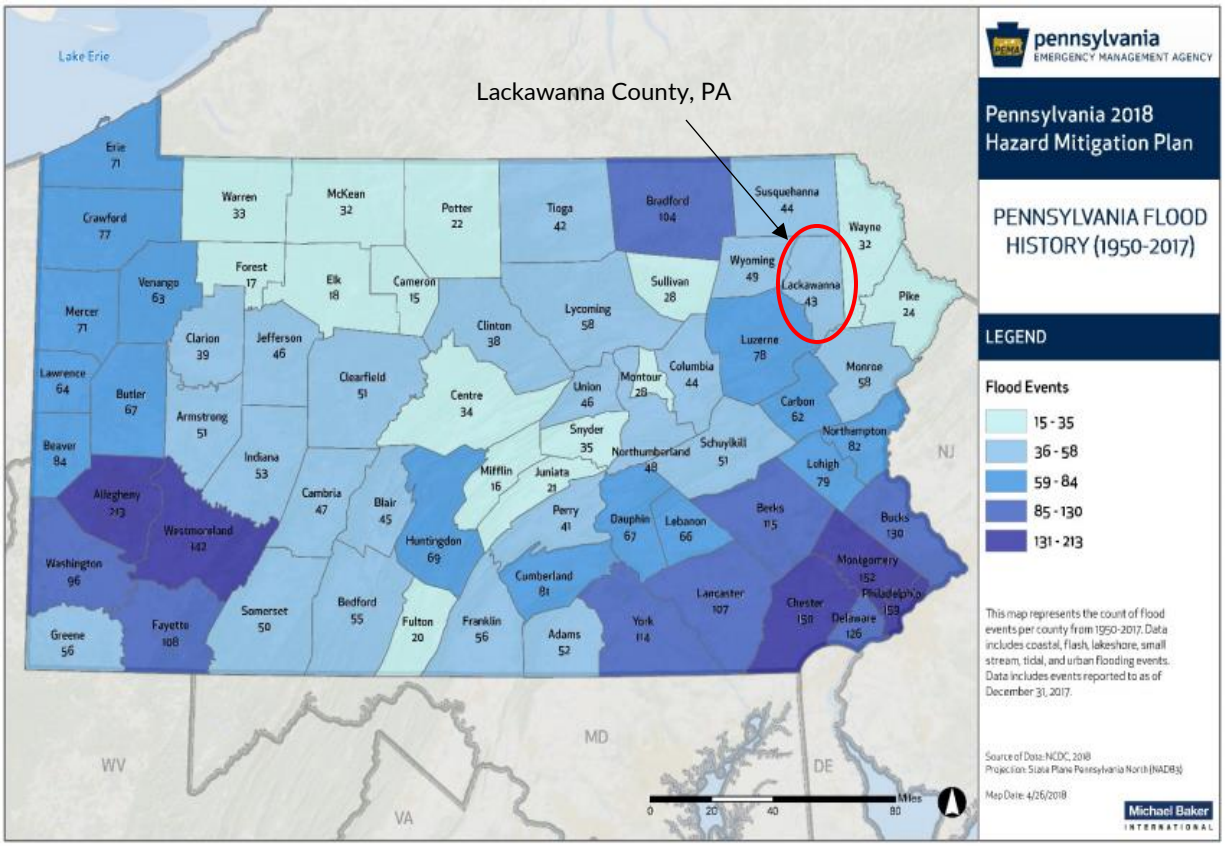
Table 4.2 Range of Magnitude - Flood Hazards

Severity	Causes	Frequency	Damage Extents
Minimum	Local Storms – Flash Floods	Annual	Minor road washouts; storm pipe failure
Medium	Regional Storms – Heavy Rainfall	5 to 10 years	Bridge and culvert damage; some properties flooded
Maximum	Large Multi-Day Storms - Hurricanes	10 to 100 years	Major rivers and large streams experience overbank flooding; properties flooded; bridge and culvert failure

4.3.1.3 Past Occurrence

Lackawanna County has experienced some of the worst flooding as the result of precipitation from tropical storms and hurricanes and from snowmelt events. Tropical storms and hurricanes have historically occurred between the months of June and November (peak season September-October). These storms have brought torrential rains and high winds, and have caused flash flooding, as well as overbank flooding of inland streams and rivers.

Figure 4.4 Pennsylvania Flood History, 1950 to 2017 (NCEI, 2018)



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

According to the NCEI Storms Events Database, there have been 54 recorded flood or flash flood events in Lackawanna County between 1980 and 2017.[39] According to NCEI, there have been 43 major flood events in the County. As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, Figure 4.5 shows how Lackawanna County compares to all other counties in Pennsylvania.

NFIP Structures and Repetitive Loss Structures

A *repetitive loss property* is defined by FEMA as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling ten-year period, since 1978. A repetitive loss property may or may not be currently insured by the NFIP. Furthermore, the NFIP definition for a *severe repetitive loss structure* is any property for which four or more flood insurance claims of more than $5,000 have been paid, or at least two claims where the building portion of the total payment exceeds the property value. These structures are important indicators of flooding in flood-prone areas, as they show the potential that a hazard could re-occur. Table 4.3 presents a summary of the repetitive loss and severe repetitive loss structures by total number of structures and total payments for each jurisdiction, and by total number and by type for the County.

Table 4.3 Lackawanna County NFIP, Repetitive Loss, and Severe Repetitive Loss Structures

Municipality	# of Rep. Losses	Total Repetitive Loss Payments	# of Severe Repetitive Losses	Total Severe Repetitive Loss Payments	Total Losses	Total Payments
Archbald Borough	2	$107,035	1	$66,722	3	$173,757
Blakely Borough	1	$30,929	-	-	1	$30,929
Carbondale City	7	$183,307	-	-	7	$183,307
Clarks Summit Borough	2	$164,117	-	$140,827	2	$304,944
Fell Township	1	$13,410	-	-	1	$13,410
Jermyn Borough	3	$22,825	-	-	3	$22,825
Mayfield Borough	2	$1,437,969	2	$1,437,969	4	$2,875,939
Moosic Borough	2	$33,806	-	-	2	$33,806
Old Forge Borough	2	$59,247	-	-	2	$59,247
Olyphant Borough	5	$45,648	-	-	5	$45,648
Scranton City	111	$7,596,346	3	$2,969,126	114	$10,565,472
South Abington Township	1	$46,494	1	$46,494	2	$92,989
Thornhurst Township	4	$204,558	-	-	4	$204,558
Totals	**143**	**$9,945,691**	**7**	**$4,661,139**	**150**	**$14,606,831**

Total and mitigated Repetitive Loss properties in Lackawanna County (Data from PA RL & SRL Inventory (January 2018))[40]												
	Single Family		2-4 Family		Assmd Condo		Other Resident		Non Resident		Total	
	Total	Mit	Total	Mit	Total	Mit	Total	Mit	Total	Mit	Total	Mit
Lackawanna County	100	7	23	1	2	0	0	0	18	1	143	9
Total and mitigated Severe Repetitive Loss properties in Lackawanna County (Data from PA RL & SRL Inventory (January 2018))[41]												
	Single Family		2-4 Family		Assmd Condo		Other Resident		Non Resident		Total	
	Total	Mit	Total	Mit	Total	Mit	Total	Mit	Total	Mit	Total	Mit
	4	0	3	0	0	0	0	0	0	0	7	0

[39] https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Ice+Storm&eventType=%28Z%29+Winter+Storm&eventType=%28Z%29+Winter+Weather&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1980&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA

[40] Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

[41] Ibid.

4.3.1.4 Future Occurrence

Large-scale river flood event probabilities are measured by the inverse of the return period. Therefore, the 100-year flood event has a 1 in 100 or 1 percent chance of occurring in any given year. Based on the historic data, however, it is clear that municipalities traversed by smaller streams experience flooding from smaller, more frequent storms. The average frequency of a flood resulting in some form of damage over the 41-year period presented in the NCEI dataset is approximately 1.3 floods per year. This essentially equates to a 100 percent annual probability of a local flood event occurring somewhere in the County.

4.3.1.5 Vulnerability Assessment

During the course of this Plan Update, DFIRMs and flood depth grids were not available either publicly or through County personnel. Due to funding limitations, the development of flood depth grids for use with HAZUS-MH is beyond the purview or scope of this Plan Update. As was the case in the previous Plan Update cycles, a GIS based flooding assessment was conducted in the absence of available data that would allow for a functional HAZUS-MH flood scenario analysis. The GIS based analysis performed for this and previous Plan Update(s) evaluated all buildings and critical facilities within the County with respect to the effective 100-year flood threat. Based on Census tract data, economic exposure values were able to be assigned to buildings within the flood hazard area, to arrive at approximate estimations of flood hazard exposure for each municipality. Should flood depth grids be available for the next 5-year Plan Update cycle, a HAZUS-MH flood analysis may be incorporated to augment the GIS based analysis.

Environmental Impacts

Potential environmental impacts from flooding include:

- Stream pollution from roadway/parking lot runoff (oils, grease, dirt, etc.)
- Streambank erosion and sediment deposits
- Unnatural debris deposits such as washed out bridges/culverts, homes, vehicles, etc.

Inventory and Summary of Vulnerable Assets

In order to determine the structures in the County that are vulnerable to flooding, all structures and critical facilities were overlain with the 100-year floodplain (current 2012 DFIRM data) using GIS tools. The analysis indicated that 6,590 structures and 5 critical facilities are located in the 100-year floodplain in the County. A map of the critical facilities in the 100-year floodplain, and a summary of the results by municipality are presented in the Appendix D. Interactive flood mapping is available at FEMA's Map Service Center: https://msc.fema.gov/portal

Estimate of Losses

The total estimated economic damage associated with the 54 flooding events in the period from 1980 to 2020 as reported by NCEI is approximately $102.2 million.[42] This equates to an annual economic loss of approximately $2.49 million (in current dollars). Refer to the Appendix for a full listing of flood events and damages as cited by NCEI data.

[42] https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Ice+Storm&eventType=%28Z%29+Winter+Storm&eventType=%28Z%29+Winter+Weather&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1980&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA

In addition to historic losses, total economic exposure to the 100-year flood was determined using the best available historic DFIRM data, economic data from census tracts, and the structures identified in the 100-year floodplain. There is approximately $2.6 billion of economic exposure due to flooding in the County. A summary of economic exposure by municipality is provided in the Appendix D.

Risk Factor

Risk Factor = 3.3 (for regional, less frequent events), and Risk Factor = 2.6 (for local annual events). Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

Per discussions with the Steering Committee, for the next few years based on subdivision and land development submissions to the planning commission, no new major developments are anticipated in flood plains or other flood hazard areas.

4.3.2 Winter Weather

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. A winter storm can range from a moderate snowfall or ice event over a period of a few hours to blizzard conditions with wind-driven snow that lasts for several days. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility and disrupt transportation. Winter weather poses threats to the safety of people and infrastructure in the following ways:

- Medical conditions such as frostbite, and serious injury, or loss of life
- Disruptions in electrical/utility systems, transportation systems and business activities
- Failure of power lines due to the weight or force of snow, wintry mix, etc. or indirectly because of the higher demand for electricity during these types of events
- Prevention of the delivery of fuel sources such as oil and propane for heating purposes when roads close or become too dangerous to traverse
- Increase in traffic accidents and blocking of evacuation routes.
- Full or partial collapse of structures due to heavy snow/ice loads.

Winter weather leaves the County vulnerable not only during the winter months, but also has an effect on the upcoming spring months. After a season of snow and ice, ice-melt brings with it a flood threat.

4.3.2.1 Location and Extent

Winter weather is a regional hazard, with county-wide impacts. Figure 4.5 shows how Lackawanna County compares to the rest of Pennsylvania in regard to average annual snowfall.

4.3.2.2 Range of Magnitude

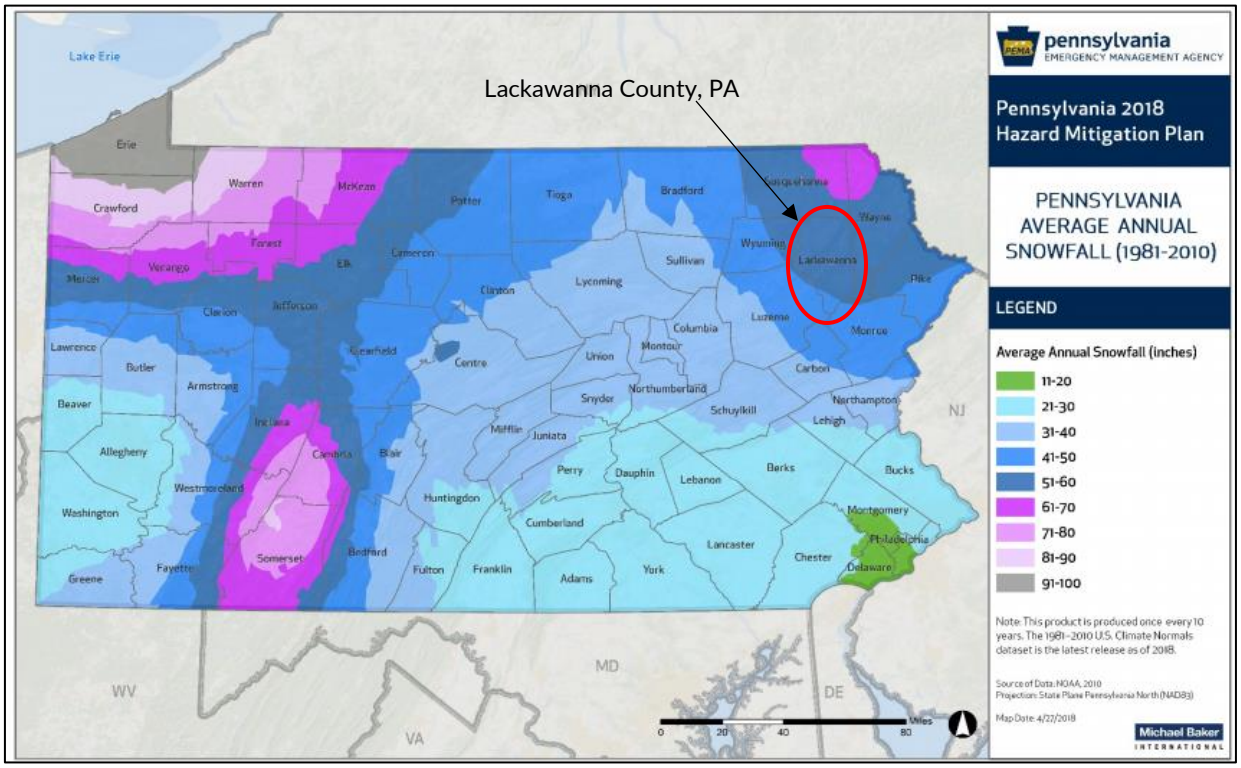
Table 4.4 summarizes the range of magnitude for winter weather hazards.

Table 4.4 Range of Magnitude - Winter Weather Hazards

Severity	Causes	Frequency	Damage Extents
Minimum	Light Snowfall	Annual	Minor traffic disruptions
Medium	Heavy Snowfall; Freezing Rain	1 to 2 years	Road closures; some downed trees and power lines

Maximum	Excess Heavy Snowfall; Severe Icing	2 to 5 years	Substantial road closures; extensive power outages; collapse of structures

Figure 4.5 Pennsylvania Average Annual Snowfall (1981-2010)



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.2.3 Past Occurrence

According to the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, which uses the FEMA National Risk Index (NRI) data, indicates that between 2005 and 2016, Lackawanna County had 201-235 winter weather warnings, including blizzard, heavy snow, and winter storm alert types.[43] Lackawanna County Emergency Management Agency staff and the Steering Committee indicated that winter weather impacts have resulted in the collapse of the Sports Dome in Jessup Borough, the County Amphitheatre in Moosic Borough, and a commercial structure in Dickson City Borough in previous years. According to the NCEI Storm Events Database, between 1998 and 2014 there were 28 reported blizzards, winter storms, winter weather, and/or ice storms in Lackawanna County.[44]

4.3.2.4 Future Occurrence

The average frequency of a winter weather event resulting in some form of damage over the 16-years reporting period presented in the NCEI dataset is approximately 1.7 winter events per year. Therefore, it can be expected that winter weather will affect the County on an annual frequency. Refer to Appendix C for a full listing of winter weather events and damages as cited by NCEI data.

[43] Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

[44] https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Ice+Storm&eventType=%28Z%29+Winter+Storm&eventType=%28Z%29+Winter+Weather&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1980&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA

4.3.2.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from winter weather include:

- Stream pollution which is a result of de-icing materials (i.e. granular or liquid road salts) used to clear roadways from snow and ice that enter waterways.

Inventory and Summary of Vulnerable Assets

Primary impacts from winter weather include power outages due to downed trees and power lines, and infrastructure impacts due to road closures. Approximately 770 miles of State and Federal highways, and approximately 1,530 miles of secondary and municipal roads are located in Lackawanna County.

Estimate of Losses

The total estimated economic damage associated with the 28 winter weather events in the period from 1998 to 2014 is approximately $120,000.[45] This equates to an annual economic loss of approximately $4,500 (in current dollars).

Risk Factor

Risk Factor = 3.0. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

New development is required to adhere to international building codes, which specify design standards for snow loadings. Therefore, the impact of winter weather on new structures is generally low. In order to accommodate the increased population associated with new development, it must be ensured that emergency response services, such as road clearing crews, are adequate.

4.3.3 Wind Events

Description

A wind storm can occur during severe thunderstorms, winter storms, coastal storms, or tornadoes. Straight-line winds such as a downburst have the potential to cause wind gusts that exceed 100 miles per hour. High winds can also develop from the general west to east movement of the jet stream, and as frontal systems move through the area. Although often less intense than hurricane force winds, winds developed by these storm systems or pressure systems occur more frequently.

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes or tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of high wind velocities and windblown debris. According to the National Weather Service, tornado wind speeds can range between 30 to more than 300 miles per hour. They are more likely to occur during the

45 https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Ice+Storm&eventType=%28Z%29+Winter+Storm&eventType=%28Z%29+Winter+Weather&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1980&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA

spring and early summer months of March through June and are most likely to form in the late afternoon and early evening. Destruction ranges from minor to catastrophic depending on the intensity, size, and duration of the storm.

High winds frequently occur during strong storm events and hurricanes or tropical storms. Hurricanes that affect Northeastern Pennsylvania typically originate in the Atlantic Ocean or Gulf of Mexico between June and November. Pennsylvania is located far north and inland compared with the areas where hurricanes typically reach landfall. Since a hurricane needs warm seawater to retain its strength, once it is over land, it dissipates energy, and will typically be downgraded to a tropical storm system before it reaches Pennsylvania.

4.3.3.1 Location and Geographic Extent

Although tornadoes and severe thunderstorms generally impact an isolated area in any given event, there is the potential for these events to impact any part of the County. Ten (10) tornadoes have been reported in or within two (2) miles of Lackawanna County; five (5) of these tornadoes were located completely within Lackawanna County.

4.3.3.2 Range of Magnitude

Tornadoes and "microbursts" can occur during thunderstorms and other weather systems where relatively high winds prevail. Tornadoes are classified according to the Enhanced Fujita (EF) scale which is based on wind speed and degrees of damages applied to various structure types. There are six categories of tornadoes with the weakest labeled as EF0 and the most intense, as EF5 (Table 4.5). Hurricanes are classified according to the Saffir-Simpson scale (Table 4.6), ranging from Category 1 (weakest) to Category 5 (strongest).

Table 4.5 Enhanced Fujita Scale[46]

Category	Wind Speed (mph)	Damage Level	Type of Damage Done
EF0	65-85	Light	Some damage to chimneys; breaks branches off trees.
EF1	86-110	Moderate	Peels surface off roofs; mobile homes pushed off foundations or overturned.
EF2	111-135	Considerable	Roofs torn off frame houses; mobile homes demolished; large trees snapped or uprooted.
EF3	136-165	Severe	Roof and some walls torn off well- constructed houses; trains overturned; most trees uprooted.
EF4	166-200	Devastating	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	>200	Incredible	Strong frame houses lifted off foundations; automobile sized missiles carried in excess of 100 meters; steel reinforced concrete structures badly damaged.

Table 4.6 Saffir-Simpson Hurricane Wind Scale[47]

Category	Sustained Winds (mph)	Type of Damage Done
1	74-95	Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.

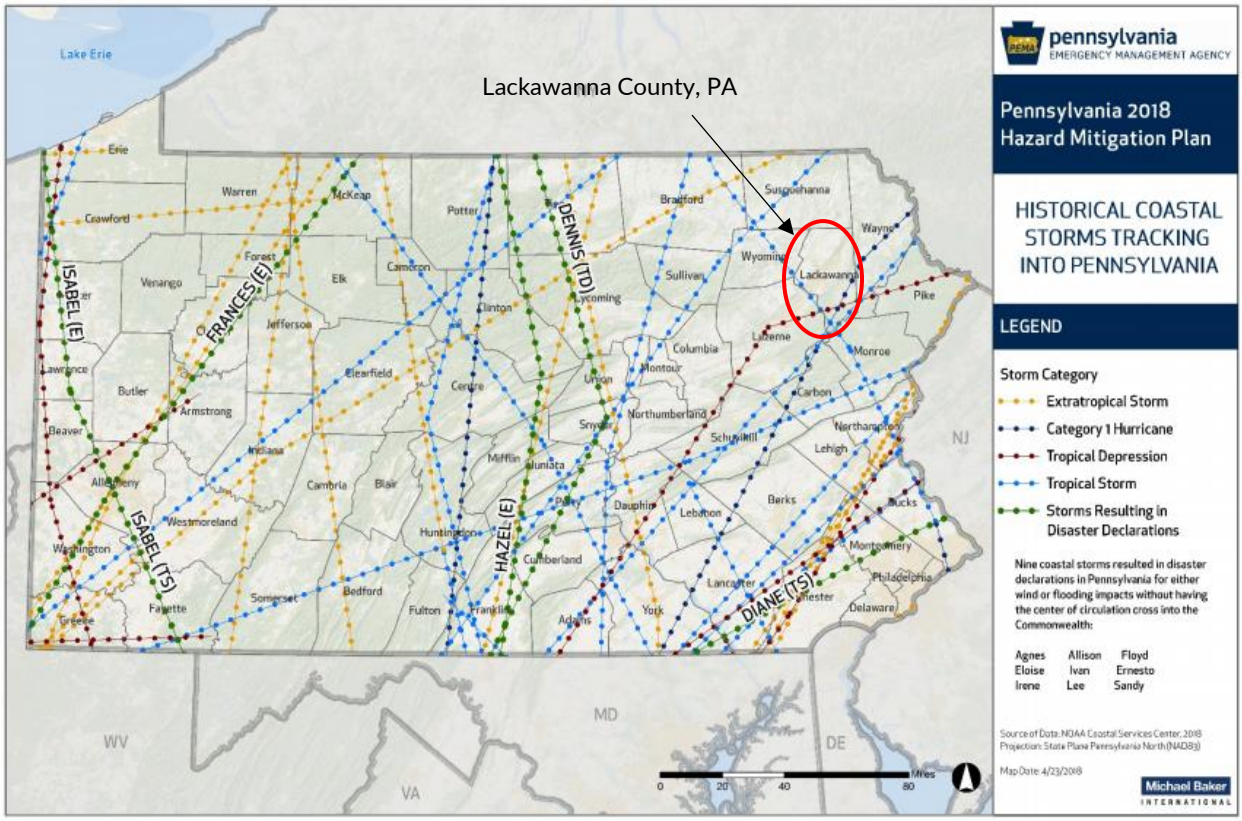
[46] http://www.tornadoproject.com/alltorns/patorn.htm
[47] National Weather Service, National Hurricane Center

2	96-110	Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111-129	Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156	Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	>157	A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

4.3.3.3 Past Occurrence

NCEI data list 193 high wind thunderstorm wind, or tornado events that resulted in damages from 1964 to 2020. Refer to Appendix C for a listing of such events. It should be noted that although hurricanes have caused flooding issues, no hurricane events have resulted in significant damages due to wind. As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, Figure 4.6 uses information to show the historical coastal storms into Lackawanna County and throughout Pennsylvania. Also reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, according to the FEMA National Risk Index (NRI),

Figure 4.6 Historical Coastal Storms Tracking into Pennsylvania



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

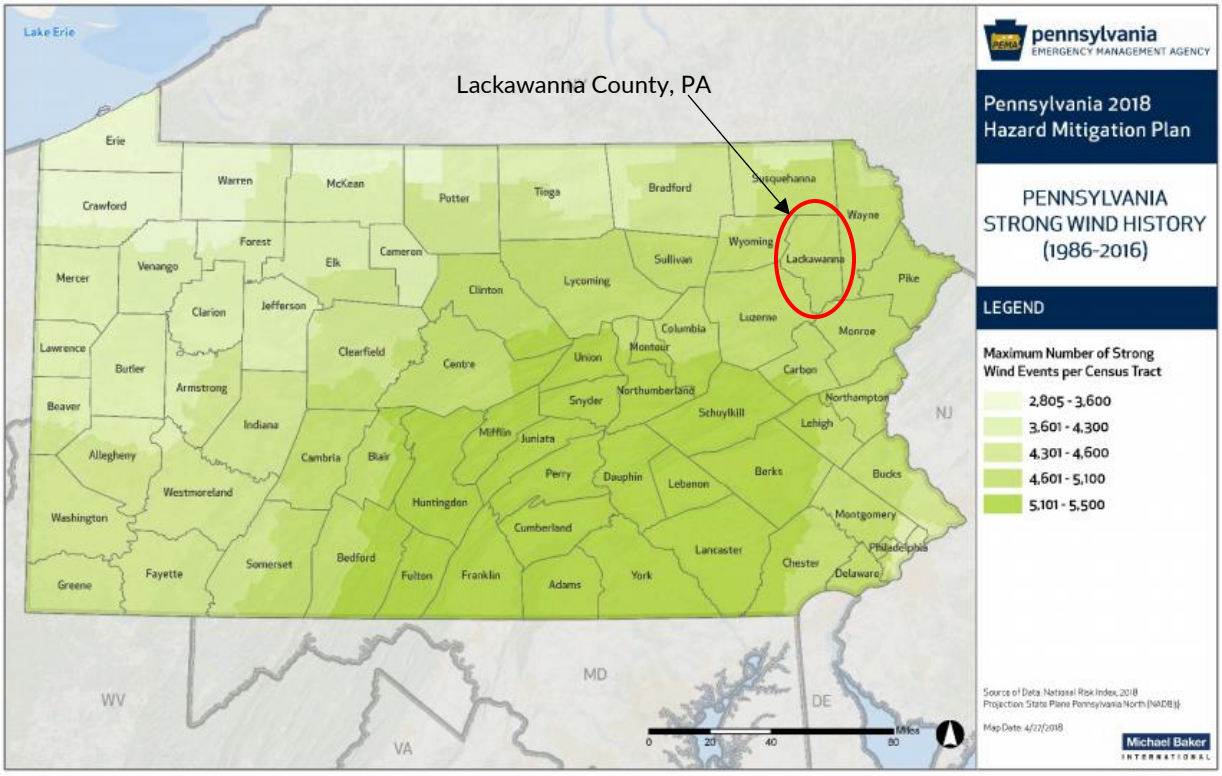
Lackawanna County experienced approximately 4,301-4,600 strong wind events between 1986 and 2016, as shown in Figure 4.7.[48]

4.3.3.4 Future Occurrence

FEMA has developed wind zones in the United States that designate regions susceptible to high winds based on wind speed. Lackawanna County falls in Zone II and Zone III, which are classified as 160 mph and 200 mph wind zones, respectively.

It can be expected that wind events will affect the County on an annual frequency. It must also be noted that tornadoes have occurred in Lackawanna County in the past, and will likely continue to impact the County, although infrequently, in the future.

Figure 4.7 Pennsylvania Strong Wind History (1986-2016), NRI 2018



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.3.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from high wind events include:

- Debris in streams, wetlands, or other sensitive environmental features
- Downing of trees

Inventory and Summary of Vulnerable Assets

Wind impacts and associated damages are generally greatest on utility transmission lines, specifically overhead electric power lines and communication lines, and older structures that were built prior to uniform code standards for wind loadings.

[48] Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

Estimate of Losses

The total estimated economic damage associated with the 193 wind events in the period from 1996 to 2020 is approximately $3.41 million.[49] This equates to an annual economic loss of approximately $190,000 (in current dollars).

FEMA HAZUS-MH software was used to evaluate estimated damages and losses that can be expected for various return period wind events (100-year, 200-year, 500-year, and 1,000-year). The results indicate that approximately 130 buildings would be at least slightly damaged in a 1,000-year wind event, with a corresponding economic loss of approximately $24 million.

Refer to Appendix E of this Plan for Hazus summary reports.

Risk Factor

Risk Factor = 2.6. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

All new residential and commercial structures are required to be constructed per the International Building Code, which requires structures to be designed to a 90 mph wind speed (in Lackawanna County). Therefore, the impact to future development due to high wind events is expected to be minimal.

4.3.4 Hazardous Material Releases

A hazardous materials release is an environmental hazard that pose threats to the natural environment, the built environment, and public safety through the diffusion of harmful substances, materials, or products. Hazardous material releases can occur at fixed facilities or in transit; and can include toxic chemicals, infectious substances, biohazardous waste, and any materials that are explosive, corrosive, flammable, or radioactive (PL 1990-165, § 207(e)). Most often, the source is from vehicular accidents involving transportation of the hazardous materials. Other sources include the unintentional release from production facilities, and negligence. These types of unintentional releases are often through stored material being leaked into groundwater or surface water systems when storage containers corrode over time.

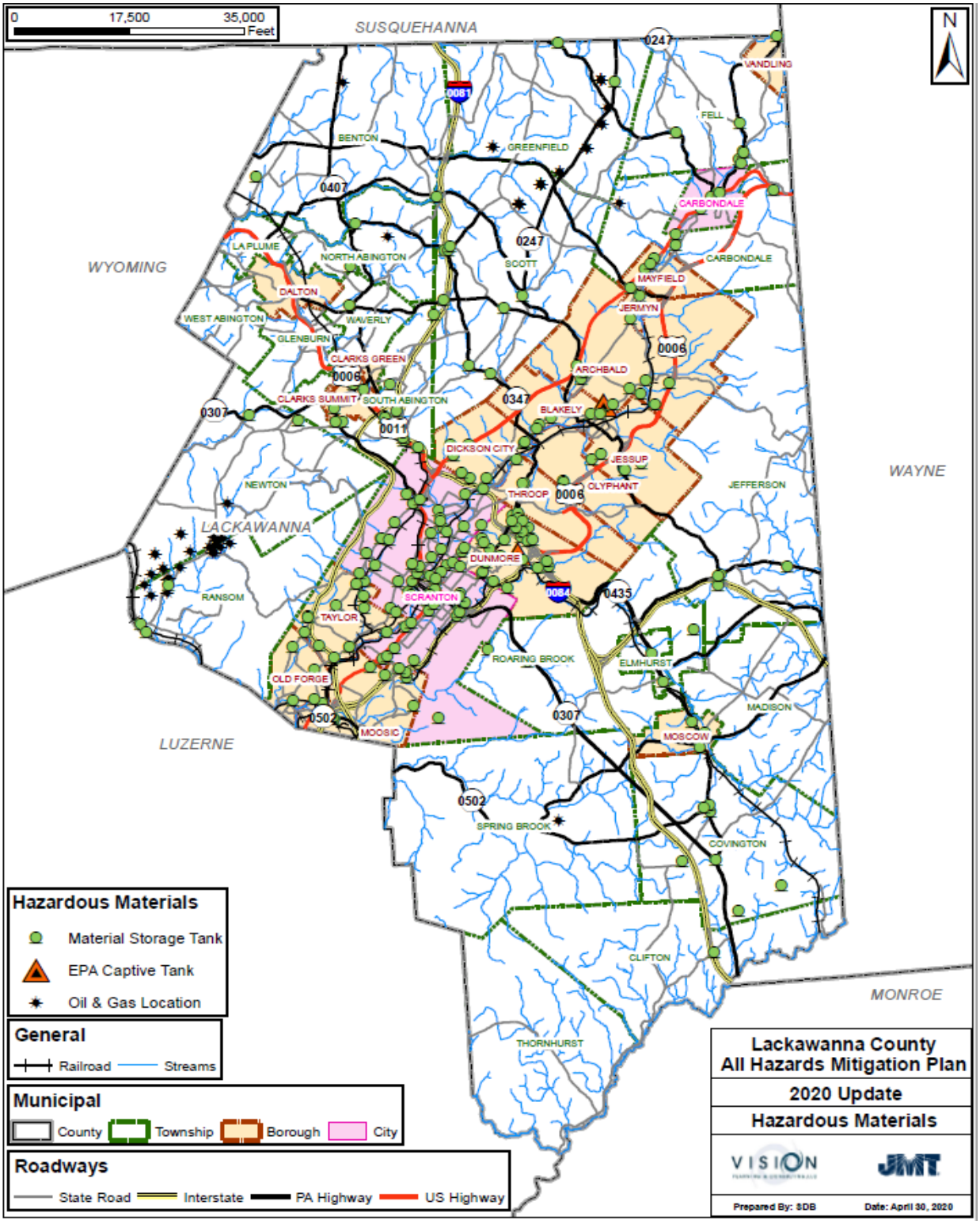
4.3.4.1 Location and Geographic Extent

There are 297 listed hazardous materials or oil and gas facilities sites within Lackawanna County, depicted in Figure 4.8. Many of the storage facilities store hazardous materials ranging from heavy metals to chemical manufacturing, with the majority of the sites located in an industrial corridor from Carbondale City/Township, through Dunmore Borough, Scott Township, the City of Scranton, and Throop Borough. In addition to hazardous material storage sites, the Steering Committee expressed concern about the intensification of transporting hazardous materials via truck and rail through the County due to natural gas operations in and around the County. Waste material resulting from drilling operations is transported via truck to Carbondale City, and then via truck and rail by way of

[49] https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+High+Wind&eventType=%28Z%29+Strong+Wind&eventType=%28C%29+Thunderstorm+Wind&eventType=%28C%29+Tornado&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1960&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA

Interstate-81, and State Routes 6, 106, and 187. The Keystone Landfill, in Dunmore Borough and Throop Borough, takes waste material from natural gas drilling operations.

Figure 4.8 Hazardous Materials in Lackawanna County



4.3.4.2 Range of Magnitude

Table 4.7 summarizes the range of magnitude for transportation issues related to local industry.

Table 4.7 Range of Magnitude - Transportation Issues Related to Local Industry

Severity	Causes	Damage Extents
Minimum	Single truck accidents or local site leak	Minor traffic disruptions; no loss of life
Maximum	Train derailments and material spills	Road closures; injuries and fatalities; release of hazardous chemicals into streams and groundwater systems

4.3.4.3 Past Occurrence

As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan* (2018), there were forty-eight (48) hazardous material related incidents in Lackawanna County over a six-year period from 2006 to 2011. However, with the increase in industrial activity associated with natural gas operations in the region over the past three years, the number of hazardous materials incidents has also increased. In the first four months of 2014, there were 439 reports of a hazardous material spill. Limited data is available on the impacts associated with these events.

4.3.4.4 Future Occurrence

Based on the previous occurrences data, there is an average of approximately eight (8) hazardous material release incidents per year. This average is expected remain steady, and may slightly increase as additional hazardous materials facilities open in Lackawanna County.

4.3.4.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from hazardous material release incidents include:

- Stream pollution from spills and releases of hazardous chemicals.
- Leaching of hazardous chemicals into groundwater systems.

Inventory and Summary of Vulnerable Assets

This hazard does not generally affect structures or critical facilities. Rather, the impact is measured by disruption to traffic and effort associated with cleaning chemical spills, impacts to water supplies, and environmental impacts to streams, lakes, or groundwater sources.

Estimate of Losses

The Steering Committee and County emergency response personnel has estimated economic damage associated with the aforementioned transportation incidents is approximately $20,000, with costs mainly arising from spill clean-up and spill spread prevention.

Risk Factor

Risk Factor = 2.5. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

The impact of hazardous material- related incidents will mainly be to emergency management resource allocation and personnel.

4.3.5 Wildfires

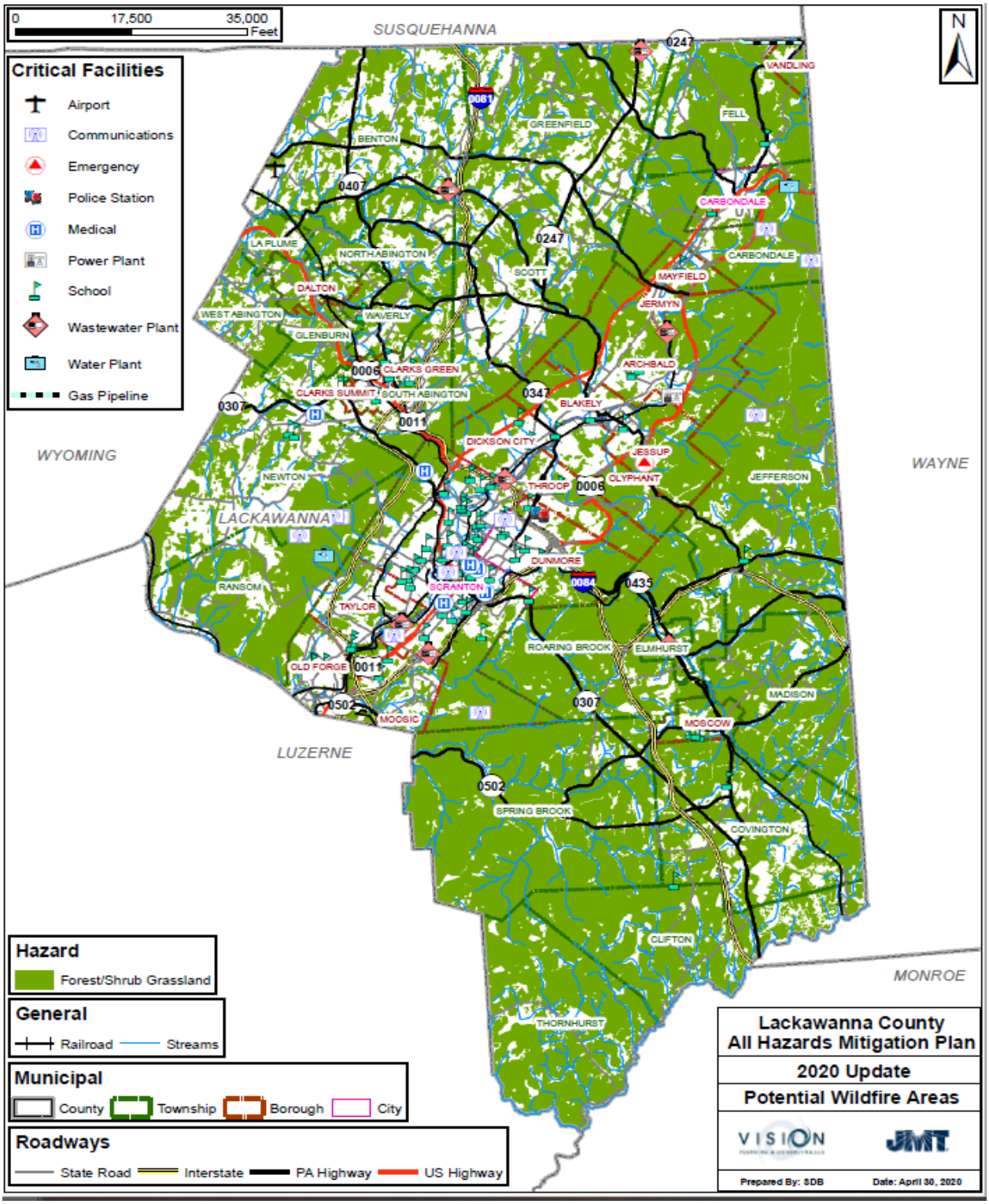
A wildfire is a raging, uncontrolled fire that spreads rapidly through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. They can occur at any time of the year, but mostly occur during long, dry hot spells. Most wildfires are caused by human carelessness, negligence, and ignorance, although they can precipitated by lightning strikes and in rare instances, spontaneous combustion. Wildfires in Pennsylvania can occur in fields, grass, brush, and forests. 98% of wildfires in Pennsylvania are a direct result of people, often caused by debris burns (PA DCNR, 1999).

Wildfires pose a safety risk to humans and can also kill wildlife and livestock. They also pose the threat of damage to property and are most dangerous in locations where forest and open grassland are adjacent to residential or urban areas.

4.3.5.1 Location and Extent

Lackawanna County is generally rural in nature, consisting of large tracts of undeveloped and forest lands. Therefore, a wildfire could potentially develop in any portion of the County. The most high-risk areas of the County are at the forest-urban interface, where the potential for wildfire to spread to structures is greatest, as shown in Figure 4.10. The County contains approximately 39,756 acres of farmland, 10,868 acres of woodland, and 4,699 acres of idle cropland. Figure 4.9 also shows the fire potential to be approximately evenly distributed throughout the County.

Figure 4.9 Potential Wildfire Areas in Lackawanna County



4.3.5.2 Range of Magnitude

Table 4.8 summarizes the range of magnitude for wildfire hazards.

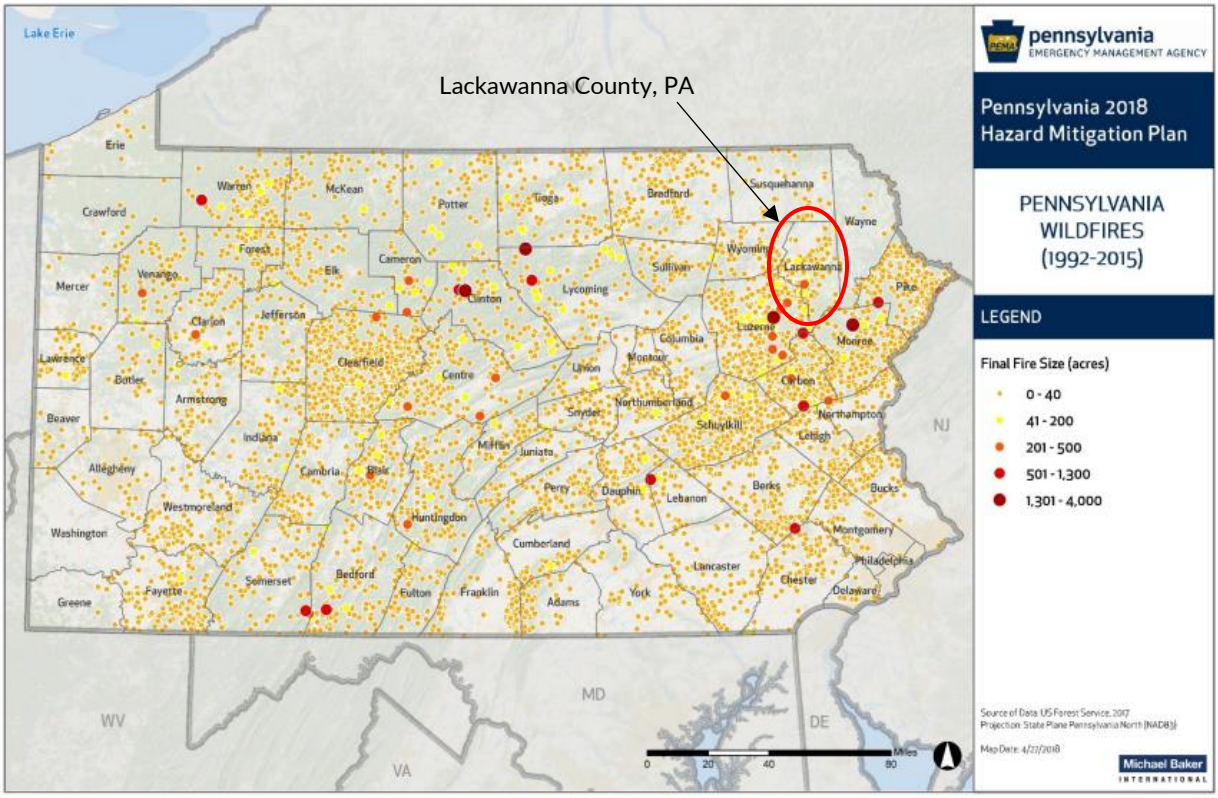
Table 4.8 Range of Magnitude - Wildfire Hazards

Severity	Causes	Frequency	Damage Extents
Minimum	Localized brush burning; contained naturally or by emergency response team	Annual	Minor loss of forest/vegetation; no damage to structures
Maximum	Extreme drought conditions prevent extinguishing and containing a fire	None Recorded	Major loss of forest, agricultural land; damage to structures

4.3.5.3 Past Occurrence

As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, from 2002 to 2015, 141 wildfires have occurred in Lackawanna County, burning approximately 1,300 acres.[50] Figure 4.10 displays a map of wildfire locations in the period from 2002 to 2015. In addition, numerous (less than 5 acres) brush/grass fires occur each year and are controlled by local fire units. Wildfire information beyond 2015 was not readily available.

Figure 4.10 Pennsylvania Wildfires (1992-2015), U.S. Forest Service 2017



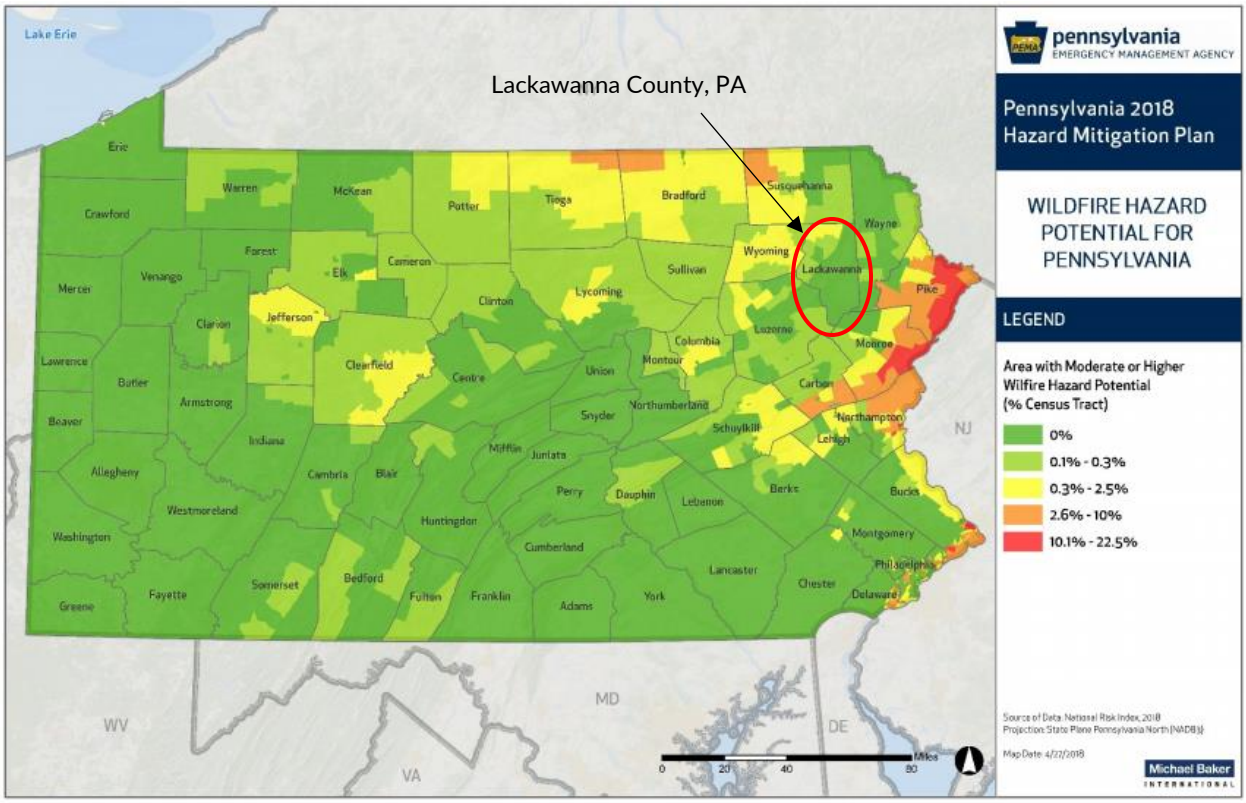
Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

[50] Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.5.4 Future Occurrence

Based on the historic information of 141 wildfires occurring over a 24-year period, the average annual occurrence of wildfires in Lackawanna County is approximately six (6) per year. Figure 4.11 displays wildfire potential throughout the State, according to the as reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan* (2018).

Figure 4.11 Wildfire Hazard Potential for Pennsylvania



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.5.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from wildfires include:

- Loss of forest/grassland habitat and ecosystems
- Erosion, streambed siltation, and flooding as the vegetation help to reduce runoff

Inventory and Summary of Vulnerable Assets

Wildfires threaten rural structures and communities that are located within forested / shrub areas, but also agricultural areas due to the spread of fire to croplands, and communities that are located along an urban/woodland interface. Lackawanna County has approximately 263 farms and 35,556 acres of farmland with an annual market value nearly $16.5 million.[51] Additionally, an analysis was conducted to evaluate structures and critical facilities within the County that are located within forested or shrub and grassland areas using Geographic Information Systems (GIS) tools. The

[51] 2017 Census of Agriculture County Profile: Lackawanna County, Pennsylvania
https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Pennsylvania/cp42069.pdf

analysis indicated that 17,258 structures and 18 critical facilities are located in wildfire potential areas. A map of the critical facilities in wildfire potential areas, and a summary of the results by municipality are presented in Appendix D.

Estimate of Losses
Historically, no substantial economic losses have resulted from wildfires in Lackawanna County.

Risk Factor
Risk Factor = 2.5. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development
The Steering Committee expressed concern that new homes, particularly high-value homes, are being constructed in forested areas, increasing the potential for wildfire impacts. The problem is two-fold; first, there is a higher probability of a wildfire impacting residential property, and secondly, new homes are being constructed in areas that may be difficult for emergency services to access during a fire event. Members of the Steering Committee noted that the ongoing construction of new high-value homes in forested areas of Jefferson, Roaring Brook Townships, and Moscow Borough is of particular concern.

4.3.6 Drought and Crop Failure

Drought is a natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought. This hazard is of particular concern in Pennsylvania due to the presence of farms as well as water-dependent industries and recreation areas across the Commonwealth.

Drought is the result of a natural reduction in precipitation expected to fall over a period of time and is generally defined by three categories: 1) A *meteorological drought* occurs when there is a deficiency in atmospheric moisture. Depending on pre-drought conditions, a meteorological drought typically has little effect on crops or water resources; 2) A more serious drought is an *agricultural drought*, which occurs when the lack of sufficient moisture starts to inhibit crop growth; 3) Should an agricultural drought last on the order of months, it could develop into a *hydrologic drought*. The hydrologic drought is the most devastating of the three types, as water resources can become significantly depleted and crops can be greatly damaged.

4.3.6.1 Location and Extent
Drought and crop failure are regional hazards, with county-wide impacts.

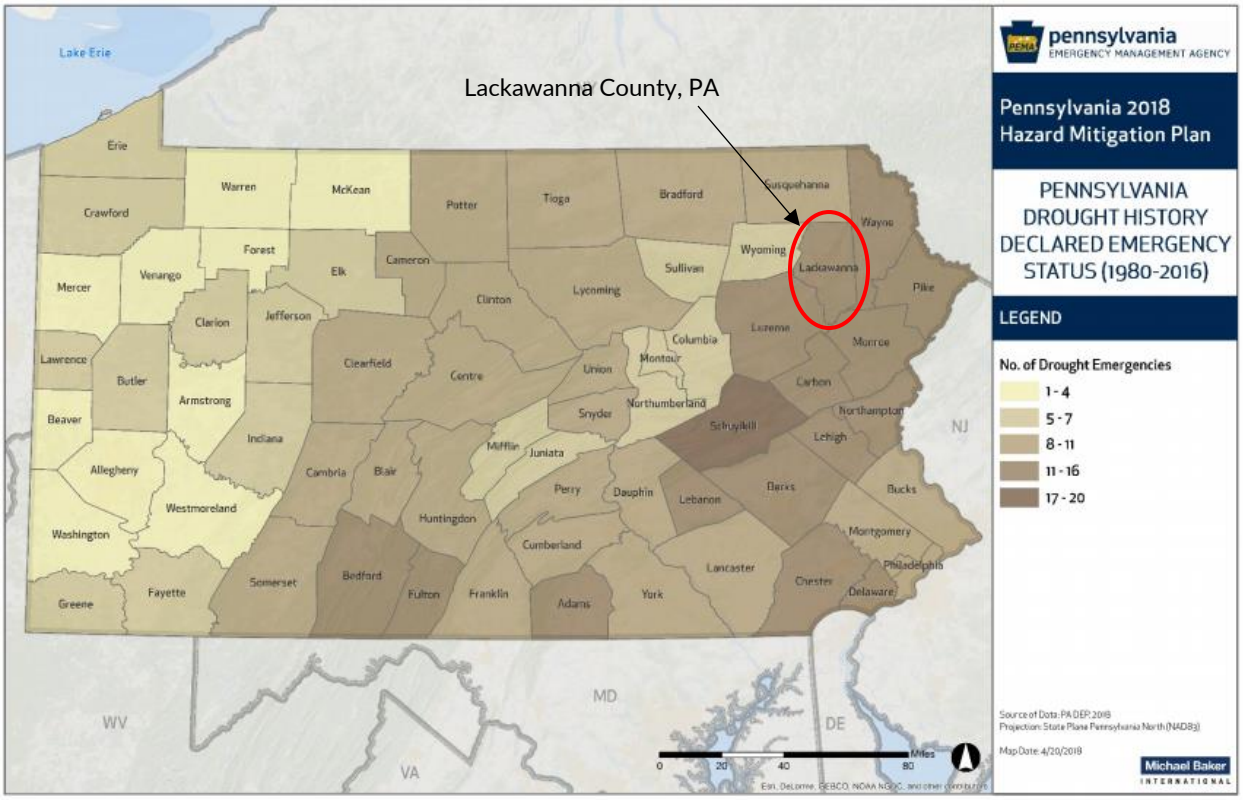
4.3.6.2 Range of Magnitude
As described above, there are three general categories pertaining to the severity of a drought. To further understand drought potential and severity, the Palmer Drought Severity Index (PDSI) is typically used for tracking moisture levels and predicting droughts. The PDSI is an indicator of moisture conditions for prolonged periods of time, and ranges from -4.0 (extreme drought) to +4.0 (extremely moist). A map of current drought PDSI is provided by the National Weather Service (NWS) Climate Prediction Center (CPC):

http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml

4.3.6.3 Past Occurrence

As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, the PA DEP identifies between 11-16 drought emergencies between 1980 and 2016, as well as 19 drought watches and 15 drought warnings. Agricultural damages and water supply deficiencies resulted from these events. Figure 4.12 shows the number of drought emergencies in Lackawanna County and compares the county to the rest of the State.

Figure 4.12 Pennsylvania Drought History Declared Emergency Status (1980-2016), PA DEP 2018



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.6.4 Future Occurrence

Drought probability is calculated in a similar manner to flooding probability. The probability of a drought occurring in any given year is the inverse of the return period. For example, a 25-year drought has a 1/25, or 4 percent, chance of occurring in any year. Based on PA DEP data, which identifies 11-16 droughts within a 36-year period, this would result in approximately 2.2-3.2 droughts per year.

4.3.6.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from drought include:

- Loss of vegetation;
- Impacts to wetlands and wetland ecosystems;
- Low stream flow conditions resulting in fish and aquatic habitat damage.

Inventory and Summary of Vulnerable Assets

The main impact of droughts is agricultural damage due to water supply shortages. Lackawanna County has approximately 32,750 acres of farmland with an annual market value of approximately $13,237,000, as reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan* (2018).

Estimate of Losses

The total estimated economic damage associated with the nine (9) drought events in the period from 1988 to 1999 is approximately $30 million ($51 million in current dollars). This equates to an annual economic loss of approximately $4.6 million (in current dollars). Additional estimated loss data was not readily available.

Risk Factor

Risk Factor = 2.2. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

Approximately 70% of Lackawanna County's water supply is provided by surface water sources (i.e. reservoirs) and 30% through groundwater, (either through private wells, municipal water authorities or community water systems). As future development increases, water supply systems should be evaluated for maximum capacity during drought conditions to ensure adequate water resources are available under increased demand and decreased supply.

4.3.7 Levee Failure

A levee is a human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding (Interagency Levee Policy Review Committee, 2006). Levee failures or breaches occur when a levee fails to contain the floodwaters for which it is designed to control or floodwaters exceed the height of the constructed levee. 51 of Pennsylvania's 67 counties have been identified as having at least one levee (FEMA Region III, 2009).

With much of the City of Scranton protected by a flood control system, there is a potential for a Lackawanna River and Roaring Brook flood event to overwhelm the levee and floodwalls that comprise the system. This could occur from either flood water surface elevations exceeding the top of protection elevations of the levee and floodwalls, or by a structural failure of a component of the system.

4.3.7.1 Location and Extent

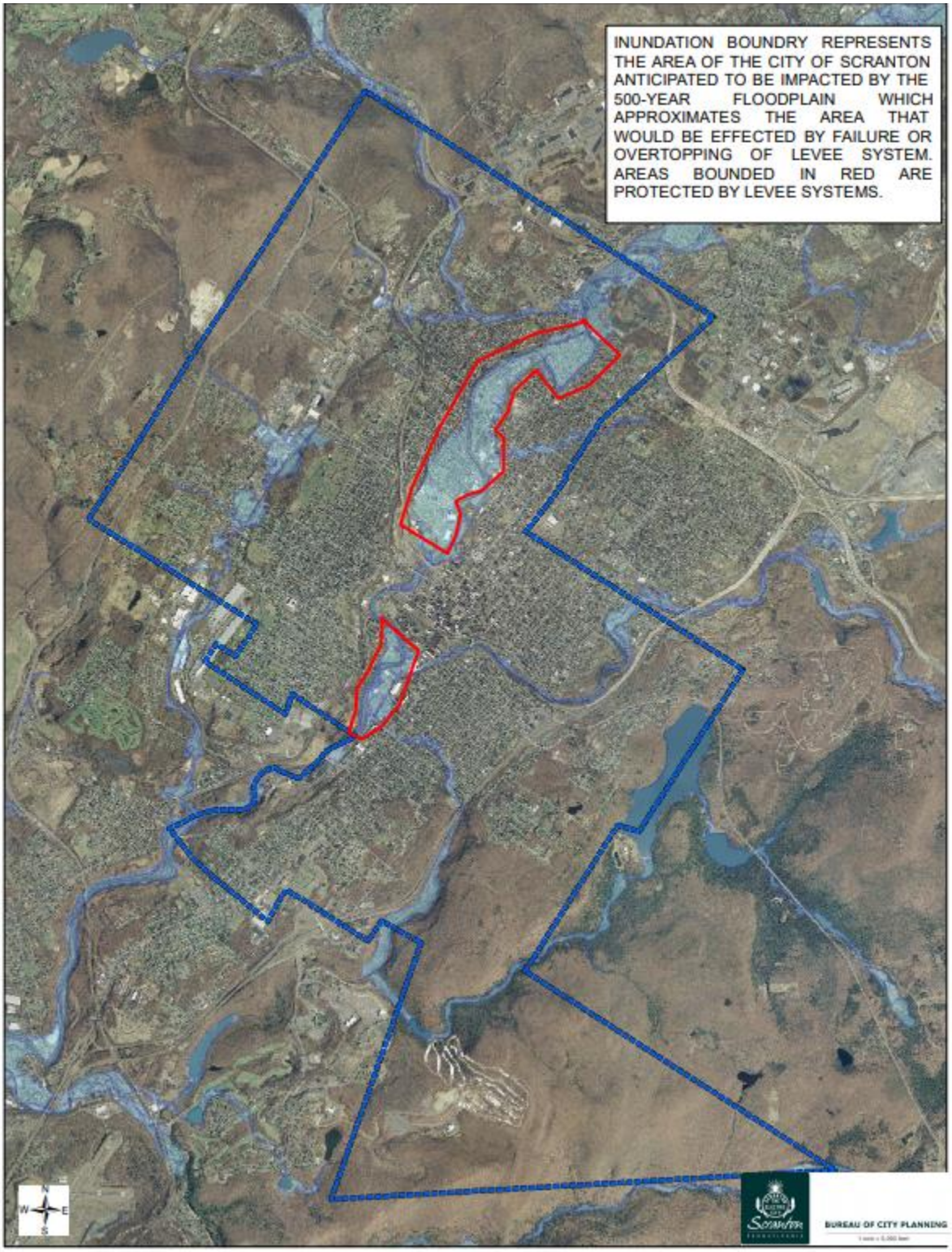
Levee systems line several different parts of the Lackawanna River, as identified in Figure 4.13, where the Plot levee in Scranton is highlighted. This map shows locations of levees (in red) and channel systems (in orange). The event of a levee failure would essentially result in the inundation of the historic (pre-levee) floodplain. This would primarily impact the Roaring Brook and southeastern portions of the City of Scranton due to a failure of the Roaring Brook section of the flood protection system, and approximately 5 miles of central Scranton due to a failure of the Albright, Green Ridge, and Plot sections of the levee system through the City of Scranton. Figure 4.14 shows the approximate inundation area, represented by the 500-year floodplain, for the City

of Scranton. It is important to note the management and maintenance protocols for levees in the County has not changed since the previous plan update."

Figure 4.13 Levee Locations in Lackawanna County

Source: https://levees.sec.usace.army.mil/#/levees/system/2305360001/summary

Figure 4.14 Levee Failure Approximate Inundation Area in City of Scranton



4.3.7.2 Range of Magnitude

Table 4.9 summarizes the range of magnitude for levee failure hazards.

Table 4.9 Range of Magnitude - Levee Failure Hazards

Severity	Causes	Damage Extents
Minimum	Brief overtopping of levee system	Minor interior ponding
Medium	Isolated portion of levee system fails (breach)	Damage isolated to immediate area near levee breach
Maximum	Levee overtopped by flood event; failure of levee system (breach) results in complete loss of protection	All municipalities protected by the levee system become vulnerable to historic flood extents

4.3.7.3 Past Occurrence

Hurricane Diane (1955) prompted the construction of the flood control system, causing widespread physical and economic damage along the Lackawanna River corridor. Since the construction of the flood control system, Hurricane Ivan (2004) and the June 2006 events resulted in flood levels near the top of protection of the flood control system, and areas outside the limits of the flood protection system were inundated.

4.3.7.4 Future Occurrence

At the time of this Plan Update, the levee would be overtopped by the 500-year event. This equates to an annual probability of occurrence of 0.2%.

4.3.7.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from a levee failure include:

- Stream pollution from roadway/parking lot runoff (oils, grease, dirt, etc.)
- Streambank erosion and sediment deposits
- Unnatural debris deposits such as washed out bridges/culverts, homes, vehicles, etc.

Inventory and Summary of Vulnerable Assets and Estimate of Losses

The Roaring Brook and southeastern portion of the City of Scranton would become vulnerable in the event of a levee failure. Using the 1955 Hurricane Diane event, which caused approximately $10 million in damage (1955 dollars) as a reasonable representation of the impact that would result from a failure of the levee system, there is an estimated $100 million of economic exposure to such an event.

Risk Factor

Risk Factor = 2.2. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

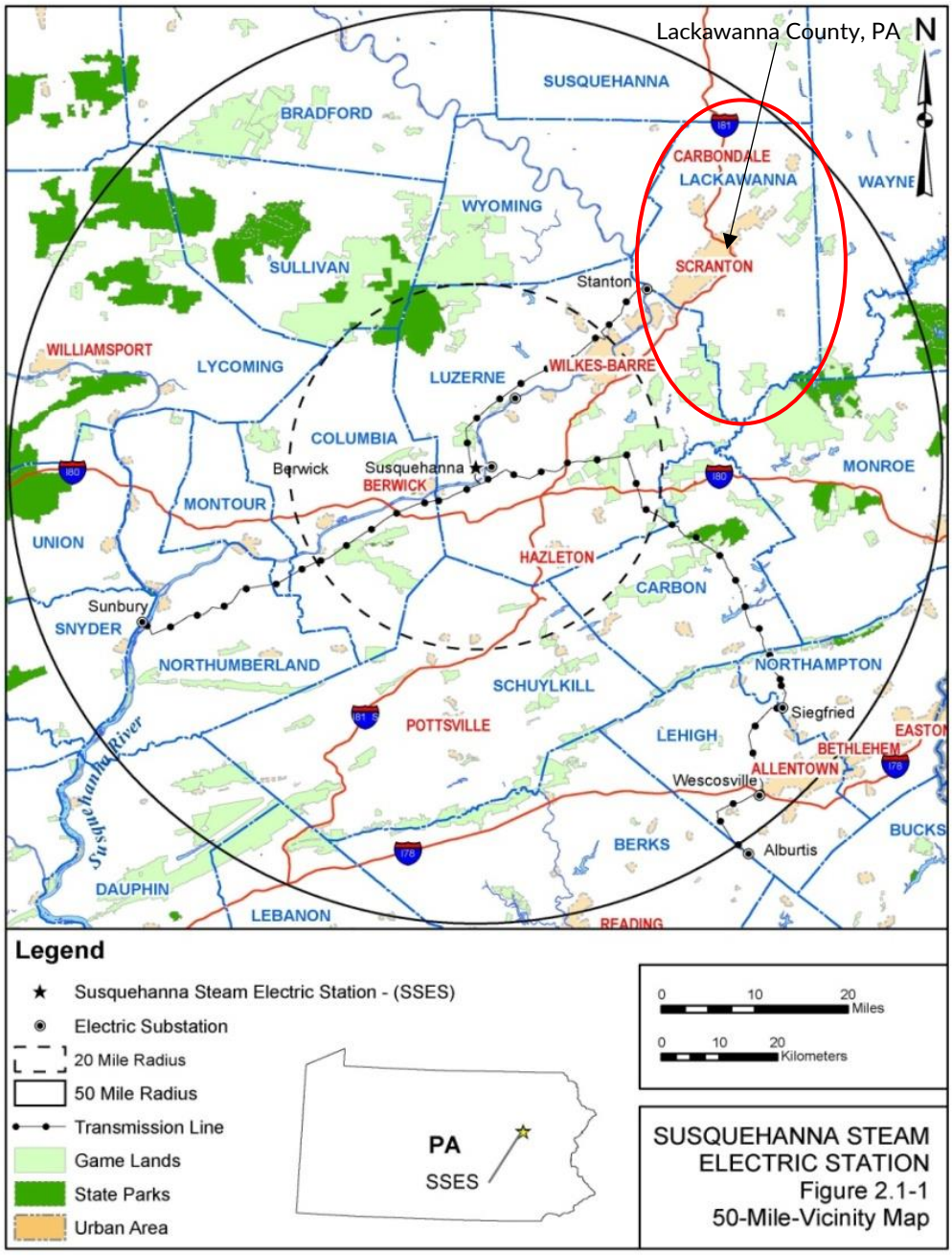
Impact on Future Development

FEMA developed a program titled "RiskMAP" in 2014, illustrating the potential impact of future flood events. Municipalities should make available to developers and homeowners this best available data, which may be found at FEMA's website: https://www.fema.gov/risk-mapping-assessment-and-planning-risk-map Although the RiskMAP flood extents are not official floodplain limits at the time of this Plan Update, homeowners and mortgage lenders should use the data to understand the true risk posed by flooding along the Lackawanna River when evaluating flood insurance policies.

4.3.8 Nuclear Release

Nuclear accidents generally refer to events involving the release of significant levels of radioactivity or exposure of workers or the general public to radiation (FEMA, 1997). Nuclear accidents/incidents can be placed into three categories: 1) Criticality accidents which involve loss of control of nuclear assemblies or power reactors, 2) Loss-of-coolant accidents which result whenever a reactor coolant

Figure 4.15 20-Mile and 50-Mile Radii from Susquehanna Steam Electric Nuclear Power Station



system experiences a break or opening large enough so that the coolant inventory in the system cannot be maintained by the normally operating make-up system, and 3) Loss-of-containment accidents which involve the release of radioactivity. The primary concern following such an incident or accident is that it can cause acute and/or health effects, and psychological effects.

4.3.8.1 Location and Extent

The only nuclear power generation facility within 50 miles of Lackawanna County is the Susquehanna Steam Electric nuclear facility in Salem Township, Luzerne County. This facility is powered by a boiling water reactor (BWR) which is notably one of the safest nuclear power systems, and component failures in any part of the system will automatically shut down the plant. Figure 4.15 displays Lackawanna County in relation to the Susquehanna Steam Electric facility, and the 20-mile and 50-mile fallout zones.

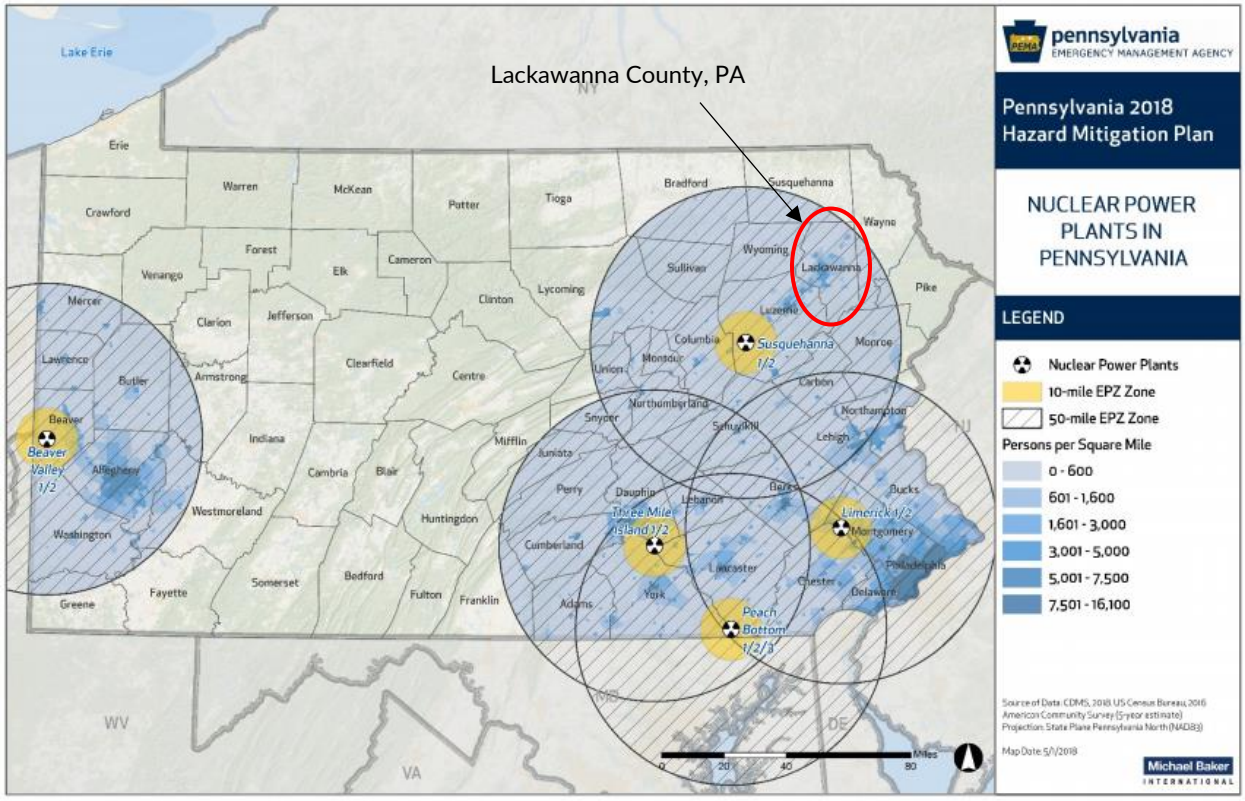
4.3.8.2 Range of Magnitude

Should a failure of the Susquehanna Steam Electric Station occur, the severity of impacts in the 50-mile radius may require evacuation of Lackawanna County, or result in an order of "shelter in place".

4.3.8.3 Past Occurrence

No failures have occurred at the plant resulting in damages, injuries, or fatalities. One (1) "alert" was declared at the station on March 2, 2006. "An Alert is the second-lowest of four emergency classifications for nuclear power plants. It is declared when an event has occurred that could reduce the plant's level of safety, but backup plant systems still work." (PEMA News Archive)

Figure 4.16 Nuclear Power Plants in Pennsylvania



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.8.4 Future Occurrence

The history of nuclear power plant failure in the U.S includes very few incidents relative to the number of active power plants (2 failures for 100+ plants). Thus, the probability of a well-monitored, well-regulated nuclear facility experiencing a failure is low. The Susquehanna Steam Electric Station is regulated by the Nuclear Regulatory Commission (NRC), and is inspected by resident inspectors, who are permanently stationed at the site. As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, Figure 4.16 shows the locations of nuclear power stations in the State along with radii from each.

4.3.8.5 Vulnerability Assessment

<u>Environmental Impacts</u>

Potential environmental impacts from nuclear release include:

- Damage to aquatic ecosystems from radiation;
- Loss of vegetation and forest habitat from radiation.

<u>Inventory and Summary of Vulnerable Assets</u>

The failure of a nuclear power facility can result in devastating and far-reaching effects. Problems and health effects from nuclear power failure are from the high levels of radioactive material that is used or produced during the power generation process. Proactive evacuation measures will ensure minimal impact to health and well-being.

Estimate of Losses

Nuclear release would not directly impact structures or critical facilities. Economic losses would mainly arise from damage to water supply systems and agriculture. As mentioned previously, Lackawanna County has approximately 32,750 acres of farmland with an annual market value of approximately $13,237,000.

Risk Factor

Risk Factor = 2.1. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

Risk to future development is no different than risk to existing infrastructure, property, or citizen health. Where development is planned, evacuation routes should be adjusted as necessary to accommodate increased traffic flow.

4.3.9 Earthquakes

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.

The main effects of earthquakes are shaking and ground rupture. These can often result in damage to buildings or other rigid superstructures on the Earth's surface, depending on several factors which control the local effects of an earthquake. These factors include the earthquake magnitude, the distance of the local area to the earthquake epicenter, and the local geologic conditions.

In northeast Pennsylvania, the cause of earthquakes is still being researched. A likely explanation is the "pre-existing zones of weakness" model, in which the cause of earthquakes in the northeast U.S. is the failure of old fault lines created millions of years ago. It remains incredibly difficult to predict when and where an earthquake will occur in the northeast U.S. and Pennsylvania.

4.3.9.1 Location and Extent

Earthquakes are a regional hazard, with countywide impacts.

4.3.9.2 Range of Magnitude

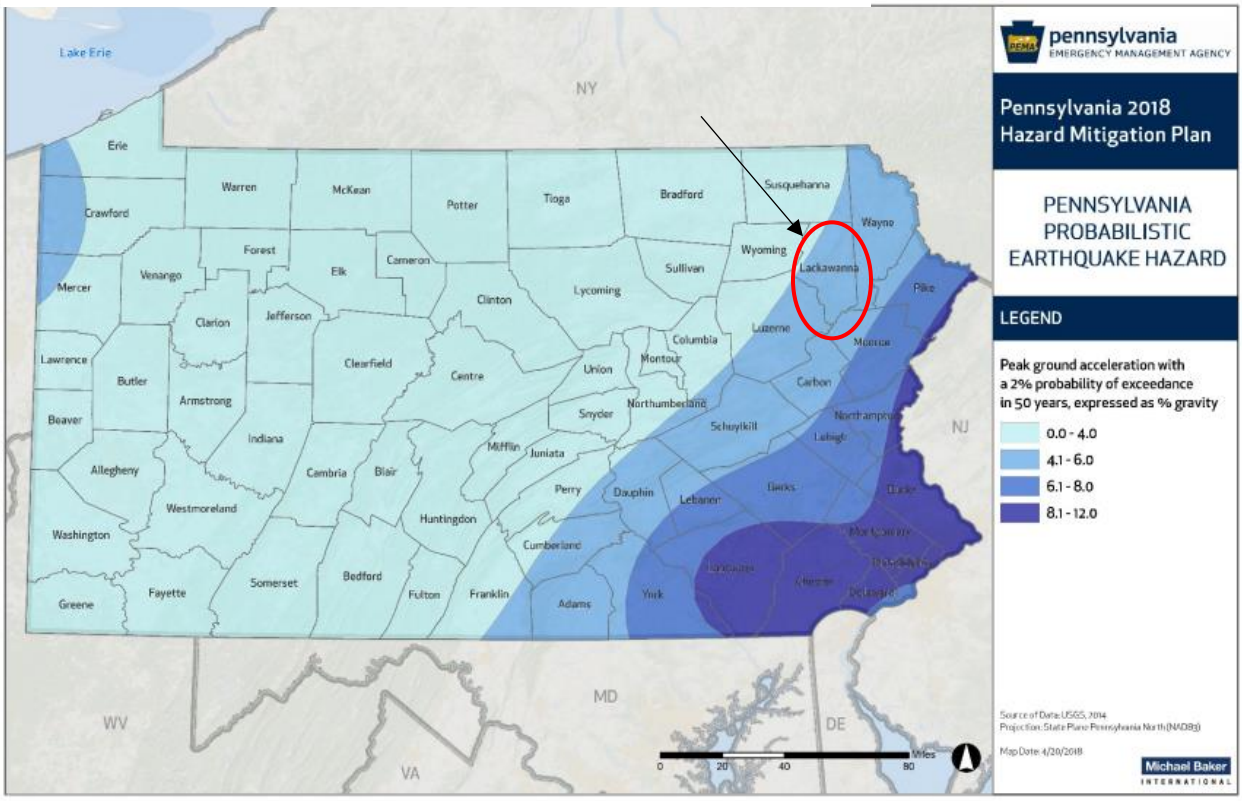
The magnitude of an earthquake was traditionally measured by the now obsolete Richter scale. Earthquake intensity is now more frequently measured by the modified Mercalli scale, which utilizes 12 categories ranging from I – Instrumental (felt by few people) to XII - Catastrophic.

4.3.9.3 Past Occurrences

With the exception of the 2011 Virginia earthquake, which was felt as far north as Ontario, Canada (but did not result in damages in Lackawanna County), no occurrences of earthquakes have been recorded in the County.

4.3.9.4 Future Occurrence

Figure 4.17 PA Probabilistic Earthquake Hazard, USGS 2018



Using the USGS model for calculating earthquake potential, it was determined that the probability of a magnitude 5.0 earthquake occurring in the next 500 years is 20 percent for Lackawanna County. As reported in the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan (2018)*, Figure 4.17 explains the probability of an earthquake hazard occurring throughout Pennsylvania.

4.3.9.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from earthquakes include:

- Pipeline ruptures releasing gas or sewage into surface water and groundwater systems.

Inventory and Summary of Vulnerable Assets

FEMA's Hazus software was used to determine the types and numbers of structures vulnerable to earthquakes. Given the rarity of earthquakes in the region of the U.S. encompassing Lackawanna County, a 1000-year return period probabilistic event with an epicenter magnitude of 5.0 was selected as a representative event to estimate damage and losses caused by earthquake hazards. The results of the Hazus analysis indicates that such an event would damage over 4,500 structures, of which approximately 1,270 would be moderately damaged. Summary reports of the Hazus analysis are provided in the Appendix E.

Estimate of Losses

According to the Hazus analysis for the 1000-year earthquake of magnitude 5.0 event, a total economic loss of approximately $102 million (including business interruptions) could be anticipated.

Risk Factor

Risk Factor = 2.0. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

Risk to future development is no different than risk to existing infrastructure, property, or citizen health. Where development is planned, emergency services should be adjusted as necessary to accommodate an increased population.

4.3.10 Land Subsidence/Mine Related Issues

Subsidence is a natural geologic process that commonly occurs in areas with underlying limestone bedrock and other rock types that are soluble in water. Water passing through naturally occurring fractures dissolves these materials leaving underground voids. Eventually, overburden on top of the voids causes a collapse which can damage structures with low strain tolerances. This collapse can take place slowly over time or quickly in a single event, but in either case. In addition to natural processes, human activity such as water, natural gas, and oil extraction can cause subsidence and sinkhole formations.

Subsidence occurs in areas overlying underground mines that are relatively close to the ground surface. This type of subsidence is fairly localized in extent and is usually recognized by an abrupt depression evident at the ground surface as overburden materials collapse into the mine void. Lackawanna County also has had underground and surface mine fires, as a result of combustible material igniting after mining operations cease.

4.3.10.1 Location and Extent

Lackawanna County has a history of mining activities throughout the County. The most intense historic mining operations were generally conducted along the Lackawanna River corridor and from the City of Scranton north to the City of Carbondale, in the south of the County in Old Forge, Taylor, and Moosic Boroughs, and in the north of the County in Fell Township and Vandling Borough. Three notable mine fires are located in Carbondale Township, and Olyphant Borough. DEP is working with both municipalities on extinguishing these fires. Figure 4.18 shows the mine hazard areas in Lackawanna County.

4.3.10.2 Range of Magnitude

Table 4.10 summarizes the range of magnitude for Land Subsidence/Mine Related hazards.

Figure 4.18 Mine Hazards in Lackawanna County

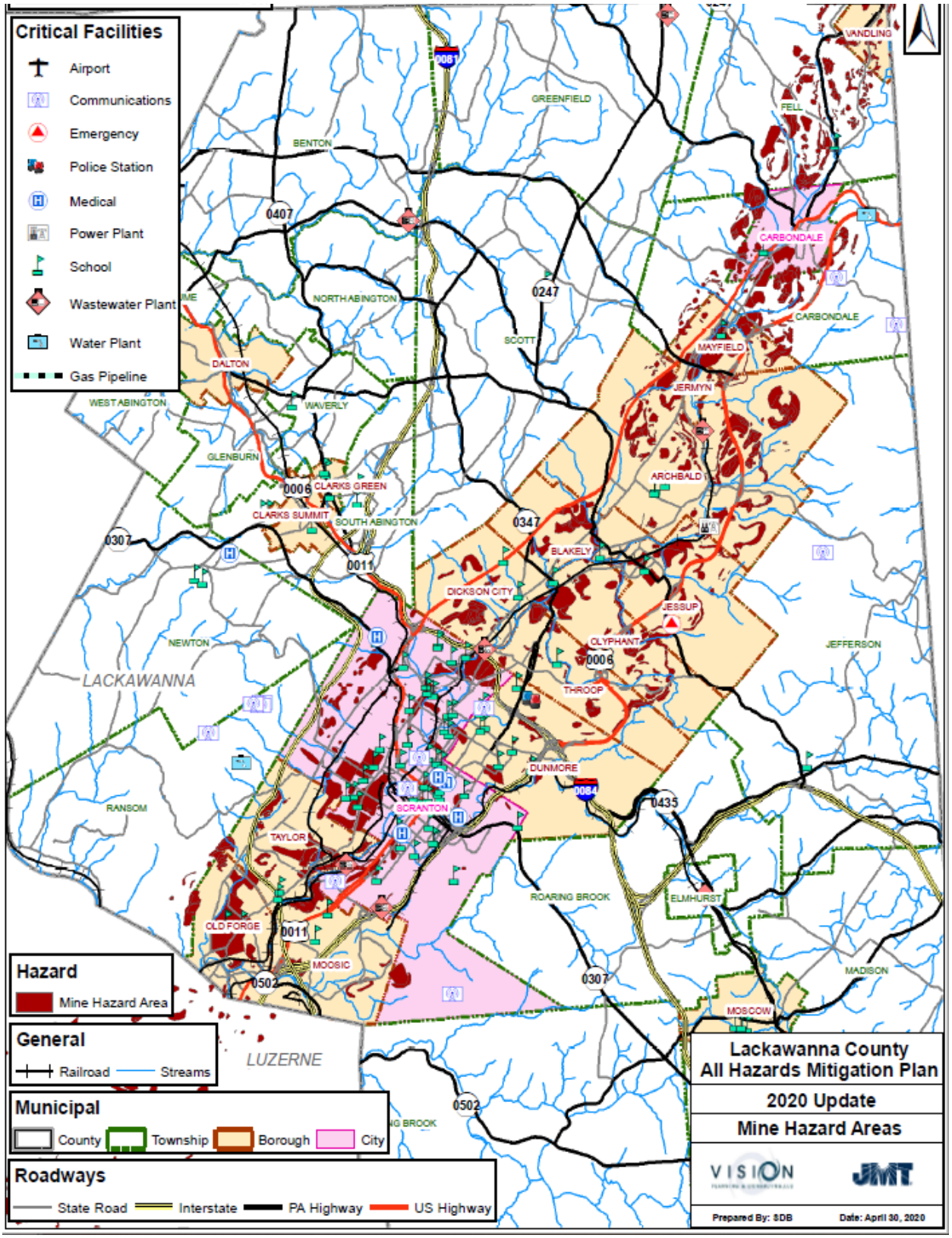


Table 4.10 Range of Magnitude - Land Subsidence Hazards

Severity	Causes	Frequency	Damage Extents
Minimum	Local mine void collapse	2 – 5 years	Single residential structure impacts
Maximum	Large scale mine collapse; mine pool disruption via earth movement	>10 years	Multiple residential structures, community impacts

4.3.10.3 Past Occurrences

The Steering Committee estimates that approximately five (5) subsidence events occur annually, and these are mainly triggered by precipitation events.

4.3.10.4 Future Occurrence

Due to the geologic condition underlying Lackawanna County from historic mining operations, and the frequency of historic events, land subsidence events can be expected to occur with an approximate recurrence interval of five (5) years.

4.3.10.5 Vulnerability Assessment

Environmental Impacts

Environmental impacts associated with land subsidence events are minimal.

Inventory and Summary of Vulnerable Assets

Overlaying the structures in the County with historic mining areas using GIS tools, it was determined that approximately 13,816 structures are located in the historic mining areas of Lackawanna County. Of those structures, approximately twenty-two (22) are critical facilities. A summary of the results by municipality are presented in the Appendix D.

Estimate of Losses

Generally, the annual occurrence of subsidence events as expressed by the Steering Committee does not result in significant damage to structures or economic losses. The Office of Surface Mining (OSM) performs flushing and grouting operations to mitigate the subsidence. However, occasionally the grouting is washed out due to heavy precipitation. One structural impact to an 8-story public housing facility resulted from a subsidence event. The total economic exposure to land subsidence of the 13,816 structures located in historic mining areas is approximately $5.4 billion. A summary of economic exposure by municipality is provided in Appendix D.

Risk Factor

Risk Factor = 1.8. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

Planned future development should take into consideration the underlying geologic conditions, especially those areas which have historic mining operations and where surface conditions such as depressions and voids indicate that subsurface sinking is occurring or is possible in the future.

4.3.11 Dam Failure

A dam is a barrier across flowing water that obstructs, directs, or slows down water flow. Dams provide benefits such as flood protection, power generation, drinking water, irrigation, and recreation. Failure of these structures results in an uncontrolled release of impounded water.

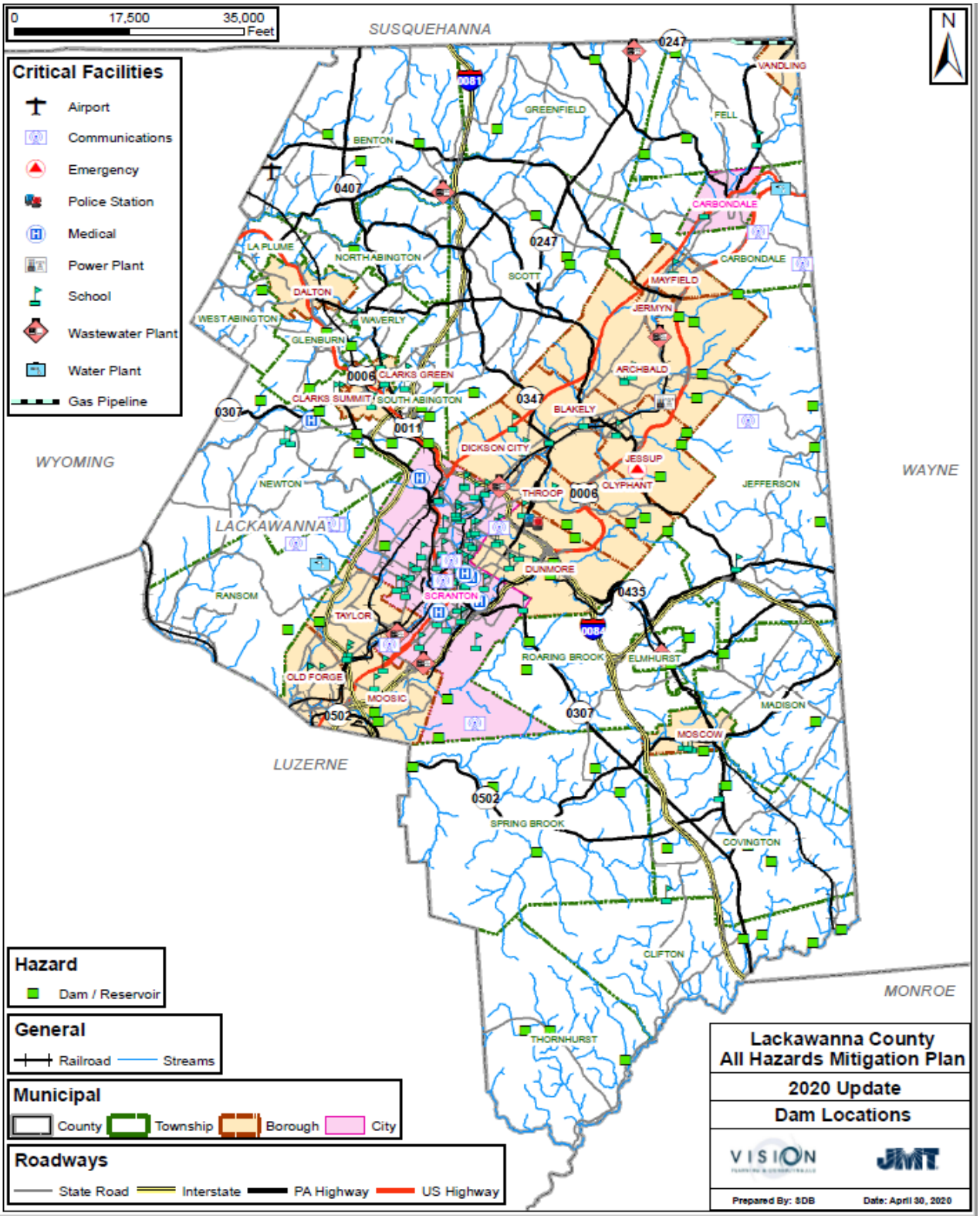
Failures are relatively rare, but immense damage and loss of life is possible in downstream communities when such events occur. Aging infrastructure, hydrologic, hydraulic and geologic characteristics, population growth, and design and maintenance practices should be considered when assessing dam failure hazards

Dam failure typically occurs when a large storm event creates surface runoff that exceeds the storage capacity of an impoundment, which causes a dam to be overtopped by the excess water (i.e., weir flow). Emergency spillways are generally designed to pass flow rates between the 100-year 24-hour storm event and the full Probable Maximum Flood (PMF); therefore, a storm larger than these events would usually be required to develop enough run-off to cause prolonged overtopping. This overtopping can cause erosion in the earthen portion of the dam, potentially resulting in a dam breach. Dam breaches result in flood waves that often flood the downstream channel to a greater extent than the 100-year flood. This can cause significant destruction to residential and developed areas.

4.3.11.1 Location and Extent

There are 82 dams within Lackawanna County registered with the DEP Division of Dam Safety, of which 33 are considered to be high-hazard. Locations of dams are displayed in Figure 4.19. The Elmhurst Reservoir, located in Elmhurst, Madison, and Roaring Brook Townships, has recently completed spillway enlargement.

Figure 4.19 Dam Locations in Lackawanna County



4.3.11.2 Range of Magnitude

A dam breach typically results in severe damages to structures in the inundation area due to the volume of water displaced in a short time period. However, the impacts of a dam breach are confined to the downstream stream corridor and overbank areas, resulting in localized impacts.

4.3.11.3 Past Occurrence

There have been no occurrences of a dam breach in Lackawanna County.

4.3.11.4 Future Occurrence

High hazard dams are required to maintain yearly inspections and up-to-date Emergency Action Plans (EAPs), and warnings are posted by the media that will allow evacuations to take place before a breach occurs. For those dams that have an EAP in place, the probability of loss of life or injuries resulting from a dam breach is low. The probability for casualties is higher for those dams without an EAP because media and warning systems have not been identified, nor has the downstream inundation area.

4.3.11.5 Vulnerability Assessment

Environmental Impacts

Potential environmental impacts from a dam breach include:

- Stream channel erosion and debris deposition.

Inventory and Summary of Vulnerable Assets and Estimate of Losses

It is beyond the purview of this Plan Update to develop inundation areas for dam breach events. Inundation maps associated with high-hazard dams are posted at municipal buildings and are on file with the Department of Environmental Protection – Northeast Regional Office.

Risk Factor

Risk Factor = 1.6. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

As new development is planned, EAPs should be updated to include any development changes downstream of a dam to ensure minimal impact in the event of a dam breach. At this time, no new development is planned downstream of dams in the County.

4.3.12 Landslides

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation reacting to the force of gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, and changes in groundwater levels. Mudflows, mudslides, rockfalls, rockslides, and rock topples are all forms of a landslide. Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, developed hillsides, and areas recently burned by forest and brush fires.

4.3.12.1 Location and Extent

Given the right conditions, landslides can occur anywhere in the County. The Lackawanna River valley may be prone to larger landslides triggered by the River's undercutting of the slope material consisting of stratified sedimentary rock.

4.3.12.2 Range of Magnitude

Table 4.11 summarizes the range of magnitude for landslide hazards.

Table 4.11 Range of Magnitude - Landslide Hazards

Severity	Causes	Frequency	Damage Extents
Minimum	Rock falls from steep roadway cuts	Annual	Minor traffic disruptions; damage to vehicles
Medium	Heavy rainfall resulting in slope failure	>10 years	Substantial road closures
Maximum	Rock block slide from River Valley	Millenia	Catastrophic

4.3.12.3 Past Occurrence

Historically, there have been several reports of small landslides within the County. All of the reports have been isolated to roadway rock falls, two of which and have resulted in minor road closures (less than a day) along secondary routes.

4.3.12.4 Future Occurrence

The probability of large-scale future landslide events in Lackawanna County is considered low due to the County's position over the glaciated low plateau physiographic province (geologic formation with low landslide potential). A landslide potential map for Pennsylvania from the USGS is provided in Figure 4.20. The map indicates that Lackawanna County is located within the low probability area with local areas of high to moderate risk from landslides.

4.3.12.5 Vulnerability Assessment

Environmental Impacts

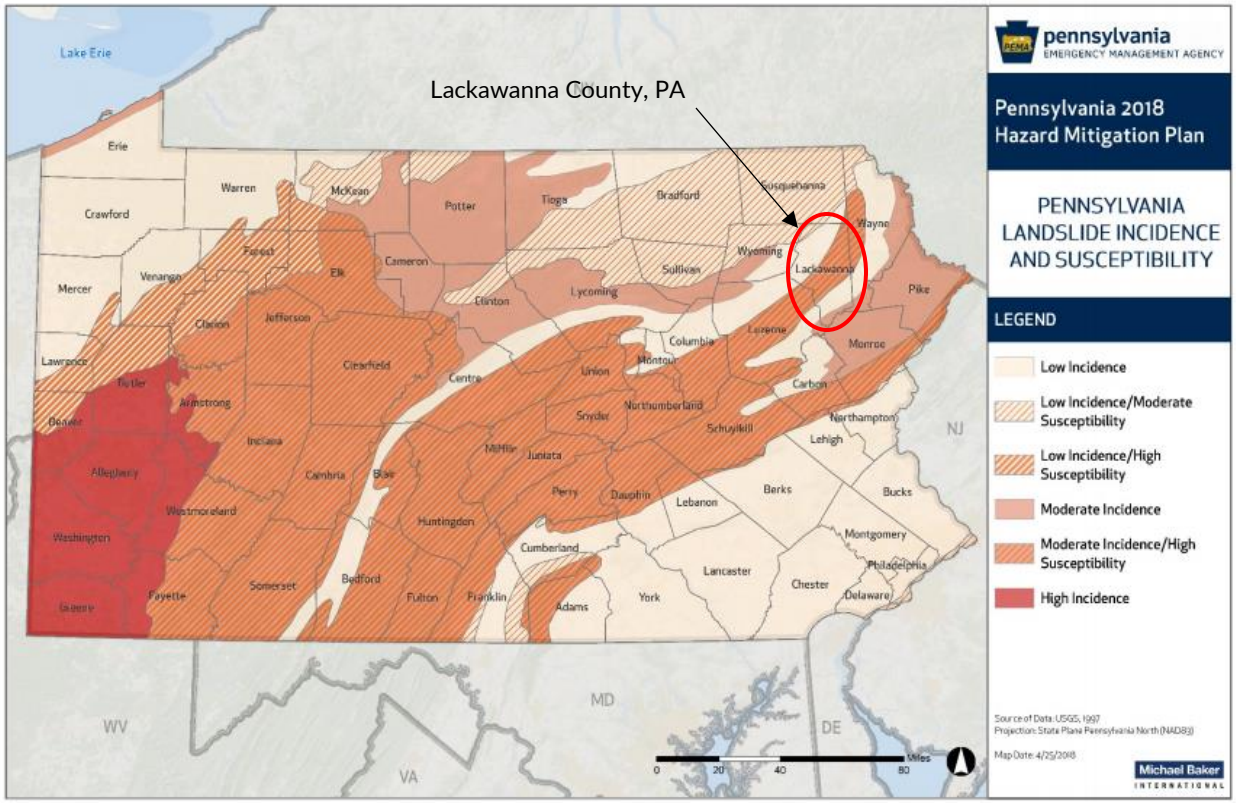
Potential environmental impacts from landslides include:

- Stream blockages and sedimentation issues from debris deposition.

Inventory and Summary of Vulnerable Assets

Most of the damage caused by landslides is to transportation routes, utility systems, and structures, but the side effects such as traffic delays and clean-up can greatly accumulate. As aforementioned, approximately 770 of state and federal highways, and approximately 1,530 miles of secondary and municipal roads are located in Lackawanna County.

Figure 4.20 Pennsylvania Landslide Incidence and Susceptibility



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

Estimate of Losses

Historically, no substantial economic losses have resulted from landslides in Lackawanna County. Landslides cause damage to transportation routes, utilities, and buildings, and create travel delays and other side effects. Fortunately, deaths and injuries due to landslides are rare in Pennsylvania. Almost all of the known deaths due to landslides have occurred when rockfalls or other slides along highways have involved vehicles.[52]

Risk Factor

Risk Factor = 1.3. Table 4.13 summarizes the risk factor calculation.

Impact on Future Development

Risk to future development is no different than risk to existing infrastructure, property, or citizen health. Where development is planned, emergency services should be adjusted as necessary to accommodate increased population.

4.3.13 Radon

Radon is a cancer-causing natural radioactive gas that you can't see, smell, or taste. It is a large component of the natural radiation that humans are exposed to and can pose a serious threat to

[52] Pennsylvania Department of Conservation and Natural Resources. Effects of Landslides in Pennsylvania. Available at https://www.dcnr.pa.gov/Geology/GeologicHazards/Landslides/Pages/default.aspx.

public health when it accumulates in poorly ventilated residential and occupation settings. Radon is a naturally occurring, invisible, and odorless radioactive gas. It originates from natural deposits of radium in the soil. As the radium decays, it turns into radon gas which can enter a home due to indoor air vacuums that cause radon laden soil gas to enter through the foundation.

4.3.13.1 Location and Extent

The Environmental Protection Agency (EPA) has generated maps of three radon level zones: Zone 1, Zone 2, and Zone 3. These rank from Zone 1, "red zone" (highest potential), to Zone 3, "yellow zone" (lowest potential). All of Lackawanna County is classified as Zone 1, meaning, it is estimated from available data by the EPA that all municipalities in the County are likely to have radon levels greater than 4 pCi/L (see below).

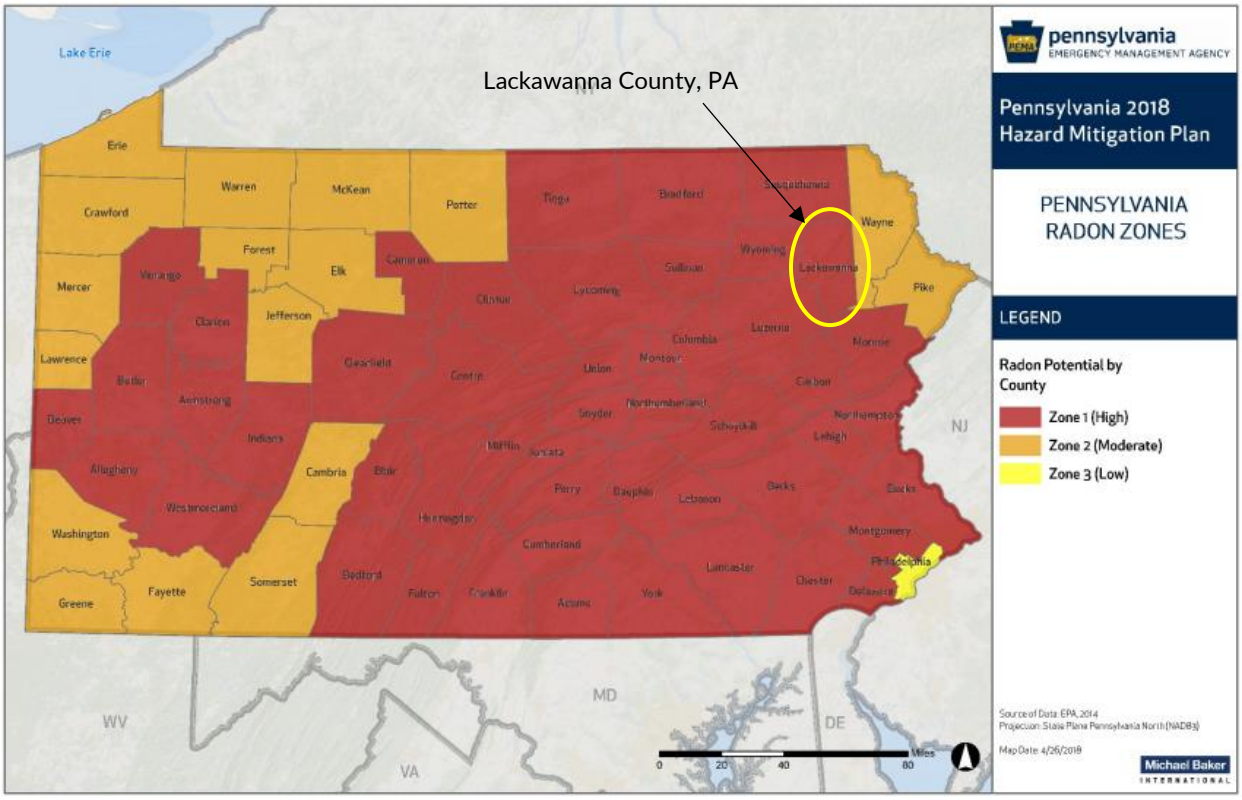
4.3.13.2 Range of Magnitude

The EPA recommends a threshold concentration of four pCi/L (pico Curies per liter) for installation of a radon mitigation system. Data shows that an exposure level of four (4) pCi/L could result in approximately seven out of 1,000 people developing health effects such as lung cancer.

4.3.13.3 Past Occurrence

Radon is estimated to cause about 21,000 lung cancer deaths per year, and an estimated 40% of the homes in Pennsylvania are believed to have elevated radon levels (Pennsylvania Department of Environmental Protection, 2009).

Figure 4.21 Pennsylvania Radon Zones



Source: Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan

4.3.13.4 Future Occurrence

Lackawanna County is in a high radon zone, as shown in Figure 4.21. Due to the geologic condition underlying Lackawanna County, radon will continue to be detected in existing and new homes.

4.3.13.5 Vulnerability Assessment

Environmental Impacts

Environmental impacts associated with radon are minimal.

Inventory and Summary of Vulnerable Assets

Critical facilities in the County should be tested for radon levels regularly and mitigated accordingly.

Estimate of Losses

Based on information from the *Commonwealth of Pennsylvania 2018 Standard All-Hazard Mitigation Plan* (2018), approximately 20 percent of homes have an elevated radon level. The Environmental Protection Agency estimates that the average radon mitigation system costs approximately $1,200. Therefore, of the approximately 65,000 structures in Lackawanna County, approximately 13,000 would require a radon mitigation system totaling approximately $15.6 million countywide.

Risk Factor

Risk Factor = 1.2. Table 4.12 toward the end of this chapter summarizes the risk factor calculation.

Impact on Future Development

Due to the geologic condition underlying Lackawanna County, radon will continue to be detected in new homes. Testing should be performed for all new construction, and radon mitigation systems should be installed as appropriate.

4.3.14 Pandemic

A pandemic occurs when infection from of a new strain of a certain disease, to which most humans have no immunity, substantially exceeds the number of expected cases over a given period of time. Such a disease may or may not be transferable between humans and animals. (Martin & Martin-Granel, 2006). Pandemic can result from the natural spread of infectious disease or from the accidental release of biological agents from health care facilities, research institutions, and industrial operations.

4.3.14.1 Location and Extent

A pandemic/disease epidemic has the potential to occur anywhere in Lackawanna County, although densely populated areas are more vulnerable to communicable disease outbreaks as the speed and likelihood of disease transmission increases in these types of environments.

Vulnerability to communicable diseases also increases with population mobility and increased exposure to individuals from diverse geographic regions. Additionally, the close proximity to major interstate highways, a regional airport, and an extensive rail network increase the vulnerability to the introduction and spread of communicable diseases.

4.3.14.2 Range of Magnitude

Pandemics can occur at the local level and be contained, or can be spread to as large as a global pandemic. COVID-19 is an example of global pandemic that spread throughout the globe very rapidly.

4.3.14.3 Past Occurrence

Just like many parts of the USA and around the world, Lackawanna County has been hit hard by SARS-CoV-2, commonly known as COVID-19, a novel strain of Coronavirus. As of July 2020, there were 1,878 confirmed cases of COVID-19, and 212 deaths in Lackawanna County as a result of COVID-19. Those numbers are expected to continue to rise until there is a readily available vaccine for public use.

4.3.14.4 Future Occurrence

The future likelihood of a pandemic/disease epidemic in Lackawanna County is expected to be higher than indicated by the historical occurrence rate alone. Expected increases in likelihood can be attributed to several factors, such as: rapid growth in population; increase in interstate and international travel; and subsequent introduction and spread of infectious diseases and/or the emergence of novel diseases (such as COVID-19), and an increased resistance to current treatment strategies. Lackawanna County also has an older population demographic making it a more vulnerable population.

4.3.14.5 Vulnerability Assessment

Environmental Impacts

There likely is little-to-no environmental impact associated with a disease epidemic/unintentional biological hazard event, although for a significant or worst-case scenario type of event, there may be significant environmental impact. Although direct environmental impact would be limited, the workforce will experience significant impacts, which in turn could cause cascading environmental effects, such as employee shortages for services like garbage disposal, wastewater treatment, maintenance of public spaces and safety, and food safety.

Inventory and Summary of Vulnerable Assets

Critical facilities, government buildings, and public places in the County should be disinfected regularly to mitigate the spread of an outbreak. In some cases, only essential workers will be required to travel to work, while others can telework, and the potential for many workers to be laid off or furloughed is high, especially during a declared pandemic.

Estimate of Losses

Estimation of losses is dependent on the extent and severity of the pandemic/disease epidemic. Many industries may suffer due to potential shutdowns, leading to high rates of unemployment. Additionally, dependent on the type, extent, and severity of the pandemic/disease epidemic, loss of human life can also be expected.

Risk Factor

Risk Factor = 2.8. Table 4.12 summarizes the risk factor calculation.

Impact on Future Development

There likely is little-to-no environmental impact associated with a disease epidemic/unintentional biological hazard event.

4.4 Hazard Vulnerability Summary

4.4.1 Methodology

To aid in prioritization efforts in terms of planning needs and mitigation strategy, each of the hazards was assigned a "risk factor". The risk factor is essentially a weighted calculation based on five variables associated with each hazard: 1) probability; 2) impact; 3) spatial extent; 4) warning time; and 5) duration. An index was then assigned to each variable depending on level: "1" – low to "4" – high. These variables, levels, and indices associated with each are summarized in Table 4.12.

Table 4.12 Risk Factor Variables and Corresponding Indices

Probability		Impact		Spatial Extent		Warning Time		Duration	
Weight – 30%		Weight – 30%		Weight – 20%		Weight – 10%		Weight – 10%	
Level	Index	Level	Index	Level	Index	Level	Index	Level	Index
Unlikely	1	Minor	1	Negligible	1	>24 Hrs	1	<6 Hours	1
Possible	2	Limited	2	Small	2	12-24 Hrs	2	<24 Hours	2
Likely	3	Critical	3	Moderate	3	6-12 Hrs	3	<1 Week	3
Highly Likely	4	Catastrophic	4	Large	4	<6 Hrs	4	>1 Week	4

The risk factor for each hazard was then calculated using the following equation:

Risk Factor = (0.3)(Probability Index) + (0.3)(Impact Index) + (0.2)(Spatial Extent Index) + (0.1)(Warning Time Index) + (0.1)(Duration Index)

4.4.2 Ranking Results

Table 4.13 presents the results of applying the risk factor calculation to each hazard.

Table 4.13 Hazard Risk Factors

Hazard	Probability Index	Impact Index	Spatial Extent Index	Warning Time Index	Duration Index	Risk Factor
Flooding (regional less frequent events)	3	4	4	1	3	3.3
Winter Storms	4	2	4	1	3	3.0
Pandemic/Disease Epidemic	2	3	4	1	4	2.8
Wind Events	4	2	2	2	2	2.6
Flooding (annual local events)	4	2	2	3	1	2.6
Hazardous Materials Incidents	4	1	2	4	2	2.5
Wildfires	4	2	2	2	1	2.5
Drought and Crop Failure	1	2	4	1	4	2.2
Levee Failure	1	4	2	1	2	2.2
Nuclear Release	1	2	3	2	4	2.1
Earthquakes	1	2	3	4	1	2.0
Land Subsidence/Mine Related Issues	1	2	2	4	1	1.8
Dam Failure	1	3	1	1	1	1.6
Landslides	1	1	1	4	1	1.3
Radon	1	1	2	1	1	1.2

Based on the results of the risk factor analysis it was determined that the top five hazards that impact Lackawanna County are: 1) Flooding (regional and local events); 2) Winter Weather; 3) Wind Events; 4) Hazardous Materials Incidents; and 5) Wildfires.

4.4.3 Potential Loss Estimates

Table 4.14 presents the results a summary table of potential loss estimates for each hazard based on the analyses conducted in the hazard profiling.

Table 4.14 Potential Loss Estimates

Hazard	Number of Exposed Structures	Number of Exposed Critical Facilities	Total Economic Exposure
Flooding	6,590	5	$2.6 Billion
Winter Storms	N/A	N/A	$60,000[1]
Wind Events	N/A	N/A	$190,000[1]
Hazardous Materials Incidents	N/A	N/A	$20,000[1]
Wildfires	17,258	18	$6.8 Billion
Drought and Crop Failure	N/A	N/A	$16 Million[1]
Levee Failure	Not Determined	Not Determined	$100 Million
Nuclear Release	N/A	N/A	N/A
Earthquakes	4,500	0	$102 Million
Land Subsidence/Mine Related Issues	13,816	22	$5.4 Billion
Dam Failure	Not Determined	Not Determined	Not Determined
Landslides	N/A	N/A	Not Determined
Radon	13,000	N/A	$15.6 Million
Pandemic	Not Determined	Not Determined	Not Determined

Note: 1 indicates annual loss estimate as opposed to total economic exposure.

4.4.4 Future Development and Vulnerability

As part of this Plan Update, the Steering Committee repeatedly expressed concern that new homes, particularly high-value homes, are being constructed in forested areas, increasing the potential for wildfire impacts. The problem is two-fold; first, there is a higher probability of a wildfire impacting residential property, and secondly, new homes are being constructed in areas that may be difficult for emergency services, specifically fire apparatus, to access during a fire event. Although the problem is county-wide, the Steering Committee noted that construction of new high-value homes in the forested areas of Jefferson and Roaring Brook Townships is of particular concern.

5.0 CHAPTER 5 –CAPABILITY ASSESSMENT

IFR §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

5.1 Update Summary Process

The capability assessment is critical to developing a comprehensive and implementable mitigation strategy. The capability assessment serves to identify existing gaps, conflicts and/or shortcomings that may need to be addressed through future mitigation actions. It also highlights the mitigation actions that have been completed or are in progress, or that merit continued support and enhancement through future efforts. The capability assessment also helps to ensure that proposed mitigation actions are practical considering the local ability to implement them. The capability assessment comprises three components:

1) Plan Integration and Document Review - an inventory of select County planning and regulatory tools and a review and incorporation of existing plans and other technical information as appropriate;
2) County Roles and Responsibilities and Emergency Response Capabilities; and
3) Municipal Capability Assessment - an analysis of municipal capacity from a planning, policy, staffing, response, and training standpoint.

The Mitigation Strategy, including the goals and actions, should be incorporated into relevant planning mechanisms based on their pertinence and relevance to specific plans and ordinances. For example, all structural projects should be included in the Capital Improvements Program. Land use and zoning related projects should be incorporated into the next update of the Community's Comprehensive Plan and Zoning Ordinance though collaboration with the Planning and Zoning departments. The departments and areas for coordination are listed below in Table 5.1:

Table 5.1 Lackawanna County Government Departments and Associated Documents

Department	Relevant Documents
Planning Department	Comprehensive Plan/Land Use Plan, Zoning/Subdivision Regulations, Floodplain Ordinance
Public Works/Transportation Department	Stormwater Management (SWM) Plan, Sediment and Erosion Control Plan, Culvert and Bridge Maintenance Plans, Long Range Transportation Plan
Emergency Management Department	Evacuation Plan, Emergency Operations/Response Plan
Environmental Planning	Climate Change Plan, Dam Safety Regulations, Wetland Regulations
Parks and Recreation	Open Space Plan

Each year, when the jurisdictions provide an annual update of their actions and their project status, they should be encouraged to indicate how and where each mitigation effort is being implemented. For example: A structural project has been included in the Capital Improvements Program or an overlay district will be introduced in the next update of the Local Zoning Ordinance.

Additionally, a Municipal Capability Assessment Questionnaire was developed for the 2020 Plan Update to obtain an understanding of the issues and gaps at the municipal level. The questionnaire contained questions on plans, policies and ordinances, critical facilities, staffing, and training needs. In the past six years, Lackawanna County has made great strides in acquisition and demolition of flood-prone properties. This information has been updated and included in the latter part of this chapter.

5.2 Capability Assessment Findings

5.2.1 Planning and Regulatory Capability

The Lackawanna County Government Structure comprise the following departments that are active in planning, hazard-related, and/or risk-reduction activities and efforts:

Department of Planning– This Department oversees a number of agencies including: Lackawanna County's Office of Economic and Community Development, Lackawanna County Regional Planning Commission, and the Lackawanna County Redevelopment Authority.

- Office of Economic and Community Development – The Office of Economic and Community Development is responsible for coordinating Lackawanna County's economic and community development programs, including administering the Community Development Block Grant Program (CDBG). This program assists communities by providing funding for decent, safe, and sanitary housing; opportunities for a suitable living environment, especially for persons of low to moderate income; and the elimination of slums, blight, and blighting influences within neighborhoods. The county contains 11 entitlement communities that receive between $1.6 and $1.8 million each year, in addition to the county's non-entitlement communities, which receive approximately $300,000. The Cities of Scranton and Carbondale administer their own CDBG programs. In addition to the CDBG, the Office of Economic and Community Development administers and the Emergency Repair Assistance Program, various business grants and community reinvestment programs.

- Lackawanna County Regional Planning Commission – The Lackawanna County Regional Planning Commission is responsible for making policy decisions on planning, subdivision, and land development issues, and proposals on local land use regulations. The Commission is involved in subdivision and land development, land use ordinance, and comprehensive plan reviews. The Commission is responsible for transportation and environmental planning, census data, and demographic analysis. Commission staff also provide planning and technical assistance to municipalities and maintain the County's mapping and GIS capabilities. The Lackawanna County Regional Planning Commission is also part of the Metropolitan Planning Organization for Transportation Planning in Lackawanna and Luzerne Counties.

- Lackawanna Redevelopment Authority – The Lackawanna Redevelopment Authority is responsible for acquiring and redeveloping blighted areas, so that they become available for economically and socially sound redevelopment.

Lackawanna County Department of Emergency Services - The Lackawanna County Department of Emergency Services comprises the Emergency Management Agency (EMA) and the 911 Center.

The County's 9-1-1 mission statement is: "*Lackawanna County Department of Emergency Services, working with our Municipal Partners, established and maintains an Enhanced 9-1-1 communications system as the primary emergency access portal for public safety services to citizens and visitors to Lackawanna County.*"[53]

- Lackawanna County Emergency Management Agency – The County EMA is responsible for the planning, assignment, and coordination of resources in the areas of mitigation, preparedness, response, and recovery for natural or human-caused emergencies. The purpose of the Agency is to mitigate the effects of disasters, prepare to respond and recover from disasters, respond to emergency conditions, and recover from the effects of disasters. The County EMA is also responsible for organizing all locally available manpower, supplies, equipment, and services necessary for disaster emergency readiness, response, and recovery. The EMA also contains a Local Emergency Planning Committee (LEPC) which is responsible for overseeing the Hazardous Materials Response Account and approving Off-Site Emergency Response Plans. The LEPC is comprised of the county emergency management coordinator, a county commissioner, local government representatives, law enforcement officials, firefighters, and emergency management personnel, among others.

- Lackawanna County Emergency Communications Center – The Lackawanna County Emergency Communication Center is the designated 911 Center, responsible for the dispatch of police, fire, rescue, and emergency medical services (EMS) during emergency situations. The Center is staffed by professional Public Safety Telecommunicators/Emergency Medical Dispatchers. The Center provides emergency dispatch and communication services for various police, fire, rescue, and emergency medical services throughout Lackawanna County, as well as for County and Municipal EMA operations.[54] Most municipalities in the County have their own police, fire, and ambulance services. Some use Pennsylvanian State Police (PSP) for police protection or contract with adjacent municipalities for police, fire, and EMS. There are also several private paramedic, emergency medical services in the County.

- Local Fire and EMS Organizations – Local fire and EMS organizations are located throughout the County. Table 5.2 lists the current fire and EMS resources:

Table 5.2 Lackawanna County Fire and EMS Resources

Lackawanna County Fire and EMS Resources	
Station 2 – South Abington Township - Chinchilla	Station 31 – Jessup Borough #1
Station 4 – Clarks Summit Borough	Station 33 – Archbald Borough-Eynon
Station 5 – Dalton Borough	Station 36 – Scott Township-Scott
Station 6 – Dunmore Borough	Station 50 – City of Scranton – Headquarters; Rescue 1; Engines 2; Engines 7 ; Engine 10; Engine 15, and Truck 4
Station 7 – Moscow Borough	Station 51 – City of Carbondale – Mitchell Hose Co. #1; Cottage Hose Co. #2; Columbia Hose Co. #5
Station 8 – Newton-Ransom	Station 53 – Springbrook Township
Station 14 – Covington Township	Station 54 – Thornhurst Township
Station 15 – Station 15 – Elmhurst-Roaring Brook	Station 55 – Gouldsboro/Clifton Township

[53] https://www.lackawannacounty.org/index.php/departmentsagencies/public-safty/emergency-services-9-1-1
[54] https://www.lackawannacounty.org/index.php/departmentsagencies/public-safty/emergency-services-9-1-1

Lackawanna County Fire and EMS Resources	
Station 20 – Blakely Borough-Wilson	Station 56 – Madison Township-Madisonville
Station 21 – Archbald Borough – Station 21-1 Hose Co. #1; Station 21-2 Black Diamond Hose Co. #2; Station 21-4 East Side Hose Co. #4;	Station 58 – Jermyn Borough – Station 58-1 - Crystal Fire Co.; Station 58-2 - Artisan Hose Co.
Station 22 – Blakely Borough	Station 59 – Mayfield Borough – Station 59-1 - Mayfield Hose Co.; Station 59-2 - Whitmore Hose Co.; Station 59-3 - Wm. Walker Hose Co
Station 23 – Dickson City Borough	Station 60 – Carbondale Township-Meredith
Station 24 – Greenfield Township	Station 61 – Fell Township
Station 25 – Jessup Borough #2	Station 62 – Carbondale Township-Whites Crossing
Station 26 – Olyphant Borough –Station 26-1 - Excelsior Hose Co. #1; Station 26-2 - Hose Co. #2; Station 26-4 - Eureka Hose Co. #4; Station 26-6 - Liberty Hose Co. #6; Station 26-8 - Queen City Hose Co. #8	Station 63 – Benton Township-Fleetville (Wyoming County Dispatch)
Station 27 – Throop Borough – Station 27-1 - Hose Co. #1; Station 27-3 - Volunteer Hose Co.	Station 93 – Old Forge Borough – Station 93-1 - Lawrence Hose Co. #1/ Old Forge Hose & Engine Co.; Station 93-3 - Eagles McClure Hose Co. #1
Station 28 – Scott Township-Justus	Station 95 – Taylor Borough; Station 95-1 Taylor Hose & Engine Co. No. 1; Station 95-2 Taylor Fire & Rescue
Station 29 – Jefferson Township	Station 98 – Moosic Borough/Greenwood

Lackawanna County Conservation District – The Lackawanna County Conservation District (LCCD) is the agency responsible for the conservation of soil and water resources through the control and prevention of soil erosion and conservation, restoration, and planning of the county's watersheds. The Conservation District serves the public by being a clearinghouse for information, erosion and sedimentation control, watershed conservation, environmental education, farmland preservation, and public outreach. The LCCD implements educational activities through the Willary Water Resource Center. Examples of educational programs include: lake and pond management workshops, the Environmental Classroom for regional educators, the Lackawanna County Envirothon, and the Water Discovery Day Camp. The Center has been successful in building cooperation and partnerships between: federal, state, and local government agencies; local non-profit organizations; school districts; civic groups; watershed associations; and lake associations.

Lackawanna County Department of Public Works – The Lackawanna County Department of Public Works (DPW) has overall responsibility for maintenance of non-park county property including all county buildings, the county road network, and county-owned bridges. The County Roads and Bridges Department is responsible for snowplowing and salting, filling potholes, maintaining storm and drainage pipes, black-topping, repairing guide rails, and installing signs on county-owned roadways. The Department is also responsible for the 151 county-owned bridges within the county and ensures that waterways are kept open, bridge decks are replaced and repaired as needed, and railings, sidewalks, culvert pipes, and bridges are replaced as needed.

- Roads and Bridges - The primary mission of Roads and Bridges is the prompt, efficient and economical repair and maintenance of existing county roads, bridges, and rights-of-way. Roads and Bridges responsibilities include: pothole patching, milling and deep-patching, county resurfacing contracts, rights-of-way mowing and tree trimming/removal/chipping,

drainage ditch and storm water structure repair, cross and side drain repair and replacement, shoulder construction and repair, hydro seeding, preparation and oversight of proper winter anti-skid application to all county roads, and bridge repair as needed. Department personnel also respond to emergencies and natural and man-made disasters 24 hours a day, seven days a week, by removing roadway debris and obstructions, clearing storm-related debris from roadways, plowing and spreading salt during ice and snow events, and closing and barricading roads which have been determined to pose a danger to drivers and pedestrians.

- Lackawanna County Department of Buildings and Grounds – The Department of Building and Grounds is responsible for the maintenance and operation of all county-owned buildings including the County Courthouse, County Government Center, and the Emergency Services Center, Jefferson Annex and the Emergency Services Center, and the county public works facility.

Lackawanna County Transit System – The Lackawanna Transportation Center is location in Scranton. The transportation system in the County include the County of Lackawanna Transit System, and the Lackawanna Coordinated Transportation System.

Lackawanna Heritage Valley Authority (LHVA) – The Authority creates, supports, and funds partnerships with government, business, civic and educational organizations, and individuals dedicated to the development of the valley's historic, cultural, natural, and economic resources. This strategy of "heritage development" is implemented through coordinated efforts in preservation and education, and promotion of regional heritage. The LHVA is a municipal authority under the sponsorship of Lackawanna County and is funded by the Pennsylvania DCNR and the National Park Service.

Communications - The Communications Office informs the public about county government, serves as a liaison with the news media, and performs various public activities for the Commissioners and county departments.

Engineering – Engineering projects are contracted to a private consulting firm, Greenman Pedersen Inc., located in Moosic, Pennsylvania. The firm serves as the County Engineer.

There are additional County departments in addition to the ones mentioned above, although the departments not discussed have little to no connection with hazard mitigation and hazard risk reduction.

Table 5.6 summarizes the four basic land use ordinances that are used within Lackawanna County and it is recommended for each municipality to conduct their own plan integration review.

Table 5.3 Land Use Ordinances by Municipality

Municipality	Comprehensive Plan	Zoning	Subdivision and Land Development	Floodplain Ordinance
Lackawanna County				
Archbald Borough	X	X	X	X
Benton Township		X	X	X
Blakely Borough	X	X	X	X
City of Carbondale	X	X	X	X

Municipality	Comprehensive Plan	Zoning	Subdivision and Land Development	Floodplain Ordinance
Carbondale Township	X	X	X	X
Clarks Green Borough	X	X	X	X
Clarks Summit Borough	X	X	X	X
Clifton Township	X	X	X	X
Covington Township	X	X	X	X
Dalton Borough	X	X	X	X
Dickson City Borough	X	X	X	X
Dunmore Borough	X	X	X	X
Elmhurst Township	X	X	X	X
Fell Township	X	X	X	X
Glenburn Township	X	X	X	X
Greenfield Township	X	X	X	X
Jefferson Township	X	X	X	X
Jermyn Borough	X	X	X	X
Jessup Borough	X	X	X	X
LaPlume Township	X	X	X	X
Madison Township	X	X	X	X
Mayfield Borough		X	X	X
Moosic Borough	X	X	X	X
Moscow Borough		X	X	X
Newton Township	X	X	X	X
North Abington Township	X	X	X	X
Old Forge Borough	X	X	X	X
Olyphant Borough	X	X	X	X
Ransom Township	X	X	X	X
Roaring Brook Township		X	X	X
Scott Township	X	X	X	X
City of Scranton	X	X	X	X
South Abington Township	X	X	X	X
Spring Brook Township	X	X	X	X
Taylor Borough	X	X	X	X
Thornhurst Township		X	X	X
Throop Borough	X	X	X	X
Vandling Borough	X	X	X	X
Waverly Township	X	X	X	X
West Abington Township	X	X	X	X

Building Codes

Building codes set construction standards for the minimum acceptable level of safety for buildings in a community. Building codes are also important in mitigating the impact of non-flood hazards on new buildings. Hazard protection standards for all new and improved or repaired buildings can be incorporated into the local building code. These standards should typically include criteria to ensure that the foundation will withstand flood forces and that all portions of the building subject to damage are above or otherwise protected from flooding.

Lackawanna County does not have a building code. Pennsylvania's statewide building code is called the Uniform Construction Code (UCC) and has been in regulation on December 31, 2006.[55] There are 2,563 municipalities located in Pennsylvania that have elected to administer the code and have hired private code enforcement agencies to enforce the UCC.[56] The local municipalities are required to handle the UCC and it is managed through the Council of Governments (COG).

Stormwater Management

Stormwater management regulations address the runoff of stormwater from new developments onto other properties and into floodplains. Development outside a floodplain can contribute significantly to flooding problems; when land is developed, the natural ground cover is replaced, and runoff is increased. Thus, in order to prevent stormwater from flooding roads and buildings, storm sewers and ditches are constructed to transport the water effectively.

Stormwater management regulations require developers to build retention or detention basins to minimize the increases in the runoff rate caused by impervious surfaces and new drainage systems. The goal is to ensure minimal increases in the rate of stormwater discharge after development, in comparison to the site's conditions prior to development.

Lackawanna County has seven Pennsylvania Act 167 Stormwater Management Plan designated watersheds: East Branch Tunkhannock Creek, Lackawanna River, Lackawaxen River, Lehigh River, South Branch Tunkhannock Creek, Susquehanna River, and Wallenpaupack Creek.[57] These watershed areas are critical in relation to the current flooding events recorded throughout the County.

The Community Rating System

The goal of the Community Rating System (CRS) program is to provide incentives for communities to go beyond the minimum floodplain management requirements and develop extra measures to provide protection from flooding. The incentives are in the form of insurance premium discounts. The CRS is administered by FEMA's NFIP. Under the CRS, flood insurance premiums for properties in participating communities are reduced to reflect the flood protection activities that are being implemented. A community receives a CRS classification based upon the credit points it receives for its activities. It can take on a wide range of activities that reduce flood losses. These activities include but are not limited to: better mapping, regulations, public information, flood damage reduction, and/or flood warning and preparedness programs.

As of August 2019, 2,472 communities in Pennsylvania participate in the NFIP. Of these communities, 27 (or 1%) participate in the CRS. Of the top 50 Pennsylvania communities (in terms of flood insurance policies-in-force), 16 participate in the CRS. Currently, there are no communities

[55] Lackawanna County Housing Coalition. 2020. Building a Home in Lackawanna County, available at http://www.lackawannahousing.org/building.html.
[56] Lackawanna County Housing Coalition. 2020. Building a Home in Lackawanna County, available at http://www.lackawannahousing.org/building.html.
[57] Pennsylvania Department of Environmental Protection. July 2020. Act 167 Stormwater Management Plan Status, available at https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Pages/Act-167.aspx

in Lackawanna County, although there are 377 NFIP policyholders in the City of Scranton, which is the 11th highest ranked community in Pennsylvania.[58]

Municipal Plans and Policies

A detailed questionnaire was developed for municipalities to provide information on their plans, policies and ordinances, critical facilities, and staffing (Table 5.8). A copy of the questionnaire is included in Appendix F of this Plan.

Table 5.4 Municipal Plans and Policies

Municipality	Freeboard Requirement	New/ Improved Development Restrictions	Floodplain Filling Restrictions	Critical Facility Protection	Cluster Development Incentives	Other
Archbald Borough	Yes	No	No	Yes	No	Yes
Benton Township	No	Yes	No	No	No	Yes
Blakely Borough	Yes	No	No	No	No	No
City of Carbondale	Yes	Yes	Yes	No	No	No
Carbondale Township	No	Yes	Yes	No	No	No
Clarks Green Borough	Yes	Yes	No	Yes	No	No
Clarks Summit Borough	Unknown	Unknown	Unknown	Unknown	Unknown	no
Clifton Township	No	No	No	Yes	No	No
Covington Township	Yes	No	No	No	No	Yes
Dalton Borough	No	Yes	Yes	No	No	No
Dickson City Borough	Yes	Yes	Yes	Yes	No	Yes
Dunmore Borough	Yes	No	No	No	No	No
Elmhurst Township	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Fell Township	Yes	Yes	Yes	Yes	Yes	No
Glenburn Township	No	Yes	Yes	No	No	Yes
Greenfield Township	No	No	No	No	No	No
Jefferson Township	No	Yes	No	No	No	No
Jermyn Borough	No	No	No	No	No	No
Jessup Borough	Yes	No	No	No	No	No
LaPlume Township	Yes	No	No	No	No	No
Madison Township	Yes	No	No	No	No	No
Mayfield Borough	Yes	Yes	Yes	Yes	No	No
Moosic Borough	No	Yes	Yes	No	No	Yes
Moscow Borough	Yes	Yes	No	No	No	Yes
Newton Township	No	No	No	No	No	No
North Abington Township	No	Yes	Yes	No	No	No
Old Forge Borough	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Olyphant Borough	Yes	Yes	Yes	Yes	No	Yes
Ransom Township	No	No	No	Yes	Yes	No
Roaring Brook Township	No	No	No	No	Yes	No
Scott Township	No	Yes	Yes	No	No	No
City of Scranton	Yes	No	Yes	No	No	No
South Abington Township	Yes	No	Yes	No	No	No

[58] Federal Emergency Management Agency. October 2019. Pennsylvania Top 50 National Flood Insurance Program Policy County Communities and Community Rating System Participation, available at https://crsresources.org/files/100/maps/states/pennsylvania_crs_map_october_2019.pdf.

Municipality	Freeboard Requirement	New/ Improved Development Restrictions	Floodplain Filling Restrictions	Critical Facility Protection	Cluster Development Incentives	Other
Spring Brook Township	Yes	No	No	Yes	No	No
Taylor Borough	Unknown	Yes	Yes	Unknown	Unknown	Unknown
Thornhurst Township	Yes	Yes	No	No	No	No
Throop Borough	Yes	No	No	No	No	No
Vandling Borough	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Waverly Township	Yes	Yes	Yes	Yes	Yes	Yes
West Abington Township	No	No	No	No	No	No

5.2.2 Administrative and Technical Capability

County Staffing and Training Capabilities

In terms of staffing for flood related projects, the County does not have an official Floodplain Administrator/CRS Coordinator. The Planning Office has a relatively small staff and, in the past, many planning efforts are performed on a regional scale with neighboring counties, or through the hiring of a consultant to develop plans. GIS presently is performed at three different locations within the County Government. Table 5.7 identifies the various types of training received by county personnel.

Table 5.5 Training Received by County Staff

Training Subject	Staff Position
GIS	Position located in the County Planning Department, Assessor's Office, and Emergency Management.
Floodplain Management/NFIP Regulations	The County houses flood maps and ordinances.
Community Rating System	No County service
Building Inspection	No County service
Building Code Administration	No County service
Building Retrofits	No County service

Properties of Concern

Municipalities were asked to self-report their number of critical facilities, and Repetitive Loss and Severe Repetitive Loss properties in the floodplain. For comparative purposes, the number of parcels in the floodplain and the number of current flood insurance policies has been included in Table 5.9.

Table 5.6 Properties of Concern

Municipality	Critical Facilities Damaged	Critical Facilities in Floodplain	Buildings in Floodplain	Flood Insurance Policies	Repetitive Loss Properties
Archbald Borough	Archbald Hose Co. #1	Archbald Hose Co. #1	None	None	Approx. 2
Benton Township	None	None	None	Unknown	None
Blakely Borough	None	None	Unknown	Unknown	Approx. 1
City of Carbondale	None	Carbondale Area High School	Unknown	Unknown	Approx. 7
Carbondale Township	None	None	Approx. 4	Unknown	Unknown
Clarks Green Borough	None	None	None	None	None
Clarks Summit Borough	None	None	Unknown	Unknown	Approx. 2
Clifton Township	None	None	Unknown	Unknown	Unknown
Covington Township	None	None	Approx. 185	Approx. 6	Unknown
Dalton Borough	Fire Department Offices	Fire Department Offices, Borough Offices, Borough Garage, PPH Substation	Approx. 104	Unknown	Unknown
Dickson City Borough	None	None	Unknown	Unknown	None
Dunmore Borough	Unknown	Unknown	Unknown	Unknown	Unknown
Elmhurst Township	Unknown	Unknown	Unknown	Unknown	Unknown
Fell Township	None	None	Approx. 5	Approx. 5	Approx. 1
Glenburn Township	None	Glenburn Services Sewage Treatment Plant	Unknown	Unknown	Unknown
Greenfield Township	No	No	Approx. 50	Unknown	Unknown
Jefferson Township	None	None	Unknown	Unknown	Unknown
Jermyn Borough	None	None	Approx. 85	Unknown	Approx. 3
Jessup Borough	None	Unknown	Unknown	Unknown	Unknown
LaPlume Township	None	None	Approx. 5	Unknown	None
Madison Township	None	None	Approx. 7	Approx. 1	None
Mayfield Borough	Lakeland - Mayfield Elementary	Lakeland - Mayfield Elementary; Emergency Service Center	Unknown	None	Approx. 2
Moosic Borough	None	None	Unknown	Unknown	Approx. 2
Moscow Borough	None	None	Approx. 18	Unknown	Unknown
Newton Township	None	None	Unknown	Approx. 6	Unknown
North Abington Township	None	None	Unknown	Unknown	Unknown
Old Forge Borough	Unknown	Unknown	Unknown	Unknown	Approx. 2
Olyphant Borough	None	None	Unknown	Approx. 111	Approx. 5
Ransom Township	None	None	Approx. 21	Unknown	Unknown
Roaring Brook Township	None	None	None	None	None
Scott Township	None	None	Unknown	Unknown	Unknown
City of Scranton	No	Public Works Complex	Approx. 2170	Approx. 503	Approx. 111
South Abington Township	None	None	Unknown	Unknown	Approx. 1
Spring Brook Township	None	None	Approx. 13	Approx. 1	Unknown

Municipality	Critical Facilities Damaged	Critical Facilities in Floodplain	Buildings in Floodplain	Flood Insurance Policies	Repetitive Loss Properties
Taylor Borough	None	None	None	None	None
Thornhurst Township	None	None	Approx. 4	Unknown	Approx. 4
Throop Borough	None	None	Unknown	Unknown	Unknown
Vandling Borough	None	None	None	None	None
Waverly Township	Sewer Pump Station	Sewer Pump Station	Approx. 1	Unknown	Unknown
West Abington Township	None	None	None	None	None

Municipal Staff Capabilities

Several municipalities stated that while they did not have a dedicated staff person for certain positions, that those responsibilities were handled by other personnel. Table 5.10 displays the staffing capabilities for the municipalities.

Table 5.7 Municipal Staff Capabilities

Municipality	Floodplain Administrator	Building Inspector	Site Plan Reviewer	Engineer/ Surveyor	Training in Floodplain Management	Training in Building Inspection	Emergency Services
Archbald Borough	No	Yes	Yes	Yes	Yes	Yes	Yes
Benton Township	No	Yes	Yes	Yes	No	No	Yes
Blakely Borough	Yes	Yes	Yes	Yes	Yes	Yes	Yes
City of Carbondale	No	Yes	Yes	Yes	No	Yes	Yes
Carbondale Township	Yes	Yes	Yes	No	No	No	Yes
Clarks Green Borough	Yes	Yes	Yes	No	No	No	Yes
Clarks Summit Borough	Yes	Yes	No	No	Yes	No	Yes
Clifton Township	Yes	Yes	Yes	No			Yes
Covington Township	No	Yes	Yes	Yes	Yes	No	Yes
Dalton Borough	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dickson City Borough	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Dunmore Borough	Yes	No	No	No	Unknown	Unknown	Unknown
Elmhurst Township	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Fell Township	Yes	Yes	Yes	No	Yes	Yes	Yes
Glenburn Township	Yes	Yes	Yes	Yes	No	Yes	Yes
Greenfield Township	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Jefferson Township	No	Yes	No	Yes	Yes	Yes	Yes
Jermyn Borough	Yes	Yes	Yes	Yes	Yes	No	Yes
Jessup Borough	No	Yes	No	Yes	Yes	Yes	Yes
LaPlume Township	Yes	Yes	No	Yes	No	Yes	Yes

Municipality	Floodplain Administrator	Building Inspector	Site Plan Reviewer	Engineer/ Surveyor	Training in Floodplain Management	Training in Building Inspection	Emergency Services
Madison Township	Yes	Yes	Yes	Yes	Yes	No	Yes
Mayfield Borough	No	Yes	No	Yes	No	No	Yes
Moosic Borough	Yes	No	No	No	No	No	Yes
Moscow Borough	Yes	Yes	Yes	Yes	Yes	No	Yes
Newton Township	Yes	Yes	Yes	Yes	No	No	Yes
North Abington Township	No	Yes	Yes	Yes	No	No	Yes
Old Forge Borough	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Olyphant Borough	Yes	Yes	Yes	Yes	No	No	Yes
Ransom Township	No	Yes	No	Yes	No	Yes	Yes
Roaring Brook Township	No	Yes	Yes	Yes	No	Yes	Yes
Scott Township	No	Yes	Yes	No	No	No	Yes
City of Scranton	Yes	Yes	Yes	Yes	Yes	Yes	Yes
South Abington Township	Yes	Yes	Yes	Yes	No	No	Yes
Spring Brook Township	Yes	Yes	No	No	Yes	No	Yes
Taylor Borough	Unknown	Yes	Yes	Yes	Unknown	Yes	Yes
Thornhurst Township	Yes	Yes	Yes	No	No	No	Yes
Throop Borough	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vandling Borough	No	Yes	Yes	Yes	No	No	Yes
Waverly Township	Yes	Yes	No	No	No	Yes	Yes
West Abington Township	No	Yes	Yes	Yes	No	No	Yes

5.2.3 Financial Capability

Lackawanna County has the initiative and drive to implement mitigation actions for a variety of hazards affecting the County, however there are still challenges to hazard mitigation at both the County and local levels. These challenges come in the form of insufficient funds available for action implementation; lack of training or education on various hazards, technologies, policies, or laws; limited emergency response staffing; and/or insufficient or limited data and information available for various analyses. Mitigation Actions have been developed to address these limitations and are discussed in the following chapter.

Although the County and individual municipalities may not have the funds available to afford specific mitigation projects or do not have the financial ability to implement certain projects or actions. The County is very familiar with different hazard mitigation grants that are available to help begin and implement mitigation activities. Additionally, with receiving 100 percent municipal participation during this plan update, all municipalities will remain eligible to receive State and Federal funding if a disaster or natural occurred in the county or in individual municipalities.

5.2.4 Education and Outreach

The County makes efforts annually to educate the public on hazards and their potential impacts through outreach techniques. This is done through information releases through outlets like the County Government website, and through the County's social media platforms.

This plan also recommends annual outreach to all municipalities in regard to tracking the status of mitigation actions included in this plan. This will help ease the process of any future plan updates.

5.2.5 Plan Integration

Requirement §201.6(b)(3) *Review and incorporate, if appropriate, existing plans, studies, reports, and technical information.*

The purpose of a plan/ordinance review as part of this planning process was tri-fold:

- To identify existing County-level initiatives;
- To provide an inventory and review of sample plans and ordinances and identify sections in these documents that address hazard mitigation related issues; and
- To provide a platform to integrate plans and other documents so recommendations and strategies are not contradictory to one another.

Plans and ordinances that assist with minimizing impacts of hazards on Lackawanna County's residents through preventative measures include zoning ordinances, stormwater management ordinances, subdivision and land development ordinances, floodplain management ordinances, comprehensive plans, etc. Preventative measures are important for local communities to focus on for hazard mitigation efforts, as one of the most cost-effective means of reducing the probability of future losses to residents. This plan includes a review of the existing planning documents in Lackawanna County, and is provided in Table 5.3 through Table 5.5.

5.2.5.1 Lackawanna-Luzerne Regional Plan

Table 5.8 Lackawanna-Luzerne Regional Plan[59]

Lackawanna-Luzerne Regional Plan: Comprehensive Plana and Long-Range Transportation Plan for Lackawanna and Luzerne Counties, PA				
Plan Topic	Page Number	Item Type	Current Clause	Recommendation/Comment
Land Use	2-3	Goal	The goal of the Land Use Plan is to achieve an overall future pattern of development that is responsive to existing and future economic, social, and cultural needs of Lackawanna and Luzerne Counties, promoting revitalization in the area's urban centers while conserving and preserving natural and agricultural resources.	No recommendation or comment.
	2-3	Objective	Designate areas for growth that…can be served over the planning period mostly by existing central water and sewer systems…	No recommendation or comment.

[59] Lackawanna County Government, Luzerne County Government. May 2011. Lackawanna-Luzerne Regional Plan: A Comprehensive Plan and Long-Range Transportation Plan for Lackawanna and Luzerne Counties.

	2-35	Statement	It is important to remember that the Plan promotes the following natural, agricultural, and open space network components: • Environmental resource protection and natural areas retention and conservation, including surface water, floodplains, wetlands, steep slopes, and woodlands.	No recommendation or comment.
	3-27	Action	Limit the amount, extent, and intensity of new development outside designated Priority Areas.	No recommendation or comment.
Transportation	2-37	Goal	Increase the safety and security of the transportation system for motorized and nonmotorized users;	No recommendation or comment.
	2-38	Objective	Identify roadway corridors, segments, and intersections with safety problems, along with methods of eliminating these deficiencies.	No recommendation or comment.
	---	---	-----	Include an additional objective to address evacuation routes in case of a major emergency or disaster.
Housing	2-55	Goal	The goal of the Housing Plan is to provide for a diversity of housing opportunities in harmony with existing development and the historical and natural environments.	No recommendation or comment.
	2-55	Objective	Ensure a high level of housing quality, both for new construction and for the existing housing stock;	No recommendation or comment.
	3-34	Action	Adopt building Code and/or SALDO regulations and guidelines that provide incentives for green building techniques and energy efficient housing design.	No recommendation or comment.
	---	---	-------	Include an additional objective to address the avoidance of development of housing in high hazard risk areas.
Community Facilities	2-63	Goal	Provide public services and facilities in the most cost-effective and environmentally-sensitive manner, taking into account the existing and future residential and non-residential needs of the two-county area.	No recommendation or comment.
	2-64	Objective	Construct new public safety and emergency service facilities in a manner consistent with the International Building Code for high wind, snow, and flood damage prevention.	No recommendation or comment.
	2-65	Statement	Most of the fire departments in Lackawanna and Luzerne Counties are volunteer, which also raises the concern of adequate manpower. These conditions can tax a fire department's ability to provide sufficient service. These issues raise the	No recommendation or comment.

			need for coordination between fire departments to ensure adequate equipment, staffing, and other resources.	
Parks, Recreation, Open Space, and Greenways	2-67	Goal	The goal of the Parks, Recreation, Open Space, and Greenways Plan is to develop a system of linked recreation resources, providing a variety of outdoor recreation opportunities while protecting and preserving important natural features and environmentally-sensitive areas.	No recommendation or comment.
	2-67	Objective	Develop an assistance program for local municipalities to develop and adopt open space plans and code amendments that support the 2004 Open Space, Greenways and Outdoor Recreation Master Plan	No recommendation or comment.
	2-70	Statement	Natural feature corridors are proposed to be combined with existing protected areas, such as state forests, game lands, parks, and reserved areas, and with projected linear buffers to form a permanent interconnected open space system	No recommendation or comment.
	3-36	Action	Provide a variety of incentives, regulations, and guidelines to ensure that development occurs in a manner that also results in open space being permanently protected.	No recommendation or comment.
Historic and Cultural Resources	2-71	Objective	Develop processes and programs that will advance the preservation of the character and integrity of historic and cultural resources.	No recommendation or comment.
	---	---	-----	Include an additional action to address the protection of historic and cultural resources from the impacts of flooding and other hazards.
Environmental Protection	2-87	Goal	The goal of the Environmental Protection Plan is to protect environmentally-sensitive areas of Lackawanna and Luzerne Counties.	No recommendation or comment.
	2-87	Objective	Protect groundwater, floodplains, creeks, wetlands, mature woodlands and specimen trees, steep slopes, ridge lines, scenic viewsheds, wildlife habitat, and other environmental features of the two-county area;	No recommendation or comment.
	2-87	Objective	Institute state-of-the-art stormwater management programs and ordinances that conform to the most current best management practices in light of the needs of Lackawanna and Luzerne Counties;	No recommendation or comment.
	2-88	Statement	Lackawanna and Luzerne Counties and their constituent municipalities can provide long term wetlands protection by directing development away from these areas, by encouraging clustered	No recommendation or comment.

			construction on higher ground surrounding wetlands, and by purchasing wetlands important to protecting local floodplains or ecological systems.	
	2-88	Statement	Many municipalities have adopted riparian buffer provisions into their zoning ordinances, limiting the development of lands within a certain distance of a stream bank, and taking into account whether floodplains, wetlands, steeply-sloped terrain, and woodlands are present. Applying the concept of riparian buffers to critical source water resources, and not only to stream courses, is another way to protect water quality.	No recommendation or comment.
	2-89	Statement	The two-county area should prepare and promote the adoption of model ordinances and design guidelines for the retention of stormwater from new development and for temporary and permanent sedimentation and erosion control. Stormwater management areas should be located and designed to be extensions of permanent natural open space areas, rather than conventional retention basins, with appropriate native vegetation and wildlife habitat.	No recommendation or comment.
	3-44	Action	Protect and restore critical stream valleys, floodplains, and wetlands to preserve their functions for flood water storage, water supply, and ground water recharge.	No recommendation or comment.
	3-44	Action	Enact riparian buffer ordinances.	No recommendation or comment.
	3-44	Action	Enact green streets ordinances, including street tree, naturalized retention basins, and rain gardens provisions.	No recommendation or comment.
	3-45	Action	Set conservation priorities from Conservation Area identified in the Land Use Plan and Hydrologic Features, Steep Slopes, Forested Areas, and Composite Constraints mapping, as well as the 2004 Open Space, Greenways, and Outdoor Recreation Master Plan.	No recommendation or comment.
Utilities and Energy Conservation	2-92	Goal	The goal of the Utilities and Energy Conservation Plan is to ensure water, energy, communications, sewage, and stormwater service systems are adequate, well maintained, affordable, and secure.	No recommendation or comment.
	2-92	Objective	Protect and enhance the quality and quantity of water resources;	No recommendation or comment.
	2-94	Statement	Consideration should be given to zoning, subdivision and land development regulations, and other approaches for protecting groundwater and surface water sources of potable water supplies,	No recommendation or comment.

			particularly for growing communities and planned new centers. Well head protection zones and source water supply zones should be enacted to protect the water supply.	
	2-95	Statement	It is recommended that all two-county area municipalities identify stormwater management and control structures that may need repair or replacement, as well as stream segments that may need clearing, riprap, bank improvements or other measures to handle anticipated stormwater flows that may occur over the course of the next 10 to 20 years.	No recommendation or comment.
	2-98	Statement	The Counties' Stormwater Management Plans include recommendation and Best Management Practices (BMPs), such as not directing rain spouts into sewers. These kinds of measures are consistent with mandates to separate stormwater and sewage flows.	No recommendation or comment.
	2-98	Statement	Studies are needed to assess the capacity of existing systems as well as address environmental issues. These studies should also address prospective new development, since the Land Use Plan clearly implies that increases in capacities and improvements to existing sewer systems will need to occur to accommodate growth in and around existing centers during the planning period.	No recommendation or comment.
	3-46	Action	Facilitate and coordinate the actions of agencies and governments regarding stormwater management, stream maintenance, and flood mitigation.	No recommendation or comment.
	3-46	Action	Utilize best management practices (BMPs) for new development through SALDOs.	No recommendation or comment.
Resource Extraction	2-101	Goal	The Goal of the Resource Extraction Plan is to maximize the opportunity for reuse and redevelopment of environmental contaminated lands, abandoned industrial areas, strip mined areas and vacant or underutilized commercial areas of the region.	No recommendation or comment.
	2-101	Objective	Develop a structured mine reclamation program that balances environmental, economic and community goals;	No recommendation or comment.
	2-101	Statement	Any plan for the future of the two-county area must address the prospects for these prominent mine features.	No recommendation or comment.
	3-49	Action	Set priorities for remediation, particularly those related to natural gas drilling and development associated with the Marcellus shale deposit and acid mine drainage in areas that have been mined	No recommendation or comment.

			(surface and deep) or quarried. Such activities may include remediation for roadways damaged as part of resource extraction.	
	3-49	Action	Require mine subsidence information to be provided as part of any development approvals process.	No recommendation or comment.

Table 5.9 Lackawanna River Watershed Act 167 Stormwater Management Ordinance Document Review[60]

Lackawanna River Watershed Act 167 Stormwater Management Ordinance			
Plan Topic	Item #	Page #	Current Clause
Article 1 - Provisions			
Purpose	102	1-2	The purpose of this Ordinance is to promote the public health, safety and welfare within the Lackawanna River Watershed by minimizing the damages described in Section 101(A) of this Ordinance by provisions designed to: A. Control accelerated runoff and erosion and sedimentation problems at their source by regulating activities which cause such problems. B. Utilize and preserve the desirable existing natural drainage systems. D. Maintain the existing flows and quality of streams and water courses in [municipality] and the Commonwealth. E. Preserve and restore the flood carrying capacity of streams. F. Provide for proper maintenance of all permanent storm water management structures which are constructed in [municipality].
Applicability	104	2	The following activities are defined as Regulated Activities and shall be regulated by this Ordinance, except those which meet the waiver specifications presented in Section 407: A. Land development. B. Subdivision. C. Construction of new or additional impervious surfaces (driveways, parking lots, etc.) D. Construction of new buildings or additions to existing buildings. E. Diversion or piping of any natural or man-made stream channel. F. F. Installation of storm water systems or appurtenances thereto.
	104	2	Additional impervious cover shall include, but not be limited to, any roof, parking or driveway areas and any new streets and sidewalks constructed as part of or for the proposed regulated activity.
Article III – Storm Water Management Requirements			
General Requirements	301.A	11	Storm drainage systems shall be provided in order to permit unimpeded flow of natural watercourses except as modified by storm water detention facilities or open channels consistent with this Ordinance.
	301.B	11	The existing points of concentrated drainage discharge onto adjacent property shall not be altered without written approval of the affected property owner(s).

[60] Lackawanna River Watershed Act 167 Stormwater Management Ordinance Document Review

	301.D	11	Where a subdivision or land development is traversed by watercourses other than permanent streams, there shall be provided a drainage easement conforming substantially with the line of such watercourse. The width of the easement shall be adequate to provide for unimpeded flow of storm runoff based on calculations made in conformance with Section 304 for the 100-year return period runoff and to provide a free-board allowance of one-half (0.5) foot above the design water surface level.
	301.G	12	Storm drainage facilities and appurtenances shall be so designed and provided as to minimize erosion in watercourse channels and at all points of discharge.
Storm Water Management District Implementation Provisions	303.A.1		New land development controls are to incorporate infiltration of the first 1.5 inches of runoff (i.e., one-half of the mean-annual event) from impervious surfaces. At a minimum, infiltration facilities design/overflow capacity should be for the 10-year event. Post-to-pre flow control should be provided for the design capacity of the receiving storm sewer systems, but in no case less than the 10-year storm event.
	303.H	17-18	Capacity improvements may also be provided as necessary to implement any regional or sub-regional detention alternatives or to implement a modified "no harm" option which proposes specific capacity improvements to document the validity of a less stringent discharge control which would not create any harm downstream.
	303.J	18	Any storm water management facility required or regulated by this Ordinance shall be designed to provide a minimum 1.0 foot of freeboard above the maximum 100-year water surface elevation for post-development conditions.
Calculation Methodology	304.A	19	Storm water runoff from all development sites shall be calculated using a method acceptable to the review agency, either the Rational Method or a Soil-covered Complex Methodology.
	304.B	19	The design of any detention basin intended to meet the requirements of this Ordinance shall be verified by routing the design storm hydrograph through the proposed basin.
	304.H	20	Any detention basin, or other structure, intended to meet the requirements of this Ordinance which required a Dam Safety Permit from DER shall be designed consistent with the provisions of the Dam Safety and Encroachments Act and the DER Chapter 105 Rules and Regulations.
Article IV – Drainage Plan Requirements			
General Requirements	401	21	For any of the Regulated Activities of this Ordinance, prior to the final approval of subdivision and/or land development plans, or the issuance of any permit, or the commencement of any land disturbance activity, the owner, subdivider, developer or his agent shall submit a Drainage Plan for approval.
Drainage Plan Contents	403.A	21-22	The following items shall be included in the Drainage Plan: 3. Written description of proposed permanent storm water controls, either as a separate document or as notes on the plan sheet. 4. Construction staging schedule, listing the beginning and completion of any earth disturbance by staging or phases, and including all erosion and sedimentation, and other, controls.
	403.B	22	Map(s) of the project area showing: 2. Existing contours at intervals of two (2) feet. In areas of steep slopes (greater than 15%), five foot contour intervals may be used, at the direction of the reviewing agency. 4. Other physical features including existing drainage swales and areas of natural vegetation to be preserved. 5. Locations of proposed underground utilities, sewers and water lines.

			9. Final contours at intervals of two (2) feet. In areas of steep slopes (greater than 15%), five foot contour intervals may be used, at the direction of the reviewing agency.
	403.D	23	A maintenance program for all storm water management control facilities must be included. This program must include the proposed ownership of the control facilities, the maintenance requirements for the facilities, and the financial responsibilities for the required maintenance.
Article V - Inspections			
Inspections	501.A	28	Inspection of all phases of installation of the control facilities and the completed installation shall be conducted by the engineer or his designee within 30 days after written notification of the completion by the developer.
Section VII – Maintenance Responsibilities			
Maintenance Responsibilities	701		The maintenance responsibilities for permanent storm water runoff control facilities shall be determined based upon the type of ownership of the property which is controlled by the facilities.

Table 5.10 Ransom Township MS4 Stormwater Management Ordinance Plan Review[61]

Ransom Township MS4 Stormwater Management Ordinance			
Plan Topic	Item #	Page #	Current Clause
Article 1 - Provisions			
Purpose	Section 103.A	2	The purpose of this ordinance is to promote health, safety, and welfare within the municipality and its watershed by minimizing the harms and maximizing the benefits…through provisions designed to: B. Protect the natural drainage systems as much as possible. C. Manage stormwater runoff close to the source. D. Provide procedures and performance standards for stormwater planning and management. F. Prevent accelerated erosion, scour, and aggradation, and degradation of stream banks and streambeds.
Article 3 – Stormwater Management Standards			
General Requirements	Section 301.F	8	Stormwater that flows onto an adjacent property shall not be created, increased, decreased, or otherwise altered without written notification of the adjacent property owner(s) by the developer.
	Section 301.G	9	All regulated activities shall include such measures as necessary to: a. Minimize disturbance to floodplains, wetlands, and wooded areas. b. Maintain or extend riparian buffers. c. Avoid erosive flow conditions in natural flow pathways. e. Disconnect impervious surfaces by directing runoff to pervious.
	Section 301.F	9	The design of all facilities over karst shall include an evaluation of measures to minimize adverse effects.
Performance Standards	Section 303.A	10	Runoff in excess of natural conditions from roofs and other surfaces which are unlikely to contain pollutants shall be recharged to the ground water table for to the maximum extent possible.

[61] Ransom Township MS4 Stormwater Management Ordinance, 2015

	303.F	10-11	Any Earth disturbance activities that involve the alteration or development of land in a manner that may affect stormwater runoff shall: 1. Protect health, safety, and property. 2. Meet water quality goals of this Ordinance.
Design Standards	304.A.4	12	Design for all proposed SWM improvements shall be reviewed and approved by the Township and its Engineer prior to construction.
	304.A.5	12	Stormwater runoff shall not be concentrated onto adjacent properties unless written approval is given by the property owner.
	304.A.7	12	Where a subdivision or land development is traversed by a watercourse, drainage way, channel, or stream, or such plans propose SWM facilities, a drainage easement conforming to the line of water course shall be provided. The easement shall be of such width (minimum 20 feet) as will be adequate to preserve the unimpeded flow of natural drainage for the 25-year design storm.
	304.A.8	12	All storm drainage facilities constructed along or crossing a public street or rights-of-way shall conform to all applicable requirements of PennDOT.
Volume Controls	305.C	13	Before infiltration is proposed on a site, site conditions shall be evaluated through subsurface investigation and testing to determine if site conditions are suitable to support proposed infiltration facilities.
	305.E	14	Infiltration devices shall not be located on slopes steeper than 20 percent.
Technical Design Criteria - Basins	307.B	14	Stormwater detention basins shall be designed to safely discharge the 100 year peak discharge through an emergency spillway with a minimum of 1 foot freeboard above the spillway outflow elevations.
	307.D	15	1. Earth fill embankments shall be designed as so the height of the embankment should never exceed twelve feet. 4. Fill slopes shall be constructed with an impervious core to prevent seepage through embankment areas.
Technical Design Criteria	308.A	15	Stormwater conveyance systems shall be designed for the 25-year design storm event.
	308.D	16	Energy dispatchers shall be places at the outlets of all stormwater pipes.
	308.E	16	Drainage swales shall be designed in accordance with procedures described in PennDOT Drainage Manual.
Article IV – Stormwater Management Site Plan Requirements			
Plan Requirements	401	16-17	The following shall be included in the SWM Site Plan: A. Appropriate sections form the municipalities SALDO and other local ordinances shall be followed in preparing SWM Site Plans.
		18	E. The SWM Plan shall provide the following information: 5. A soil erosion and sediment control plan 6. The effect of the project on surrounding properties and aquatic features and on any existing stormwater conveyance system that may be affected. 20. Floodplain and floodway limits
Article V – Operations and Maintenance			
Responsibilities of Developers and Landowners	501.A	20	The municipality shall make the final determination on the continuing maintenance responsibilities prior to the final approval of the SWM Site Plan.
Article VII – Prohibited Activities			

Roof Drains and Sump Pumps	702	23	Roof drains and sump pumps shall discharge to infiltrations or vegetative BMPs.

Municipalities have the opportunity to integrate these hazard mitigation actions into already existing planning mechanisms. The municipalities that have comprehensive plans can integrate these actions into various aspects of those plans. Growth management techniques, such as buffering, can be integrated into the future land use strategy, while different housing programs can be created to retrofit publicly subsidized affordable housing to reduce damage after a disaster occurs. These actions can also be integrated through municipal floodplain or zoning ordinances, which can be utilized to limit the density of development in high hazard areas, and/or through a municipal Subdivision and Land Development Ordinance (SALDO), for example, by reviewing the placement of roads, residential lots, public facilities within subdivisions that can increase natural hazard risks and evacuation/emergency access points. Hazard mitigation actions could also be integrated through any of the eight stormwater management plans in the County, and/or through existing building codes and design controls.

6.0 CHAPTER 6 – MITIGATION STRATEGY

CFR §201.6(c)(3): *The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

6.1 Update Summary Process

The mitigation strategy serves as the long-term road map to reduce the potential losses, vulnerabilities and shortcomings identified in the risk assessment chapter. A typical mitigation strategy includes a list of goals and objectives and mitigation actions to address the goals and objectives, that are then prioritized, based on the community's requirements. The mitigation strategy in this Plan comprises the following five subsections:

- Hazard Mitigation Goals and Objectives
- Identification and Analysis of Mitigation Actions
- Compliance with the NFIP
- Prioritization and Implementation of Mitigation Actions (County level)
- Multi-jurisdictional Mitigation Actions (municipal level)
- Status of Past Actions

6.2 Mitigation Goals and Objectives

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

For the purposes of this Plan, goals are defined as general policy guidelines or broad statements that represent a vision for a community. Objectives define strategies or implementation steps to attain the identified goals. Compared to goals, objectives are more specific and measurable. The goals for this planning process have been developed in close coordination with the Steering Committee, based on the findings of the HIRA, the mitigation capability assessment, as well as the 2015 plan. The goals and objectives are also designed to serve as the basis for the mitigation actions at the county and municipal levels. Each mitigation action (in the next section) is linked to one or more goals and objectives in this chapter.

The goals and objectives have been formulated in the areas of: local plans and regulations, structure and infrastructure projects, natural systems protection, and education and awareness. Although not considered a 'primary type' of mitigation actions, it may also be important to identify emergency response or operational preparedness actions, some of which are included in this mitigation strategy.

Vision – "Protect the residents, their property, and reducing related costs of disaster response, recovery, and minimize the disruption that any disaster will cause to the community."

Goal 1: Continue to protect residents and property in Lackawanna County from the impacts of all identified hazards.

- Ensure timely delivery of warning, information, and necessary supplies, to county residents, *including* providing residents with adequate warning of potential hazards through CodeRed, IPAWS, and other mass notification services.
- Work with municipalities to continue to be compliant with the National Flood Insurance Program (NFIP) through periodic training of municipal officials.
- Ensure timely delivery of mass care supplies and services within the County.
- Provide an adequate inventory of shelters and supplies for use during hazard events
- Provide assistance for unmet needs identified during hazard events.

Goal 2: Ensure hazard mitigation goals and objectives are consistent with goals of other plans and ordinances in the county and municipalities.

- Promote responsible growth and development via proper enforcement and through the incorporation of hazard mitigation principals in municipal plans, and zoning, subdivision and land development, stormwater ordinances, and floodplain ordinances, as appropriate.
- Incorporate hazard mitigation planning projects into capital improvement plans
- Better integrate plans and ordinances to ensure concurrency and harmony between them.

Goal 3: Ensure continuity of emergency services and critical government services during and following hazard events.

- Continue to ensure that hazards do not interrupt emergency response services, emergency operations, and critical functions.
- Identify safe and efficient evacuation routes for use during various hazard events to ensure a safe and organized evacuation process.

Goal 4: Minimize structural damage caused by flooding, wind events, winter storms, transportation incidents, and wildfires.

- Encourage the enforcement of high construction standards to protect new development from all identified hazards.
- Minimize damage to critical facilities in high hazard areas, (i.e. 100-year floodplain, heavily forested areas, areas of geologic subsidence) and develop measures to prevent or mitigate the effect of future damages.
- Encourage the removal or retrofit of repeatedly flooded structures to reduce the flood risk and provide information or guidance on available resources.
- Continue to ensure existing drainage systems (pipes, culverts, and channels) are adequate and functioning properly through regular maintenance or upgrades

Goal 5: Promote sustainable development to improve the quality of life and safety of residents and visitors in Lackawanna County.

- Protect natural resources and open space, including parks and wetlands within the floodplain and watersheds.
- Continue to regulate development in conservation areas and within floodplains to prevent flood damage.

Goal 6: Promote public understanding, support and involvement in hazard and flood mitigation related activities.

- Encourage adherence to NFIP requirements/regulations.
- Work with television, radio, and newspaper partners as well as social media and websites to promote public awareness on the potential impacts of natural hazards and actions to reduce those impacts.
- Continue to conduct education campaigns and workshops to promote 'safe' development and other hazard mitigation principles.

6.3 Identification and Analysis of Mitigation Techniques

Requirement §201.6(c)(3)(ii): *[The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

In formulating the Mitigation Strategy, the Steering Committee explored four mitigation categories for attaining the plan's goal and objectives. They include: local plans and regulations, structure and infrastructure projects, natural systems protection, and education and awareness. Emergency response or operational preparedness actions are also included in this plan. This includes the four categories recognized by FEMA, as well as one additional category for ease of organization. These categories formed the basis of the mitigation actions in the Plan Update. Descriptions of these categories and examples for each category are included below:

1. Local Plans and Regulations

   These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built. Examples include: comprehensive plans, land use ordinances, subdivision regulations, development review, building codes and enforcement, NFIP community rating system, capital improvement programs, open space preservation plans, stormwater management regulations, and master plans, and other local plans and regulations.[62]

2. Structure and Infrastructure Projects

[62] Federal Emergency Management Agency. Local Mitigation Planning Handbook - https://www.fema.gov/media-library-data/1590070172371-48e87ca446838ba81afc2aca995940bc/FEMA_Local_Mitigation_Planning_Handbook_508.pdf

These actions 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 manmade structures to reduce the impact of hazards. Many of these types of actions are projects eligible for funding through the FEMA HMA program. Examples include: acquisitions and elevations of structures in flood prone areas, utility undergrounding, structural retrofits, floodwalls and retaining walls, detention and retention structures, culverts, and safe rooms.[63]

3. Natural Systems Protection
   These are actions that minimize damage and losses and also preserve or restore the functions of natural systems. Examples include: sediment and erosion control, stream corridor restoration, forest management, conservation easements, wetland restoration and preservation.[64]

4. 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. Although this type of mitigation reduces risk less directly than structural projects or regulation, it is an important foundation. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions. Examples include: radio or television spots, websites with maps and information, real estate disclosure, presentations to school groups or neighborhood organizations, mailings to residents in hazard-prone areas, Stormready, and Firewise communities.[65]

   Emergency Response/Operation Preparedness: When analyzing risks and identifying mitigation actions, the planning team may also identify emergency response or operational preparedness actions. This is not considered by FEMA to be mitigation action type and is included in this plan for ease of organization. Examples include: creating mutual aid agreements with neighboring communities to meet emergency response needs; purchasing radio communications equipment for the Fire Department; and developing procedures for notifying citizens of available shelter locations during and following an event.[66]

Mitigation actions have been developed for the entire County as well as for each municipality. While some actions may apply to more than one jurisdiction, most actions are specific to each jurisdiction.

The mitigation actions that were developed were based on results from the risk assessment, the mitigation capability analysis, input from the Steering Committee, actions that have been completed in the past, recent past hazard occurrences, and feedback from the municipal workshop, worksheets, and questionnaires. The mitigation actions that have been developed can be implemented through a variety of local tools such as changes in ordinances and policies, capital improvements budgets, and applying for grant funding.

Continued Compliance with NFIP

[63] Ibid.
[64] Ibid.
[65] Ibid.
[66] Ibid.

Requirement §201.6(c)(3)(ii): *[The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.*

We understand that while FEMA is the official administering agency for NFIP participation, it is the community's responsibility to have the capability and to serve as a resource for flood mitigation activities. Lackawanna County is a participant in the NFIP and is committed to continuing compliance with the NFIP via three basic components of the NFIP:

1) Floodplain identification and mapping risk;
2) Responsible floodplain management; and
3) Flood insurance.

After discussions with the Steering Committee, and a survey sent to County and Local Floodplain Coordinators, GIS Specialists, and County's Office of Planning, the following information is included (Table 6.1) to document how the County currently addresses and will continue to address NFIP compliance and requirements in the future.

Table 6.1 NFIP Questionnaire

Flood Identification and Mapping	County	Municipalities
Does the County make the Flood Insurance Rate Map and Flood Insurance Studies available to the public? Where are these documents housed within the County?	Yes. Planning Department.	No
Will the recently developed Digital Flood Insurance Rate Maps be made available to the public as well? How?	Yes. Planning Department/GIS Coordinator.	No
Are Letters of Map Revisions (LOMRs) reviewed and signed by County officials? If during the subdivision review process, a new development determines a reduction in the floodplain delineation of the DFIRM floodplain, is the developer required to submit a LOMR submission to FEMA?	No. No, not by the county planning commission, through local municipality only.	Yes
Does the County provide advice to community residents regarding elevation certificates and Letter of Map Amendment (LOMA) applications?	Yes	Yes
Does the County maintain records of approved letters of map change?	No	No
Does the County assist residents in interpreting the DFIRM and County flood studies to determine the property's status in the floodplain? If yes, which department?	Yes. Planning Department.	No
Floodplain Management		
Are any restrictions on floodplain use enforced through the subdivision and building permit process?	Not by the county, by local municipality only.	Yes.
Do all proposed developments require plans to go through the County's subdivision approval process or to acquire a building permit for new structures?	Required to be reviewed by the county planning agency; however, approval and permits are through local municipality only.	Yes.
Are all new structures required to be at least 1.5 feet above the 100-year base flood elevation?	Yes, through local municipal floodplain ordinances.	Yes, through local municipal ordinances
Flood Insurance		

Is the County committed to educating residents about the value and availability of flood insurance? Is an annual letter sent to residents in the floodplain explaining the importance of flood insurance and where it may be obtained?	The county is committed to educating residents; however, responsibility to notify residents has been by local municipality only. The county planning department, through the GIS coordinator, will be more involved with local municipalities once DFIRMs are finalized.	Yes
Does the County assist residents in interpreting the DFIRM and County flood studies to determine their property's floodplain status, and offer advice regarding elevation certificates and LOMA applications?	Yes on assistance; No on certificates and LOMAs.	Yes.
When was the last Community Assistance Visit conducted and, as of that date, was Lackawanna County found to meet the requirements for continued participation in the NFIP?	N/A	N/A

Communities that participate in the NFIP are required to adopt flood maps and local requests for map updates; adopt and enforce minimum floodplain management regulations that help mitigate the effects of flooding on new and improved structures in the Special Flood Hazard Area; offer property owners flood insurance as a protection against flood losses in exchange for floodplain management regulations that reduce future flood damages; and perform community assistance and monitoring activities.

Currently, all 40 municipalities in Lackawanna County participate in the NFIP. Table 6.2 indicates community and its effective map date.[67]

Table 6.2 Municipalities Effective Map Dates

Municipality	Effective Map Date	Municipality	Effective Map Date
Archbald Borough	08/05/20 (>)	Madison Township	08/05/20 (>)
Benton Township	08/05/20 (>)	Mayfield Borough	08/05/20 (>)
Blakely Borough	08/05/20 (>)	Moosic Borough	08/05/20 (>)
Carbondale City	08/05/20 (>)	Moscow Borough	08/05/20 (>)
Carbondale Township	08/05/20 (>)	Newton Township	08/05/20 (>)
Clarks Green Borough	08/05/20 (>)	North Abington Township	08/05/20 (>)
Clarks Summit Borough	08/05/20 (>)	Old Forge Borough	08/05/20 (>)
Clifton Township	08/05/20 (>)	Olyphant Borough	08/05/20 (>)
Covington Township	08/05/20 (>)	Ransom Township	08/05/20 (>)
Dalton Borough	08/05/20 (>)	Roaring Brook Township	08/05/20 (>)
Dickson City Borough	08/05/20 (>)	Scott Township	08/05/20 (>)

[67] https://www.fema.gov/cis/PA.html

Municipality	Effective Map Date	Municipality	Effective Map Date
Dunmore Borough	08/05/20 (>)	Scranton City	08/05/20 (>)
Elmhurst Township	08/05/20 (>)	South Abington Township	08/05/20 (>)
Fell Township	08/05/20 (>)	Spring Brook Township	08/05/20 (>)
Glenburn Township	08/05/20 (>)	Taylor Borough	08/05/20 (>)
Greenfield Township	08/05/20 (>)	Thornhurst Township	08/05/20 (>)
Jefferson Township	08/05/20 (>)	Throop Borough	08/05/20 (>)
Jermyn Borough	08/05/20 (>)	Vandling Borough	08/05/20 (>)
Jessup Borough	08/05/20 (>)	Waverly Township	08/05/20 (>)
Laplume Township	08/05/20 (>)	West Abington Township	08/05/20 (>)
(>) = Date of the current effective map is after the date of this FEMA Report.			

6.4 Mitigation Action Plan

Once the mitigation actions and implementation plan were finalized, the Steering Committee developed specific criteria to prioritize the actions. The Steering Committee agreed on three criteria which involved addressing the following questions to determine the level (high, medium, and low) for the social, administrative, and economic considerations for each action. These priorities were translated into points and facilitated the ranking and identification of high priority projects as shown in Table 6.3.

Social Considerations – Life/Safety Impact

- Will the project have minimal/direct/or significant impact on the safety of businesses, residents, and properties?
- Will the proposed action adversely affect one segment of the population?
- Will the project be a proactive measure to reducing flood risk?

Administrative Considerations – Administrative/Technical Assistance

- Is there sufficient staff currently to implement the project?
- Is training required for the staff to implement this project?

Economic Considerations – Project Cost

- What is the approximate cost of the project?

Table 6.3 Evaluation Criteria for Action Prioritization

Criteria	Points	High	Points	Medium	Points	Low
Life/Safety Impact	10	Significant impact on public safety for businesses, residents, and/or properties	6	Direct impact on businesses, residents, and/or properties	2	Minimal/negligible impact on businesses, residents, and/or properties
Administrative/ Tech Assistance	5	No additional staff or technical support needed to implement action	3	Some administrative and technical support needed to implement action	1	Significant administrative and technical support needed to implement action
Project Cost	5	Low cost (<$25,000)	3	Moderate cost ($25,000-$100,000)	1	High cost to implement (>$100,000)

It should be noted that this Plan does not include a prioritization of projects within a category, i.e., there is no ranking of projects listed within the Structure and Infrastructure mitigation category. Points were then assigned to each action and totaled as shown in Table 6.4 and Table 6.5. For the purposes of funding, a benefit-cost analysis should be conducted. The projects would be prioritized as individual municipalities prepare applications for specific funding agencies for particular projects.

The overall timeline for the completion of projects is dependent on available funding and involvement and commitment by the municipality. The tables that follow identify County-level mitigation actions. The projects are described, refer to the hazard(s) mitigated, lead agency for implementation, timeline, and possible funding sources.

Table 6.4 shows the new county mitigation actions that have been developed as part of this plan update.

Table 6.4 New County Mitigation Actions

New County Mitigation Actions											
	Action	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Project Cost	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
1	Conduct annual workshops/regular trainings and exercises with key Emergency Management stakeholders (municipal EM officials, local floodplain coordinators, local elected officials, etc.) and municipalities to educate them on various types of mitigation projects they could be undertaken to reduce risks to specific hazards.	All Hazards	County Emergency Management Agency	10	3	5	18	HMA Grants	25,000-100,000	Continuous	Education Awareness Programs
2	Digitize data and records or other files into tables, databases, or GIS format for future use and analysis.	All Hazards	County Department of Planning	2	1	3	6	Staff Time	<25,000	Continuous	Education Awareness Programs
3	Increase public awareness on wildfires by providing outreach and education on increasing buffers and defensible spaces to reduce vulnerability.	Wildfire	DCNR – Forestry; County Emergency Management Agency	6	3	5	14	Staff Time	<25,000	Continuous	Education Awareness Programs
4	Compile a list of frequently flooded roads countywide, to prioritize repairs and replacements.	Flood	County Engineer or County Roads/Bridges	6	3	5	14	Staff Time	<25,000	1-2 years	Education Awareness Programs / Emergency Response / Operational Preparedness
5	Explore the use of traffic calming devices such as speed bumps, speed humps, traffic lights, and roundabouts at high volume intersections, near industrial/hazmat facilities, near schools, and in residential areas.	Transportation Hazards	County Department of Planning; PennDOT	6	5	3	14	Staff Time, County Funds	<25,000	1-2 years	Structure and Infrastructure Projects
6	Develop and distribute educational and informational materials twice a year, to include information on each county's hazards and how to prepare before, during, and after hazard events.	All Hazards	Lackawanna Hazards Coalition	6	5	5	16	Staff Time	25,000-100,000	Continuous	Education Awareness Programs
7	Establish pre-disaster debris contracts and develop debris removal MOUs with appropriate local, county, and state agencies.	All Hazards	County Emergency Management Agency	6	5	5	16	Staff Time	<25,000	Continuous	Emergency Response/ Operational Preparedness
9	Develop and implement operational strategies and a Cistern Plan for dealing with rural water supply during protracted drought events.	Drought	Conservation District	2	3	5	10	Conservation District Funds, County Funds	>100,000	Continuous	Local Plans and Regulations

New County Mitigation Actions

	Action	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Project Cost	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
10	Continue to enhance and develop mutual aid agreements with neighboring counties and state partners for response and recovery efforts.	All Hazards	County Emergency Management Agency	10	3	5	18	Staff Time	<25,000	Continuous	Local Plans and Regulations
11	Conduct response training exercises for hazard events at least twice a year.	All Hazards	County Emergency Management Agency	6	3	3	12	HMA Grants, Staff Time	25,000-100,000	Continuous	Education Awareness Programs
12	Maintain requirements to continue recognition as a Storm Ready Community (by the National Weather Service StormReady® Program).	All Hazards	County Emergency Management Agency	6	3	3	12	Staff Time	<25,000	Continuous	Education Awareness Programs
13	Utilize FEMA's Integrated Public Alert and Warning System (IPAWS) for sudden onset hazards such as tornados, thunderstorms, or flash floods.	All Hazards	County Emergency Management Agency	6	3	5	14	Staff Time	<25,000	Continuous	Structure and Infrastructure Projects
14	Coordinate with County PIO, municipalities, and other stakeholders to develop a "pre-approved' set of releases to be disseminated to the public in a timely manner in the event of an emergency.	All Hazards	County Emergency Management Agency	6	3	3	12	Staff Time	25,000-100,000	Continuous	Education Awareness Programs
15	Purchase NOAA Weather Alert radios located in designated critical facilities across the County.	All Hazards	County Emergency Management Agency	6	5	5	16	County funds	<25,000	1-2 years	Emergency Response/ Operational Preparedness
16	Encourage local businesses and local industry owners to develop a business continuity plan and provide educational materials.	All Hazards	Lackawanna Hazards Coalition; County Environmental Office Economic Development	6	5	5	16	Hazards Coalition Funds	<25,000	Continuous	Education Awareness Programs
17	Develop and carry out a strategy to integrate the new 2020 FEMA DFIRMs into this HMP Update within one years following the completion and release of the new 2020 DFIRMs.	Flood	Lackawanna Hazards Coalition	10	3	3	16	Hazards Coalition Funds, County Funds	25,000-100,000	1-2 years	Local Plans and Regulations
18	Explore ways to obtain and store personal protective equipment to protect essential workers and emergency service agencies from an infectious disease outbreak.	Infectious Disease	County Emergency Management Agency	10	3	5	18	Staff Time	25,000-100,000	Continuous	Emergency Response/ Operational Preparedness
19	Educate county residents and emergency personnel on the potential risk of an infectious disease outbreak, and on safety and mitigation techniques to follow before, during, and after an infectious disease outbreak.	Infectious Disease	County Public Information Officer; County Emergency Management Agency	10	3	5	18	Staff Time	25,000-100,000	Continuous	Education Awareness Programs

New County Mitigation Actions

	Action	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Project Cost	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
20	Utilize tracking reports during the annual review process to identify potential barriers or hindrances to implementation of hazard mitigation activities and projects.	All Hazards	Lackawanna Hazards Coalition	6	3	5	14	Hazards Coalition Funds, Cunty Funds	<25,000	Continuous	Education Awareness Programs
21	Continue to educate homeowners on the potential risk of earthquakes and on safety techniques to follow during and after an earthquake.	Earthquake	Lackawanna Hazards Coalition	6	3	5	14	Hazards Coalition Funds, Cunty Funds	<25,000	Continuous	Education Awareness Programs
22	Continue to conduct routine inspections, regular maintenance, and annual tests on all emergency communications equipment, public address systems, and hazard alert sirens to ensure effective operation during an emergency event.	All Hazards	911 Center – City of Scranton/County Emergency Management Agency	10	3	3	16	City Funds, County Funds	25,000-100,000	Continuous	Structure and Infrastructure Projects
23	Ensure reconstruction activities are compliant with NFIP substantial damage/improvement requirements and existing codes.	Flood	Local Levels/ Municipalities	6	5	5	16	Staff Time	<25,000	Continuous	Local Plans and Regulations
24	In flooded areas, conduct rigorous sampling and analysis of public and private drinking water supply sources immediately after an inundating flood event and issue boil water advisories as needed.	Flood	Private Water Companies Environmental Office Conservation District County Public Information Officer	10	3	5	18	Staff Time	25,000-100,000	Continuous	Natural Systems Protection
25	Promote and offer Community Emergency Response Team (CERT) training/classes to increase the number of citizen responders in the municipalities.	All Hazards	County Emergency Management Agency	6	5	3	14	Staff Time	<25,000	Continuous	Education Awareness Programs
26	Identify at-risk populations (elderly, homeless, persons with physical or mental disabilities) to various hazards and maintain records of vulnerable populations and the types of assistance needed before, during, or after a hazard.	All Hazards	911 Center keeps database	6	3	5	14	Staff Time	25,000-100,000	1-2 years	Education Awareness Programs

Table 6.5 shows actions from the 2015 plan that are being carried forward to this plan update. Any actions that were not given a final disposition (completed, cancelled, etc.) by the County, have been included in this list as not started, in progress, or ongoing.

Table 6.5 County Mitigation Actions Carried Forward from the 2015 County HMP (Past Actions)

County Mitigation Actions Carried Forward from 2015 Plan (Past Actions)													
	Action	Status	Notes	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Cost Ranking	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
1	Update the evacuation strategy for Lackawanna County and municipalities in conjunction with the Long Range Transportation Plan. The Plan should include issues such as staging areas, feeding plan for displaced persons, signs, temporary housing, decontamination, and destination points such as shelters. Involve experts in emergency planning, transportation planning, and traffic engineering in developing the plan.	Not Started		All hazards	County Emergency Management Agency	10	1	3	14	HMGP, EMPG, PENNDOT Funds	75,000 - 100,000	3-5 years	Local Plans and Regulations
2	Continue to work with the Red Cross to conduct an annual assessment of existing shelters in the county to determine their condition and adequacy with respect to beds, etc. and determine which ones would need to be retrofitted. Identify additional locations that could be equipped and identified as shelters based on the needs and the population centers in the county (Red Cross has done evaluations in 2014 and renewed agreements with all shelters. All the shelters are in schools and there are renewed agreements with every shelter in the county).	Ongoing	A few facilities have been added/deleted to the inventory in response to new planning for nuclear power plant evacuations and for lack of meeting accessibility requirements.	All hazards	County EMA	6	1	3	10	HMGP, EMPG	10,000 per year	Ongoing	Structure and Infrastructure Projects
3	Conduct a Commodity Flow Study for the County and its municipalities.	Not Started		Hazardous Materials	County EMA	2	1	3	6	--	Staff Time	1-2 years	Natural Systems Protection
4	Identify a point-of-contact to property owners and municipalities who have flooding problems and provide advice to municipalities on the flood hazard, availability of flood insurance, flood protection, and stormwater management methods. Also provide inquirers with technical advice and information from the community's DFIRM, RiskMAP\ information, and FEMA's website on a property's location in a Special Flood Hazard Area, zone, and its base flood elevation.	Ongoing		Flood		10	3	5	18	FMA, PDM, HMGP	Staff time	1-2 years	Education Awareness Programs

County Mitigation Actions Carried Forward from 2015 Plan (Past Actions)

	Action	Status	Notes	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Cost Ranking	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
5	Encourage the individual municipalities to be firmly committed to continue compliance with the NFIP: a)Work with municipalities to encourage them to include language in their zoning ordinances to concur with the Model Floodplain Ordinance and the Subdivision/Land development Ordinance with respect to what is allowed in the floodplain. b) Conduct a training program for floodplain officials in the county and those who administer the floodplain ordinance in the municipalities to educate them on sound flood management principles. c) Regulate development and redevelopment through the adoption of provisions that exceed the minimum NFIP requirements. d) Work with communities to ensure that there are no deficiencies when the Community Assistance Visits are conducted to ensure continued compliance.	Ongoing	Munis are developing standalone floodplain ordinances in anticipation of new floodplain maps (8/2020)	Flood	County Regional Planning Commission, County Emergency Management Agency	10	1	1	12	LUPTAP	Staff time	1-2 years	Education Awareness Programs
6	Develop stormwater management programs for the Borough of Dunmore and City of Scranton and transfer permitting, management, and maintenance to a single agency.	Ongoing	Looking to expand to a countywide SWM agency	Flood	County Regional Planning Commission	6	3	3	12	User Fees	Staff time	1-2 years	Local Plans and Regulations
7	Conduct an annual workshop to encourage regional cooperation between municipalities for multi-municipal planning to reduce the impact of hazard events on adjacent municipalities.	Ongoing	Multi plan has been adopted, in process of implementation	All Hazards	County Regional Planning Commission, Borough of Dunmore, City of Scranton	6	3	5	14	LUPTAP	Staff time	Ongoing	Education Awareness Programs
8	Work with the municipalities to integrate the County's Hazard Mitigation Plan into the municipalities' comprehensive plan and zoning ordinance by: a) encouraging them to include principles and strategies for safe development; b) Including language in the zoning ordinance to discourage development in the 100-year floodplain; and c) encouraging municipalities to include measures in their zoning ordinance to enhance the concept of defensible space practice; d) discourage development on permeable soils to reduce the impacts	Ongoing		All Hazards	County Regional Planning Commission, County Engineer	6	3	5	14	LUPTAP. FLUAP	Staff time	3-5 years	Local Plans and Regulations

County Mitigation Actions Carried Forward from 2015 Plan (Past Actions)

	Action	Status	Notes	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Cost Ranking	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
	of drought; and e) best management practices in stormwater management.												
9	Promote denser development (small lot single family development) or cluster development to preserve environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).	Ongoing		All Hazards	County Regional Planning Commission	6	5	5	16	LUPTAP	Staff time	1-2 years	Local Plans and Regulations
10	Develop a Source Water Protection Plan to properly utilize and protect ground water resources in Lackawanna County.	Canceled		Drought	County Regional Planning Commission, County Engineer	6	3	3	12	DEP	$100,000	3-5 years	Local Plans and Regulations
11	Work with the City of Scranton and any municipality along large rivers and streams, to join the CRS by educating them on the benefits of CRS and also providing them with technical assistance.	Ongoing		Flood	County Regional Planning Commission, Municipality	6	3	5	14	PDM, FMA, HMGP	5,000 - 10,000 per community	3-5 years	Education Awareness Programs
12	Work with the municipalities to identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	Ongoing		All	County Regional Planning Commission	2	3	5	10	PDM	Staff time	1-2 years	Education Awareness Programs
13	Work with real estate agents, mortgage lenders, and homeowners to implement radon testing for new homebuyers. Investigate ways to education current homeowners on how to conduct radon testing, and methods to mitigate high levels of radon in households.	Ongoing	Add DEP as a funding source/technical assistance	Radon	Community Development	10	3	5	18	HUD	2,000 average per Home	3-5 years	Local Plans and Regulations
14	Review the SALDO and encourage all standards in the SALDO address the ability of emergency access and work with municipalities to address the accessibility issue for large pieces of equipment/vehicles in these forested areas.	Ongoing/ Combined	Change to encourage	Wildfire	County Regional Planning Commission	10	3	5	18	PDM, HMGP	Staff time	3-5 years	Local Plans and Regulations
15	Develop outreach efforts to promote such items as noncombustible roof covering, fire safe construction, and the importance of clearing brush and grass away from buildings. Emphasize how the damage potential can be reduced by ensuring that structures are surrounded by defensible space or buffer zones (generally 30 to 100 feet and cleared of combustible materials).	Ongoing		Wildfire	County Regional Planning Commission	10	3	5	18	PDM, HMGP	Staff time	3-5 years	Education Awareness Programs
16	Encourage the adoption of building codes to require residential sprinkler systems installed in new construction	Ongoing	Local fire chief should review	Wildfire	County Regional Planning Commission	6	5	5	16	PDM, HMGP	Staff time	3-5 years	Local Plans and Regulations

County Mitigation Actions Carried Forward from 2015 Plan (Past Actions)

	Action	Status	Notes	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Cost Ranking	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
17	Identify areas where power lines can be buried underground in order to offer the security of uninterrupted power during and after storms. However, consideration needs to be made for maintenance and repair, particularly in cold climates where soil freezes.	Not Started		Winter Weather	County Emergency Management Agency	6	3	3	12	PDM	Staff time	1-2 years	Structure and Infrastructure Projects
18	Ensure regular training in and compliance with all safety procedures and systems related to the manufacture, storage, transport, use, and disposal of hazardous materials.	Ongoing		Hazardous Materials	County Emergency Management Agency	10	3	3	16	PDM	Staff time	1-2 years	Local Plans and Regulations
19	Develop outreach programs to promote the importance of strengthening public and private structures against severe wind damage by encouraging wind engineering measures and construction techniques – structural bracing, straps and clips, anchor bolts, laminated or impact resistant glass, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles.	Ongoing		Wind Events	County Regional Planning Commission	6	3	5	14	PDM	Staff time	1-2 years	Education Awareness Programs
21	Earthquake hazards can be mitigated through land use planning. Communities can develop and distribute guidelines or pass ordinances that require developers/building owners to locate lifelines, buildings, critical facilities, and hazardous materials out of areas subject to significant seismic hazards. Particular consideration should be given to enforcing such ordinances in areas with steep slopes or subject to ground displacement, severe ground shaking, or liquefaction.	Ongoing	Comment on LD plans for setback areas or fall zones	Earthquake, Mine related hazards	County Regional Planning Commission, County Emergency Management Agency	6	3	5	14	PDM	Staff time	1-2 years	Local Plans and Regulations
22	Encourage annual inspections of all dams and levees to identify any structural defects.	Ongoing	County engineer does inspections and reporting on all COUNTY OWNED dams	Dam/Levee Failure	County Emergency Management Agency	10	3	3	16	PDM	Staff time	1-2 years	Structure and Infrastructure Projects
23	Continue to identify steep slope/high-risk areas in the comprehensive plan and develop guidelines or restricting new development in those areas. Restrict/limit industrial activity that would strip slopes of essential topsoil and incorporate economic development activity restrictions in high-risk areas.	Ongoing	Updating county comp plan	Landslides	County Regional Planning Commission	10	3	3	16	PDM	Staff time	1-2 years	Local Plans and Regulations

County Mitigation Actions Carried Forward from 2015 Plan (Past Actions)

	Action	Status	Notes	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Cost Ranking	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
24	Consider introducing mandatory radon testing and a county real estate disclosure requirement for radon presence.	Not Started	Encourage municipalities to adopt requirement	Radon	County Regional Planning Commission	6	5	5	16	PDM	Staff time	1-2 years	Local Plans and Regulations
25	Conduct a structural assessment and engineering inspection of all County-owned critical facilities that have been identified in high hazard areas. The assessment should include the ability of each facility to sustain damage from any hazard event and recommendation of specific retrofitting measures in a technical report.	Not Started		All hazards	Department of Buildings and Grounds, County Engineer	10	1	1	12	FMA, PDM, HMGP	Staff time	3-5 years	Structure and Infrastructure Projects
26	Encourage municipalities to reduce the vulnerability of critical facilities to wildfires by: increasing buffers and introducing defensible spaces; identifying farm roads, service roads, and other private access corridors in high hazard areas that could be used as fire breaks; and providing assistance to the County Emergency Management Agency to identify vulnerable structures (Firewise communities).	Ongoing		Wildfire	Pennsylvania Department of Environmental Protection - Bureau of Forestry	6	3	3	12	PDM, HMGP	Staff time	3-5 years	Natural Systems Protection
27	Develop methods to secure funding to initiate a structural survey for 4 older communities in the County. The survey should involve an\ inventory of all pre-1970 buildings - age of structure, construction material, and structural flaws.	Not Started		All hazards	County Engineer, Office of Economic and Community Development	6	3	5	14	PDM, HMGP	Staff time	3-5 years	Structure and Infrastructure Projects
28	Designate specific locations throughout the County such as the County Emergency Management Agency, County Planning Department, municipal libraries, and events such as fairs to provide information to the public on flooding and other hazards. Encourage these locations to stock a variety of FEMA publications on various natural hazards and also the most recent DFIRMs; also include information on the County's website and develop brochures on specific topics.	In Progress	Sent Postcards, public meetings, fairs/public events, lobby displays	All hazards	County Regional Planning Commission, Public Information Office, County EMA	6	5	5	16	PDM	Staff time	1-2 years	Education Awareness Programs
29	Encourage the Flood POC to stay closely involved with the activities of the Susquehanna River Basin Commission, Delaware River Basin Commission by encouraging a staff member from the County Regional Planning Commission to be present at their meetings.	Ongoing		Flood	County Regional Planning Commission	2	5	5	12	LUPTAP	Staff time	1-2 years	Education Awareness Programs

County Mitigation Actions Carried Forward from 2015 Plan (Past Actions)

	Action	Status	Notes	Hazard Mitigated	Lead Agency for Implementation	Life/Safety Impact	Admin/Tech Assistance	Cost Ranking	Total	Possible Funding Source	Approximate Cost ($)	Project Timeline	Action Category
30	Work with real estate agents throughout the county and encourage them to advise prospective property purchasers in flood prone and mine subsidence.	Ongoing	Held meeting last December (2018)	Flood, Mine Related hazards	County Flood Protection Department, County Regional Planning Commission, County Emergency Management Agency, State agencies	6	3	5	14	PDM	Staff time	1-2 years	Local Plans and Regulations
31	Monitor and evaluate mitigation actions annually and update the hazard mitigation plan every five years to reflect changes in development after a major hazard event.	Ongoing		All hazards	County Planning Commission	6	3	3	12	PDM	Staff time	Ongoing	Education Awareness Programs

6.4.1 Municipal Mitigation Actions

***Requirement: §201.6(c)(3)(iii)**: [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

In addition to the above actions developed for Lackawanna County, mitigation actions have been provided for each municipality.

***Requirement §201.6(c)(3)(iv):** For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Multi-jurisdictional plans require all municipalities to have at least one mitigation action to be included in the hazard mitigation plan. These actions were developed in the same manner as the county-level projects, and in addition, drew heavily from the municipal workshop, surveys and worksheets, and suggestions from local representatives via email and feedback forms. Actions from the 2015 Plan that were categorized as "In Progress" or "On-Going," or those not yet begun, were included in this 2020 Plan Update. Once these actions were finalized, an implementation strategy was developed in the same manner as for the new county actions. The table includes mitigation actions for each municipality, the hazard mitigated by the action, responsible entity for implementing the project, potential costs, and a project timeline. The projects are listed in alphabetical order by municipality.

Table 6.6 below lists actions from the 2015 plan that are being carried forward to this plan update for each municipality. Any actions that were not given a final disposition (completed, cancelled, etc.) by the county, have been included in this list as not started, in progress, ongoing, or carried forward.

Table 6.6 Lackawanna County Municipal Mitigation Actions (Past Actions Update)

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
Past Municipal Actions Carried Forward from the 2015 Plan							
Archbald Borough							
1	Flood	Preserve the Theta Company lands in the Laurel Run Watershed through acquisition or easements to reduce flooding in the downstream portions of the watershed.	Borough Council, Bureau of Abandoned Mine Reclamation	Carried Forward	Ongoing	25,000-100,000	Natural Systems Protection
2	Flood	The headwater of Tinklepaugh Creek has numerous encroachments and mine impacts. Conduct a study to address flooding problems (eliminate flow diversion into the Gravity Slope mine outfall).	Borough Council	Carried Forward	1-2 years	<25,000	Natural Systems Protection
3	Flood	Consider the feasibility of constructing a levee from Gilmartin Street to South Laurel to control flooding on the Lackawanna River.	Bourgh Council, U.S. Army Corps of Engineers	Ongoing	1-2 years	>100,000	Structure and Infrastructure Projects
4	Flood	Consider stream channelization on Oak Creek Run and upgrade the culvert from Ash Street to the Lackawanna River.	Borough Council	Ongoing	1-2 years	25,000-100,000	Structure and Infrastructure Projects
5	Flood	Consider approximately 2000 feet of stream channelization of Laurel Run from the Lackawanna River upstream.	Borough Council	Ongoing	3-5 years	25,000-100,000	Natural Systems Protection
6	Flood	Consider stream channelization of Tinklepaugh Creek from Kennedy Boulevard, downstream to Blakely Borough.	Borough Council	Ongoing	3-5 years	25,000-100,000	Natural Systems Protection
7	Flood	Develop mitigation measures including an implementation strategy for Archbald House #2 that is located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for\ Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Township Board of Supervisors	Carried Forward	1-2 years	25,000-100,000	Structure and Infrastructure Projects
Benton Township							
1	Flood	Develop mitigation measures including an implementation strategy for Seaman's Airport that is located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Township Board of Supervisors	Ongoing	1-2 years	25,000-100,000	Structure and Infrastructure Projects

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
Blakely Borough							
1	Flood	Conduct an engineering study for the design of flood control projects in Blakely Borough to mitigate flooding at the Hull Creek/Lackawanna River confluence and maintain and restore a forested riparian buffer through this reach.	Borough Council	Ongoing	1-2 years	25,000-100,000	Structure and Infrastructure Projects /Natural Systems Protection
2	Flood	Identify options to reduce flooding on Riverside Drive and Adele Drive.	Borough Council	Ongoing	Continuous	<25,000	Structure and Infrastructure Projects /Natural Systems Protection
3	Flood	Conduct a channelization study at Tinklepaugh Creek at the Lackawanna River to avoid back up into the channel from flooding of the Lackawanna River.	Borough Council	Ongoing	3-5 years	25,000-100,000	Natural Systems Protection
Carbondale City							
1		Construct retaining walls to replace the degraded flood walls at Racket Brook Creek.	City of Carbondale, USACE	In Progress	1-2 years	>100,000	Structure and Infrastructure Projects
2		Restore the riparian corridor along Fall Brook Creek to mitigate flooding along Fall Brook Creek and the Lackawanna River	City of Carbondale	Not Started	1-2 years	25,000-100,000	Natural Systems Protection
3		Conduct an engineering study to investigate solutions to controlling stormwater runoff from Salem Mountain / Wayne Street and 8th Avenue	City of Carbondale, USACE	Not Started	1-2 years	25,000-100,000	Structure and Infrastructure Projects
4		Conduct an engineering study to investigate solutions to controlling stormwater runoff from the City which impacts the intersection of Church St. And 7th Avenue	City of Carbondale, USACE	Not Started	1-2 years	25,000-100,000	Structure and Infrastructure Projects
5		Conduct an engineering study to investigate solutions to controlling stormwater runoff from the City which impacts Rear Park St. near Carbondale Township line.	City of Carbondale, USACE	Not Started	1-2 years	25,000-100,000	Structure and Infrastructure Projects
6		Acquire a backup emergency generator at the Fire Department (6th Ave) and Police Department (Main St)	City of Carbondale	Not Started	1 year	<5,000	Emergency Response/Operational Preparedness
Carbondale Township							
No actions carried forward							
Clarks Green Borough							

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
1	Flood	Since Ackerly Creek has overtopped its banks on several occasions conduct a watershed study to determine the sources of the flooding problems.	Borough Council	In Progress	1-2 years	<25,000	Natural Systems Protection
2	Flood	Include language in the Township's zoning, land development and subdivision plans to improve the management of small lot subdivisions, especially relative to slope, soil and drainage conditions.	Borough Council	Ongoing	Continuous	<25,000	Local Plans and Regulations
3	All hazards	Include language in the Township's zoning, subdivision and land development ordinances and comprehensive plans to protect open space, natural areas, wetlands, woodlands, and stream corridors.	Borough Council	Ongoing	Continuous	<25,000	Local Plans and Regulations
4	Flood	Include language in the Borough's zoning, subdivision and land use ordinances and comprehensive plan to protect Landsdowne Creek.	Borough Council	Ongoing	Continuous	<25,000	Local Plans and Regulations
Clarks Summit Borough							
1	Flood	Since Ackerly Creek has overtopped its banks on several occasions conduct a watershed study to determine the sources of the flooding problems.	Borough Council, Lackawanna County Planning Department, and the Scranton Abingtons Planning Association	Ongoing	1-2 years	<25,000	Natural Systems Protection
2	Flood	Conduct a study to identify areas within the Borough that require the replacement of storm drains and culverts along roadways to handle stormwater effectively.	Borough Council	Ongoing	3-5 years	<25,000	Structure and Infrastructure Projects
3	Flood	Develop mitigation measures including an implementation strategy for the Sewer Authority that is located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Township Board of Supervisors	Ongoing	1-2 years	25,000-100,000	Structure and Infrastructure Projects /Natural Systems Protection
Clifton Township							
No actions carried forward.							
Covington Township							
No actions carried forward.							

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
Dalton Borough							
1	Flood	Since Ackerly Creek has overtopped its banks on several occasions conduct a watershed study to determine the sources of the flooding problems.	Borough Council, Lackawanna County Planning Department, and the Scranton Abingtons Planning Association	Carried Forward	1-2 years	<25,000	Natural Systems Protection
2	All hazards	Upgrade fire company communications system that serves the Borough fire company, emergency management agency, and other borough departments.	Borough Council	Not Started	1-2 years	25,000-100,000	Emergency Response/Operational Preparedness
3	Flood	Identify ways to protect the sewage treatment plant on the creek through creek bank restoration and other means such as levees or floodwalls.	Borough Council	Ongoing	3-5 years	25,000-100,000	Structure and Infrastructure Projects /Natural Systems Protection
4	Flood	Conduct a study to identify the work needed on Ackerly Creek north and south of Route 632 (Main Street) to protect the businesses and residences on Main Street from flooding.	Borough Council	Ongoing	1-2 years	<25,000	Structure and Infrastructure Projects /Natural Systems Protection
Dickson City Borough							
1	Flood	Include language in the Borough's ordinances for stream corridor buffer and set back requirements and emphasize the protection of stream and river corridors, flood plains and habitat values and functions.	Borough Council	Ongoing	Continuous	<25,000	Local Plans and Regulations
2	Flood	Clean and repair stormwater drainage collection systems.	Borough Council	Ongoing	Continuous	<25,000	Natural Systems Protection
Dunmore Borough							
1	Flood	Restore the stream channels of Roaring Brook to restore the capacity of the stream.	Township Board of Supervisors	Ongoing	1-2 years	25,000-100,000	Natural Systems Protection
Elmhurst Township							
1	Hazardous Material	Investigate ways to prevent / mitigate a potential train derailment carrying hazardous material through the Township	Lackawanna County RR Authority	Ongoing	1-2 years	<25,000	Structure and Infrastructure Projects
2	Hazardous Material	Ensure adequate emergency response services are available to respond to potential truck accidents carrying hazardous material on I-84 and I-380.	Township Board of Supervisors	Ongoing	Continuous	<25,000	Emergency Response/Operational Preparedness

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
3	All hazards	Work with PennDOT and applicable local agencies to determine the structural condition of SR 435, Gardner Rd, and Front St bridges over the Railroad that in case of failure would affect traffic and the Railroad.	Elmhurst Township, PennDOT	Ongoing	3-5 years	<25,000	Structure and Infrastructure Projects
Fell Township							
1	Flood and Mine Subsidence	Consider a channel restoration project on Wilson Creek to reduce flooding and eliminate infiltration into the mine pool from Richmondale to Simpson	Township Board of Supervisors	Carried Forward	1-2 years	25,000-100,000	Structure and Infrastructure Projects /Natural Systems Protection
Glenburn Township							
1	Flood	Since Ackerly Creek has overtopped its banks on several occasions conduct a watershed study to determine the sources of the flooding problems.	Township Board of Supervisors, Lackawanna County Planning Department, and the Scranton Abingtons Planning Association	Carried Forward	1-2 years	<25,000	Natural Systems Protection
2	All Hazards	Identify the most appropriate mitigation measures for Edgewood Trailer Park since there is a sewage treatment plant nearby.	Township Board of Supervisors	Ongoing	Continuous	<25,000	Natural Systems Protection
Greenfield Township							
1	Flood	Include language in the Township's zoning, subdivision, and land development ordinances for the protection of upper headwater reaches of Rush Brook and Fall Brook.	Township Board of Supervisors	Ongoing	Continuous	<5,000	Local Plans and Regulations
2	Flood	Consider enhancements to the Township's zoning, land development and subdivision plans to improve the management of small lot subdivisions, especially relative to slope, soil and drainage conditions and participate with other municipalities, county agencies in programs to better manage minor subdivision development.	Township Board of Supervisors	Ongoing	1-2 years	<5,000	Local Plans and Regulations
Jefferson Township							
1	Flood	Incorporate language in the Township's plans and ordinances to protect appropriate resources in the Wallenpaupack headwaters along Moosic Mountain. Support the acquisition, protection, and conservation of these resources	Township Board of Supervisors	Ongoing	1-2 years	<5,000	Local Plans and Regulations
Jermyn Borough							

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
1	Flood	Identify flood control measures on Rushbrook Creek including the construction of concrete channels.	Borough Council; U.S. Army Corps of Engineers; PA Department of Environmental Protection	On-Going	1-2 years	<5,000	Local Plans and Regulations
Jessup Borough							
1		Include language in the Borough's SALDO to require a 75-foot building setback from each side of the creek's channel center and from the bank full line along the Lackawanna River, for all new development	Borough Council	Ongoing	1-2 years	<5,000	Local Plans and Regulations
La Plume Township							
1	Flood	Work with DEP to remove fallen trees and large branches that have fallen into the stream during past storms to prevent future flooding of the stream.	Township Board of Supervisors	Ongoing	Continuous	<25,000	Natural Systems Protection
Madison Township							
1	Flood	Consider the acquisition of a majority of the Theta Company properties within the Elmhurst and Curtis Reservoir sheds Reservoirs in Madison Township, or the development of a conservation easement program to ensure that these lands are maintained as open space in the future.	Township Board of Supervisors	In Progress	3-5 years	25,000-100,000	Structure and Infrastructure Projects /Natural Systems Protection
Mayfield Borough							
1	Flood	Construct flood control berms along the Lackawanna River North of Hosey Creek.	Borough Council, DEP, US Army Corps of Engineers	Not Started	3-5 years	25,000-100,000	Structure and Infrastructure Projects
2	Hazardous Material	Develop a regular inspection program and upgrade the containment system for the 15,000 gallon gasoline storage tanks near BR0006.	Borough Council, DEP	Ongoing	3-5 years	<25,000	Education Awareness Programs
3	Flood	Replace undersized pipe culvert at Hill Street which affects homes in the 400, 500, and 600 block of Hill Street during heavy rain.	Borough Council	Not Started	3-5 years	>100,000	Structure and Infrastructure Projects
4	Flood	Conduct an engineering study for the design of a new/improved flood protection system along the Lackawanna River from Meredith Street bridge (Carbondale Township) to the Powderly Creek at Oak Street.	Borough Council; PennDOT	Not Started	1-2 years	25,000-100,000	Structure and Infrastructure Projects
Moosic Borough							

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
1	Flood	Consider using the lower reaches of Spring Brook in Moosic, Spike Island and Belin Village for educational interpretation of the various types of structural and nonstructural responses to issues related to bank stabilization, flood control and mine water infiltration.	Borough Council	Completed	1-2 years	<25,000	Educational Awareness Programs
2	Flood	Provide upgrades to the pump station.	Borough Council	Not Applicable	1-2 years	25,000-100,000	Structure and Infrastructure Projects
3	Flood	Conduct a study to explore alternatives to address flooding along the Lackawanna River and Springbrook Creek.	Borough Council	Completed	1-2 years	<5,000	Structure and Infrastructure Projects /Natural Systems Protection
4	Dam Failure	Conduct a study of high hazard dams in Springbrook Township, Rocky Glen, and Glenwood Lakes, since a breach of the dams would impact Moosic Borough.	Borough Council; USACE	Ongoing	1-2 years	<25,000	Structure and Infrastructure Projects /Natural Systems Protection
5	Hazardous Material	Explore alternatives to address transportation hazard\ concerns with- 1) I-81 and the Pa Turnpike; 2) CP Railroad and auxiliary rail lines that service manufacturing on Corey Street and along the old Power Mill corridor; 3) the International Airport.	Borough Council; PennDOT	Not Applicable	Continuous	<25,000	Structure and Infrastructure Projects / Local Plans and Regulations
6	Hazardous Material	Conduct a study to address the large ammonia storage facilities involving manufacturing at the Preferred Meals and Mia Products sites.	Borough Council	Ongoing	1-2 years	<25,000	Emergency Response/ Operational Preparedness
7	Flood	Conduct a study to address stormwater issues at the Birney Plaza intersection and on Birney Avenue through the Lombardi property to the Lackawanna River.	Borough Council	Completed	1-2 years	<25,000	Structure and Infrastructure Projects /Natural Systems Protection
8	Hazardous Material	Conduct a study to address transportation hazard concerns involving the continued closure of the 500 block of Main Street bridge, and the temporary bridge on 3rd Street between Moosic and Old Forge.	Borough Council	Not Applicable	1-2 years	<25,000	Structure and Infrastructure Projects / Local Plans and Regulations
9	All hazards	Install a backup generator and radio equipment upgrades to the Greenwood Fire Station to better prepare the facility to function as the Borough's EOC.	Borough Council	Ongoing	1-2 years	<5,000	Emergency Response/ Operational Preparedness
Moscow Borough							
1	Flood	Conduct an engineering study to investigate solutions to mitigate flooding potential at Vaubrunt St, SR 690, and Brook St from Van Brunt Creek and Bear Brook which would impact three schools and the Moscow Sewer Authority Facility.	2014 Municipal Mitigation Workshop	Not Applicable	1-2 years	<25,000	Structure and Infrastructure Projects

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
2	All hazards	Investigate ways to prevent / mitigate a potential train derailment at the underpass at Market St (SR 690) which would cause potential for hazardous materials release putting at risk nearby homes and business, and which would cut off emergency services to a large portion of the Borough.	2014 Municipal Mitigation Workshop	Not Applicable	1-2 years	<25,000	Structure and Infrastructure Projects
3	All hazards	Ensure adequate emergency response services are available to respond to potential accidents on I-380 involving hazardous material spills.	2014 Municipal Mitigation Workshop	In Progress	Continuous	<25,000	Emergency Response/ Operational Preparedness
4	All hazards	Develop a plan to address the evacuation needs of a large population of senior citizens in a proposed senior housing development.	2014 Municipal Mitigation Workshop	In Progress	1-2 years	<5,000	Local Plans and Regulations
5	Winter Storm	Acquire an emergency generator at the Borough/Police Building, which is needed in the event of power outages which would leave the Borough without emergency response capabilities.	2014 Municipal Mitigation Workshop	In Progress	1 year	<5,000	Emergency Response/ Operational Preparedness
6	All hazards	Develop an additional crossing over the Railroad to mitigate potential incidents at the underpass of SR 690 and SR 435 which would cut off half of the Borough and much of the surrounding municipalities from critical emergency services.	2014 Municipal Mitigation Workshop	Not Applicable	3-5 years	>100,000	Structure and Infrastructure Projects
7	All hazards	Develop a plan to address the evacuation needs of a large population of school students from the 3 schools.	2014 Municipal Mitigation Workshop	Not Started	1-2 years	<5,000	Local Plans and Regulations
Newton Township							
1	Flood	Conduct a regional watershed study for Gardner, Keyser, Buttermilk, and Falls Creek.	Township Board of Supervisors, Lackawanna County Planning Department, and the Scranton Abingtons Planning Association	Carried Forward	1-2 years	<25,000	Natural Systems Protection
2	Flood	Include language for the protection of Keyser Creek, in Newton Township's zoning, subdivision and land development ordinances and comprehensive plans.	Township Board of Supervisors	Carried Forward	Continuous	<5,000	Local Plans and Regulations
3	Flood	Consider enhancements to the Township's zoning, land development and subdivision plans to improve the management of small lot subdivisions, especially relative to slope, soil and drainage conditions. Participate with local municipalities and county agencies in programs to better manage minor subdivision development.	Township Board of Supervisors	Carried Forward	Continuous	<5,000	Local Plans and Regulations

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
4	Flood	Include language in the Township's zoning, subdivision and land development ordinances and comprehensive plans to further define and protect open space, natural areas, wetlands, woodlands, and stream corridors.	Township Board of Supervisors	Carried Forward	Continuous	<5,000	Local Plans and Regulations
5	Flood	Consider conservation easements, acquisition, or other protection measures for headwaters of Keyser Creek.	Township Board of Supervisors	Carried Forward	Continuous	25,000-100,000	Structure and Infrastructure Projects/Natural Systems Protection
North Abington Township							
No actions carried forward							
Old Forge Borough							
1	Flood and Mine related hazards	Replace the borehole culvert at the Old Forge, Duryea, and Butler Mine outfalls.	Borough Council, Army Corps of Engineers, Bureau of Abandoned Mine Reclamation	Carried Forward	1-2 years	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Consider easements through acquisition to reduce flooding to structures along St. John's Creek in the Borough.	Borough Council	Carried Forward	Continuous	<25,000	Natural Systems Protection
3	Mine related hazards	Conduct annual inspections of the structures that discharge stormwater and groundwater from the flooded mine pool and identify any structural repairs needed.	Borough Council, Borough Department of Public Works	Carried Forward	Continuous	<25,000	Structure and Infrastructure Projects
Olyphant Borough							
1	Mine related hazards	Work with the Office of Surface Mining (OSM) to continue to contain the mine fire in Olyphant Borough near S.R. 6 with trenches and barriers and ensure the fire does not spread to adjacent mines or properties.	Borough Council, Office of Surface Mining – US Department of the Interior	Ongoing	Continuous	<5,000	Structure and Infrastructure Projects
Ransom Township							
1	Flood	Consider easements or acquisitions to conserve upper headwater areas of St. Johns Creek and its tributary streams, Race Brook and Sawmill Creek.	Township Board of Supervisors	Ongoing	Continuous	<5,000	Natural Systems Protection

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
2	Flood	Consider conservation easements or acquisition for the headwaters of Keyser Creek and its tributary streams Lucky Run and Lindy Creek.	Township Board of Supervisors	Ongoing	Continuous	<5,000	Natural Systems Protection
3	Flood	Remove debris from tributary streams to Gardners Creek.	PennDOT	Ongoing	Continuous	<5,000	Natural Systems Protection
4	Hazardous Material	Investigate ways to prevent / mitigate a potential train derailment carrying hazardous material through the Township.	Township Board of Supervisors	Ongoing	Continuous	<25,000	Structure and Infrastructure Projects
5	All hazards	Develop education procedures and mass notification systems such as an early warning system for the Village of Ransom to notify residents of potential hazard events.	Township Board of Supervisors	Ongoing	3-5 years	25,000-100,000	Education Awareness Programs
Roaring Brook Township							
1	Hazardous Material	Develop education procedures and mass notification for large and small incidents at major interstates I-380 and I-84.	Roaring Brook Town Supervisor	Ongoing	3-5 years	<5,000	Education Awareness Programs
2	Wildfire	Create program for educating homeowners through newsletters and the Township web site on wildfire prevention, particularly for two new subdivisions containing 98 lots and 198 lots of which multiple acre lots are carved from, and are adjacent to, woodlands. Ensure adequate emergency response services are available to respond to wildfires.	Roaring Brook Town Supervisor	Ongoing	1-2 years	<5,000	Education Awareness Programs
Scott Township							
1	Flood	Consider the acquisition of a majority of Theta Company lands in the Leggetts Creek watershed, including property around Griffin Reservoir, by public or private conservation agencies for long term preservation.	Township Board of Supervisors	Ongoing	1-2 years	<25,000	Natural Systems Protection
2	Flood	Consider acquisition of conservation easements along upper reaches of Hull Creek to protect the properties from flooding.	Township Board of Supervisors	Ongoing	Continuous	<25,000	Natural Systems Protection
Scranton City							
1	Flood	Repair/Replace the Roaring Brook flood control structure through south Scranton.	City Council	Ongoing	3-5 years	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Conduct a regional watershed study of the Pine Brook Watershed and engineering studies for the local drainage and nuisance flooding problems in the residential areas of the watershed.	City Council	Not Started	3-5 years	<25,000	Natural Systems Protection

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
3	Flood	Increase height of the Albright, Plot and Green Ridge levees along the Lackawanna River in areas that fail to comply with FEMA freeboard regulations.	USACE/City Council	Not Started	3-5 years	>100,000	Structure and Infrastructure Projects
4	All hazards	Create disaster recovery site for City Activities.	Planning Commission	Ongoing	1-2 years	<25,000	Emergency Response/Operational Preparedness
5	Flood	Continue to buyout Repetitive Loss, Severe Repetitive Loss, and substantially damaged structures within the municipality	Planning Commission	Ongoing	3-5 years	25,000-100,000	Structure and Infrastructure Projects/Natural Systems Protection
South Abington Township							
1	Flood	Conduct a watershed study for Leggetts and Summit Lake Creek.	Township Board of Supervisors, Lackawanna County Planning Department, and the Scranton Abingtons Planning Association	Carried Forward	1-2 years	<25,000	Natural Systems Protection
2	Flood	Consider the acquisition of majority of Theta Company lands in the Leggetts Creek watershed, including property around Griffin Reservoir and downstream along the creek and Maple Lake, by public or private conservation agencies for long-term preservation.	Lackawanna County, Township Board of Supervisors	Ongoing	1-2 years	<25,000	Natural Systems Protection
3	Flood	Develop mitigation measures including an implementation strategy for the municipal building that is located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Township Board of Supervisors	Carried Forward	1-2 years	25,000-100,000	Structure and Infrastructure Projects/Natural Systems Protection
4	Flood	Conduct an engineering study to investigate potential solutions to flooding of SR 6 & 11 between I-81 and the off ramp to the Abington Shopping Center and provide adequate warning signs and alternate routes to drivers to detour to other areas.	PennDOT	Carried Forward	1-2 years	<25,000	Structure and Infrastructure Projects
5	Flood	Remove debris from the creek under Shady Lane Rd, and at multiple bridges to the south.	PennDOT	Ongoing	Continuous	<5,000	Natural Systems Protection
6	All hazards	Work with PennDOT and applicable local agencies to continue to pursue the design and construction of a bypass around SR 611 at Clarks Summit to I-81 to relieve congestion on SR 611 which prevents efficient evacuation in the event of potential hazards.	PennDOT	Carried Forward	3-5 years	>100,000	Structure and Infrastructure Projects

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
Spring Brook Township							
1	Flood	Consider the acquisition of a majority of the Theta Company properties within the Spring Brook Intake, and Nesbitt and Watres Reservoir sheds, or the development of a conservation easement program to ensure that these lands are maintained as open space in the future.	Township Board of Supervisors, EPA	Ongoing/ Not Started	1-2 years	<25,000	Natural Systems Protection
2	Flood	Clear fallen debris (trees) from Rattle Snake Creek and Trout Run to allow maximum flow during high volume times.	Township Board of Supervisors	Ongoing	Continuous	<5,000	Natural Systems Protection
Taylor Borough							
	No actions carried forward						
Thornhurst Township							
1	All hazards	Since the firehouse is also used as a shelter during emergencies, determine the feasibility of constructing a building next to fire house to store fire trucks during disasters.	Township Board of Supervisors	Not Started	3-5 years	<25,000	Structure and Infrastructure Projects
Throop Borough							
1	Flood	Consider a flood control project in Throop Borough to mitigate flooding along the Lackawanna River and Eddy Creek, while maintaining and restoring a forested riparian buffer through this reach of Eddy Creek.	Borough Council	Ongoing	Continuous	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Replace the existing stormwater conveyance system from Cypress St to Sulphur Creek with an upgraded system to improve drainage and mitigate flooding in the Borough.	Borough Council	In Progress	3-5 years	25,000-100,000	Structure and Infrastructure Projects
3	All hazards	Acquire emergency backup generators at the police department and civic center facilities.	Borough Council	In Progress	1 year	<5,000	Emergency Response/ Operational Preparedness
4	Mine Area	Conduct a mine restoration activity to cap the open mine areas in the Borough.	Borough Council	Not Started	Continuous	25,000-100,000	Natural Systems Protection
Vandling Borough							
	No mitigation actions carried forward.						
Waverly Township							

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Timeline	Approximate Cost ($)	Action Category
1	Flood	Improve, repair, and maintain multiple stormwater management facilities (detention basins) in the Township.	Township Board of Supervisors	Ongoing	Continuous	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Since Ackerly Creek has overtopped its banks on several occasions conduct a watershed study to determine the sources of the flooding problems.	Lackawanna County Planning Department and the Scranton Abingtons Planning Association	Ongoing	1-2 years	<25,000	Natural Systems Protection
West Abington Township							
1	Flood	Identify areas throughout the Township that need to be replaced with drainpipes of a larger diameter to handle increase water flow due to flooding.	Township Board of Supervisors	Ongoing	Continuous	<5,000	Structure and Infrastructure Projects
2	All hazards	Identify areas in the Township where the road widths are not wide enough to allow passage of emergency/utilities vehicles during an emergency	Township Board of Supervisors	Ongoing	1-2 years	<5,000	Structure and Infrastructure Projects
3	Flood	Replace/repair drainage ditches and pipes on Lower Staton Town Road, Beech Hill Road, and Orchard Road.	Township Board of Supervisors	Ongoing	1-2 years	25,000-100,000	Structure and Infrastructure Projects
4	Flood	Conduct a transportation study to include a traffic analysis, road improvements, and address evacuation routes so they are better prepared to face flood events.	Township Board of Supervisors	Ongoing	1-2 years	<25,000	Education Awareness Programs

The below actions (Table 6.7) are newly developed based on responses to the municipal survey, hazard areas identified by the municipalities, and discussions during the municipal workshop.

Table 6.7 Lackawanna County New Municipal Mitigation Actions

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
New Municipal Mitigation Actions						
Archbald Borough						
No new additional actions						
Benton Township						

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
1	Flood	Prepare for large volumes of surface water run off created by heavy rains or snow melt by increasing ditch and culvert capacities in areas most vulnerable.	Benton Township Supervisors	Continuous	25,000-100,000	Structure and Infrastructure Projects
2	Winter Storm	Identify and prioritize snow removal routes. Identifying these routes to township residents and first responders. Identifying those residents which may require special attention due to medical reasons.	Benton Township Supervisors	1-2 years	<5,000	Education Awareness Programs
3	Wind event	Ensure the safety of residents by conducting an immediate appraisal of damage township wide. Provide for stranded residents with water, ice, and other essentials. Clearing of major arteries within the township. Provide for emergency shelter.	Benton Township Supervisors.	Continuous	<25,000	Emergency Response/Operational Preparedness
Blakely Borough						
1	Flood	Develop mitigation measures including an implementation strategy for Blakely High Rise for the Lackawanna County Housing Authority, which experiences rear flooding due to riverbank overflow. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for\ Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Borough Council	1-2 years	25,000-100,000	Structure and Infrastructure Projects
Carbondale City						
No new additional actions						
Carbondale Township						
1	Flood	Consider conducting streambank stabilization along Brookside Creek near Main Street/Business Route 6 to reduce flood impacts from heavy rain events.	Township Board of Supervisors	1-2 years	<25,000	Natural Systems Protection
2	Flood	Develop mitigation measures/projects to minimize flood impacts when flooding occurs behind the residences on the western side of Lower Powderly Street near the intersection with Erie Street.	Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects/Natural Systems Protection
Clarks Green Borough						
No new additional actions						
Clarks Summit Borough						

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
1	Flood	Conduct streambank stabilization along creek between Center St, Bedford St., and Marion St.	Borough Council	1-2 years	25,000-100,000	Natural Systems Protection
2	Flood	Take land upstream of creek behind E Greenwood, develop stormwater detention system	Borough Council	1-2 years	>100,000	Structure and Infrastructure Projects/Natural Systems Protection
3	Flood	Replace stormwater pipes under N State St @ Highland	Borough Council	3-5 years	>100,000	Structure and Infrastructure Projects
4	Flood	Replace stormwater pipes under N State St @ E Greenwood	Borough Council	3-5 years	>100,000	Structure and Infrastructure Projects
5	Flood	Improve stormwater infrastructure to handle increased loads coming from outside of the community	Borough Council	Continuous	25,000-100,000	Structure and Infrastructure Projects
6	Flood	Develop and maintain a preventive maintenance program involving storm drains, swales, and trash racks	Borough Council	1-2 years	>100,000	Structure and Infrastructure Projects
7	Wind	Removal of dead ash trees throughout town	Borough Council	Continuous	25,000-100,000	Natural Systems Protection
8	Winter Storm	Develop snow removal strategy for downtown after a major event	Borough Council	1-2 years	<25,000	Local Plans and Regulations
9	Rail	Develop plan for addressing rail accident involving hazardous materials	Borough Council	1-2 years	<25,000	Local Plans and Regulations
10	Infectious Disease/Pandemic	Educate municipal residents and local emergency personnel on the potential risk of an infectious disease outbreak, and on safety and mitigation techniques to follow before, during, and after an infectious disease outbreak.	Borough Council	Continuous	<5,000	Education Awareness Programs
Clifton Township						
1	Infectious Disease/ Pandemic	Educate municipal residents and local emergency personnel on the potential risk of an infectious disease outbreak, and on safety and mitigation techniques to follow before, during, and after an infectious disease outbreak.	Clifton Township	Continuous	<5,000	Education Awareness Programs
Covington Township						
1	Transportation Hazards	Develop spill and emergency response plans for rail and hazmat incidents.	Covington Township Supervisors	1-2 years	<5,000	Local Plans and Regulations
2	All Hazards	Identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	Covington Township Supervisors	6-12 months	<5,000	Education Awareness Programs
Dalton Borough						
No new additional actions.						

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
Dickson City Borough						
1	Flood	Consider developing mitigation measures/projects to minimize flood impacts when flooding occurs near the intersection of Main Street and Sunset.	Borough Council	1-2 years	25,000-100,000	Structure and Infrastructure Projects/Natural Systems Protection
2	Flood	Consider developing mitigation measures/projects to minimize flood impacts when flooding occurs near the intersection of Main Street and Sunset Bowman	Borough Council	1-2 years	25,000-100,000	Structure and Infrastructure Projects/Natural Systems Protection
3	Mine-related Hazards	Ensure verbiage is included in local plans/ordinances to discourage and/or allow no new development in known mine and potentially land subsiding areas.	Borough Council	Continuous	<5,000	Local Plans and Regulations
Dunmore Borough						
1	Flood	Consider dredging along Roaring Brook to help restore stream capacity and to protect from future riverbank overflow in the Borough.	Borough Council	1-2 years	25,000-100,000	Natural Systems Protection
Elmhurst Township						
1	Flood	Dredge and stabilize stream banks on Roaring Brook Creek Between Route 435 bridge (culvert) and 100 Feet downstream from the Lackawanna County owned bridge on G.C. Smith Street. Need immediate removal of large sandbar between Route 435 and G.C. Smith Street	Elmhurst Township Supervisors	1-2 years	25,000-100,000	Natural Systems Protection
2	Flood	Replace state owned bridge on route 435, just south of G.C. Smith Street, over unnamed creek. Small passageway is fed by an 8'or 10' culvert which runs under State Route 590. Stabilize stream banks on unnamed creek between Route 590 and G.C. Smith Street.	Elmhurst Township Supervisors	3-5 years	>100,000	Structure and Infrastructure Projects
3	Flood	Remove debris (logs etc.) from dam and waterfalls at Elmhurst Reservoir (PG&W ownership) Debris, mainly logs float downstream with high water levels and become lodged under the G.C. Smith Street Bridge blocking water flow.	Elmhurst Township Supervisors	Continuous	<25,000	Natural Systems Protection
4	Flood/ Transportation Hazards	Replace culverts (3) with larger arch pipes on Rattlesnake creek between Front Street and Roaring Brook Creek. This involves the railroad bed, Front Street and an access roadway leading the Elmhurst Reservoir.	Elmhurst Township Supervisors	3-5 years	>100,000	Structure and Infrastructure Projects
5	Flood/ Transportation Hazards	Replace culvert with large arch pipe on Front Street @ Rudy's Recycling.	Elmhurst Township Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects
6	Flooding/ Transportation Hazards	Repair road and improve drainage systems to prevent future roadway washouts on Knickerbocker Lane	Elmhurst Township Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
7	Transportation Hazards	Develop spill and emergency response plans for rail and hazmat incidents	Elmhurst Township Supervisors	1-2 years	<5,000	Local Plans and Regulations
Fell Township						
No new additional actions.						
Glenburn Township						
1		Ensure adequacy of snow emergency routes and road clearing priorities, policies, and procedures in the Township.	Glenburn Township Supervisors	Continuous	<5,000	Local Plans and Regulations
Greenfield Township						
1	Transportation Hazards	Ensure the adequacy of spill and emergency response plans for hazmat incidents along I-81 in the Township	Greenfield Township Supervisors	Continuous	<5,000	Local Plans and Regulations
2	Wildfire	Consider working the county and other local municipalities to partner with Federal, state, county, local and other agencies to become a “Firewise Communities".	Greenfield Township Supervisors	Continuous	<5,000	Education Awareness Programs
Jefferson Township						
1	Flood	Improve drainage systems to prevent future roadway washouts and to reduce flood impacts at the Jefferson Heights Development on Jefferson Boulevard.	Jefferson Township Supervisors	1-2 years	<25,000	Structure and Infrastructure Projects
Jermyn Borough						
1	Flood	Conduct an engineering study to determine best mitigation options for flooding in the area of the 500 block of Mellow Court, to reduce flood impacts following severe storm events.	Borough Council	1-2 years	<25,000	Structure and Infrastructure Projects
Jessup Borough						
1	Mine-related Hazards	Restrict development in areas with soil that is considered poor or unsuitable for development.	Borough Council	Continuous	<5,000	Local Plans and Regulations
La Plume Township						
1	Transportation Hazards	Consider developing and implementing traffic calming measures to reduce truck and automobile traffic speeds at the intersection of East LaPlume Road (PA-438) and Routes 6 and 11.	LaPlume Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
Madison Township						
1	Flood	Consider conducting an engineering study to determine best mitigation options to reduce runoff, overflow, and flood impacts in the area of Bird Road	Madison Township Board of Supervisors	1-2 years	<25,000	Structure and Infrastructure Projects
Mayfield Borough						
1	Flood	Replace culverts with larger arch pipes along the 400,500, and 600 block of Hill Street, to reduce or eliminate flood impacts due to undersized and occluded storm sewer system.	Borough Council	3-5 years	>100,000	Structure and Infrastructure Projects
2	Flood	Raise freeboard along the Lackawanna River Levee between Oak Street and the Jermyn Borough line to meet the freeboard requirements identified in the new FEMA Flood Insurance Rate Maps.	Borough Council; DEP	1-2 years	<5,000	Local Plans and Regulations
3	Flood	Conduct streambank stabilization along the Lackawanna River north of Oak Street, to reduce flood impacts north of this area that result from eroded riverbanks.	Borough Council	1-2 years	<25,000	Natural Systems Protection
Moosic Borough						
No new additional actions.						
Moscow Borough						
No new additional actions.						
Newton Township						
1	Flood	Replace culverts with larger arch pipes on Hilltop Drive.	Newton Township Board of Supervisors	1-2 years	>100,000	Structure and Infrastructure Projects
2	Flood	Replace the collapsing culverts on Fords Pond Road.	Newton Township Board of Supervisors	1-2 years	>100,000	Structure and Infrastructure Projects
North Abington Township						
1	Flood	Continue to buyout Repetitive Loss, Severe Repetitive Loss, and substantially damaged structures within the municipality, as necessary	North Abington Township Board of Supervisors	Continuous	25,000-100,000	Structure and Infrastructure Projects / Natural Systems Protection
2	Wildfire	Work with the county and other local municipalities to partner with Federal, state, county, local and other agencies to become “Firewise Communities”	North Abington Township Board of Supervisors	Continuous	<5,000	Education Awareness Programs
Old Forge Borough						

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
1	Mine-related Hazards	Restrict development in areas with soil that is considered poor or unsuitable for development.	Borough Council	Continuous	<5,000	Local Plans and Regulations
2	Flood	Continue to buyout Repetitive Loss, Severe Repetitive Loss, and substantially damaged structures within the municipality	Borough Council	Continuous	25,000-100,000	Structure and Infrastructure Projects / Natural Systems Protection
Olyphant Borough						
1	Mine related hazards	Work with the Office of Surface Mining (OSM) to continue to contain thee mine fire in Olyphant Borough near S.R. 6 with trenches and barriers and ensure the fire does not spread to adjacent mines or properties.	Borough Council, Office of Surface Mining - US Department of the Interior	Continuous	25,000-100,000	Structure and Infrastructure Projects / Natural Systems Protection
2	Infectious Disease/ Pandemic	Educate municipal residents and local emergency personnel on the potential risk of an infectious disease outbreak, and on safety and mitigation techniques to follow before, during, and after an infectious disease outbreak.	Borough Council	Continuous	<5,000	Education Awareness Programs
3	Winter Storm	Develop and update snow emergency routes and road clearing priorities, policies, and procedures.	Borough Council	Continuous	<5,000	Local Plans and Regulations
4	All Hazards	Identify a point of contact to perform an annual review of the mitigation actions for their municipality from this Hazard Mitigation Plan.	Borough Council	6-12 months	<5,000	Education Awareness Problems
Ransom Township						
No new additional actions						
Roaring Brook Township						
1	Wildfire	Develop a Township Open Burn Ordinance through the planning or zoning process to help reduce the risk of human-caused wildfires.	Roaring Brook Township Board of Supervisors	1-2 years	<5,000	Local Plans and Regulations
2	Transportation Hazards	Develop/Ensure adequacy of spill and emergency response plans for hazmat and other transportation incidents.	Roaring Brook Township Board of Supervisors	Continuous	<5,000	Local Plans and Regulations
3	Transportation Hazards	Develop traffic calming measures at the intersection of I-380 and I-84 in the township to help decrease the probability of transportation accidents and hazardous materials releases.	Roaring Brook Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects
Scott Township						
1	Flood	Complete stream bank stabilization at an un-named tributary to Hull Creek in the 100 block of Green Grove Road	Hull Creek	1-2 years	<25,000	Natural Systems Protection

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
Scranton City						
1	Infectious Disease/ Pandemic	Educate municipal residents and local emergency personnel on the potential risk of an infectious disease outbreak, and on safety and mitigation techniques to follow before, during, and after an infectious disease outbreak.	City Council	Continuous	<5,000	Education Awareness Programs
	Flood	Perform mitigation on 700 E Parker St. Property requires protection due to increased flood heights due to Plot levee construction.	Public Works/Planning	Continuous	25,000-100,000	Structure and Infrastructure Projects
	Flood	Perform mitigation on 805 Raines St. Property requires protection due to increased flood heights due to Plot levee construction.	Public Works/Planning	Continuous	25,000-100,000	Structure and Infrastructure Projects
	Flood	Conduct streambank stabilization at areas along Keyser Creek, Leggetts Creek, Roaring Brook to prevent further damage	Public Works	3-5 years	25,000-100,000	Natural Systems Protection
	Winter Storm	Develop snow emergency routes and road clearing priorities, policies, and procedures.	Public Works	Continuous	<25,000	Local Plans and Regulations
	Flood	Increase capacity of river gage at Parker St. on Lackawanna River to include forecasted river heights.	NOAA, USGS, PA DEP	2-3 years	25,000-100,000	Structure and Infrastructure Projects
South Abington Township						
1	Flood	Work with PennDOT to clean debris from the stormwater system along the 800, 900, 1000, 1100 blocks of Northern Boulevard	South Abington Township Board of Supervisors	1-2 years	<25,000	Natural Systems Protection
Spring Brook Township						
1	Flood	Continue to buyout Repetitive Loss, Severe Repetitive Loss, and substantially damaged structures within the township	Spring Brook Township Board of Supervisors	Continuous	25,000-100,000	Structure and Infrastructure Projects / Natural Systems Protection
Taylor Borough						

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
1	Flood	Develop mitigation measures including an implementation strategy for the following areas: • 900 Block of Union Street Sewer Pump Station Area • 200 Block of Oak Street Over Keyser Creek • Stauffer Industrial Park Road/Kane Road Over Keyser Creek • 400 Block of Old North Main Street Over Keyser Creek • 1000 Block of Sibley Avenue Over St. John's Creek • 1300 Block of South Main Avenue Near Paroby Auto/Taylor Commons/Walmart Shopping Center • Bald Mountain Road Near McDade Park to Keyser Avenue Adjacent to Lucky Run Creek	Borough Council	3-5 years	>100,000	Structure and Infrastructure Projects / Natural Systems Protection
2	Transportation Hazards	Develop and update spill and emergency response plans for transportation and hazmat incidents along transportation networks and industrial sites.	Borough Council	Continuous	<5,000	Local Plans and Regulations
3	Transportation Hazards	Ensure adequate ingress and egress of emergency vehicles in response to pipeline-related emergencies.	Borough Council	Continuous	<25,000	Emergency Response/ Operational Preparedness
4	Mine-related Hazards	Restrict development in areas with soil that is considered poor or unsuitable for development, with a focus on Reading Blue Mountain and Northern Railroad	Borough Council	Continuous	<5,000	Local Plans and Regulations
Thornhurst Township						
1	Flood	Replace culverts/stormwater pipes with larger culverts/stormwater pipes at the intersection of River Road and Bear Lake Road, to reduce flood impacts from the Lehigh River.	Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Develop mitigation measures including an implementation strategy at River Road near Sang Spring Road and River Road near the cemetery, to reduce flood impacts from the Lehigh River during large precipitation events.	Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects / Natural Systems Protection
Throop Borough						
1	Flood	Replace culverts/stormwater pipes with larger culverts/stormwater pipes at the intersection of George Street and Simpsom Street, to mitigate the impacts of stormwater backup during extreme rain events.	Borough Council	1-2 years	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Replace culverts/stormwater pipes with larger culverts/stormwater pipes along the 800 block of Center Street, to mitigate the impacts of stormwater backup during extreme rain events.	Borough Council	1-2 years	25,000-100,000	Structure and Infrastructure Projects

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Timeline	Approximate Cost ($)	Action Category
3	Flood	Reduce the stream channel encroachments at Marshwood Road and the former Erie Railroad, to reduce impacts from stormwater backup during extreme rain events.	Borough Council	Continuous	25,000-100,000	Natural Systems Protection
Vandling Borough						
1	Wildfire	Develop a Borough Open Burn Ordinance through a planning process, to help reduce the risk of human-caused wildfires.	Borough Council	1-2 years	<5,000	Local Plans and Regulations
2	Mine-related Hazards	Restrict development in areas with soil that is considered poor or unsuitable for development.	Borough Council	Continuous	<5,000	Local Plans and Regulations
Waverly Township						
1	Flood	Replace culverts/stormwater pipes with larger culverts/stormwater pipes along the along State Road 632 segment #80, to reduce or eliminate roadway flooding.	Waverly Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects
2	Flood	Replace culverts/stormwater pipes with larger culverts/stormwater pipes along the along State Road 407 segment #30/40, to reduce roadway erosion and road closures due to roadway flooding.	Waverly Township Board of Supervisors	1-2 years	25,000-100,000	Structure and Infrastructure Projects
3	Flood	Ensure proper maintenance and debris removal form the stormwater system along State Road 407 segment #40, so the roadway is not overwhelmed with stormwater during and following extreme rain events	Waverly Township Board of Supervisors	Continuous	<25,000	Natural Systems Protection
West Abington Township						
No additional new actions						

6.4.2 Status of Past Actions

Action items from the 2015 HMP that have been completed, deemed infeasible, or merged/combined with another action item have been removed from this plan. Those actions are itemized, described, and justified in Table 6.9 for County actions, and in Table 6.10 for municipal actions.

The Steering Committee reviewed the actions in the 2015 Plan and each action from the original plan was discussed and categorized based on definitions given in Table 6.8. Municipalities not completing any actions since 2015, or not providing updates have been left blank.

Table 6.8 Action Status Definitions

Status	Definition
In Progress	Work has been initiated on these actions. These projects have a definite end-date.
On-Going	Actions that are performed on a regular and continuous basis
Completed	The lead department has completed the action since the development of the 2015 Plan.
Not Applicable	Actions that were deemed by the Steering Committee to not apply to the HMP Update.
Cancelled	Officials have decided to terminate this project.
Infeasible	After further study this project was deemed to be infeasible based on benefit/cost analysis, engineering study, or other criterion.
Combined	Actions that were combined with other existing actions that are very similar in nature.
Carried Forward	A status was not determined, therefore carried forward to this plan.

Table 6.9 Lackawanna County 2015 Completed, Cancelled, Not Applicable

Action	Hazard Mitigated	Lead Agency for Implementation	Status	Notes
Consider developing an ordinance to prioritize or control water use, particularly for emergency situations like firefighting.	Drought	County Regional Planning Commission	Cancelled	No longer relevant to this plan.
Review the SALDO and ensure all standards address the ability of emergency access based on radius and width of roadways. Determine size what it should be and approach townships to address accessibility issue with large pieces of equipment in these forest areas.	Wildfire	Pennsylvania Department Conservation and Natural Resources - Forestry	Combine with other action	----
Work with State agencies, professional organizations, real-estate agents, and non-government organizations to conduct an annual workshop at a key location in each Muni/county for private developers to involve them in hazard mitigation activities and educate them on 'safe' development	All hazards	Department of Community and Economic Development, Pennsylvania Association of Township Supervisors, County Emergency Management Agency	Cancelled	This is conducted at the state level

Action	Hazard Mitigated	Lead Agency for Implementation	Status	Notes
principles that can be incorporated into their development proposals.				

For the municipalities with no actions included in this table, no actions from the 2015 Plan were determined as having been competed, cancelled, combined, or not applicable.

Table 6.10 2015 Municipal Actions Completed, Cancelled, or Not Applicable

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Notes
Past Municipal Actions Completed, Cancelled, or N/A					
Archbald Borough	None				
Benton Township	None				
Blakely Borough	None				
Carbondale City	None				
Carbondale Township	None				
	Flood	Construct retaining walls to replace the degraded flood walls at Racket Brook Creek.	City of Carbondale, USACE	Cancelled	Location not in Carbondale Township
	Flood	Restore the riparian corridor along Fall Brook Creek to mitigate flooding along Fall Brook Creek and the Lackawanna River		Cancelled	Location not in Carbondale Township
	Flood	Conduct an engineering study to investigate solutions to controlling stormwater runoff from Salem Mountain / Wayne Street and 8th Avenue	City of Carbondale, USACE	Cancelled	Location not in Carbondale Township
	Flood	Conduct an engineering study to investigate solutions to controlling stormwater runoff from the City which impacts the intersection of Church St. And 7th Avenue	City of Carbondale, USACE	Cancelled	Location not in Carbondale Township
	Flood	Conduct an engineering study to investigate solutions to controlling stormwater runoff from the City which impacts Rear Park St. near Carbondale Township line.	City of Carbondale, USACE	Cancelled	Location not in Carbondale Township
	All Hazards	Acquire a backup emergency generator at the Fire Department (6th Ave) and Police Department (Main St)	City of Carbondale	Cancelled	Location not in Carbondale Township
Clarks Green Borough					
Clarks Summit Borough					

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Notes
	Flood	Conduct a Corridor Stormwater Management Study to analyze the hydrology of the tributary to Summit Lake Creek.	Borough Council	Not applicable	--
	Flood	Provide information on the importance of purchasing flood insurance to all property owners in the floodplain.	Borough Council	Completed	--
	Flood	Conduct a study to determine the replacement and/or upgrade of the major sewer main running along the railroad.	Borough Council	Completed	--
	Mine Related hazards	Conduct a workshop to educate residents on the impacts of stormwater infiltration in the sewer system.	Borough Council	Not applicable	--
Clifton Township					
Covington Township					
Dalton Borough					
Dickson City Borough					
Dunmore Borough					
Elmhurst Township					
	Flood	Conduct an engineering study to identify the most appropriate mitigation measure for the Township Government Building on South Main Street and the sanitary station on G.C. Smith Street	Township Board of Supervisors	Completed	New dam finished in 2018 and is DEP approved.
	Dam	Ensure that the Elmhurst Reservoir meets all DEP Division of Dam Safety requirements for high hazard dams	Township Board of Supervisors	Completed	New dams meet requirements.
Fell Township					
Glenburn Township					
Greenfield Township					
Jefferson Township					
Jermyn Borough					
	Flood	Consider additional streambank stabilization along Aylesworth Creek upstream of the confluence with the Lackawanna River.	Borough Council	Cancelled	To the best of my knowledge, this was not completed.
	Flood	Conduct a study to address stormwater issues on the 700 blocks of Lincoln, Jefferson, and Madison Avenues.	Borough Council	Completed	Storm sewer installed through Lackawanna

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Notes
					County CDBG grant
	All hazards	Determine the feasibility of setting up a command center in the Borough to provide support during emergencies.	Borough Council	Completed	Police, Fire, Emergency Management Coordinators work together to setup command center based on type of emergency (mobile, fire station, borough building, etc.)
	Flood	Determine the feasibility of constructing a levee in the Borough along the Lackawanna River.	Borough Council	Cancelled	To the best of my knowledge, this was not completed
	Flood	Remove sand bars and gravel bars in the Lackawanna River on Evergreen Drive and Delaware Street to restore the flood carrying capacity of the River.	Borough Council	Cancelled	This was not completed.
Jessup Borough					
La Plume Township					
Madison Township					
Mayfield Borough					
	Flood	Remove debris and sedimentation from Powderly Creek on the east side of the D&H Railroad tracks.		Complete	DEP did some type of channel reconstruction in Carbondale Twp. Which is upstream of Mayfield
Moosic Borough					
	Flood	Consider using the lower reaches of Spring Brook in Moosic, Spike Island and Belin Village for educational interpretation of the various types of structural and nonstructural responses to issues related to bank stabilization, flood control and mine water infiltration.	Borough Council	Completed	
	Flood	Provide upgrades to the pump station.	Borough Council	N/A	

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Notes
	Flood	Conduct a study to explore alternatives to address flooding along the Lackawanna River and Springbrook Creek.	Borough Council	Completed	This action is completed
	Hazardous Material	Explore alternatives to address transportation hazard\ concerns with- 1) I-81 and the Pa Turnpike; 2) CP Railroad and auxiliary rail lines that service manufacturing on Corey Street and along the old Power Mill corridor; 3) the International Airport.	Borough Council	Not applicable	This action is no longer applicable to Moosic Borough
	Flood	Conduct a study to address stormwater issues at the Birney Plaza intersection and on Birney Avenue through the Lombardi property to the Lackawanna River.	Borough Council	Completed	This action is completed
	Hazardous Material	Conduct a study to address transportation hazard concerns involving the continued closure of the 500 block of Main Street bridge, and the temporary bridge on 3rd Street between Moosic and Old Forge.	Borough Council	Not applicable	This is a PennDOT concern
Moscow Borough					
Newton Township					
North Abington Township					
	Flood	Conduct a watershed study for Kennedy Creek and South Branch Tunkhannock Creek.	Township Board of Supervisors, Lackawanna County Planning Department, and the Scranton Abingtons Planning Association	Not Applicable	--
Old Forge Borough					
Olyphant Borough					
Ransom Township					
Roaring Brook Township					

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Notes
	All hazards	Acquire emergency backup generators for Roaring Brook Township Operations Center (430 Blue Shutters Road) and the maintenance facility (210 Elmhurst Blvd) to be used for power outages and provide charging stations for cell phones and computers.	Roaring Brook Town Supervisor	Complete	Installed and operational in February 2020
Scott Township					
Scranton City					
	Flood	Identify appropriate measures for the undersized bridges on Greenbush Run.	City Council	Complete	Completed
	Flood	Acquire remaining 3 properties for FEMA mitigation – 2 on Parker Street, 1 on Raines Street	City council	Not Applicable	Action has been reworded
South Abington Township					
Spring Brook Township					
	Flood	Replace undersized culvert on Swartz Valley Road.	Township Board of Supervisors	Completed	--
Taylor Borough					
	Flood	Consider acquisition of conservation easements along Taylor Borough along the Lackawanna River.	Borough Council	Not Applicable	--
	Flood	Acquire protective easements along restored stream reaches on St. Johns Creek	Borough Council	Not Applicable	--
	Flood	Develop easements or acquisitions to conserve upper headwater areas of St. Johns Creek and two of its tributaries, Race Brook and Sawmill Creek.	Borough Council	Not Applicable	--
	Flood	Develop mitigation measures including an implementation strategy for the sewer pump station on the border of Scranton and Taylor Borough and is located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Township Board of Supervisors	Not Applicable	--
Thornhurst Township					
	Flood	Replace undersized culverts at the intersection of Bear Lake and River Road.	Township Board of Supervisors	Not Applicable	This is not the Township's responsibility,

Municipality	Hazard Mitigated	Mitigation Action	Lead Agency	Action Status	Notes
					would like assistance from PennDOT
	Flood	Replace or repair the two dams (Kahulitus Dam) at Thornhurst Country Club Estates.	Township Board of Supervisors	Not Applicable	DCNR responsibility
	Flood	Identify means to alleviate the erosion problem along the banks of the Lehigh River through riverbank stabilization.	Township Board of Supervisors	Not Applicable	--
	Flood	Develop mitigation measures including an implementation strategy for the Township building and firehouse that are both located in the floodplain. Use FEMA publication 551, Selecting Appropriate Mitigation Measures for Floodprone Structures, which provides guidance on determining appropriate mitigation measures.	Township Board of Supervisors	Not Applicable	Township Building and firehouse not in floodplain
Throop Borough					
Vandling Borough					
Waverly Township					
	Flood	The pump station is inadequate to handle larger storm events. Conduct a study to determine appropriate upgrades to the sewer pump station.	Township Board of Supervisors	Completed	--
West Abington Township					

Funding Sources

Financial sources are a critical aspect to implementing projects within a community. In the past, the municipalities, as well as the County, have taken an active role in seeking funds for these planning efforts. The following funding sources provide grants for hazard mitigation planning and project related activities:

- Hazard Mitigation Grant Program (HMGP) – HMGP is administered by FEMA and provides grants to states, tribes and local governments to implement hazard mitigation actions after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation activities to be implemented as a community recovers from a disaster. Eligible projects include: elevating flood-prone homes or businesses; acquisition of flood-prone homes from willing owners and returning the property to open space; retrofitting buildings; and construction of floodwall systems to protect critical facilities.
- Building Resilient Infrastructure and Communities (BRIC) Program – BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM). The Program supports states, local communities, tribes and territories as they undertake hazard mitigation projects, and its guiding principles are supporting

communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.[68] The BRIC program provides FEMA a platform through which to apply its lifelines concept to mitigation practices so the communities can build their resilience to the cascading impacts of disruptive events.

This amendment to the Stafford Act creates a new funding source that will set aside six percent of federal post-disaster grant funding in support of a new pre-disaster hazard mitigation grant program. The BRIC Program specifically ensures funding is available every year and removes the uncertainty associated with the annual appropriations process that funded the PDM.

- Public Health Emergency Preparedness – The PHEP program provides funds for health departments to build and strengthen their abilities to effectively respond to a range of public health threats, including infectious diseases, natural disasters, and biological, chemical, nuclear, and radiological events. Preparedness activities funded by the PHEP cooperative agreement are targeted specifically for the development of emergency-ready public health departments that are flexible and adaptable.
- Urban Areas Security Initiative (UASI)– The UASI program assists high-threat, high-density urban areas in efforts to build and sustain the capabilities necessary to prevent, protect against, mitigate, respond to, and recover from acts of terrorism. The UASI program is intended to provide financial assistance to address the unique multi-discipline planning, organization, equipment, training, and exercise needs of high-threat, high-density Urban Areas, and to assist these areas in building and sustaining capabilities.
- Flood Mitigation Assistance (FMA) Program – FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, or other National Flood Insurance Program (NFIP) insurable structures with a focus on repetitive loss properties. The NFIP enables 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 damages. Three types of FMA grants are available to States and communities: 1) planning grants to prepare Flood Mitigation Plans; 2) project grants to implement measures to reduce flood losses, such as elevation, acquisition, or relocation of NFIP-insured structures; and 3) technical assistance grants for the State to help administer the FMA program and activities.
- Repetitive Flood Claims – The program provides funding to States and communities to reduce or eliminate the long-term risk of flood damage to structures insured under the NFIP that have had one or more claims for flood damages, and that cannot meet the requirements of the FMA program for either cost share or capacity to manage the activities. Eligible activities include: 1) acquisition of properties and either demolition or relocation of flood-prone structures, where the property is deed restricted for open space uses in perpetuity; 2) elevations; 3) dry flood-proofing of non-residential structures; and 4) minor localized flood control projects.
- Severe Repetitive Loss (SRL) - A SRL property is defined as a residential property that is covered under a NFIP flood insurance policy and: 1) that has at least four NFIP claim

[68] Federal Emergency Management Agency 2020, Building Resilient Infrastructure and Communities, available at: https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or 2) for which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. Eligible flood mitigation project activities under the SRL program include: 1) acquisition and demolition or relocation of at-risk structures and conversion of the property to open space; 2) elevation of existing structures to at least the base flood elevation; 3) minor physical localized flood reduction projects; and 4) dry flood-proofing for historic properties.

- Emergency Management Performance Grants (EMPG) – The EMPG program provides resources to state and local governments to develop an all-hazards planning approach to emergency management and to sustain and enhance all-hazards emergency management capabilities. Every State is eligible for a percentage of the available funds and is intended to sustain the core capabilities of the five (Prevention, Protection, Mitigation, Response, and Recovery) mission areas.

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. While the percentage of local contribution varies from program to program, Local communities need to assess their financial capability and resources to implement their hazard mitigation action plans. Lackawanna County can meet match requirements through various funding sources.

- Annual Budgets
  The County Comprehensive Plan discusses the intent of the Capital Improvements Program (CIP) to provide a logical and orderly sequence for undertaking the recommendations of the Comprehensive Plan and that consideration be given to the scheduling of projects in a manner as to distribute their costs realistically over a number of years. Recognizing the scarcity of the local financial resources and the increased competition for the tax dollar, the County-wide CIP makes every attempt to maximize the various financial resources available to the individual municipalities. The CIP classifications described in the Comprehensive Plan include improvements related to housing, transportation, public utilities, community facilities, and economic development.

All of the above sources of funding can serve as financial resources for implementation of this Plan. It is important to recognize that many of these sources have limited funds, and that the County will need to partner with the municipalities to provide as many opportunities for planning and hazard mitigation funds as possible. Wherever possible, County, and municipal funding should be used to leverage funds from state, federal, or other sources in order to maximize dollars.

7.0 CHAPTER 7 – PLAN MAINTENANCE

Requirement §201.6(c)(4)(i): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle

Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

7.1 Update Process Summary

Once this Plan has received approval from the PEMA and the FEMA, the Plan will be adopted by the Lackawanna County Commission and its 40 participating jurisdictions. This County HMP Update is intended to be a 'living document'. Plan adoption is not considered the final step in the planning process, but rather as a first step to 'realization'. The plan monitoring and maintenance schedule is a cycle of events that involve periodic review, adjustments, and improvement. This Chapter establishes a method to monitor how the Plan will be evaluated and maintained in the future.

7.2 Monitoring, Evaluating, and Updating the Plan

This 2020 HMP Update will be monitored by the County for several related purposes:

1. Maintain the currency of hazard and risk information.
2. Ensure mitigation projects and actions reflect the priorities of the County, the HMP Steering Committee, and the general public.
3. Comply with FEMA and PEMA requirements for HMP maintenance, and to maintain eligibility for Federal disaster assistance and mitigation grants.

In order to ensure that the Plan continues to provide a framework of reducing risk in the County, the Planning Department will take responsibility to convene an annual meeting of the Hazard Mitigation Plan Steering Committee. The Committee will comprise of the members who were involved in the preparation of the Plan Update as well as municipal representatives. This annual review will evaluate the plans effectiveness, applicability, and ongoing strategy.

Two annual report forms have been developed and included at the end of this chapter: 1) the County form that will be completed for each high priority project; and 2) a Municipality Annual Report Form that will be completed by each municipality to provide an update to the County on the status of their mitigation projects. This form will be distributed to all municipalities requesting them to document the status of each hazard mitigation action for their jurisdiction. Each action proposed in the Mitigation Plan will be categorized as one of the following: completed, in progress, not started/delayed, modified, or cancelled. The Steering Committee will assist the Planning Director to prepare a status report of the mitigation actions based on the annual report forms from the municipalities as well as the County.

In addition to conducting an annual review of the plan, the Steering Committee will review the Plan within 30 days after a disaster. Each goal and objective will be examined for its relevance and validity to the changing situation in each municipality and the mitigation actions will be reviewed to ensure that it addresses any recent issues that may have stemmed from disaster events. During periods without hazard events, the Plan will be updated every five years to reflect the current risk, vulnerabilities, development trends and as mitigation actions are implemented. While an annual report will be competed each year, any state and federal mandates from PEMA and FEMA respectively, will be addressed in the five-year update. The municipalities will not be responsible for making any changes to the HMP based on PEMA or FEMA requirements in between the five-year update.

The Lackawanna County Planning Department is responsible for coordinating the Steering Committee, and the Committee shall monitor and maintain the HMP Update. The Planning Department and Steering Committee shall continuously monitor the HMP for the purposes noted above and with respect to the update triggers discussed in the section below.

Upon adoption of this plan, the Department of Planning will annually convene a meeting of representatives from the SC to discuss and determine implementation accomplishments and/or implementation obstacles and recommended solutions. Although the individuals filling the positions may change from year to year, future Steering Committee members will continue to be comprised of the same departments and organizations involved in this current update. Planning will also be responsible for monitoring and preparing the annual progress reports, and will utilize the data obtained from the annual meeting to note the progress made on mitigation action items in annual progress reports.

Circumstances or conditions under which Lackawanna County will initiate HMP reviews and updates:

1. On the recommendation of the County Executive, or on its own initiative, the County may initiate an HMP review at any time.
2. At approximately the one-year anniversary of the HMP's re-adoption, and approximately at the same anniversary every year thereafter.
3. After a natural hazard event that appears to significantly change the apparent risk to County assets, operations and/or citizens.
4. Upon receipt of new or updated data or information that may affect the HIRA.
5. When activities within the County, Region, or State significantly alter the potential effect of natural hazards on County assets, operations and/or citizens. Examples include completed mitigation projects that reduce risk, or actions or circumstances that increase risk.

In addition to the circumstances listed above, revisions that warrant changing the text of this HMP or incorporating new information may be prompted by a number of circumstances, including identification of specific new mitigation projects, completion of several mitigation actions, or requirements for qualifying for specific funding. Minor revisions may be handled by addenda.

A benefit-cost analysis determines the cost effectiveness of a project to minimize damage or prevent future damage from future hazard events. By determining the benefit cost of the proposed mitigation projects, it will provide the communities as well as project developers with additional knowledge about the feasibility of the proposed mitigation alternative. If the costs

outweigh the benefits, then other alternatives that are more effective can be identified to accomplish the Plan's goals.

This 2020 HMP Update will be posted on Lackawanna County's website under the Planning Department's tab. Notices of the website's availability will be distributed to the following groups:

- The Federal and State agencies that were notified and invited to participate in the HMP's development;
- The organizations, agencies, and elected officials who received notices of public meetings; and,
- Citizens who attended public meetings and provided contact information.

7.3 Continued Public Involvement

The preparation of this Plan has involved the municipalities and public throughout the process through meetings and via newspapers, the internet, and social media. Lackawanna County is dedicated to continuing to solicit municipal and public participation during the five-year update as required by FEMA. Copies of the HMP Update will be placed on the County's website, along with a mechanism for submission for comments. Additionally, annual update meetings should be open to the public and all municipalities, and an advertising and outreach campaign undertaken to encourage the public to attend and provide comment.

Upon adoption of the updated 2020 HMP, the public will be notified of any substantial changes to the document prior to the next scheduled update in 2025. Any changes proposed by the Steering Committee that are considered significant, will be distributed to the list of stakeholders identified in Chapter 3, *Planning Process*. The Steering Committee will then review any and all suggested changes and make recommendations for revisions to the plan as deemed appropriate and/or necessary.

8.0 CHAPTER 8 - PLAN ADOPTION

Requirement §201.6(c)(5): *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., County Commission).*

Adoption by the Local Governing Body

Include adoption resolution from Lackawanna County here

Multi-Jurisdictional Plan Adoption

Requirement §201.6(c)(5): *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan* ***must*** *document that it has been formally adopted.*

Include adoption resolutions from all municipalities in Lackawanna County here.

Incorporation of Mitigation Actions into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): *[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

The County/ Regional Comprehensive Plan; CIP; Building Code, Municipal Floodplain Management Regulations, Emergency Operations Plan (EOP), and Zoning Ordinances are identified for incorporation of hazard mitigation actions once the Plan is adopted. Each of these mechanisms will continue to be used to meet the intent of this Plan, as appropriate. Once the County adopts this County HMP Update, mitigation strategies discussed in this plan will be implemented via the aforementioned mechanisms as well as through the incorporation into the new planning mechanisms. For these documents that are already in existence, mitigation actions should be incorporated as an amendment to the document.

Incorporation of Mitigation Actions into Existing Planning Mechanisms - Municipalities

Once the County Commission adopts the 2020 Lackawanna County HMP Update, each individual jurisdiction will be required to adopt the Plan Update as well. Once this is completed, the County EMA will continue to assist local jurisdictions with the implementation of mitigation projects. Each participating municipality will be responsible for implementing the specific mitigation actions identified in this Plan and incorporating these actions into their local planning documents such as comprehensive plans, zoning ordinances, land development, and subdivision regulations, as amendments and will identify capital improvement projects that are consistent with this Plan's goals. Municipalities will be responsible for obtaining funds from suggested state and Federal sources to implement their respective mitigation actions.

APPENDIX A – BIBLIOGRAPHY

1. Lackawanna County Conservation District, 2020. Watershed Program, available at http://www.lccd.net/watershed-program/
2. Lackawanna County Government, 2020, available at https://www.lackawannacounty.org/pages/education.html
3. Lackawanna County Government, Luzerne County Government. May 2011. Lackawanna-Luzerne Regional Plan: A Comprehensive Plan and Long-Range Transportation Plan for Lackawanna and Luzerne Counties
4. Lackawanna County Government, 2020. Emergency Services/9-11, available at: https://www.lackawannacounty.org/index.php/departmentsagencies/public-safty/emergency-services-9-1-1
5. Lackawanna County Government, 2020, Quick Facts, available at https://www.lackawannacounty.org/index.php/quick-facts#4.
6. Lackawanna County Government, 2020, Quick Facts, available at https://www.lackawannacounty.org/index.php/quick-facts#4.
7. Lackawanna County Government, 2020, Schools, available at https://www.lackawannacounty.org/index.php/school-map.
8. Lackawanna County Housing Coalition. 2020. Building a Home in Lackawanna County, available at http://www.lackawannahousing.org/building.html.
9. Lackawanna County Regional Planning Commission, 2018. County Lines: A Profile of Lackawanna County, 2018, available at https://www.lackawannacounty.org/uploads/planning/CountyLines2018.pdf.
10. Lackawanna-Luzerne Metropolitan Planning Association, 2016. 2016 Luzerne-Lackawanna Lang Range Transportation Plan, available at http://www.lltsmpo.com/wp-content/uploads/2017/06/2016-02-17-Final-Lackawanna-Luzerne-LRTP.pdf.
11. Lackawanna River Watershed Act 167 Stormwater Management Ordinance, available at: https://covingtontwp.org/wp-content/uploads/2010/11/Lackawanna-River-Watershed-Storm-Water-Management-Ordinance-Fee-Schedule.pdf.
12. National Oceanic and Atmospheric Administration, National Centers for Environmental Information, 2020. Storm Events Database, Lackawanna County, Pennsylvania, Event Types: High Wind, Strong Wind, Thunderstorm Wind, Tornado, available at: https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+High+Wind&eventType=%28Z%29+Strong+Wind&eventType=%28C%29+Thunderstorm+Wind&eventType=%28C%29+Tornado&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1960&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA
13. National Oceanic and Atmospheric Administration, National Centers for Environmental Information, 2020. Storm Events Database, Lackawanna County, Pennsylvania, Event Types: Ice Storm, Winter Storm, Winter Weather, available at: https://www.ncdc.noaa.gov/stormevents/listevents.jsp?eventType=%28Z%29+Ice+Storm&eventType=%28Z%29+Winter+Storm&eventType=%28Z%29+Winter+Weather&beginDate_mm=01&beginDate_dd=01&beginDate_yyyy=1980&endDate_mm=04&endDate_dd=30&endDate_yyyy=2020&county=LACKAWANNA%3A69&hailfilter=0.00&tornfilter=0&windfilter=000&sort=DT&submitbutton=Search&statefips=42%2CPENNSYLVANIA
14. Pennsylvania Department of Conservation and Natural Resources. Effects of Landslides in Pennsylvania. Available at https://www.dcnr.pa.gov/Geology/GeologicHazards/Landslides/Pages/default.aspx.
15. Pennsylvania Department of Environmental Protection. July 2020. Act 167 Stormwater Management Plan Status, available at https://www.dep.pa.gov/Business/Water/CleanWater/StormwaterMgmt/Pages/Act-167.aspx
16. Pennsylvania Emergency Management Agency, 2018. Commonwealth of Pennsylvania 2018 State Hazard Mitigation Plan, available at: https://www.pema.pa.gov/Mitigation/Planning/State-Hazard-Mitigation-Plan/Pages/default.aspx.

17. Ransom Township, Pennsylvania, 2015. Ransom Township MS4 Stormwater Management Ordinance, 2015, available at: http://ransomtownship.com/ms4.

18. Tornado Project Online, 2015, available at: http://www.tornadoproject.com/alltorns/patorn.htm

19. United States Census Bureau, 2018, All Sectors: County Business Patterns by Legal Form of Organization and Employment Size Class for U.S., States, and Selected Geographies: 2018, available at: https://data.census.gov/cedsci/table?g=0500000US42069&d=ANN%20Business%20Patterns%20County%20Business%20Patterns&table=CB1800CBP&tid=CBP2018.CB1800CBP&hidePreview=true&lastDisplayedRow=18&t=Business%20and%20Economy%3AEmployment%3AEmployment%20and%20Labor%20Force%20Status%3AIndustry.

20. United States Census Bureau, 2020. Lackawanna County, Pennsylvania, available at: https://data.census.gov/cedsci/profile?q=Lackawanna%20County,%20Pennsylvania&g=0500000US42069&tid=ACSDP1Y2018.DP05

21. United States Department of Agriculture, 2017. 2017 Census of Agriculture County Profile: Lackawanna County, Pennsylvania. Available at: https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Pennsylvania/cp42069.pdf

22. United States Federal Emergency Management Agency, 2013. Local Mitigation Planning Handbook, available at: https://www.fema.gov/media-library-data/1590070172371-48e87ca446838ba81afc2aca995940bc/FEMA_Local_Mitigation_Planning_Handbook_508.pdf

23. United States Federal Emergency Management Agency, 2020. Hazard Mitigation Planning, available at: https://www.fema.gov/what-mitigation

24. United States Federal Emergency Management Agency. October 2019. Pennsylvania Top 50 National Flood Insurance Program Policy County Communities and Community Rating System Participation, available at https://crsresources.org/files/100/maps/states/pennsylvania_crs_map_october_2019.pdf.

APPENDIX B - LOCAL MITIGATION PLAN REVIEW TOOL

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction: Lackawanna County, PA	**Title of Plan:** 2020 Lackawanna County Hazard Mitigation Plan	**Date of Plan:** Janaury 27, 2021
Local Point of Contact: Mary Liz Donato		**Address:** 123 Wyoming Avenue, Suite 505, Scranton, PA 18503
Title: Regional Planning Manager		
Agency: Lackawanna County Dept of Planning & Econ Development		
Phone Number: 570.963.6400 x 1354		**E-Mail:** donatoml@lackawannacounty.org

State Reviewer:	**Title:**	**Date:**

FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region ***(insert #)***		

Plan Not Approved	
Plan Approvable Pending Adoption	
Plan Approved	

SECTION 1:
REGULATION CHECKLIST

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))	Section 3.1 (pg. 24) Section 3.2 (pg. 26) Section 3.3 (Pg. 27) Section 3.5 (pg. 29)		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))	Section 3.2 (pg. 26) Section 3.3 (pg. 27)		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))	Section 3.4 (pg. 29)		
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))	Section 5.2.5 (pg. 88-97) Chapter 8 (pg. 151)		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))	Section 7.2 (pg. 146) Section 7.3 (pg. 148)		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))	Section 7.2 (pg. 146)		

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan (section and/or page number)**	**Met**	**Not Met**
ELEMENT A: REQUIRED REVISIONS **REQUIRED REVISION:** **REQUIRED REVISION:** **REQUIRED REVISION:** **Recommended Revision**: **Recommended Revision**:			
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))	Section 4.3		
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))	Section 4.2.1 Section 4.3 Appendix E		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))	Section 4.3 Section 4.4 Appendix D		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))	Section 4.3.1.3 Section 5.2.2		
ELEMENT B: REQUIRED REVISIONS **REQUIRED REVISION:**			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))	Section 5.2.1 Section 5.2.2		

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	**Location in Plan** (section and/or page number)	**Met**	**Not Met**
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))	Section 6.3		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))	Section 6.2		
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))	Section 6.3 Section 6.4		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))	Section 6.4		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))	Section 5.2.5 Chapter 8		
ELEMENT C: REQUIRED REVISIONS **REQUIRED REVISION:**			
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))	Section 2.4		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3)) a)	Section 6.4 Section 6.4		
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 4.2.2 Section 4.3.14 Section 6.4		
ELEMENT D: REQUIRED REVISIONS **REQUIRED REVISION:**			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Chapter 8		

1. REGULATION CHECKLIST **Regulation** (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Chapter 8		
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

SECTION 2:
PLAN ASSESSMENT

INSTRUCTIONS: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

Plan Strengths and Opportunities for Improvement is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

Resources for Implementing Your Approved Plan provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.

A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

Element A: Planning Process

How does the Plan go above and beyond minimum requirements to document the planning process with respect to:

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

Element B: Hazard Identification and Risk Assessment

In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:

1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*

2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

Element C: Mitigation Strategy

How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:

- *Status of previously recommended mitigation actions;*

- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*

B. Resources for Implementing Your Approved Plan

Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

Multi-Jurisdiction Summary Sheet										
Jurisdiction/ Jurisdiction Type	Plan POC	Mailing Address	Email	Phone (570)	Requirements Met					
					Planning Process	HIRA	Mitigation Strategy	Plan Review, Eval., and Imp.	Plan Adoption	State Requirements
Archbald Borough	Robert Turlip	400 Church Street	archbaldboro@comcast.net	876-1800	X	X	X	X	X	X
Benton Township	Mary Pat Saxton	PO Box 29	pat_saxton@epix.net	563-2661	X	X	X	X	X	X
Blakely Borough	Thomas Wascura	1439 Main Street	twascura@blakelyborough.org	383-3340	X	X	X	X	X	X
City of Carbondale	Michele Bannon	1 North Main Street	mbannon@icontech.com	282-4633	X	X	X	X	X	X
Carbondale Township	Lawrence Catanzaro	103 School Street	NONE	282-5112	X	X	X	X	X	X
Clarks Green Borough	Joanne Culbertson	104 North Abington Road	jculbertson@clarksgreen.info	586-4446	X		X	X	X	X
Clarks Summit Borough	Virginia Kehoe	304 South State Street	clarkssummitmanager@gmail.com	586-9316	X	X	X	X	X	X
Clifton Township	Donna Stefanski	361 State Route 435	clftwp@ptd.net	842-4272	X	X	X	X	X	X
Covington Township	Kate Tierney	20 Moffat Drive	office@covingtontwp.org	842-8336	X	X	X	X	X	X
Dalton Borough	Joanne Davies	PO Box 95	daltonboro@comcast.net	563-1800	X	X	X	X	X	X
Dickson City Borough	Cesare Forconi	901 Enterprise Street	cforconi@dicksoncity-PA.gov	489-4758	X	X	X	X	X	X
Dunmore Borough	Vito Ruggiero	400 South Blakely Street	vito.ruggiero@dunmorepa.gov	343-7611	X		X	X	X	X
Elmhurst Township	Doreen Salt	112 Municipal Lane	elmhursttownship@comcast.net	842-9999	X	X	X	X	X	X
Fell Township	Annette Borosky	1 Veterans Drive	felltownship@echoes.net	282-0321	X		X	X	X	X

Glenburn Township	Bernadette Menendez	PO Box 694	glenburntwp@comcast.net	563-1177	X	X	X	X	X	X
Greenfield Township	Chaz Brewer	424 Route 106	supervisor@greenfieldtownship.org	282-7000	X	X	X	X	X	X
Jefferson Township	Coleen Watt	487 Cortez Road	cwatt@jeffersontownshippa.com	689-7028	X	X	X	X	X	X
Jermyn Borough	Dan Markey	440 Jefferson Avenue	jermynborough@jermynpa.com	876-0610	X	X	X	X	X	X
Jessup Borough	Mia Stine	395 Lane Street	jessupborough@comcast.net	489-0411	X	X	X	X	X	X
LaPlume Township	Shirley Lewis	2080 Hickory Ridge Road	laplumetwp@yahoo.com	945-5438	X	X	X	X	X	X
Madison Township	Doreen Salt	3200 Madisonville Road	doreensaltsec@gmail.com	842-3088	X	X	X	X	X	X
Mayfield Borough	Phyllis Jaskowiec	739 Penn Avenue	mayfieldboro@echoes.net	876-4391	X	X	X	X	X	X
Moosic Borough	Jane Sterling	715 Main Street	manager@moosicborough.com	457-5480	X		X	X	X	X
Moscow Borough	Constance Sanko	123 Van Brunt Street	office@moscowboro.com	842-1699	X	X	X	X	X	X
Newton Township	Francine Fawcett	1528 Newton-Ransom Blvd	newtontwp@epix.net	587-1520	X	X		X	X	X
North Abington Township	Mary Redel	PO Box 462	info@northabingtontownship.org	563-2385	X	X	X	X	X	X
Old Forge Borough	Mary Lynn Bartoletti	310 South Main Street	ofboromanager@comcast.net	457-8852	X		X	X	X	X
Olyphant Borough	C. J. Mustacchio	113 Willow Avenue	olyphant1@comcast.net	489-2135	X	X	X	X	X	X
Ransom Township	JoAnn Pane	2435 Hickory Lane	ransom2435@epix.net	586-7250	X	X	X	X	X	X
Roaring Brook Township	Dale Baird	430 Blue Shutters Road	roaringbrooktwp@comcast.net	842-6080	X	X	X	X	X	X
Scott Township	Carl Ferraro	1038 Montdale Road	cferraro@scotttownship.org	319-1296	X	X	X	X	X	X
City of Scranton	Lori Reed	340 North Washington Avenue	lreed@scrantonpa.gov	348-4113	X		X	X	X	X

South Abington Township	David O'Neill	PO Box 259	davido01@comcast.net	586-2111	X	X	X	X	X	X
Spring Brook Township	Tami Gillette	966 State Route 307	springbrooktwp@comcast.net	842-7028	X	X	X	X	X	X
Taylor Borough	Dan Zeleniak	122 Union Street	dzeleniak@taylorborough.com	562-1400	X		X	X	X	X
Thornhurst Township	Kim Grab	356 Old River Road	thornhurst4@gmail.com	842-4273	X	X	X	X	X	X
Throop Borough	Renee O'Malley	436 Sanderson Street	throopboro@comcast.net	489-8311	X	X	X	X	X	X
Vandling Borough	Nancy Perri	449 Hillside Street	vandling449@yahoo.com	785-5070	X		X	X	X	X
Waverly Township	Christine Capozzi	PO Box 8	waverlytownship@comcast.net	586-0111	X	X	X	X	X	X
West Abington Township	Francine Fawcett	2545 Bald Mountain Road	WATSEC@frontier.com	586-6489	X	X	X	X	X	X

APPENDIX C – MEETING AND OTHER PARTICIPATION DOCUMENTATION

Lackawanna County Hazard Mitigation Plan Update
Steering Committee Meeting #1
Meeting Summary
Date: February 25, 2020 Time: 2:30-4:30pm
Location: Lackawanna County Center for Public Safety, 30 Valley View Dr, Jessup, PA 18434

Attendees were given an introduction to the Consulting firm contracted for the planning and update process, Vision Planning and Consulting. Introductions were given to the principal Vision contacts working on the project, Ashley Samonisky and Andrew Estrain. Andrew discussed the project purpose, integrated planning process, deliverables, timelines, and progress to date for the plan. Andrew discussed the importance of Plan Integration, the mitigation action development process, and development of the implementation plan.

The Steering Committee was then presented with the initial findings of the Hazard Identification and Risk Assessment by Stephen Boone. This presentation provided definitions of terms used throughout the process and identified the various hazards Lackawanna County could potentially face. Stephen was also able to assign an estimated dollar amount for the potential losses associated with a serious various hazards such as flooding, earthquake, wildfire, land subsidence, and tropical cyclone wind events.

Committee members then discussed changing the prioritization (Low, Moderate, High) for the identified hazards based on the probability of them occurring. Some items were moved from high to moderate and some from moderate to low. The Committee then confirmed the county hazard rankings, which did not differ from the previous.

Committee members then examined each of the goals and objectives laid out in the 2015 County Hazards Mitigation Plan. Each goal and objective was evaluated line by line for clarity, cohesiveness, and relevance. Terminology was discussed, and suggestions made to help the plan be more comprehensible to the business sector and the general public. Following goals and objectives, Andrew then worked with the Committee to perform an initial review the status of past mitigation actions.

Major concerns raised and questions asked had to do with the new FEMA flood maps that were being developed for the County on a simultaneously, but separately, from the HMP Update. This made the HMP update process a bit confusing to some members as they were not aware that two different projects were taking place at the same time. Concerns were alleviated when told to follow the old flood maps, as the new ones were not yet released during the information gathering phase of the planning process.

Lackawanna County Hazard Mitigation Plan Update

Steering Committee Meeting #1

Agenda

Date: February 25, 2020; Time: 2:30-4:30pm

Location: Lackawanna County Center for Public Safety, 30 Valley View Dr, Jessup, PA 18434

Introductions

- Lackawanna County Department of Planning and Economic Development
- Consultants – Vision Planning and Consulting and JMT

Project Overview Presentation

- Planning Process
- Meetings
- Progress to Date

Goals and Objectives Exercise

- Review 2015 Hazard Mitigation Plan Goals and Objectives
- Discuss additional Goals and Objectives

Review Hazard Identification and Risk Assessment

- HIRA summary
- Glean input on risks from flood and other hazards
- Hazard prioritization

Mitigation Actions Review

- 2015 HMP mitigation actions - identify current status a past actions (in progress, completed, ongoing, etc.)

Capability Assessment

- Glean input on capability assessment related information.

Open Discussion

- Hot Topics

Next Steps

- Plan Integration
- Mitigation Strategy
- Implementation Plan
- Meetings (Steering Committee and Municipality Meetings – Round 2)

Questions

Adjournment

VISION
PLANNING & CONSULTING, LLC

SIGN-IN SHEET
Lackawanna County Hazard Mitigation Update

Steering Committee Meeting 1

February 25, 2020, 2:30-4:30 p.m.

Name	Phone	Email	Agency/Organization
Matthew Jones		JonesMat@LackawannaCounty.org	Lackawanna County Planning Dept.
Margaret Donato	570-963-6400	donatoml@lackawannacounty.org	Lack. C. Planning
Kate Crowley	570-877-3145	kate.crowley@redcross.org	American Red Cross
Jason McCain	570-241-6157	JMcCain1982@Gmail	Spring Brook twp
Steve Jarbola	570 947 7318	SJarbola@Som.Geisinger.EDU	Geisinger Commonwealth School of Medicine
Rich Barbolish	5703077304	barbolishr@lackawannacounty.org	Lack. EMA
Lonell Shalkowski	570.335.9300	lshalkowski@pa.gov	PennDOT District 4-0
Frank Summa	570 499 6134	Fsumma@gpinet.com	Greenman-Pedersen, Inc.
Dave Johns	570.507.9017	davidjohns@gpinet.com	GPI
Don King	570-348-4280	dKing@scrantonpa.gov	City of Scranton
Stephen Boone	610-366-2518	sboone@jmt.com	JMT
Ashley Simonitsky	888-872-9626	asimonitsky@vision-pc.net	VPC
Andrew Estrain	888-872-9626	aestrain@vision-pc.net	VPC

Lackawanna County Hazard Mitigation Plan Update

Steering Committee Meeting #2

Agenda

Date: June 16th, 2020

Time: 2:00-4:00pm

Location: Zoom Video Conference

Attendees were first provided with the project's progress to date. The Steering Committee was presented with the results of municipal participation. Vision Planning and Consulting (VPC) representative, Andrew Estrain, led an exercise to finalize and prioritize the list of mitigation actions for the Hazard Mitigation Plan, which had been emailed out prior to the meeting to ensure the Committee had sufficient time for review.

VPC then had a brainstorming session with the Steering Committee to determine and develop additional new mitigation actions based on results of the information provided back by municipalities. Several new mitigation actions were developed, and appropriate content and verbiage finalized. The Steering Committee also provided input on lead agency and potential funding sources related to the newly developed mitigation actions.

Each action item was discussed to determine phrasing, efficacy, and implementation methods. Some action items were combined for clarification and efficiency. An implementation plan was developed to determine Lead Agency, Timeline, Estimated cost and potential Funding Sources for each action item. Additionally, VPC then discussed the prioritization rubric which was based on Life/Safety, Technical/Administrative Difficulty, and Cost. As Life/Safety is the main goal of mitigation actions, it received a weight double that of the other considerations.

VPC worked with Committee members to examine and prioritize mitigation actions. Newly developed actions, as well as those carried forward from the previous plans, were evaluated and given a score based on their projected cost, the difficulty in performing or implementing the action, and the scale of area the action would protect (one street, one neighborhood, countywide, etc.). Actions were then ranked based on the prioritization score.

Specific concerns raised by committee members once again included the simultaneous development of FEMA floodplain maps and the HMP Update, which once again confused committee members. Committee members also questioned why some municipalities havd not yet participated. Due to that concern our Team reached out again to the handful of municipalities who were in jeopardy of not being approved for participating in, and filling the municipal requirements of, the Plan Update process.

Next steps include assembling the draft report for county and public review, and hosting the second and final public meeting.

Lackawanna County Hazard Mitigation Plan Update

Steering Committee Meeting #2

Agenda

Date: June 16th, 2020

Time: 2:00-4:00pm

Location: Zoom Video Conference

Progress to Date

- Brief Presentation

Past Actions Review

- Brief Discussion of Past Mitigation Actions

New Actions Review

- Examine New Mitigation Actions that Address Goals and Objectives

Mitigation Actions*

- Mitigation Action Finalization
- Prioritize Mitigation Actions
- Implementation Strategy

Open Discussion

Next Steps

- Public Meeting (webinar forum)
- Develop Draft Plan for Public Review
- Develop Final Plan for PEMA/FEMA Review

Questions

Adjournment

Discussions will also take place via email with Steering Committee representative and municipal representatives

SIGN-IN SHEET
Lackawanna County Hazard Mitigation Update
Steering Committee Meeting 2
June 16th, 2020 9:00am-11:00am
Location: Zoom Video Conference

Name	Phone	Email	Municipality/Organization
Mary Liz Donato	570-963-6400	donatoml@lackawannacounty.org	Lackawanna County Planning Dept.
Steve Pitoniak	----	---	Lackawanna County Planning Dept.
Jason McClain	570-241-6157	JMcLain1982@gmail.com	Spring Brook Township
Kate Crowley	570-877-3145	Kate.crowley@redcross.org	American Red Cross
Frank Summa	570 499 6134	fsumma@gpi.net	GPI
David Johns	570 507 9017	davidjohns@gpi.net	GPI
Steve Jarbolo	570 947 7318	---	Geisinger School of Medicine
Lonell Shalkowski	570 335 9300	lshalkowski@pa.gov.	PennDOT
Rich Barbolish	570 307 7304	barbolishr@lackawannacounty.org	Lackawanna County Emergency Management Agency
Andrew Estrain	888-872-9626	aestrain@vision-pc.net	VPC
Ashley Samonisky	888-872-9626	asamonisky@vision-pc.net	VPC

Lackawanna County Hazard Mitigation Plan Update
Municipal Meeting and Workshop
Meeting Summary

Date: February 25/26, 2020 Time: 6:00-8:00pm (25th)/9:00-11:00pm (26th)
Location: Lackawanna County Center for Public Safety, 30 Valley View Dr, Jessup, PA 18434

Attendees were given an introduction to the Consulting firm contracted for the planning and update process, Vision Planning and Consulting. Introductions were given to the principal Vision contacts working on the project, Andrew Estrain and Ashley Samonisky. Andrew discussed the project purpose, integrated planning process, deliverables, timelines, and progress to date for the plan. He also discussed the importance of Plan Integration, the mitigation action development process, and development of the implementation plan.

The municipal representatives were then presented with the initial findings of the Hazard Identification and Risk Assessment. This presentation provided definitions of terms used throughout the process and identified the various hazards Lackawanna County and different municipalities could potentially face.

Members were then provided a brief review of the municipal capabilities survey responses, and a general discussion of the results was held. Finally, an exercise was held to identify the current status of mitigation actions from the previous plan, and to identify potential new mitigation actions based on the survey responses. After discussions and the presentation, VPC opened the meeting up as a workshop to allow municipal representative the opportunity to complete municipal worksheets and questionnaires. VPC staff was available for anybody who had questions or needed help identifying information.

Like the Steering Committee meetings, major concerns raised and questions asked had to do with the new FEMA flood maps that were being developed for the County on a simultaneously, but separately, from the HMP Update. This made the HMP update process a bit confusing to some municipal representatives as they were not aware that two different projects were taking place at the same time. Concerns were alleviated when told to follow the previous flood maps, as the new ones were not yet released during the information gathering phase of the planning process.

Lackawanna County Hazard Mitigation Plan Update
Municipality Meeting #1
Agenda

Date: February 25, 2020 / February 26, 2020
Time: 6:00pm-8:00pm / 9:00am-11:00am
Location: Lackawanna County Center for Public Safety, 30 Valley View Dr, Jessup, PA 18434

(It is encouraged for part-time municipality staff to attend the evening meeting on February 25th, and for full-time staff to attend the morning meeting on February 26th. This is to allow ample time to meet with all municipality representatives that desire assistance. Municipal representatives are expected to attend **ONLY** one of the two meetings).

Introductions

- Lackawanna County Department of Planning and Economic Development
- Consultants – Vision Planning and Consulting and JMT

Project Overview Presentation

- Planning process
- Meetings
- Progress to date
- Updated Hazard Mitigation Plan Goals and Objectives

Review Hazard Identification and Risk Assessment (countywide)

- HIRA summary
- Glean input on risks from flood and other hazards
- Hazard prioritization

Municipal Representative Working Sessions

- Assist municipal representatives as necessary to complete the Municipality Survey and NFIP Questionnaires
- Identify specific hazard areas within municipalities
- Glean input and updates on municipal capabilities for hazard mitigation
- 2015 HMP mitigation actions - identify current status a past municipal actions (in progress, completed, ongoing, etc.)

Open Discussion

- Hot topics

Next Steps

- Local Risk Worksheet
- Plan Integration
- Mitigation Strategy
- Implementation Plan
- Meetings (Steering Committee and Municipality Meetings – Round 2)

Questions

Adjournment

VISION
PLANNING & CONSULTING, LLC

SIGN-IN SHEET
Lackawanna County Hazard Mitigation Update

Municipality Meeting 1
February 25, 2018 6:00pm-8:00pm

Name	Phone	Email	Municipality/Organization
GEORGE Aschen (JERRY) BRENNER	570-945-5511	aschgt@ad.com	LAPLUME TWP.
JOE TROPIAK	5736489088	JTROPIAK@THROOPBORO.COM	THROOP BOROUGH
SCOTT JORDAN	570 983 8682	THOMASSCOTTJORDAN@GMAIL.COM	
Gregg Barber	945-5897	bentontownship@frontier.com	Benton
Merle Lyon	570-842-74[illegible]	woothill1@comcast.net	Elmhurst
Tony Jordan	570-842-6080	TONYJRST@COMCAST.NET	Roaring Brook Twp
John Cudo	570-499-1801	JCUDO@TAYLORBOROUGH.COM	TAYLOR
Ashley Samenishy		asamenishy@vision-pc.net	VPC
Andrew Estrain		aestrain@vision-pc.net	VPC
Stephen Boone		Sboone@JMT.com	JMT

Meeting Location: Lackawanna County Center for Public Safety, 30 Valley View Dr, Jessup, PA 18434

VISION
PLANNING & CONSULTING, LLC

SIGN-IN SHEET
Lackawanna County Hazard Mitigation Update

Municipality Meeting 1
February 26, 2018 9:00am-11:00am

Name	Phone	Email	Municipality/Organization
Marykte Donato	570-963-6400		Lacka. Co Planning
JoAnn Pane	570-586-7250	Ransom2435@epix.net	Ransom Twp
Francine Fawcett	570-587-1520	newtontwp@epix.net	Newton Twp.
William Santarsiero	"	"	"
Clark Robbins	570-562-1400	CRobbins@TaylorBorough.com	Taylor Borough
William Dixon	570-562-1400	BDixon@taylorborough.com	Taylor Borough
William Wicks	570-575-1698	willywicks@aol.com	Glenburn Township
Alexander J. Chelik	570-876-3107	AJChelik@Echoes.	Mayfield
Wendy Bochnovich	570 954 4483	wbochn@gmail.com	Mayfield
Diana Campbell	570 267 7115	dkcampbell18@yahoo.com	Mayfield
Bill Braudt	570-36-0522	WB4CAPE@AOL.com	DALTON
Robert Carpenter	570/878-2082	CARPENTER5208@GMAIL	DALTON
Thomas Mundrake	5708400281	NORTH ABINGTON TOWNSHIP@FRONTIER.com	NORTH ABINGTON
Robert Turlip	570 877 2338	RTURLIP@ARCHBALDBOROUGHPA.gov	ARCHBALD
Brian Gilgallon	570 947 8036	BRIAN GILGALLON@GMAIL.COM	ARCHBALD
Virginia Keyes	570 585 4800	MANAGER@CLARKSSUMMITPA.GOV	CLARKS SUMMIT
Scot Haan	570 840-4267	Newtontwp@epix.net	Newton Township
Jason McLain	570-241-6157	JMcLain1982@Gmail	Spring Brook Twp
Frank Lapka	570-282-6561	HOOT@1951OUTDOOR	Carbondale Twp.
David O'Neill	570-587-8717	DAVIDO01@COMCAST.NET	South Abington Twp

Meeting Location: Lackawanna County Center for Public Safety, 30 Valley View Dr, Jessup, PA 18434

Lackawanna County Hazard Mitigation Plan Update

Municipality Meeting #2

Agenda

Date: June 16th, 2020/June 17th, 2020

Time: 6:00-7:30pm/10:00-11:30am

This meeting was held virtually via Zoom Videoconference

This meeting was conducted in a similar fashion to the second Steering Committee meetings. Municipal representatives were first provided with the project's progress to date, follow by the results of municipal participation, including those who participated and eligible for adoption, and those who currently were not. Vision Planning and Consulting (VPC) representative, Andrew Estrain, led an exercise to finalize the municipal mitigation actions for the Hazard Mitigation Plan, which had been sent out and discussions had take place, out prior to the meeting to ensure that municipal representatives had sufficient time to complete and review.

VPC then presented final local municipal hazard area maps, along with county wide maps for specific hazards, which provided a new opportunity for representatives to think of and develop new mitigation actions based on information in front of them. Several municipalities were able to develop new mitigation actions based on newly develop county and municipal hazard maps. The new mitigation actions were developed, and appropriate content and verbiage finalized.

Municipal representatives worked individually to determine phrasing, efficacy, and implementation methods for each of their actions. Some action items were combined for clarification and efficiency. An implementation plan was developed to determine Lead Agency, Timeline, Estimated cost and potential Funding Sources for each action item.

The only real concerns or questions from the attendees cetnered around municipal participation efforts, and when the plan would be finished and adopted. Municipal representatives that were in attendance made sure to confirm that their municipality has participated and is eligible for adoption. Next steps include assembling the draft report for county and public review, and hosting the public meeting.

Lackawanna County Hazard Mitigation Plan Update

Municipality Meeting #2

Agenda

Date: June 16th, 2020/June 17th, 2020

Time: 6:00-7:30pm/10:00-11:30am

This meeting was held virtually via Zoom Videoconference

Progress to Date

- Brief Presentation

Past Actions Review

- Brief Discussion of Past Mitigation Actions

New Actions Review*

- Discuss New Mitigation Actions that Address Goals and Objectives*

Mitigation Actions*

- Mitigation Action Finalization*
- Prioritize Mitigation Actions*
- Implementation Strategy*

Open Discussion

Next Steps

- Public Meeting (webinar forum)
- Develop Draft Plan for Public Review
- Develop Final Plan for PEMA/FEMA Review

Questions

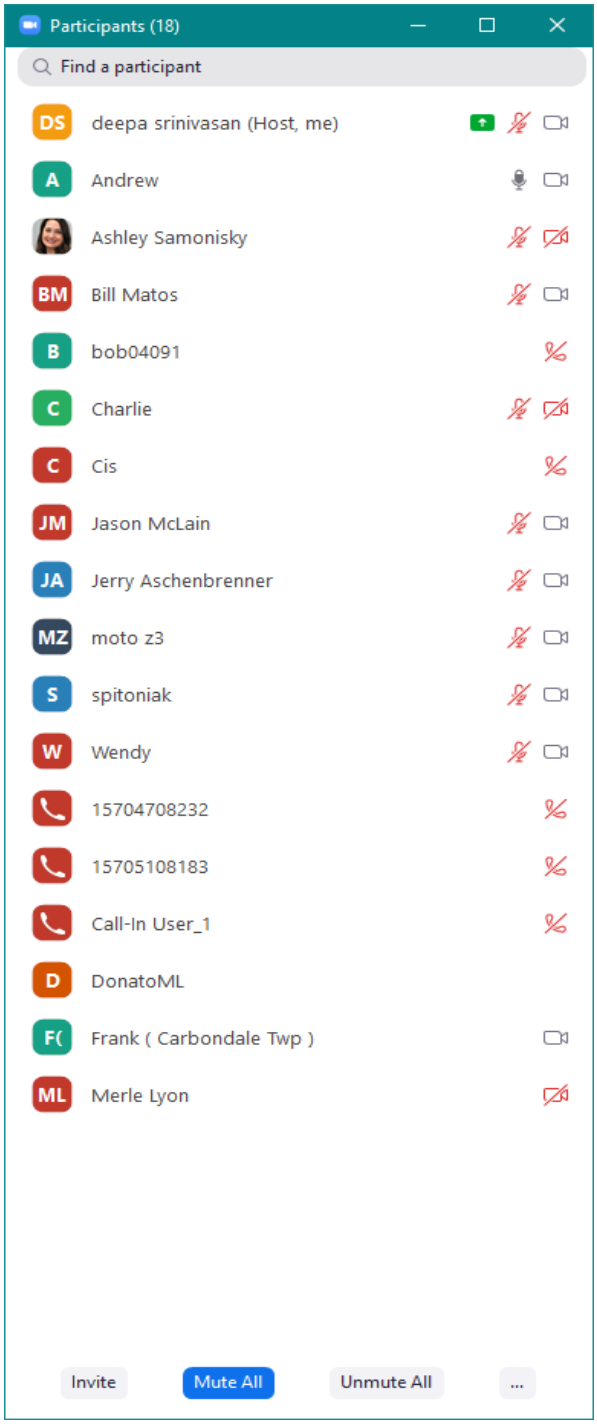
Adjournment

Discussions will also take place via email with Steering Committee representative and municipal representatives

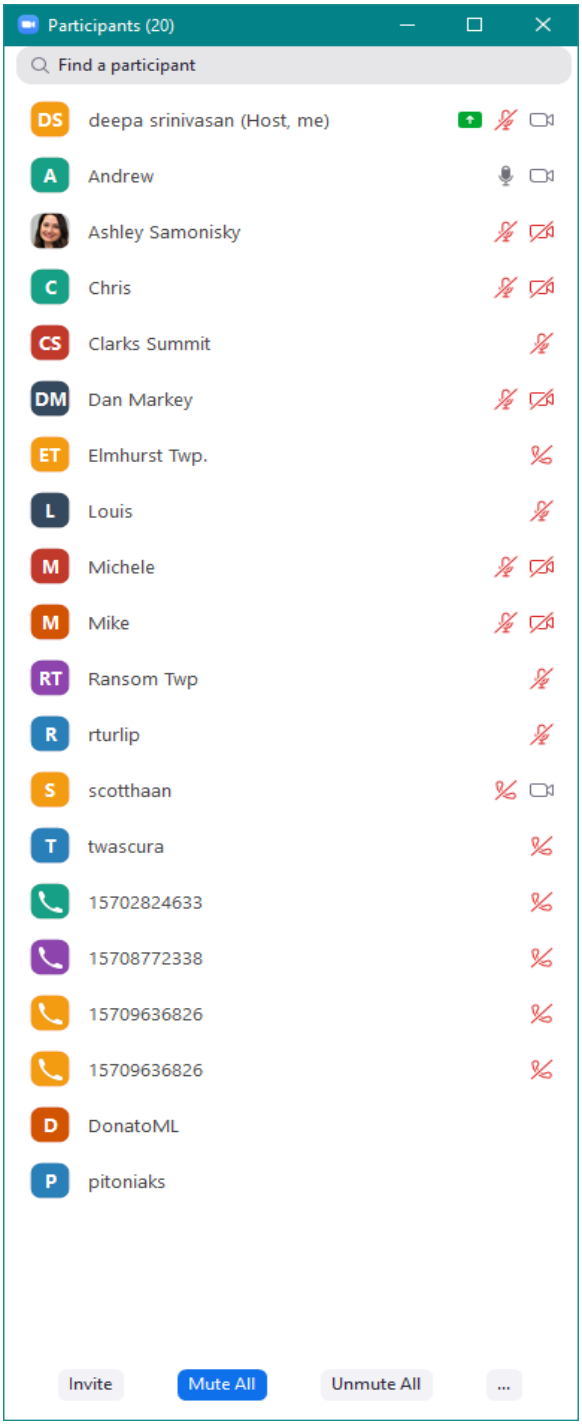
Municipality Meeting 2 Attendees List
Lackawanna County Hazard Mitigation Plan Update
Municipality Meeting 2

Date: June 16th, 2020/June 17th, 2020; Time: 6:00-7:30pm/10:00-11:30am
Location: Zoom Videoconference

6/16 Attendees



6/17 Attendees



Lackawanna County Hazard Mitigation Plan Update
Public Meeting
Date: July 8, 2020 Time: 6:30-8:30pm
Location: Zoom Videoconference

A Public Meeting was held on July 8th, 2020. Due to the ongoing Covid-19 Pandemic, this public meeting was facilitated through Zoom Videoconferencing. The public meeting was advertised in the local newspaper, The Scranton Time (DBA of the Times Tribune), and on the County Planning Department's website, as well as on the County's Facebook and Twitter social media pages. A PowerPoint was developed and presented by VPC Consultants. The public was provided an opportunity to:

- Review the results of the updated Hazard Risk and Vulnerability Assessment;
- Review updated goals and objectives;
- Examine options for mitigation actions and projects, and
- Review proposed prioritization criteria for mitigation projects.

There was nobody in attendance for the virtual public meeting, therefore, no specific concerns or questions were raised by the public at this meeting. Due to the lack of attendance for the virtual public meeting, the meeting presentation was posted again on the on the County Planning Department's website, as well as on the County's Facebook and Twitter social media pages to provide county residents an opportunity to review the planning process and provide comments. Copies of the draft Plan Update were made available on the Lackawanna County Planning Website for a period of two weeks for public comment. No comments were received during the public meeting or public review period.

Press Releases, Notices, And Public Participation

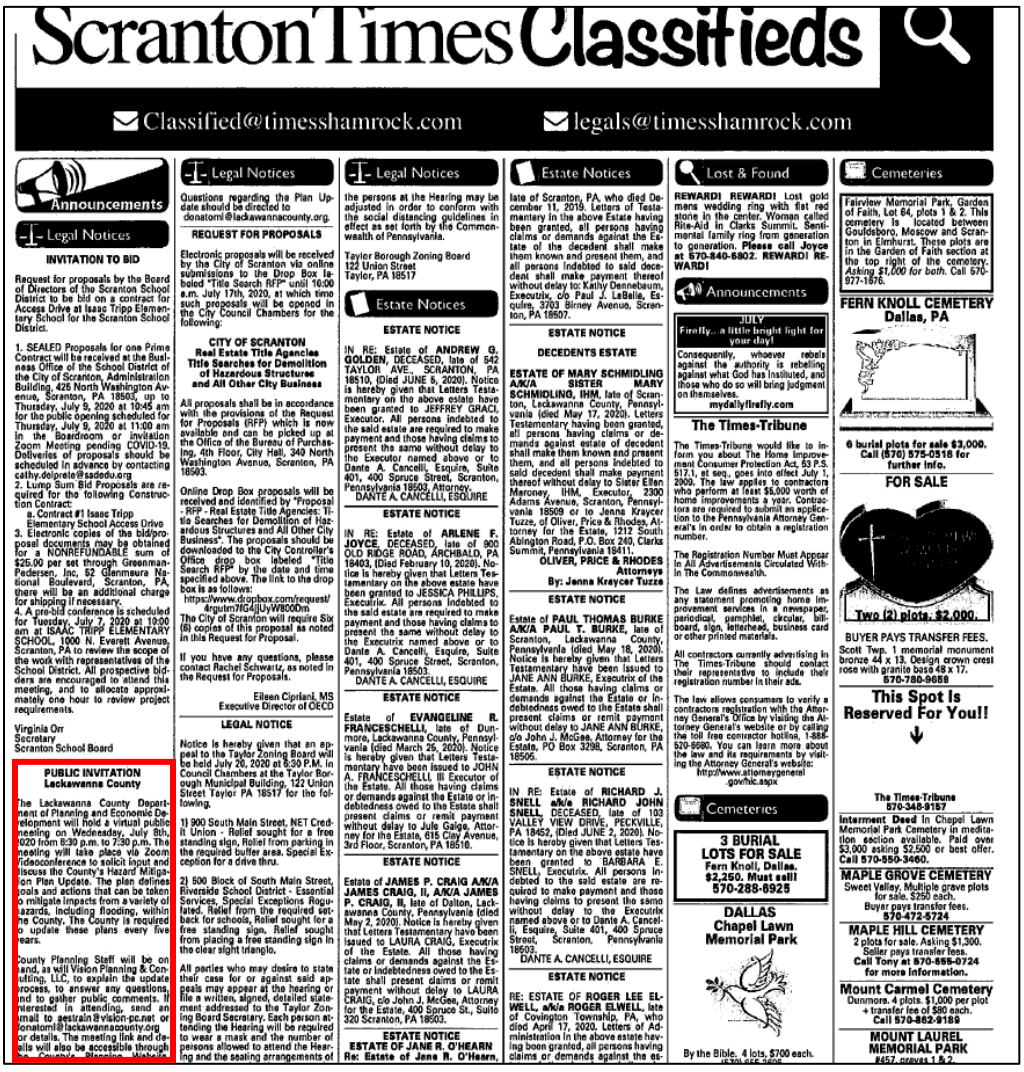
A requirement of the planning process is to not only solicit input from the public and stakeholders in developing the plans, but to keep them informed on the entire process as well.

Requirement §201.6(c)(1): The Plan must document the planning process, including how it was prepared and who was involved in the process for each jurisdiction.

Notices regarding meetings were distributed through press outlets. Lackawanna County Government does maintain social media accounts, including Facebook and Twitter. Notices regarding the Planning process meetings were distributed by the EMA Office, and were advertise on the County Government Website, Facebook, Twitter, and through the local newspaper, The Scranton Times. A sample of the informational releases are included below.

Public Meeting Advertisements

Below is The Scranton Times advertisement snapshot:



Scranton Times Classifieds

Classified@timesshamrock.com legals@timesshamrock.com

Announcements

Legal Notices

INVITATION TO BID

Request for proposals by the Board of Directors of the Scranton School District to be bid on a contract for Access Drive at Isaac Tripp Elementary School for the Scranton School District.

1. SEALED Proposals for one Prime Contract will be received at the Business Office of the School District of the City of Scranton, Administration Building, 426 North Washington Avenue, Scranton, PA 18503, up to Thursday, July 9, 2020 at 10:45 am for the public opening scheduled for Thursday, July 9, 2020 at 11:00 am in the Boardroom or Invitation Zoom Meeting pending COVID-19. Deliveries of proposals should be scheduled in advance by contacting cathy.delprete@sadedu.org
2. Lump Sum Bid Proposals are required for the following Construction Contract:
   a. Contract #1 Isaac Tripp Elementary School Access Drive
3. Electronic copies of the bid/proposal documents may be obtained for a NONREFUNDABLE sum of $25.00 per set through Greenman-Pedersen, Inc, 52 Glenmaura National Boulevard, Scranton, PA, there will be an additional charge for shipping if necessary.
4. A pre-bid conference is scheduled for Tuesday, July 7, 2020 at 10:00 am at ISAAC TRIPP ELEMENTARY SCHOOL, 1000 N. Everett Avenue, Scranton, PA to review the scope of the work with representatives of the School District. All prospective bidders are encouraged to attend this meeting, and to allocate approximately one hour to review project requirements.

Virginia Orr
Secretary
Scranton School Board

PUBLIC INVITATION
Lackawanna County

The Lackawanna County Department of Planning and Economic Development will hold a virtual public meeting on Wednesday, July 8th, 2020 from 6:30 p.m. to 7:30 p.m. The meeting will take place via Zoom Videoconference to solicit input and discuss the County's Hazard Mitigation Plan Update. The plan defines goals and actions that can be taken to mitigate impacts from a variety of hazards, including flooding, within the County. The County is required to update these plans every five years.

County Planning Staff will be on hand, as will Vision Planning & Consulting, LLC, to explain the update process, to answer any questions, and to gather public comments. If interested in attending, send an email to aestrain@vision-pc.net or donatomi@lackawannacounty.org for details. The meeting link and details will also be accessible through the County Planning Website

Legal Notices

Questions regarding the Plan Update should be directed to donatomi@lackawannacounty.org.

REQUEST FOR PROPOSALS

Electronic proposals will be received by the City of Scranton via online submissions to the Drop Box labeled "Title Search RFP" until 10:00 a.m. July 17th, 2020, at which time such proposals will be opened in the City Council Chambers for the following:

CITY OF SCRANTON
Real Estate Title Agencies
Title Searches for Demolition of Hazardous Structures and All Other City Business

All proposals shall be in accordance with the provisions of the Request for Proposals (RFP) which is now available and can be picked up at the Office of the Bureau of Purchasing, 4th Floor, City Hall, 340 North Washington Avenue, Scranton, PA 18503.

Online Drop Box proposals will be received and identified by "Proposal - RFP - Real Estate Title Agencies: Title Searches for Demolition of Hazardous Structures and All Other City Business". The proposals should be downloaded to the City Controller's Office drop box labeled "Title Search RFP" by the date and time specified above. The link to the drop box is as follows:
https://www.dropbox.com/request/4rgutm7fG4jUyW8O0Dm
The City of Scranton will require Six (6) copies of this proposal as noted in this Request for Proposal.

If you have any questions, please contact Rachel Schwartz, as noted in the Request for Proposals.

Eileen Cipriani, MS
Executive Director of OECD

LEGAL NOTICE

Notice is hereby given that an appeal to the Taylor Zoning Board will be held July 20, 2020 at 6:30 P.M. in Council Chambers at the Taylor Borough Municipal Building, 122 Union Street Taylor PA 18517 for the following.

1) 900 South Main Street, NET Credit Union - Relief sought for a free standing sign, Relief from parking in the required buffer area. Special Exception for a drive thru.

2) 500 Block of South Main Street, Riverside School District - Essential Services, Special Exceptions Regulated. Relief from the required setback for schools, Relief sought for a free standing sign. Relief sought from placing a free standing sign in the clear sight triangle.

All parties who may desire to state their case for or against said appeals may appear at the hearing or file a written, signed, detailed statement addressed to the Taylor Zoning Board Secretary. Each person attending the Hearing will be required to wear a mask and the number of persons allowed to attend the Hearing and the seating arrangements of

Legal Notices

the persons at the Hearing may be adjusted in order to conform with the social distancing guidelines in effect as set forth by the Commonwealth of Pennsylvania.

Taylor Borough Zoning Board
122 Union Street
Taylor, PA 18517

Estate Notices

ESTATE NOTICE

IN RE: Estate of **ANDREW G. GOLDEN**, DECEASED, late of 542 TAYLOR AVE., SCRANTON, PA 18510, (Died JUNE 5, 2020). Notice is hereby given that Letters Testamentary on the above estate have been granted to JEFFREY GRACI, Executor. All persons indebted to the said estate are required to make payment and those having claims to present the same without delay to the Executor named above or to Dante A. Cancelli, Esquire, Suite 401, 400 Spruce Street, Scranton, Pennsylvania 18503, Attorney.
DANTE A. CANCELLI, ESQUIRE

ESTATE NOTICE

IN RE: Estate of **ARLENE F. JOYCE**, DECEASED, late of 900 OLD RIDGE ROAD, ARCHBALD, PA 18403, (Died February 10, 2020). Notice is hereby given that Letters Testamentary on the above estate have been granted to JESSICA PHILLIPS, Executrix. All persons indebted to the said estate are required to make payment and those having claims to present the same without delay to the Executrix named above or to Dante A. Cancelli, Esquire, Suite 401, 400 Spruce Street, Scranton, Pennsylvania 18503.
DANTE A. CANCELLI, ESQUIRE

ESTATE NOTICE

Estate of **EVANGELINE R. FRANCESCHELLI**, late of Dunmore, Lackawanna County, Pennsylvania (died March 26, 2020). Notice is hereby given that Letters Testamentary have been issued to JOHN A. FRANCESCHELLI, III Executor of the Estate. All those having claims or demands against the Estate or indebtedness owed to the Estate shall present claims or remit payment without delay to Jule Gale, Attorney for the Estate, 615 Clay Avenue, 3rd Floor, Scranton, PA 18510.

ESTATE NOTICE

Estate of **JAMES P. CRAIG A/K/A JAMES CRAIG, II, A/K/A JAMES P. CRAIG, II**, late of Dalton, Lackawanna County, Pennsylvania (died May 2, 2020). Notice is hereby given that Letters Testamentary have been issued to LAURA CRAIG, Executrix of the Estate. All those having claims or demands against the Estate or indebtedness owed to the Estate shall present claims or remit payment without delay to LAURA CRAIG, c/o John J. McGee, Attorney for the Estate, 400 Spruce St., Suite 320 Scranton, PA 18503.

ESTATE NOTICE
ESTATE OF JANE R. O'HEARN
Re: Estate of Jane R. O'Hearn,

Estate Notices

late of Scranton, PA, who died December 11, 2019. Letters of Testamentary in the above Estate having been granted, all persons having claims or demands against the Estate of the decedent shall make them known and present them, and all persons indebted to said decedent shall make payment thereof without delay to: Kathy Dennebaum, Executrix, c/o Paul J. LaBalle, Esquire, 3703 Birney Avenue, Scranton, PA 18507.

ESTATE NOTICE
DECEDENTS ESTATE

ESTATE OF MARY SCHMIDLING A/K/A SISTER MARY SCHMIDLING, IHM, late of Scranton, Lackawanna County, Pennsylvania (died May 17, 2020). Letters Testamentary having been granted, all persons having claims or demands against estate of decedent shall make them known and present them, and all persons indebted to said decedent shall make payment thereof without delay to Sister Ellen Maroney, IHM, Executor, 2300 Adams Avenue, Scranton, Pennsylvania 18509 or to Jenna Kraycer Tuzze, of Oliver, Price & Rhodes, Attorney for the Estate, 1212 South Abington Road, P.O. Box 240, Clarks Summit, Pennsylvania 18411.
OLIVER, PRICE & RHODES
Attorneys
By: Jenna Kraycer Tuzze

ESTATE NOTICE

Estate of **PAUL THOMAS BURKE A/K/A PAUL T. BURKE**, late of Scranton, Lackawanna County, Pennsylvania (died May 18, 2020). Notice is hereby given that Letters Testamentary have been issued to JANE ANN BURKE, Executrix of the Estate. All those having claims or demands against the Estate or indebtedness owed to the Estate shall present claims or remit payment without delay to JANE ANN BURKE, c/o John J. McGee, Attorney for the Estate, PO Box 3298, Scranton, PA 18505.

ESTATE NOTICE

IN RE: Estate of **RICHARD J. SNELL a/k/a RICHARD JOHN SNELL**, DECEASED, late of 103 VALLEY VIEW DRIVE, PECKVILLE, PA 18452, (Died JUNE 2, 2020). Notice is hereby given that Letters Testamentary on the above estate have been granted to BARBARA E. SNELL, Executrix. All persons indebted to the said estate are required to make payment and those having claims to present the same without delay to the Executrix named above or to Dante A. Cancelli, Esquire, Suite 401, 400 Spruce Street, Scranton, Pennsylvania 18503.
DANTE A. CANCELLI, ESQUIRE

ESTATE NOTICE

RE: ESTATE OF **ROGER LEE ELWELL, a/k/a ROGER ELWELL**, late of Covington Township, PA, who died April 17, 2020. Letters of Administration in the above estate having been granted, all persons having claims or demands against the es-

Lost & Found

REWARD! REWARD! Lost gold mens wedding ring with flat red stone in the center. Woman called Rite-Aid in Clarks Summit. Sentimental family ring from generation to generation. **Please call Joyce at 570-840-6802. REWARD! REWARD!**

Announcements

JULY
Firefly... a little bright light for your day!
Consequently, whoever rebels against the authority is rebelling against what God has instituted, and those who do so will bring judgment on themselves.
mydallyfirefly.com

The Times-Tribune

The Times-Tribune would like to inform you about The Home Improvement Consumer Protection Act, 73 P.S. 517.1, et seq., goes into effect July 1, 2009. The law applies to contractors who perform at least $5,000 worth of home improvements a year. Contractors are required to submit an application to the Pennsylvania Attorney General's in order to obtain a registration number.

The Registration Number Must Appear In All Advertisements Circulated Within The Commonwealth.

The Law defines advertisements as any statement promoting home improvement services in a newspaper, periodical, pamphlet, circular, billboard, sign, letterhead, business card or other printed materials.

All contractors currently advertising in The Times-Tribune should contact their representative to include their registration number in their ads.

The law allows consumers to verify a contractors registration with the Attorney General's Office by visiting the Attorney General's website or by calling the toll free contractor hotline, 1-888-520-6680. You can learn more about the law and its requirements by visiting the Attorney General's website: http://www.attorneygeneral.gov/hic.aspx

Cemeteries

3 BURIAL LOTS FOR SALE
Fern Knoll, Dallas.
$2,250. Must sell!
570-288-6925

DALLAS
Chapel Lawn Memorial Park

By the Bible. 4 lots, $700 each.

Cemeteries

Fairview Memorial Park. Garden of Faith, Lot 64, plots 1 & 2. This cemetery is located between Gouldsboro, Moscow and Scranton in Elmhurst. These plots are in the Garden of Faith section at the top right of the cemetery. *Asking $1,000 for both.* Call 570-877-1976.

FERN KNOLL CEMETERY
Dallas, PA

6 burial plots for sale $3,000. Call (570) 575-0518 for further info.

FOR SALE

Two (2) plots: $2,000.

BUYER PAYS TRANSFER FEES.
Scott Twp. 1 memorial monument bronze 44 x 13. Design crown crest rose with granite base 48 x 17.
570-780-9658

This Spot Is Reserved For You!!

The Times-Tribune
570-348-9157

Interment Deed In Chapel Lawn Memorial Park Cemetery in meditation section available. Paid over $3,000 asking $2,500 or best offer. **Call 570-550-3460.**

MAPLE GROVE CEMETERY
Sweet Valley. Multiple grave plots for sale, $250 each.
Buyer pays transfer fees.
570-472-5724

MAPLE HILL CEMETERY
2 plots for sale. Asking $1,300. Seller pays transfer fees.
Call Tony at 570-855-0724 for more information.

Mount Carmel Cemetery
Dunmore. 4 plots. $1,000 per plot + transfer fee of $80 each.
Call 570-862-9189

MOUNT LAUREL MEMORIAL PARK
#457, graves 1 & 2.

Scranton Times Advertisement:

PUBLIC INVITATION
Lackawanna County

The Lackawanna County Department of Planning and Economic Development will hold a virtual public meeting on Wednesday, July 8th, 2020 from 6:30 p.m. to 7:30 p.m. The meeting will take place via Zoom Videoconference to solicit input and discuss the County's Hazard Mitigation Plan Update. The plan defines goals and actions that can be taken to mitigate impacts from a variety of hazards, including flooding, within the County. The County is required to update these plans every five years.

County Planning Staff will be on hand, as will Vision Planning & Consulting, LLC, to explain the update process, to answer any questions, and to gather public comments. If interested in attending, send an email to aestrain@vision-pc.net or donatoml@lackawannacounty.org for details. The meeting link and details will also be accessible through the County's Planning Website. Questions regarding the Plan Update should be directed to donatoml@lackawannacounty.org.

Below is the Lackawanna County Government Website Advertisement and Public Invitation:

HOME MEETINGS & EVENTS PUBLIC RECORDS GOVERNMENT DIRECTORY

Regional Planning Commission

Lackawanna County Public Hazard Mitigation Plan Meeting

The Lackawanna County Department of Planning and Economic Development will hold a public meeting on Wednesday, July 8th, 2020 from 6:30 p.m. to 7:30 p.m. The meeting will take place via Zoom Videoconference, to solicit input and discuss the County's Hazard Mitigation Plan Update. These plans define goals and actions that can be taken to mitigate impacts from a variety of hazards, including flooding, within the County. Every five years the County is required to update these plans.

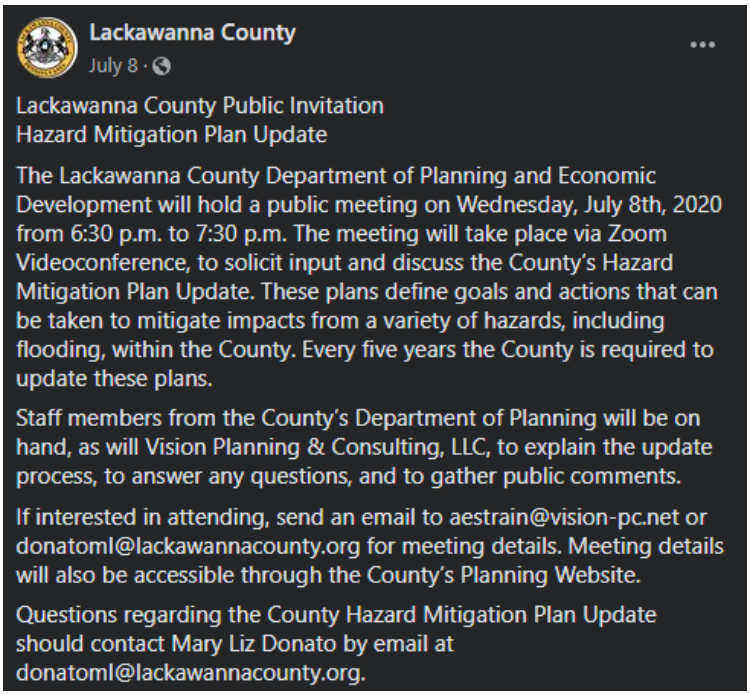
Staff members from the County's Department of Planning will be on hand, as will Vision Planning & Consulting, LLC, to explain the update process, to answer any questions, and to gather public comments.

Meeting details will also be accessible through the County's Planning Website.

If you have questions or comments regarding the County Hazard Mitigation Plan Update please e-mail: **aestrain@vision-pc.net** or Mary Liz Donato at **donatoml@lackawannacounty.org**.

Hazard Mitigation Plan

Below is the Lackawanna social media post advertising the public meeting:



Lackawanna County
July 8 ·

Lackawanna County Public Invitation
Hazard Mitigation Plan Update

The Lackawanna County Department of Planning and Economic Development will hold a public meeting on Wednesday, July 8th, 2020 from 6:30 p.m. to 7:30 p.m. The meeting will take place via Zoom Videoconference, to solicit input and discuss the County's Hazard Mitigation Plan Update. These plans define goals and actions that can be taken to mitigate impacts from a variety of hazards, including flooding, within the County. Every five years the County is required to update these plans.

Staff members from the County's Department of Planning will be on hand, as will Vision Planning & Consulting, LLC, to explain the update process, to answer any questions, and to gather public comments.

If interested in attending, send an email to aestrain@vision-pc.net or donatoml@lackawannacounty.org for meeting details. Meeting details will also be accessible through the County's Planning Website.

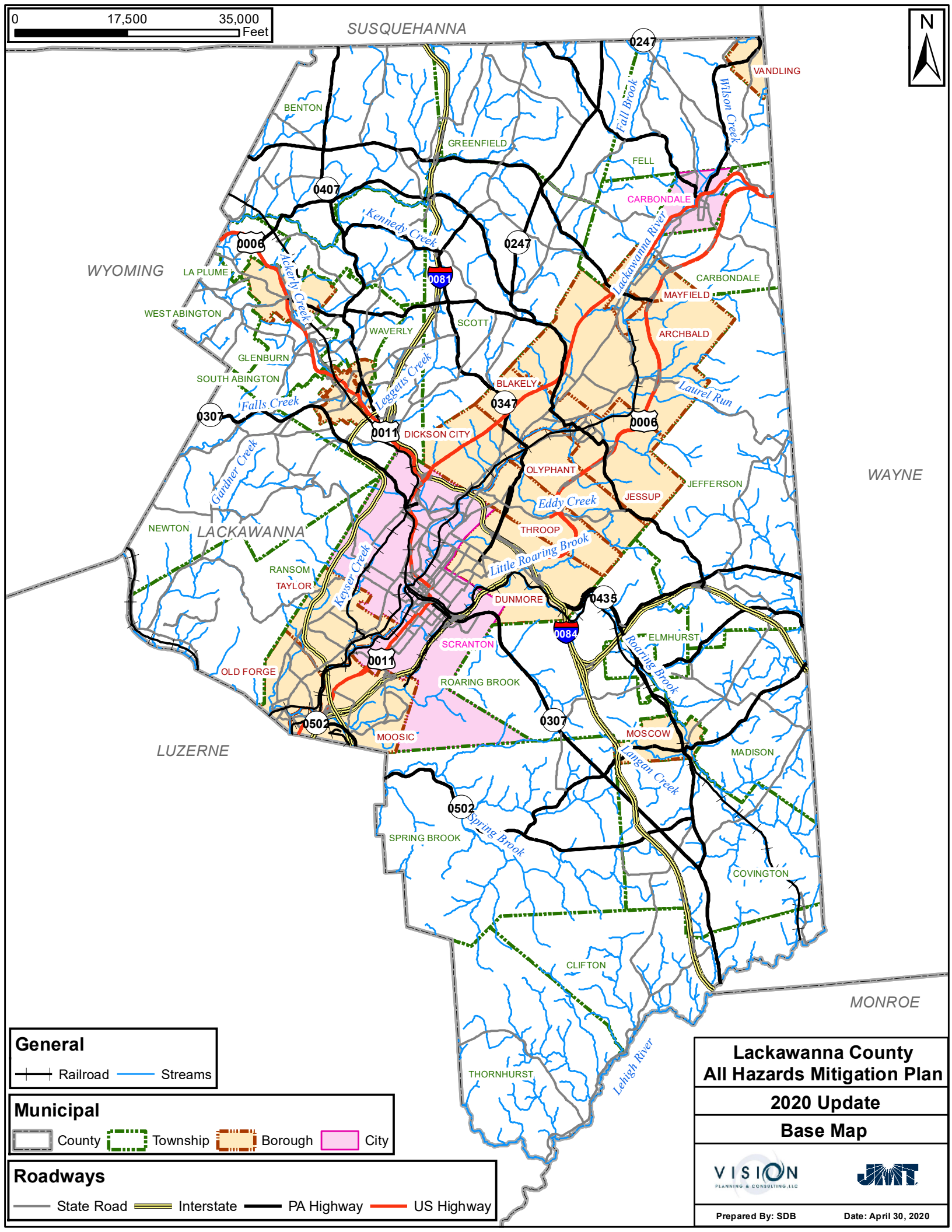
Questions regarding the County Hazard Mitigation Plan Update should contact Mary Liz Donato by email at donatoml@lackawannacounty.org.

APPENDIX D – HAZARD MAPS AND EXPOSURE

This Appendix provides County hazard maps as well as exposure estimates by municipality. This Appendix also provides local hazard are maps in which the information included on the maps were provided directly by the municipalities and design under the influence of local experience. This Appendix provides the following:

- County Base Map
- County Critical Facilities Map
- County Historic Floodplain Areas and Critical Facilities Map
- County Structures and Critical Facilities in 100-year Floodplain and Economic Exposure
- County Hazardous Materials Map
- County Hazardous Materials Sites by Municipality
- County Mine Hazard Areas Map
- County Structures and Critical Facilities in Mine Hazard Areas and Economic Exposure
- County Potential Wildfire Areas Map
- County Structures and Critical Facilities in Potential Wildfire Areas and Economic Exposure
- County Dam Locations Map
- Municipal Hazard Area Maps

County Hazard Maps and Exposure Estimates



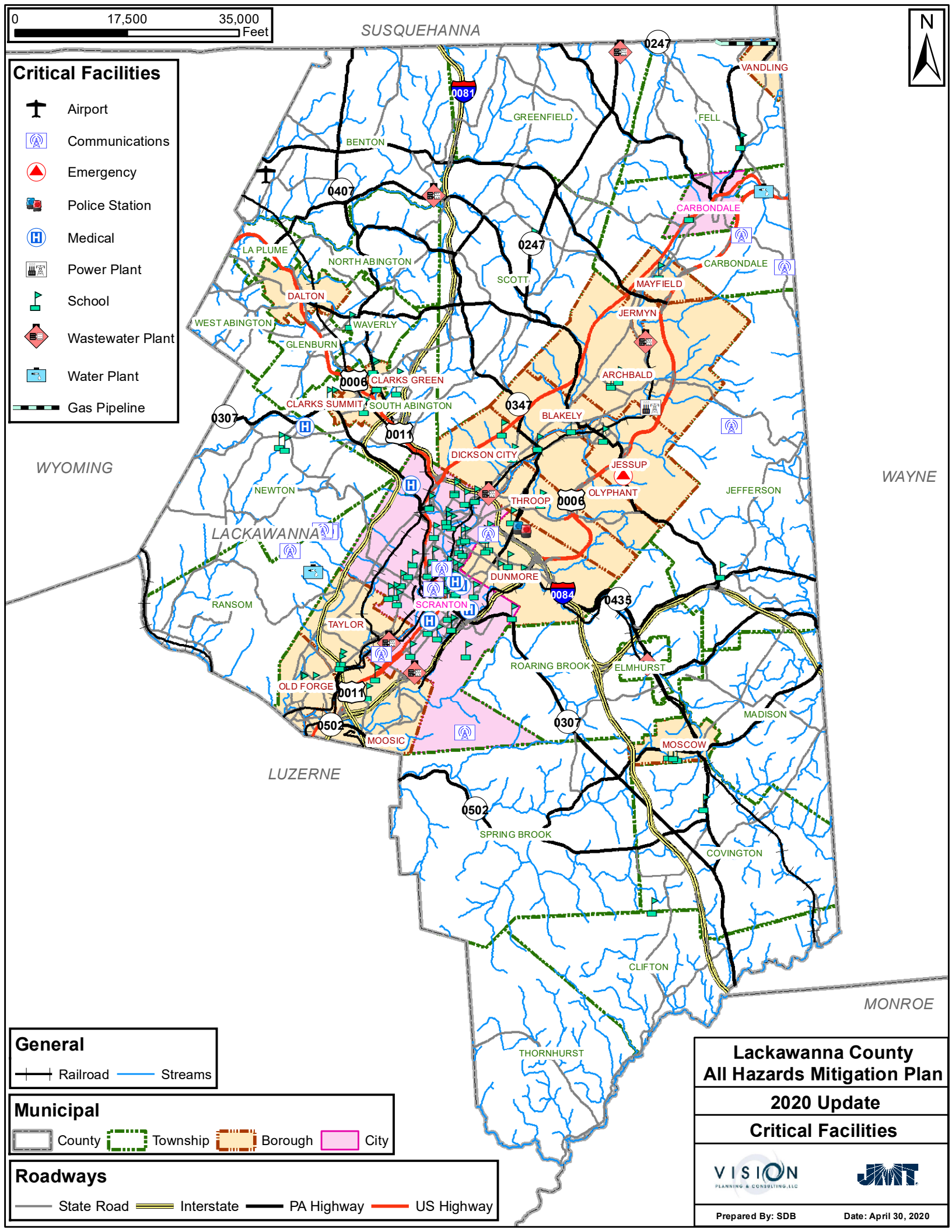
Lackawanna County All Hazards Mitigation Plan

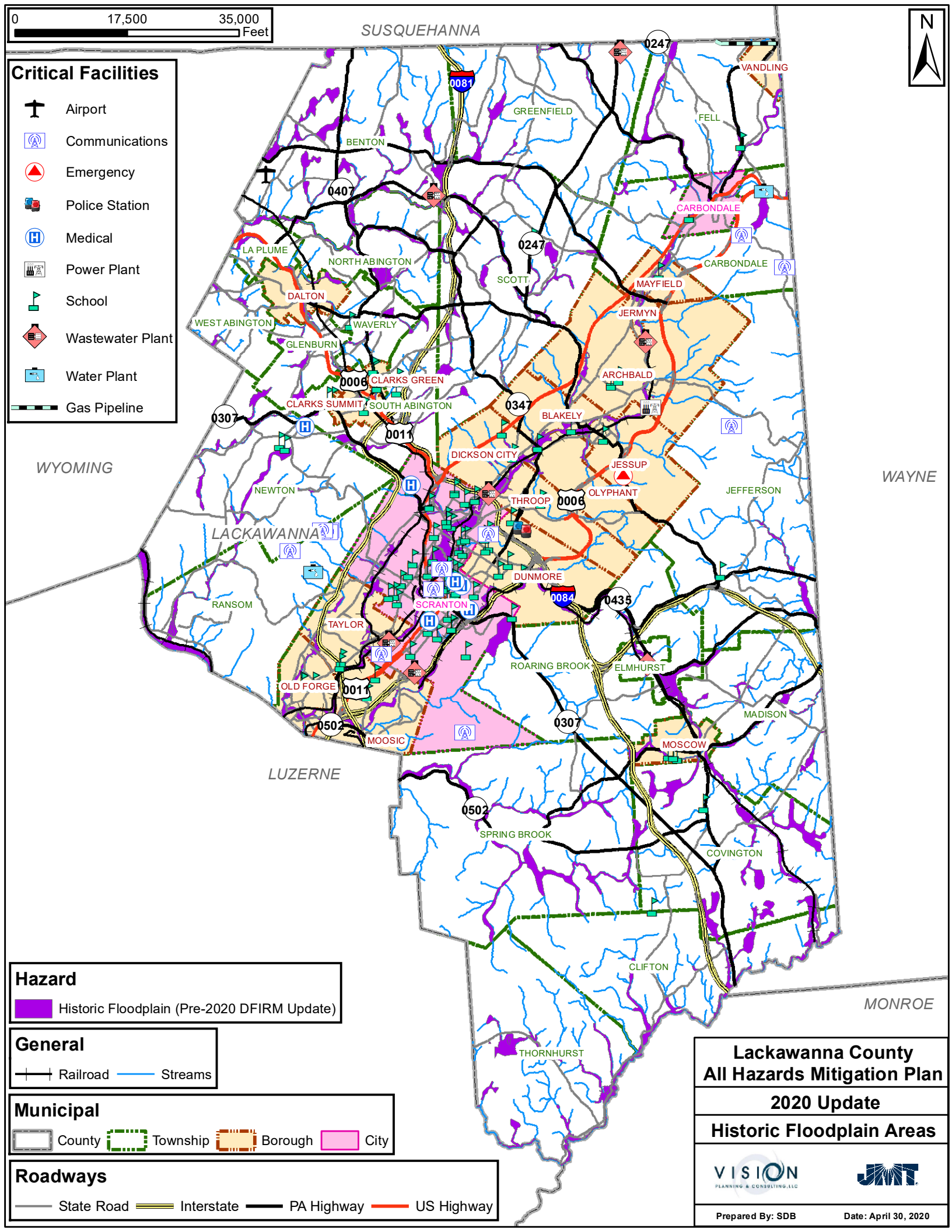
2020 Update

Base Map

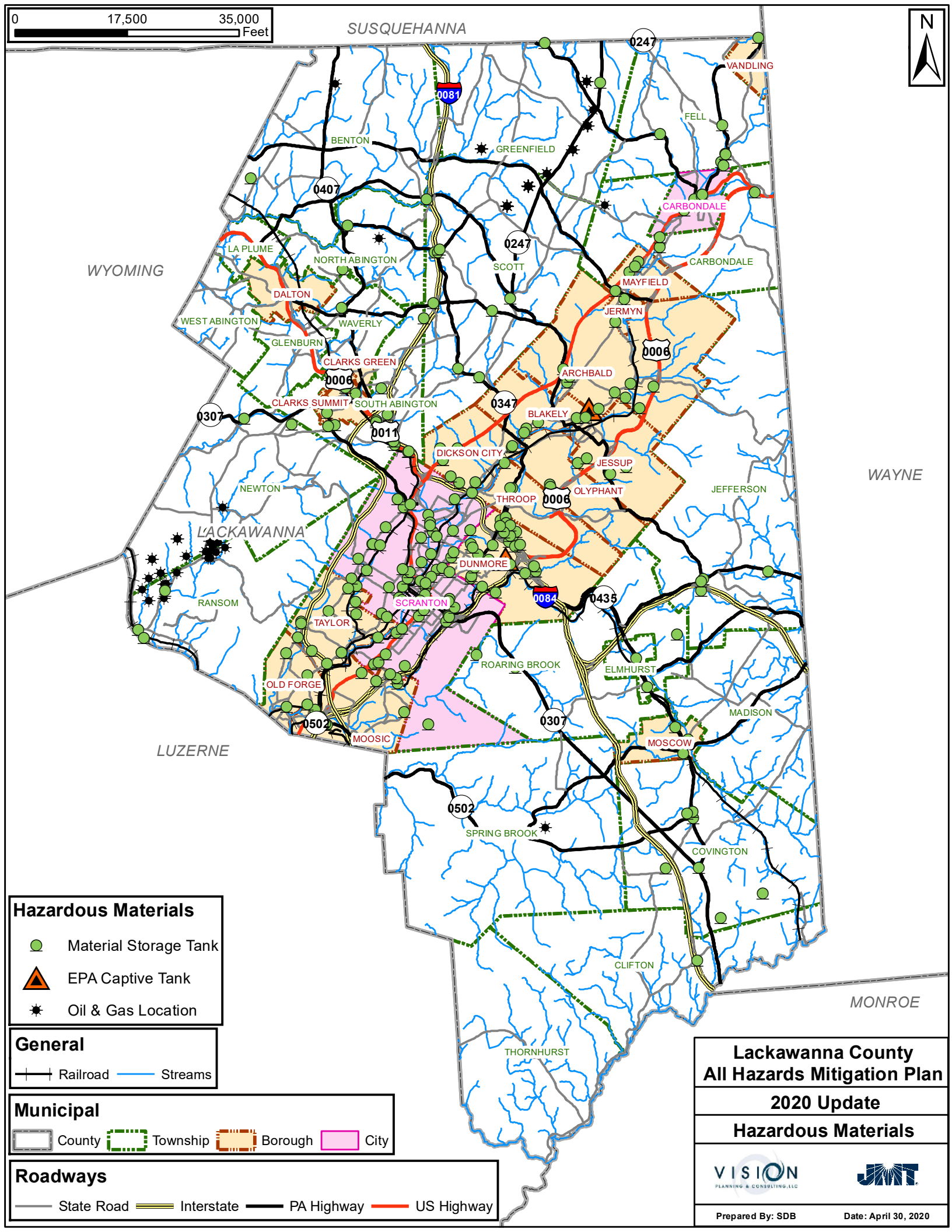
Prepared By: SDB

Date: April 30, 2020

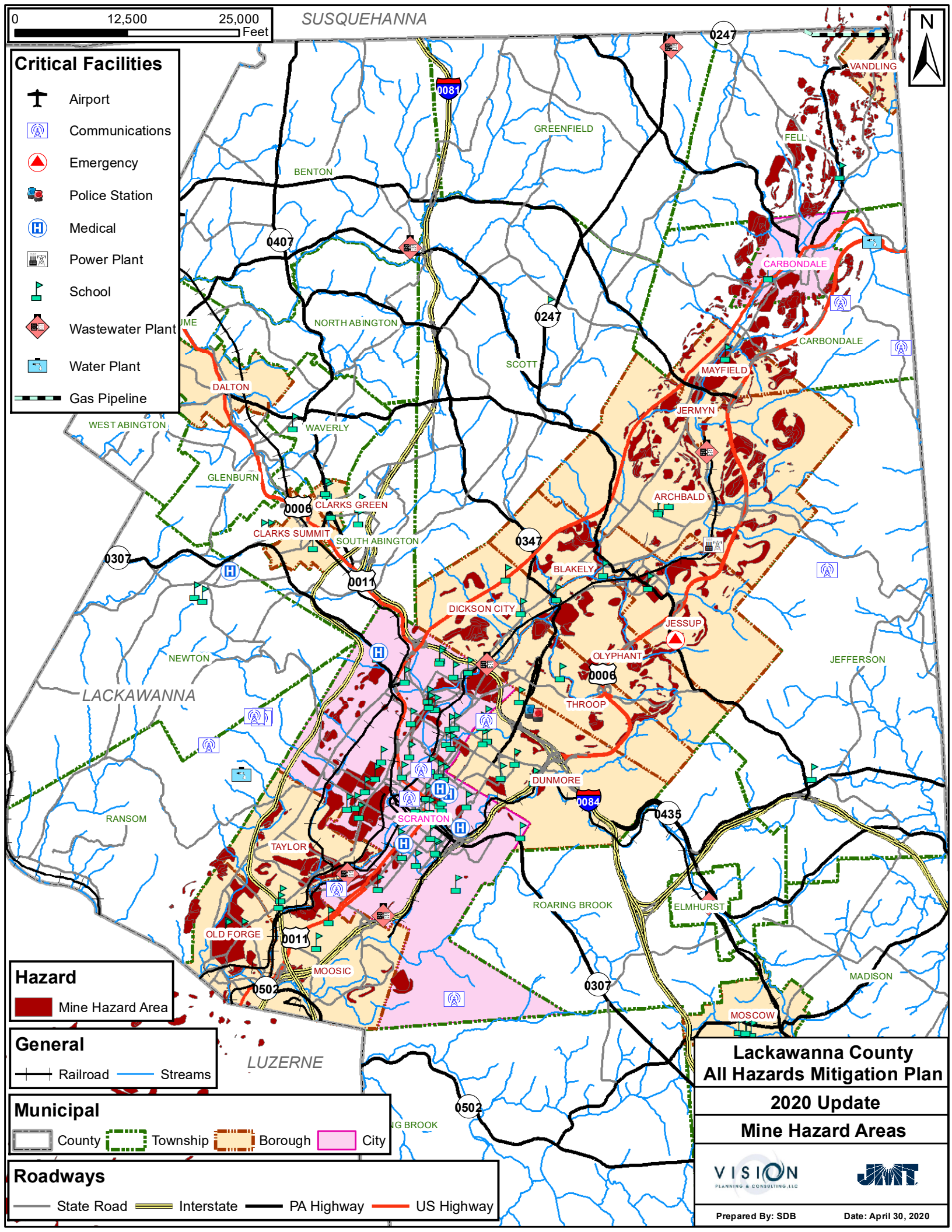

0 17,500 35,000 Feet
N
SUSQUEHANNA
WYOMING
LACKAWANNA
LUZERNE
WAYNE
MONROE
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
VANDLING
FELL
GREENFIELD
BENTON
CARBONDALE
LA PLUME
NORTH ABINGTON
SCOTT
MAYFIELD
JERMYN
DALTON
WEST ABINGTON
WAVERLY
GLENBURN
CLARKS GREEN
CLARKS SUMMIT
SOUTH ABINGTON
ARCHBALD
BLAKELY
DICKSON CITY
JESSUP
NEWTON
THROOP
OLYPHANT
JEFFERSON
DUNMORE
SCRANTON
RANSOM
TAYLOR
ROARING BROOK
ELMHURST
OLD FORGE
MOOSIC
MADISON
MOSCOW
SPRING BROOK
COVINGTON
CLIFTON
THORNHURST
0247
0081
0407
0307
0011
0006
0347
0084
0435
0502
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Critical Facilities
VISION
PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: April 30, 2020


0 17,500 35,000 Feet
N
SUSQUEHANNA
WYOMING
LACKAWANNA
LUZERNE
WAYNE
MONROE
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
Hazard
Historic Floodplain (Pre-2020 DFIRM Update)
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
State Road
Interstate
PA Highway
US Highway
VANDLING
FELL
GREENFIELD
BENTON
CARBONDALE
LA PLUME
NORTH ABINGTON
SCOTT
MAYFIELD
JERMYN
DALTON
WEST ABINGTON
WAVERLY
GLENBURN
CLARKS GREEN
CLARKS SUMMIT
SOUTH ABINGTON
ARCHBALD
BLAKELY
DICKSON CITY
JESSUP
NEWTON
THROOP
OLYPHANT
JEFFERSON
DUNMORE
SCRANTON
RANSOM
TAYLOR
OLD FORGE
ROARING BROOK
ELMHURST
MADISON
MOOSIC
MOSCOW
SPRING BROOK
COVINGTON
CLIFTON
THORNHURST
0247
0081
0407
0307
0011
0006
0347
0435
0084
0502
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Historic Floodplain Areas
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: April 30, 2020

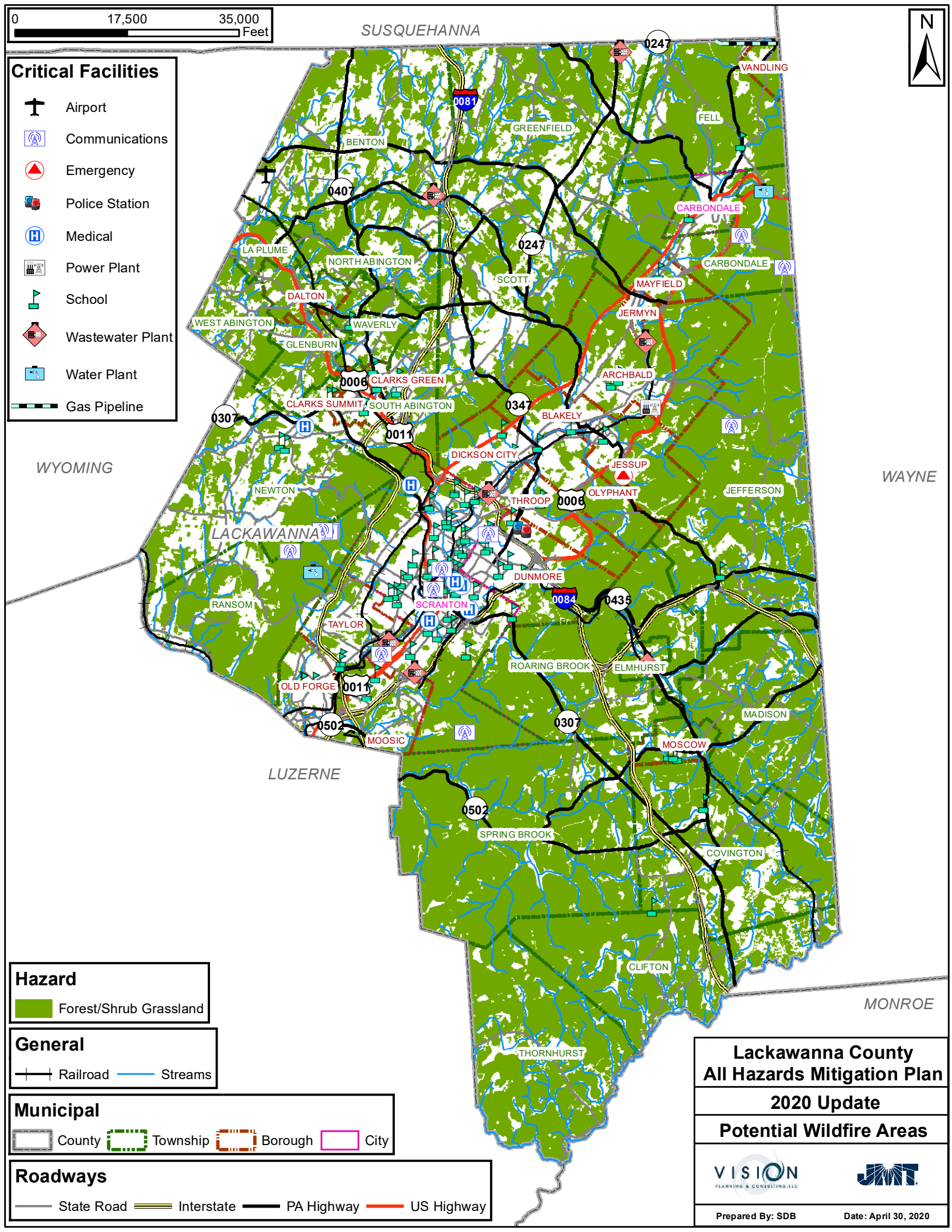
Lackawanna County Structures and Critical Facilities in 100-Year Floodplain and Ecomonic Exposure			
Municipality	**Number of Structures in Floodplain Areas**	**Critical Facilities in Floodplain Areas**	**Economic Exposure ($ Million)**
Archbald Borough	175		68.4
Benton Township	174		68.0
Blakely Borough	424		165.7
Carbondale City	203	Schools - 2	79.3
Carbondale Township	40		15.6
Clarks Green Borough	5		2.0
Clarks Summit Borough	114		44.5
Clifton Township	113		44.2
Covington Township	160		62.5
Dalton Borough	76		29.7
Dickson City Borough	799		312.2
Dunmore Borough	29		11.3
Elmhurst Township	22	Wastewater Plant - 1	8.6
Fell Township	134		52.4
Glenburn Township	47		18.4
Greenfield Township	15		5.9
Jefferson Township	38		14.8
Jermyn Borough	228		89.1
Jessup Borough	132		51.6
La Plume Township	35		13.7
Madison Township	40		15.6
Mayfield Borough	37		14.5
Moosic Borough	87		34.0
Moscow Borough	63		24.6
Newton Township	78		30.5
North Abington Township	37		14.5
Old Forge Borough	179		69.9
Olyphant Borough	363	Schools - 1	141.8
Ransom Township	45		17.6
Roaring Brook Township	1		0.4
Scott Township	159		62.1
Scranton City	2193	Schools - 1	856.9
South Abington Township	120		46.9
Spring Brook Township	38		14.8
Taylor Borough	62		24.2
Thornhurst Township	87		34.0
Throop Borough	33		12.9
Waverly Township	3		1.2
West Abington Township	2		0.8
Totals	**6590**	**5**	**$2.6 Billion**


0 17,500 35,000 Feet
N
SUSQUEHANNA
WYOMING
LACKAWANNA
LUZERNE
WAYNE
MONROE
VANDLING
FELL
BENTON
GREENFIELD
CARBONDALE
LA PLUME
NORTH ABINGTON
SCOTT
CARBONDALE
MAYFIELD
DALTON
JERMYN
WEST ABINGTON
WAVERLY
GLENBURN
CLARKS GREEN
ARCHBALD
CLARKS SUMMIT
SOUTH ABINGTON
BLAKELY
DICKSON CITY
JESSUP
NEWTON
THROOP
OLYPHANT
JEFFERSON
DUNMORE
RANSOM
SCRANTON
TAYLOR
ROARING BROOK
ELMHURST
OLD FORGE
MADISON
MOOSIC
MOSCOW
SPRING BROOK
COVINGTON
CLIFTON
THORNHURST
0247
0081
0407
0006
0307
0011
0347
0084
0435
0502
Hazardous Materials
Material Storage Tank
EPA Captive Tank
Oil & Gas Location
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Hazardous Materials
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: April 30, 2020

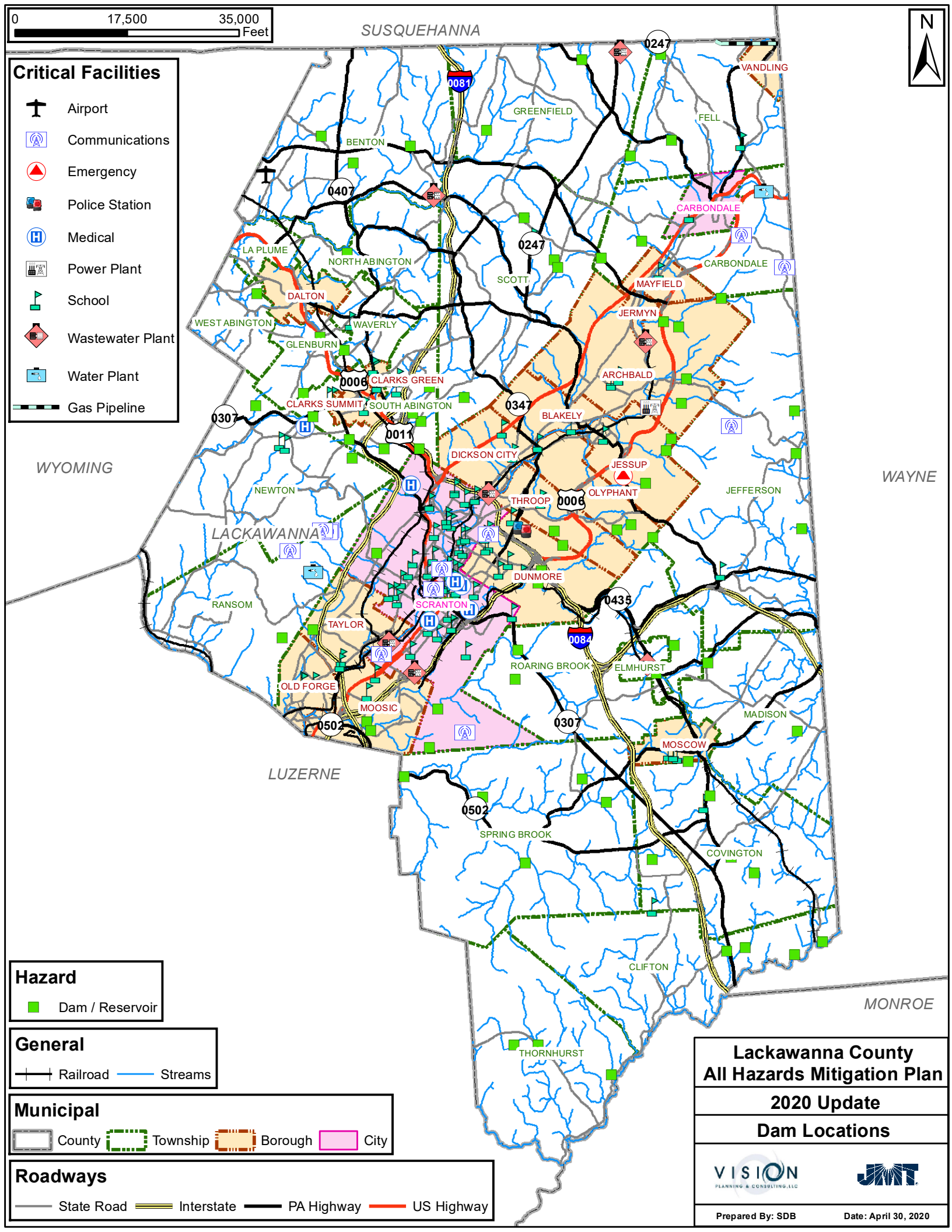
Lackawanna County Hazardous Materials Sites	
Municipality	**Number of Hazardous Material Sites**
Archbald Borough	12
Benton Township	2
Blakely Borough	4
Carbondale City	8
Carbondale Township	4
Clarks Summit Borough	3
Clifton Township	1
Covington Township	7
Dickson City Borough	10
Dunmore Borough	28
Elmhurst Township	2
Fell Township	6
Greenfield Township	19
Jefferson Township	4
Jermyn Borough	1
Jessup Borough	5
Mayfield Borough	4
Moosic Borough	12
Moscow Borough	3
Newtown Township	21
North Abington Township	3
Old Forge Borough	6
Olyphant Borough	4
Ransom Township	14
Roaring Brook Township	3
Scott Township	20
Scranton City	63
South Abington Township	11
Spring Brook Township	1
Taylor Borough	11
Throop Borough	3
Vandling Borough	1
Waverly Township	1
Totals	**297**


0 12,500 25,000 Feet
SUSQUEHANNA
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
VANDLING
FELL
GREENFIELD
BENTON
CARBONDALE
NORTH ABINGTON
SCOTT
MAYFIELD
JERMYN
DALTON
WEST ABINGTON
WAVERLY
GLENBURN
CLARKS GREEN
CLARKS SUMMIT
SOUTH ABINGTON
ARCHBALD
BLAKELY
DICKSON CITY
JESSUP
NEWTON
OLYPHANT
JEFFERSON
LACKAWANNA
THROOP
DUNMORE
SCRANTON
RANSOM
TAYLOR
ROARING BROOK
ELMHURST
OLD FORGE
MOOSIC
MADISON
MOSCOW
LUZERNE
0247
0081
0407
0307
0011
0006
0347
0084
0435
0502
Hazard
Mine Hazard Area
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Mine Hazard Areas
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: April 30, 2020

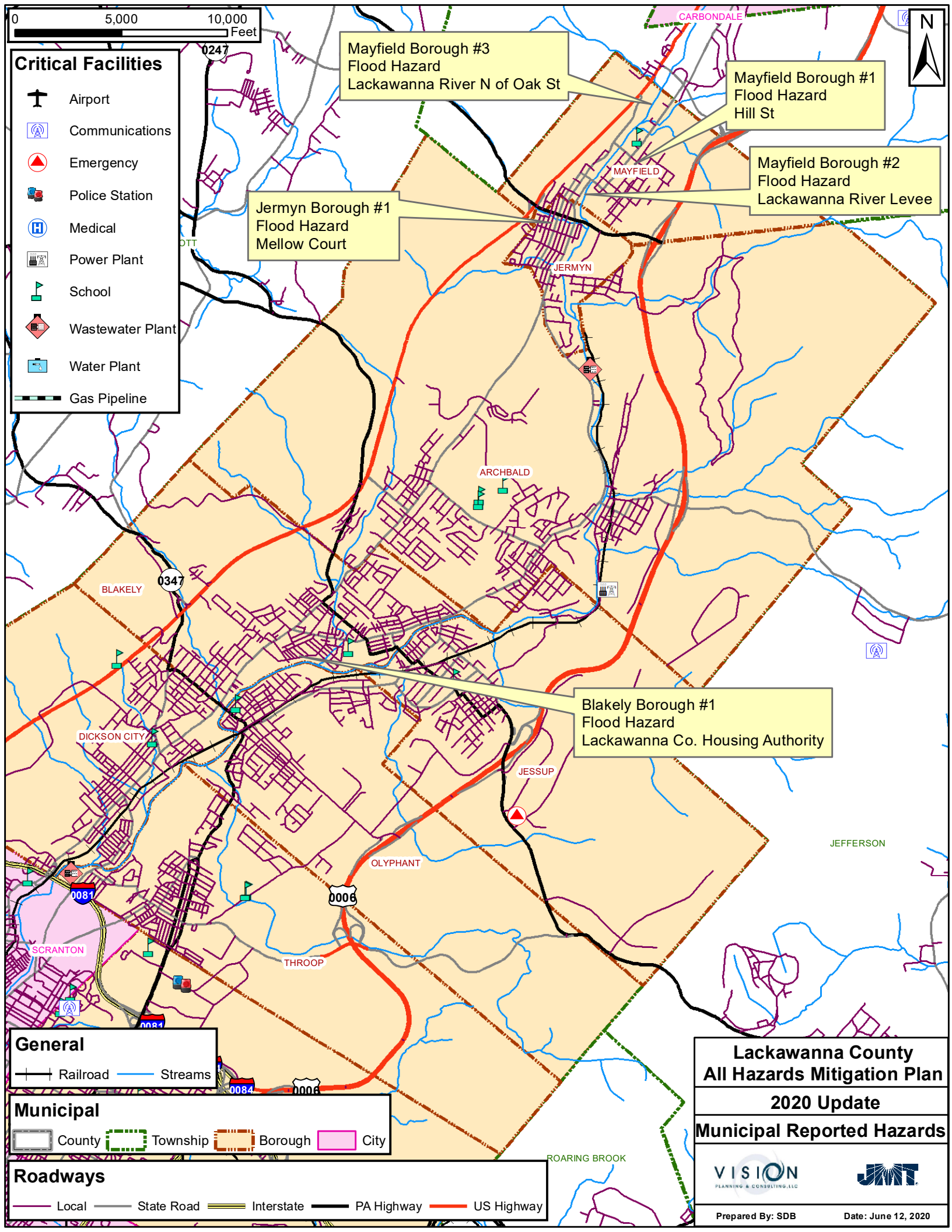
Lackawanna County Structures and Critical Facilities in Mine Hazard Areas and Economic Exposure			
Municipality	**Number of Structures in Mine Hazard Areas**	**Critical Facilities in Mine Hazard Areas**	**Economic Exposure ($ Million)**
Archbald Borough	51	Power Plant - 1	19.9
Blakely Borough	374		146.1
Carbondale Township	173	Communications Facilities - 1	67.6
Carbondale City	527		205.9
Dickson City Borough	99		38.7
Dunmore Borough	643	Schools - 1	251.3
Fell Township	-	Gas Pipeline	-
Jermyn Borough	297		116.1
Jessup Borough	732	Schools - 1	286.0
Mayfield Borough	779	Schools - 1	304.4
Moosic Borough	53		20.7
Old Forge Borough	2377	Schools - 3	928.9
Olyphant Borough	820		320.4
Scranton City	6460	Medical Facilities - 2; Schools - 11	2524.4
Taylor Borough	280		109.4
Throop Borough	150		58.6
Vandling Borough	1	Gas Pipeline	0.4
Totals	**13816**	**22**	**$5.4 Billion**

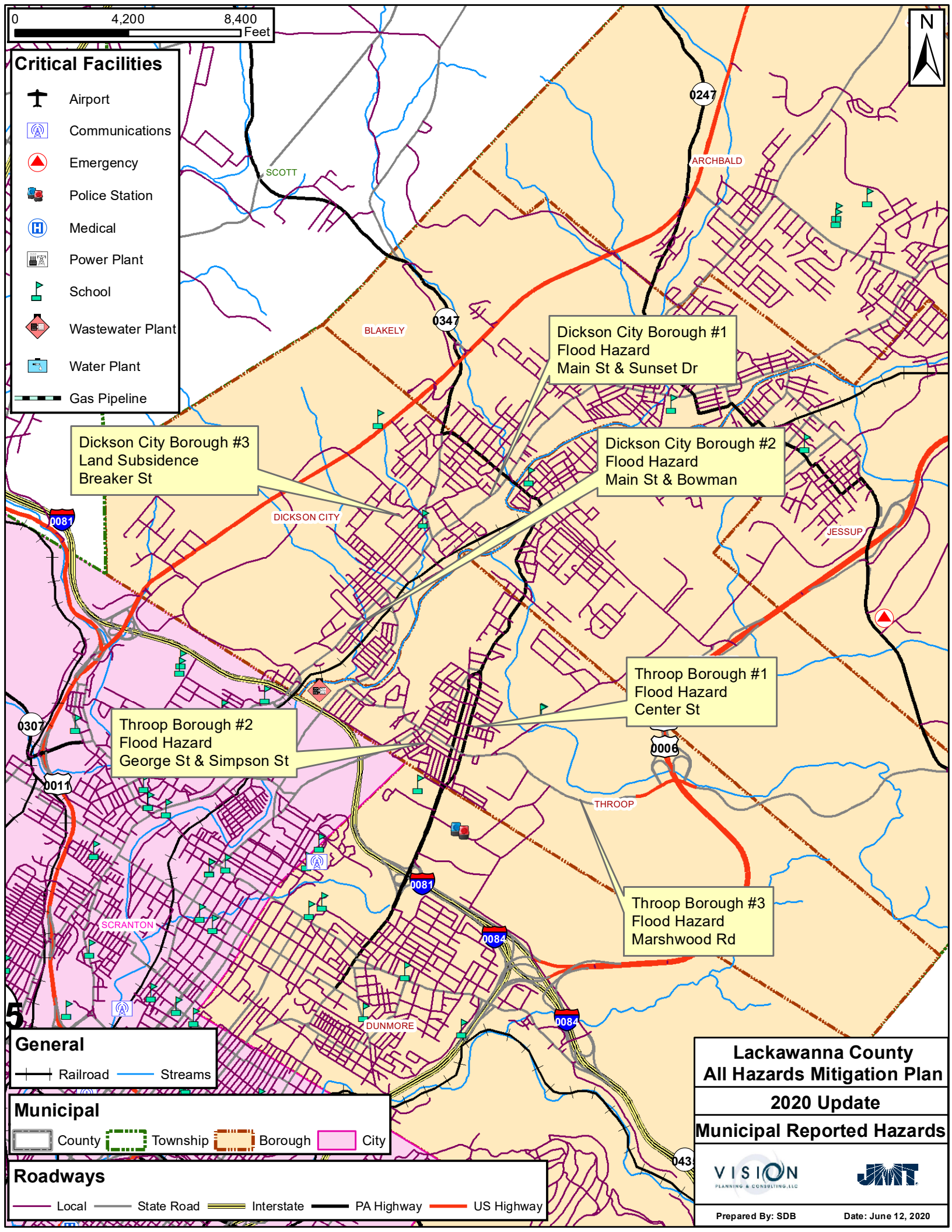

0 17,500 35,000 Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
SUSQUEHANNA
WYOMING
WAYNE
LUZERNE
MONROE
LACKAWANNA
VANDLING
FELL
GREENFIELD
BENTON
CARBONDALE
LA PLUME
NORTH ABINGTON
SCOTT
MAYFIELD
DALTON
JERMYN
WEST ABINGTON
WAVERLY
GLENBURN
ARCHBALD
CLARKS GREEN
CLARKS SUMMIT
SOUTH ABINGTON
BLAKELY
DICKSON CITY
JESSUP
NEWTON
THROOP
OLYPHANT
JEFFERSON
DUNMORE
RANSOM
SCRANTON
TAYLOR
ROARING BROOK
ELMHURST
OLD FORGE
MADISON
MOOSIC
MOSCOW
SPRING BROOK
COVINGTON
CLIFTON
THORNHURST
0247
0081
0407
0006
0307
0011
0347
0084
0435
0502
Hazard
Forest/Shrub Grassland
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Potential Wildfire Areas
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: April 30, 2020

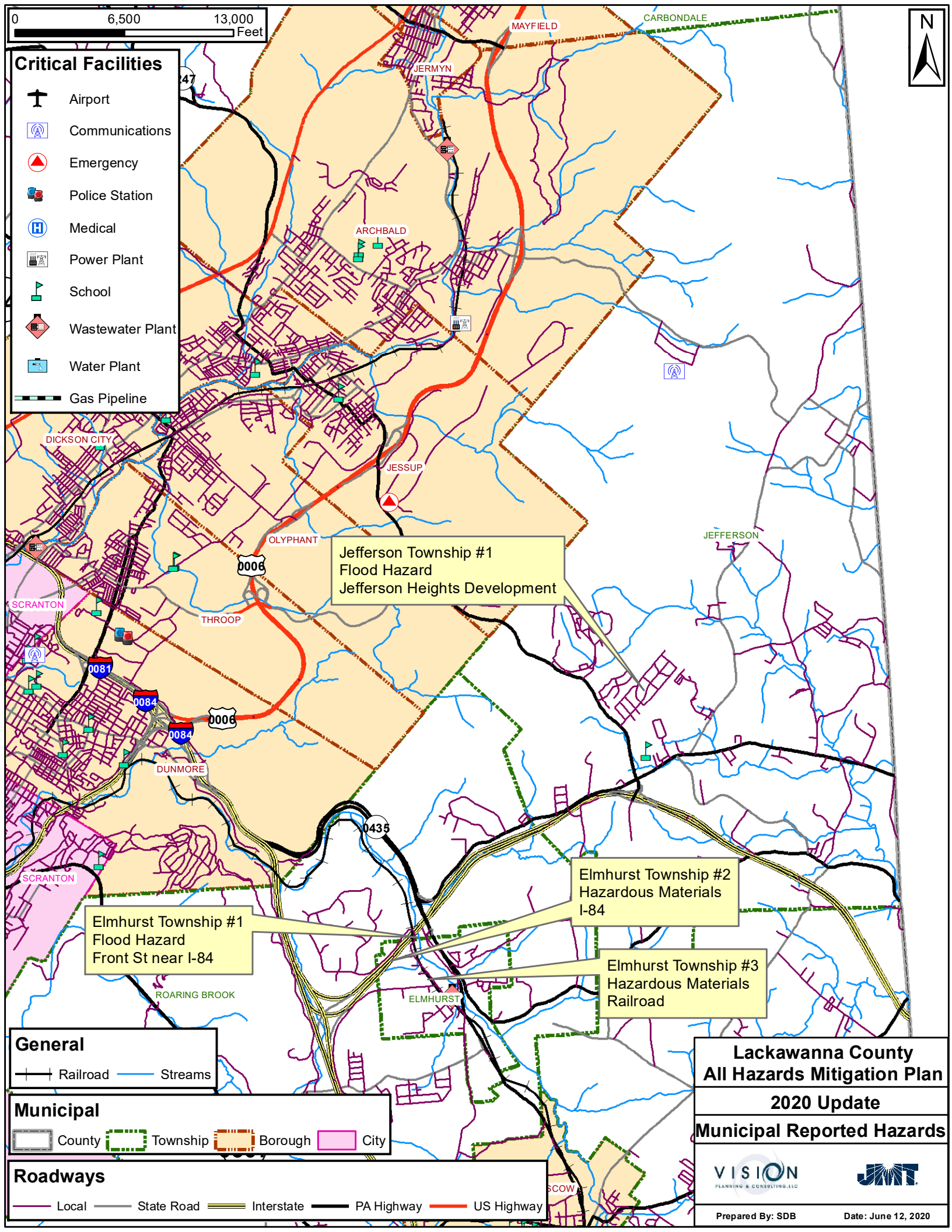
Lackawanna County Structures and Critical Facilities in Potential Wildfire Areas and Economic Exposure			
Municipality	**Number of Structures in Wildfire Areas**	**Critical Facilities in Wildfire Areas**	**Economic Exposure ($ Million)**
Archbald Borough	183		71.5
Benton Township	734	Wastewater Plant - 1	286.8
Blakely Borough	90		35.2
Carbondale City	110		43.0
Carbondale Township	223	Communications Facilities - 1; Water Plant - 1	87.1
Clarks Green Borough	93		36.3
Clarks Summit Borough	152		59.4
Clifton Township	966		377.5
Covington Township	1968		769.0
Dalton Borough	349		136.4
Dickson City Borough	58		22.7
Dunmore Borough	50		19.5
Elmhurst Township	191	Wastewater Plant - 1	74.6
Fell Township	404	Gas Pipeline	157.9
Glenburn Township	414		161.8
Greenfield Township	735		287.2
Jefferson Township	1800		703.4
Jermyn Borough	23		9.0
Jessup Borough	53		20.7
La Plume Township	207		80.9
Madison Township	1416		553.3
Mayfield Borough	41		16.0
Moosic Borough	58		22.7
Moscow Borough	226	Schools - 1	88.3
Newton Township	571		223.1
North Abington Township	235		91.8
Old Forge Borough	62		24.2
Olyphant Borough	39	Communications Facilities - 2	15.2
Ransom Township	598	Water Plant - 1	233.7
Roaring Brook Township	472		184.4
Scott Township	1318		515.0
Scranton City	314	Communications Facilities - 8	122.7
South Abington Township	637		248.9
Spring Brook Township	1359		531.0
Taylor Borough	26		10.2
Thornhurst Township	430		168.0
Throop Borough	11		4.3
Vandling Borough	27	Gas Pipeline	10.6
Waverly Township	457		178.6
West Abington Township	158		61.7
Totals	**17258**	**18**	**$6.8 Billion**

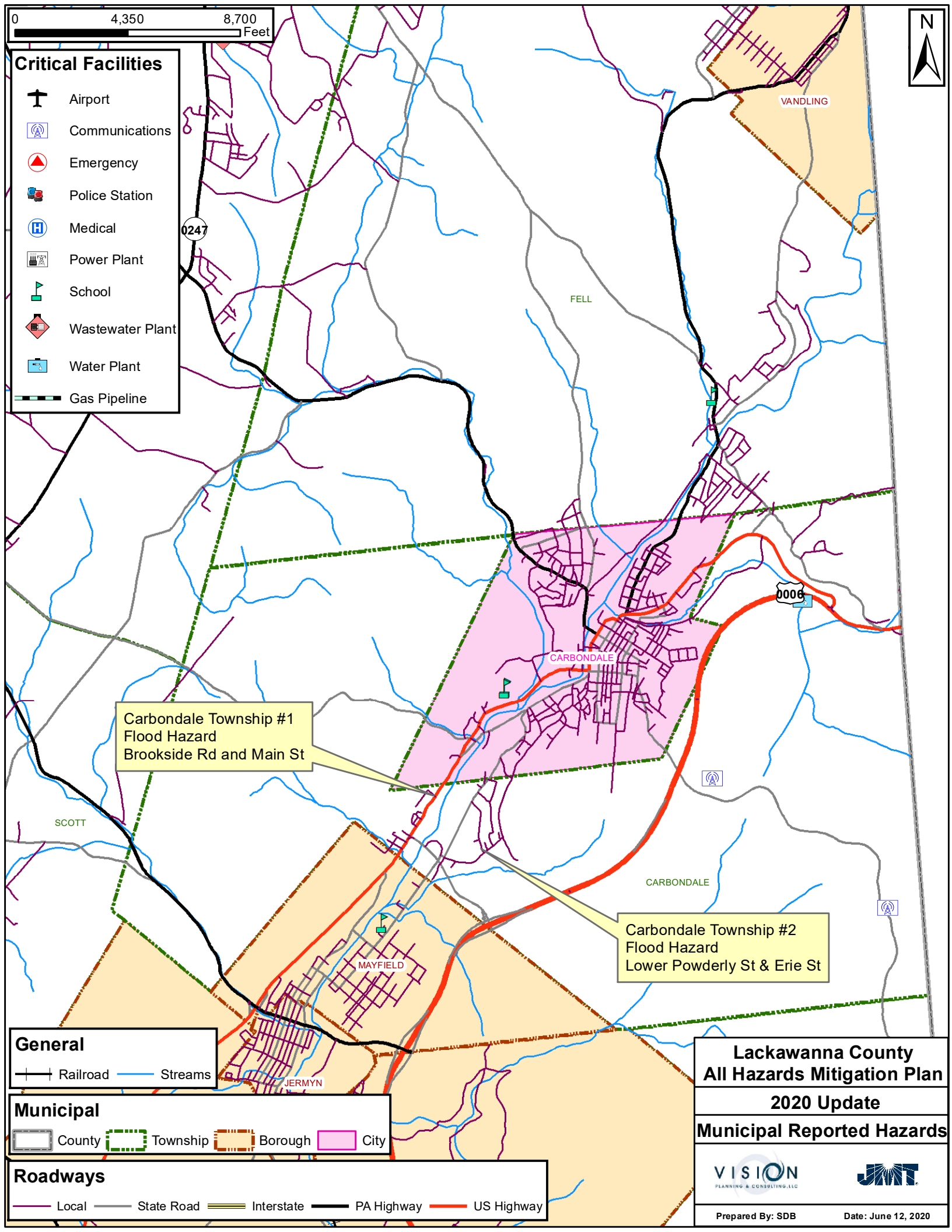

0 17,500 35,000 Feet
N
SUSQUEHANNA
WYOMING
LACKAWANNA
LUZERNE
WAYNE
MONROE
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
Hazard
Dam / Reservoir
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
State Road
Interstate
PA Highway
US Highway
VANDLING
GREENFIELD
FELL
BENTON
CARBONDALE
LA PLUME
NORTH ABINGTON
SCOTT
MAYFIELD
JERMYN
DALTON
WEST ABINGTON
WAVERLY
GLENBURN
CLARKS GREEN
CLARKS SUMMIT
SOUTH ABINGTON
ARCHBALD
BLAKELY
DICKSON CITY
JESSUP
NEWTON
THROOP
OLYPHANT
JEFFERSON
DUNMORE
SCRANTON
RANSOM
TAYLOR
ROARING BROOK
ELMHURST
OLD FORGE
MOOSIC
MADISON
MOSCOW
SPRING BROOK
COVINGTON
CLIFTON
THORNHURST
0247
0081
0407
0006
0307
0011
0347
0435
0084
0502
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Dam Locations
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: April 30, 2020

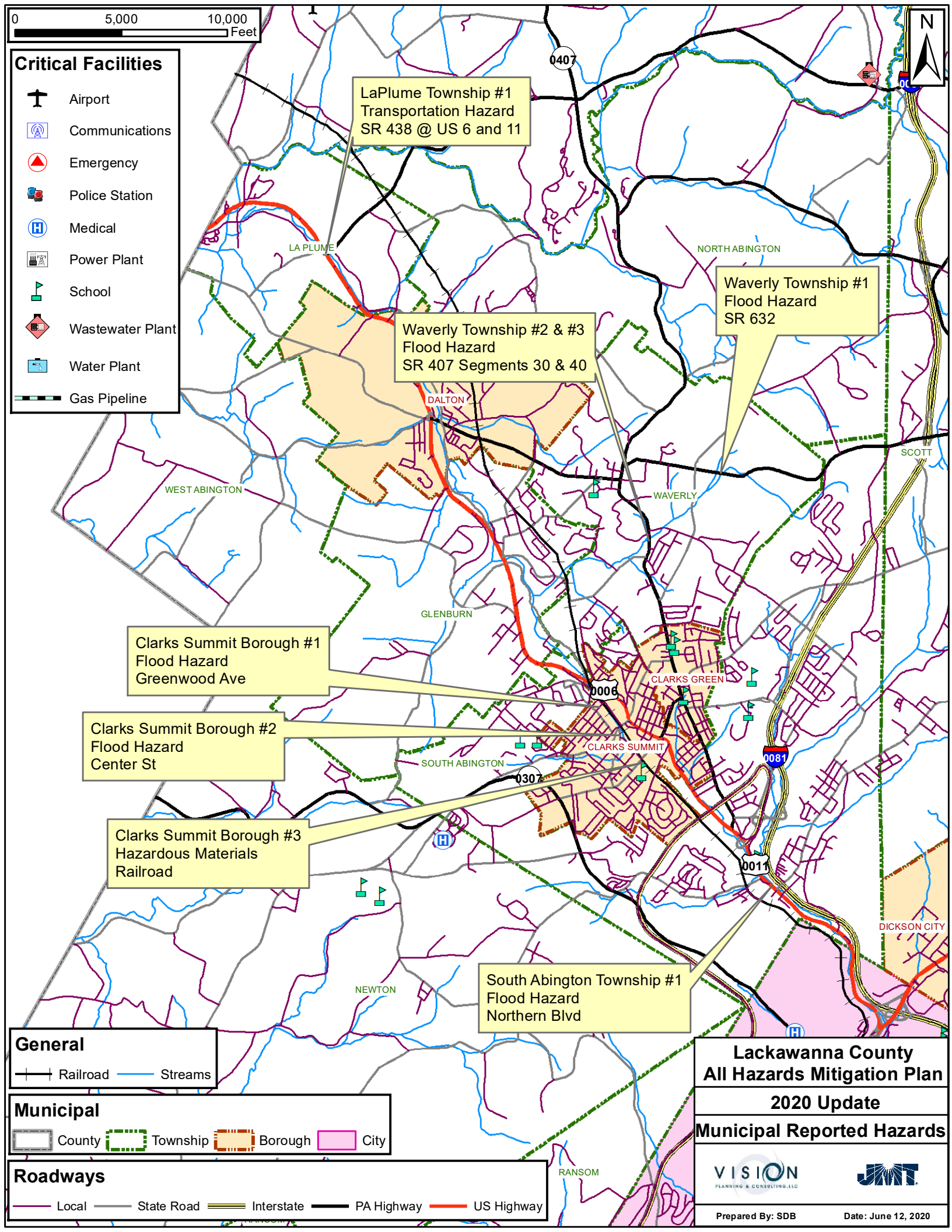
Muni ipa Hazard Area Maps

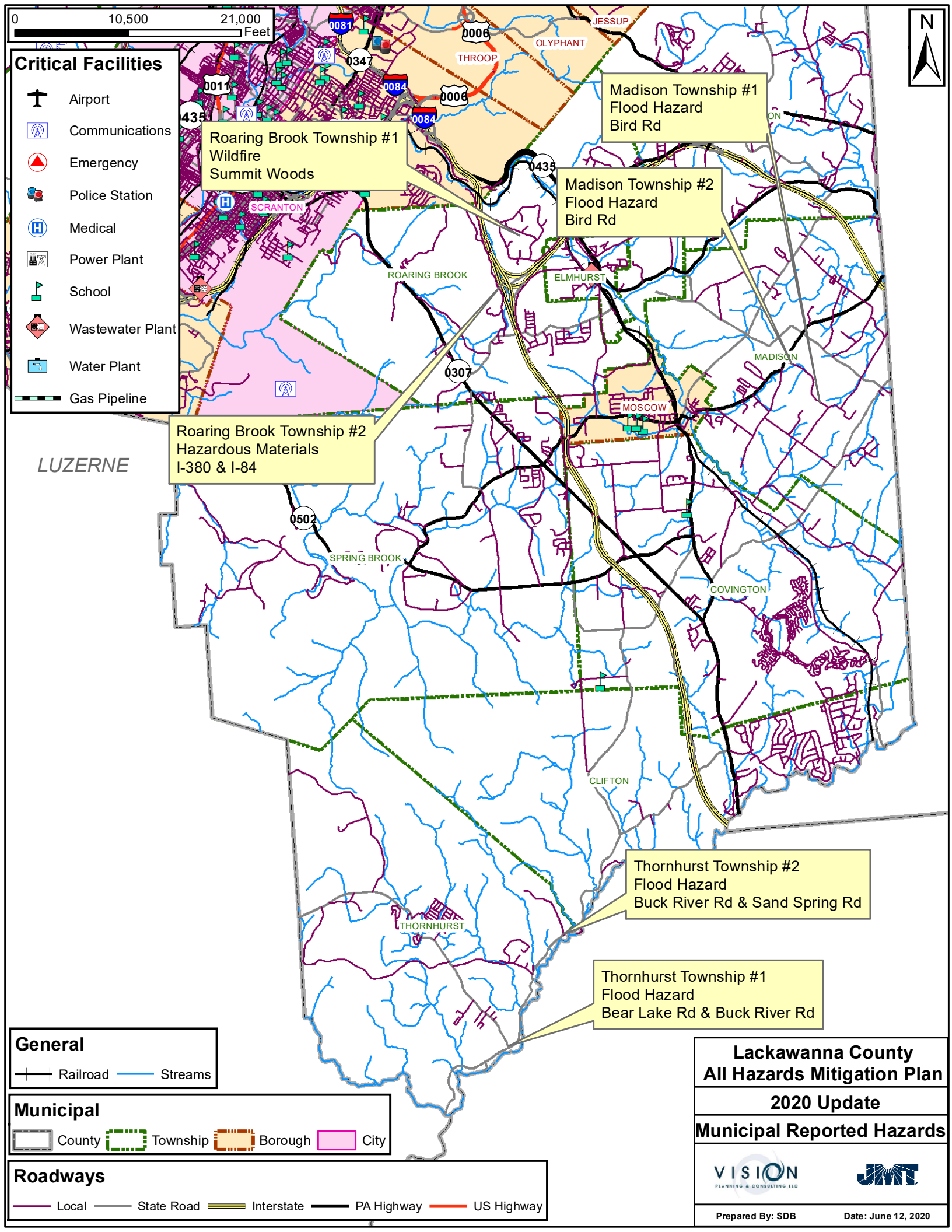

0 5,000 10,000 Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
Mayfield Borough #3
Flood Hazard
Lackawanna River N of Oak St
Mayfield Borough #1
Flood Hazard
Hill St
Mayfield Borough #2
Flood Hazard
Lackawanna River Levee
Jermyn Borough #1
Flood Hazard
Mellow Court
Blakely Borough #1
Flood Hazard
Lackawanna Co. Housing Authority
CARBONDALE
MAYFIELD
JERMYN
ARCHBALD
BLAKELY
DICKSON CITY
JESSUP
OLYPHANT
THROOP
SCRANTON
JEFFERSON
ROARING BROOK
0247
0347
0081
0006
0084
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
Local
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Municipal Reported Hazards
VISION PLANNING & CONSULTING, LLC
Prepared By: SDB
Date: June 12, 2020


0 4,200 8,400 Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
Dickson City Borough #1
Flood Hazard
Main St & Sunset Dr
Dickson City Borough #2
Flood Hazard
Main St & Bowman
Dickson City Borough #3
Land Subsidence
Breaker St
Throop Borough #1
Flood Hazard
Center St
Throop Borough #2
Flood Hazard
George St & Simpson St
Throop Borough #3
Flood Hazard
Marshwood Rd
SCOTT
ARCHBALD
BLAKELY
DICKSON CITY
JESSUP
THROOP
SCRANTON
DUNMORE
0247
0347
0081
0307
0011
0006
0084
0435
5
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
Local
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Municipal Reported Hazards
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: June 12, 2020


0 6,500 13,000 Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
MAYFIELD
CARBONDALE
JERMYN
ARCHBALD
DICKSON CITY
JESSUP
OLYPHANT
JEFFERSON
SCRANTON
THROOP
DUNMORE
ROARING BROOK
ELMHURST
Jefferson Township #1
Flood Hazard
Jefferson Heights Development
Elmhurst Township #2
Hazardous Materials
I-84
Elmhurst Township #1
Flood Hazard
Front St near I-84
Elmhurst Township #3
Hazardous Materials
Railroad
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
Local
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Municipal Reported Hazards
VISION PLANNING & CONSULTING, LLC
Prepared By: SDB
Date: June 12, 2020


0
4,350
8,700
Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
0247
VANDLING
FELL
0006
CARBONDALE
Carbondale Township #1
Flood Hazard
Brookside Rd and Main St
SCOTT
CARBONDALE
Carbondale Township #2
Flood Hazard
Lower Powderly St & Erie St
MAYFIELD
JERMYN
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
Local
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Municipal Reported Hazards
VISION
PLANNING & CONSULTING, LLC
Prepared By: SDB
Date: June 12, 2020


0 5,000 10,000 Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
LaPlume Township #1
Transportation Hazard
SR 438 @ US 6 and 11
Waverly Township #2 & #3
Flood Hazard
SR 407 Segments 30 & 40
Waverly Township #1
Flood Hazard
SR 632
Clarks Summit Borough #1
Flood Hazard
Greenwood Ave
Clarks Summit Borough #2
Flood Hazard
Center St
Clarks Summit Borough #3
Hazardous Materials
Railroad
South Abington Township #1
Flood Hazard
Northern Blvd
LA PLUME
NORTH ABINGTON
DALTON
WEST ABINGTON
WAVERLY
SCOTT
GLENBURN
CLARKS GREEN
CLARKS SUMMIT
SOUTH ABINGTON
NEWTON
RANSOM
DICKSON CITY
0407
0006
0081
0307
0011
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
Local
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Municipal Reported Hazards
VISION PLANNING & CONSULTING, LLC
JMT
Prepared By: SDB
Date: June 12, 2020



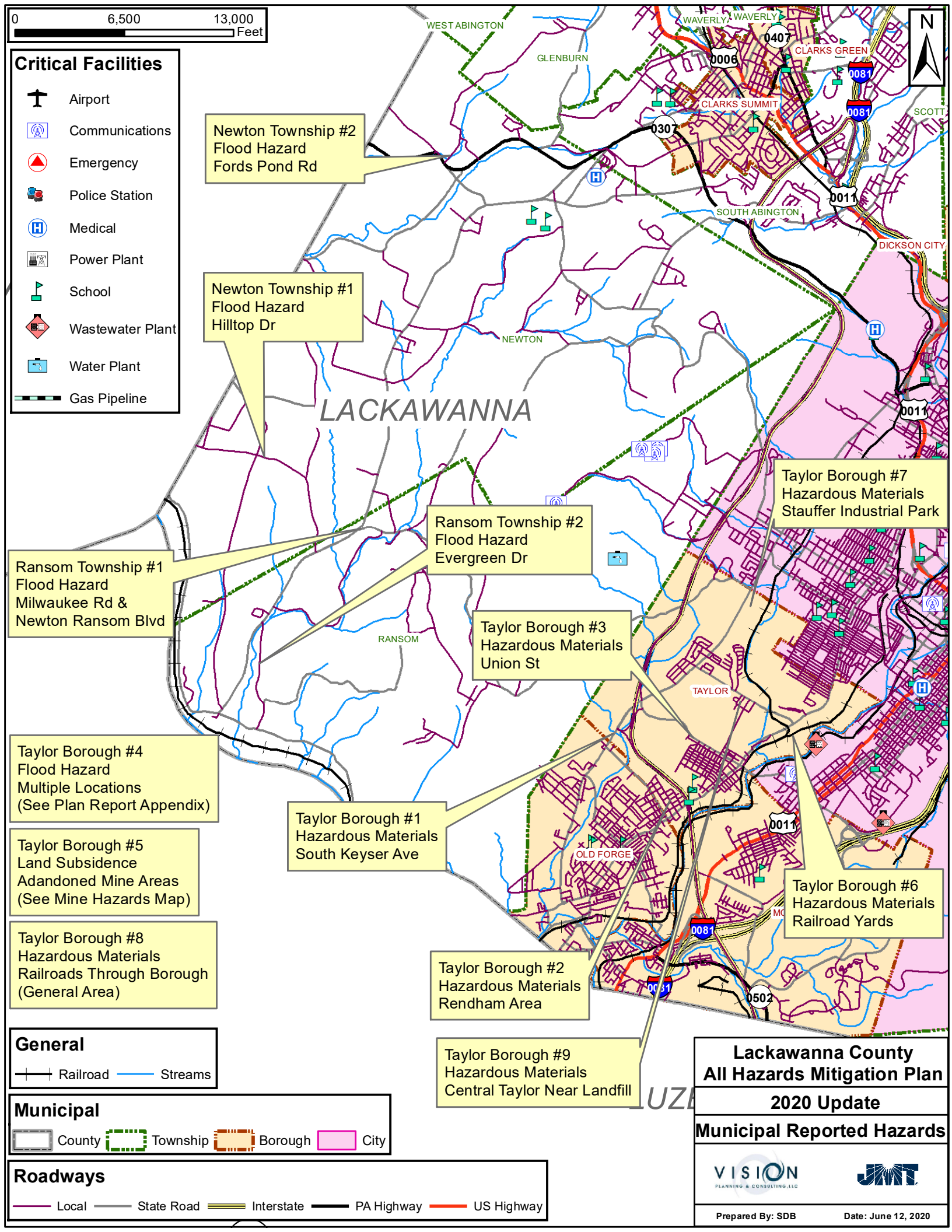
Lackawanna County All Hazards Mitigation Plan

2020 Update

Municipal Reported Hazards

Prepared By: SDB

Date: June 12, 2020


0 6,500 13,000 Feet
N
Critical Facilities
Airport
Communications
Emergency
Police Station
Medical
Power Plant
School
Wastewater Plant
Water Plant
Gas Pipeline
Newton Township #2
Flood Hazard
Fords Pond Rd
Newton Township #1
Flood Hazard
Hilltop Dr
Ransom Township #2
Flood Hazard
Evergreen Dr
Ransom Township #1
Flood Hazard
Milwaukee Rd &
Newton Ransom Blvd
Taylor Borough #7
Hazardous Materials
Stauffer Industrial Park
Taylor Borough #3
Hazardous Materials
Union St
Taylor Borough #4
Flood Hazard
Multiple Locations
(See Plan Report Appendix)
Taylor Borough #5
Land Subsidence
Adandoned Mine Areas
(See Mine Hazards Map)
Taylor Borough #8
Hazardous Materials
Railroads Through Borough
(General Area)
Taylor Borough #1
Hazardous Materials
South Keyser Ave
Taylor Borough #6
Hazardous Materials
Railroad Yards
Taylor Borough #2
Hazardous Materials
Rendham Area
Taylor Borough #9
Hazardous Materials
Central Taylor Near Landfill
WEST ABINGTON
GLENBURN
WAVERLY
CLARKS GREEN
CLARKS SUMMIT
SCOTT
SOUTH ABINGTON
DICKSON CITY
NEWTON
LACKAWANNA
RANSOM
TAYLOR
OLD FORGE
0006
0407
0081
0307
0011
0502
General
Railroad
Streams
Municipal
County
Township
Borough
City
Roadways
Local
State Road
Interstate
PA Highway
US Highway
Lackawanna County
All Hazards Mitigation Plan
2020 Update
Municipal Reported Hazards
VISION PLANNING & CONSULTING, LLC
Prepared By: SDB
Date: June 12, 2020

APPENDIX E – PAST STORM EVENTS

The following provides a full listing of flood or flash flood events recorded in Lackawanna County. This information is provided by the NCEI Storm Events Database, and can be viewed at: https://www.ncdc.noaa.gov/stormevents/.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	102.226M	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	01/19/1996	09:00	EST	Flash Flood		0	0	19.500M	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/19/1996	11:30	EST	Flood		0	0	0.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	11/08/1996	20:00	EST	Flash Flood		0	0	25.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	11/09/1996	08:00	EST	Flood		0	0	0.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	09/16/1999	18:00	EST	Flash Flood		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/27/2000	14:00	EST	Flood		0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	07/30/2000	15:00	EST	Flood		0	0	0.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	12/17/2000	10:00	EST	Flash Flood		0	0	0.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	06/16/2001	22:00	EST	Flash Flood		0	0	0.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	05/13/2002	11:00	EST	Flood		0	0	0.00K	0.00K
THORNHURST	LACKAWANNA CO.	PA	05/28/2002	14:30	EST	Flash Flood		0	0	100.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	08/15/2002	19:15	EST	Flood		0	0	5.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	06/01/2003	06:00	EST	Flash Flood		0	0	30.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	09/03/2003	23:00	EST	Flash Flood		0	0	5.000M	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	08/30/2004	18:40	EST	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	09/18/2004	03:15	EST	Flash Flood		0	0	20.000M	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	09/18/2004	03:52	EST	Flood		0	0	1.000M	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	11/28/2004	10:00	EST	Flash Flood		0	0	50.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	03/29/2005	00:30	EST	Flash Flood		0	0	20.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	04/02/2005	19:00	EST	Flash Flood		0	0	200.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	04/02/2005	21:30	EST	Flood		0	0	200.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	06/11/2005	15:50	EST	Flash Flood		0	0	10.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	06/27/2006	09:00	EST	Flash Flood		0	0	50.000M	0.00K
OLD FORGE	LACKAWANNA CO.	PA	06/27/2006	11:00	EST	Flood		0	0	5.000M	0.00K
SCRANTON	LACKAWANNA CO.	PA	11/16/2006	16:35	EST-5	Flash Flood		0	0	5.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	11/16/2006	17:45	EST-5	Flash Flood		0	0	2.00K	0.00K
OLD FORGE	LACKAWANNA CO.	PA	11/16/2006	20:00	EST-5	Flash Flood		0	0	10.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	11/16/2006	20:00	EST-5	Flash Flood		0	0	5.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	03/08/2008	16:50	EST-5	Flash Flood		0	0	0.00K	0.00K
CARBONDALE ARPT	LACKAWANNA CO.	PA	07/31/2009	10:30	EST-5	Flash Flood		0	0	10.00K	0.00K
BUSH PATCH	LACKAWANNA CO.	PA	08/19/2009	13:00	EST-5	Flash Flood		0	0	2.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	06/13/2010	14:00	EST-5	Flash Flood		0	0	150.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	09/30/2010	22:00	EST-5	Flash Flood		0	0	10.00K	0.00K
SIMPSON	LACKAWANNA CO.	PA	07/08/2011	16:20	EST-5	Flash Flood		0	0	10.00K	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	09/27/2011	17:17	EST-5	Flash Flood		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
CHINCHILLA	LACKAWANNA CO.	PA	09/27/2011	18:30	EST-5	Flash Flood		0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	09/29/2011	02:00	EST-5	Flood		0	0	0.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	06/27/2013	22:05	EST-5	Flash Flood		0	0	5.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	06/30/2013	13:45	EST-5	Flash Flood		0	0	10.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	10/15/2014	17:18	EST-5	Flash Flood		0	0	150.00K	0.00K
THROOP	LACKAWANNA CO.	PA	10/15/2014	17:20	EST-5	Flash Flood		0	0	250.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	07/30/2016	17:02	EST-5	Flash Flood		0	0	150.00K	0.00K
ELMHURST	LACKAWANNA CO.	PA	07/30/2016	18:15	EST-5	Flash Flood		0	0	10.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	02/25/2017	16:00	EST-5	Flash Flood		0	0	75.00K	0.00K
CHINCHILLA	LACKAWANNA CO.	PA	02/25/2017	16:00	EST-5	Flash Flood		0	0	75.00K	0.00K
PECKVILLE	LACKAWANNA CO.	PA	02/25/2017	16:00	EST-5	Flash Flood		0	0	75.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	01/23/2018	09:25	EST-5	Flood		0	0	0.00K	0.00K
DALTON	LACKAWANNA CO.	PA	01/23/2018	09:25	EST-5	Flood		0	0	0.00K	0.00K
MOOSIC	LACKAWANNA CO.	PA	08/13/2018	20:10	EST-5	Flood		0	0	0.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	05/28/2019	17:45	EST-5	Flash Flood		0	0	15.00K	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	05/28/2019	18:14	EST-5	Flash Flood		0	0	2.00K	0.00K
THROOP	LACKAWANNA CO.	PA	05/28/2019	18:23	EST-5	Flash Flood		0	0	20.00K	0.00K
ELMHURST	LACKAWANNA CO.	PA	05/28/2019	18:27	EST-5	Flash Flood		0	0	15.00K	0.00K
TAYLOR	LACKAWANNA CO.	PA	05/29/2019	15:42	EST-5	Flood		0	0	20.00K	0.00K
Totals:								0	0	**102.226M**	**0.00K**

The following provides a full listing of blizzards, ice storms, winter weather, and winter storms recorded in Lackawanna County. This information is provided by the NCEI Storm Events Database, and can be viewed at: https://www.ncdc.noaa.gov/stormevents/.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	120.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/15/1998	19:00	EST	Ice Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/02/1999	17:00	EST	Ice Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/13/1999	20:00	EST	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/13/2000	17:00	EST	Ice Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	12/13/2000	23:00	EST	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/24/2001	23:00	EST	Ice Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/31/2002	01:00	EST	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/01/2002	00:00	EST	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	12/11/2002	08:00	EST	Winter Weather		0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/06/2005	04:00	EST	Winter Weather		0	0	50.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/25/2005	11:00	EST	Winter Weather		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	12/16/2005	06:00	EST	Winter Storm		0	0	10.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/13/2007	15:00	EST-5	Winter Storm		0	0	50.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	04/15/2007	01:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	11/17/2007	20:00	EST-5	Winter Weather		0	0	5.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	12/13/2007	07:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/28/2008	06:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/15/2009	20:00	EST-5	Winter Weather		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/10/2010	00:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/25/2010	03:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/20/2011	22:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	03/23/2011	02:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/29/2011	09:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	01/02/2014	14:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/05/2014	00:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/13/2014	02:00	EST-5	Winter Storm		0	0	5.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	11/26/2014	06:00	EST-5	Winter Storm		0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	03/14/2017	00:00	EST-5	Blizzard		0	0	0.00K	0.00K
Totals:								0	0	120.00K	0.00K

The following provides a full listing of high wind, thunderstorm wind, and tornado events recorded in Lackawanna County. This information is provided by the NCEI Storm Events Database, and can be viewed at: https://www.ncdc.noaa.gov/stormevents/.

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	2	3.381M	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/21/1958	15:00	CST	Thunderstorm Wind	58 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	07/22/1964	14:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/11/1966	15:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	06/16/1967	16:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	11/22/1967	15:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	12/28/1968	16:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	03/26/1970	17:50	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/19/1973	15:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	09/29/1974	12:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/26/1975	17:25	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	09/02/1977	13:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	05/06/1980	17:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	06/07/1980	17:40	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	07/13/1981	13:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	06/24/1985	10:30	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	07/12/1985	17:03	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	11/16/1989	09:45	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	11/16/1989	09:50	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	11/20/1989	19:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	06/30/1990	09:15	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	06/30/1990	20:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/13/1990	15:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/13/1990	15:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	08/28/1990	20:35	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	09/02/1990	14:00	CST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	09/02/1990	15:00	CST	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	07/23/1991	13:30	EST	Tornado	F1	0	0	2.50K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	01/14/1992	09:41	EST	Tornado	F1	0	0	25.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
LACKAWANNA CO.	LACKAWANNA CO.	PA	01/14/1992	09:45	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	01/14/1992	09:50	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
LACKAWANNA CO.	LACKAWANNA CO.	PA	07/15/1992	16:14	PST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Dalton	LACKAWANNA CO.	PA	08/02/1993	14:35	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Scranton	LACKAWANNA CO.	PA	08/28/1993	13:00	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Jermyn	LACKAWANNA CO.	PA	06/13/1994	22:55	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Southern Portion	LACKAWANNA CO.	PA	06/17/1994	17:47	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Fleetville	LACKAWANNA CO.	PA	08/27/1994	15:20	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Clarks Summit	LACKAWANNA CO.	PA	05/24/1995	19:20	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Olyphant	LACKAWANNA CO.	PA	08/31/1995	19:51	EST	Thunderstorm Wind	0 kts.	0	0	7.00K	0.00K
Clark's Summit	LACKAWANNA CO.	PA	09/14/1995	12:45	EST	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Scranton	LACKAWANNA CO.	PA	10/14/1995	18:30	EST	Thunderstorm Wind	0 kts.	0	0	20.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	03/19/1996	19:00	EST	High Wind		0	0	20.00K	0.00K
MOOSIC	LACKAWANNA CO.	PA	04/30/1996	13:45	EST	Thunderstorm Wind		0	0	12.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	05/21/1996	12:15	EST	Thunderstorm Wind		0	0	5.00K	0.00K
MADISONVILLE	LACKAWANNA CO.	PA	05/21/1996	12:35	EST	Thunderstorm Wind		0	0	5.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/19/1996	12:00	EST	High Wind		0	0	0.00K	0.00K
DALTON	LACKAWANNA CO.	PA	05/19/1997	19:45	EST	Thunderstorm Wind		0	0	80.00K	0.00K
MOOSIC	LACKAWANNA CO.	PA	08/16/1997	14:45	EST	Thunderstorm Wind	50 kts.	0	0	20.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/17/1998	16:00	EST	High Wind	55 kts.	0	0	30.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	04/01/1998	14:30	EST	Thunderstorm Wind		0	0	40.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	05/29/1998	16:15	EST	Thunderstorm Wind		0	0	10.00K	0.00K
OLD FORGE	LACKAWANNA CO.	PA	05/31/1998	18:35	EST	Thunderstorm Wind		0	0	10.00K	0.00K
OLD FORGE	LACKAWANNA CO.	PA	05/31/1998	19:20	EST	Tornado	F0	0	0	100.00K	0.00K
ELMHURST	LACKAWANNA CO.	PA	05/31/1998	19:20	EST	Tornado	F0	0	0	75.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	05/31/1998	20:45	EST	Thunderstorm Wind		0	0	30.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
DALTON	LACKAWANNA CO.	PA	06/02/1998	21:05	EST	Thunderstorm Wind		0	0	10.00K	0.00K
LA PLUME	LACKAWANNA CO.	PA	06/02/1998	21:40	EST	Tornado	F1	0	0	300.00K	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	07/21/1998	13:35	EST	Thunderstorm Wind		0	0	10.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/01/1998	11:00	EST	High Wind		0	0	20.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	11/10/1998	19:00	EST	High Wind		0	0	5.00K	0.00K
NEWTON	LACKAWANNA CO.	PA	07/09/1999	22:17	EST	Thunderstorm Wind		0	0	10.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	07/18/1999	16:50	EST	Thunderstorm Wind		0	0	15.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	08/13/1999	19:25	EST	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	09/16/1999	16:00	EST	High Wind		0	0	630.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	11/02/1999	17:00	EST	High Wind		0	0	210.00K	0.00K
GLENBURN	LACKAWANNA CO.	PA	03/09/2000	18:10	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	05/13/2000	18:00	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	05/18/2000	15:32	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
WAVERLY	LACKAWANNA CO.	PA	05/24/2000	14:55	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	05/24/2000	15:05	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
FELLS CORNERS	LACKAWANNA CO.	PA	05/24/2000	15:10	EST	Thunderstorm Wind	52 kts. E	0	0	0.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	06/02/2000	16:35	EST	Thunderstorm Wind	55 kts. E	0	0	0.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	12/12/2000	05:00	EST	High Wind	50 kts. E	0	0	100.00K	0.00K
EAST BENTON	LACKAWANNA CO.	PA	06/20/2001	14:30	EST	Thunderstorm Wind	55 kts. E	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	07/11/2001	04:15	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	11/25/2001	16:00	EST	Thunderstorm Wind		0	0	0.00K	0.00K
COUNTYWIDE	LACKAWANNA CO.	PA	03/09/2002	23:30	EST	Thunderstorm Wind	60 kts. E	0	0	0.00K	0.00K
WAVERLY	LACKAWANNA CO.	PA	05/31/2002	17:10	EST	Thunderstorm Wind	50 kts. E	0	0	0.00K	0.00K
OLD FORGE	LACKAWANNA CO.	PA	08/02/2002	16:30	EST	Thunderstorm Wind	55 kts. E	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	08/15/2002	19:00	EST	Thunderstorm Wind	50 kts. E	0	0	10.00K	0.00K
DALTON	LACKAWANNA CO.	PA	07/21/2003	17:10	EST	Thunderstorm Wind	60 kts. EG	0	0	15.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	09/19/2003	05:00	EST	High Wind	50 kts. EG	0	0	50.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/15/2003	12:00	EST	High Wind	60 kts. EG	0	0	100.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	11/13/2003	12:00	EST	High Wind	53 kts. MG	0	0	30.00K	0.00K
WAVERLY	LACKAWANNA CO.	PA	06/09/2004	18:20	EST	Thunderstorm Wind	60 kts. EG	0	0	5.00K	0.00K
TOMPKINSVILLE	LACKAWANNA CO.	PA	06/09/2004	20:40	EST	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
THROOP	LACKAWANNA CO.	PA	08/20/2004	15:40	EST	Thunderstorm Wind	60 kts. EG	0	0	5.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	11/25/2004	08:25	EST	Thunderstorm Wind	75 kts. EG	0	0	200.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	06/06/2005	12:58	EST	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
VANDLING	LACKAWANNA CO.	PA	06/06/2005	13:00	EST	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	09/29/2005	08:40	EST	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
DALTON	LACKAWANNA CO.	PA	11/06/2005	18:10	EST	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	06/01/2006	13:45	EST	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
BLAKELY	LACKAWANNA CO.	PA	12/01/2006	15:56	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	12/01/2006	16:00	EST-5	High Wind	51 kts. MG	0	0	5.00K	0.00K
OAKHILL	LACKAWANNA CO.	PA	06/08/2007	21:35	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
JESSUP	LACKAWANNA CO.	PA	06/16/2007	13:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CHILDS	LACKAWANNA CO.	PA	06/19/2007	17:49	EST-5	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
OAKHILL	LACKAWANNA CO.	PA	06/19/2007	17:49	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	06/27/2007	12:15	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	06/27/2007	17:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	06/27/2007	18:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
ARCHBALD	LACKAWANNA CO.	PA	06/28/2007	14:52	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	07/10/2007	16:10	EST-5	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	08/07/2007	23:30	EST-5	Thunderstorm Wind	55 kts. EG	0	0	35.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	08/17/2007	20:20	EST-5	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	10/09/2007	16:15	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
CLARKS GREEN	LACKAWANNA CO.	PA	05/31/2008	16:23	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	06/08/2008	18:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
MAYFIELD	LACKAWANNA CO.	PA	06/10/2008	18:59	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
MONTDALE	LACKAWANNA CO.	PA	06/10/2008	19:05	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	06/10/2008	19:07	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CHAPMAN	LACKAWANNA CO.	PA	06/29/2008	19:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
JESSUP	LACKAWANNA CO.	PA	07/23/2008	04:38	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	06/26/2009	14:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
WALLSVILLE	LACKAWANNA CO.	PA	06/26/2009	14:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
CARBONDALE	LACKAWANNA CO.	PA	07/21/2010	12:46	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
JESSUP	LACKAWANNA CO.	PA	11/17/2010	02:30	EST-5	Tornado	EF1	0	0	125.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	02/18/2011	22:00	EST-5	High Wind	50 kts. EG	0	1	50.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	04/16/2011	17:00	EST-5	High Wind	52 kts. EG	0	0	50.00K	0.00K
EAST BENTON	LACKAWANNA CO.	PA	04/28/2011	04:26	EST-5	Thunderstorm Wind	70 kts. EG	0	0	30.00K	0.00K
DALTON	LACKAWANNA CO.	PA	04/28/2011	07:45	EST-5	Thunderstorm Wind	60 kts. EG	0	0	20.00K	0.00K
EAST BENTON	LACKAWANNA CO.	PA	04/28/2011	07:50	EST-5	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
DALTON	LACKAWANNA CO.	PA	04/28/2011	07:57	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
CHINCHILLA	LACKAWANNA CO.	PA	05/30/2011	02:49	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
OAKHILL	LACKAWANNA CO.	PA	07/26/2011	15:58	EST-5	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	07/29/2011	16:30	EST-5	Thunderstorm Wind	65 kts. EG	0	1	10.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	08/28/2011	09:00	EST-5	High Wind	50 kts. EG	0	0	100.00K	0.00K
WAVERLY	LACKAWANNA CO.	PA	05/29/2012	16:02	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
CHAPMAN	LACKAWANNA CO.	PA	05/29/2012	16:44	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	10/29/2012	18:00	EST-5	High Wind	56 kts. EG	0	0	100.00K	0.00K
PECKVILLE	LACKAWANNA CO.	PA	04/10/2013	16:19	EST-5	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	04/10/2013	16:24	EST-5	Thunderstorm Wind	50 kts. EG	0	0	30.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
JESSUP	LACKAWANNA CO.	PA	04/10/2013	16:27	EST-5	Thunderstorm Wind	60 kts. EG	0	0	20.00K	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	09/11/2013	15:50	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
OAKHILL	LACKAWANNA CO.	PA	07/08/2014	18:35	EST-5	Thunderstorm Wind	56 kts. MG	0	0	0.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	07/08/2014	18:37	EST-5	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
OLYPHANT	LACKAWANNA CO.	PA	05/16/2015	15:00	EST-5	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
OAKHILL	LACKAWANNA CO.	PA	02/24/2016	20:10	EST-5	Thunderstorm Wind	53 kts. MG	0	0	0.00K	0.00K
JESSUP	LACKAWANNA CO.	PA	07/25/2016	15:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
HILLSIDE JCT	LACKAWANNA CO.	PA	02/25/2017	14:48	EST-5	Tornado	EF2	0	0	50.00K	0.00K
ELMHURST	LACKAWANNA CO.	PA	05/01/2017	22:35	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	06/30/2017	15:35	EST-5	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
JUSTUS	LACKAWANNA CO.	PA	07/20/2017	16:28	EST-5	Thunderstorm Wind	63 kts. MG	0	0	0.00K	0.00K
JUSTUS	LACKAWANNA CO.	PA	07/20/2017	17:06	EST-5	Thunderstorm Wind	63 kts. MG	0	0	0.00K	0.00K
FLEETVILLE	LACKAWANNA CO.	PA	07/24/2017	15:15	EST-5	Thunderstorm Wind	55 kts. EG	0	0	10.00K	0.00K
DALTON	LACKAWANNA CO.	PA	07/24/2017	15:20	EST-5	Thunderstorm Wind	60 kts. EG	0	0	5.00K	0.00K
DALTON	LACKAWANNA CO.	PA	07/24/2017	15:30	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
PECKVILLE	LACKAWANNA CO.	PA	07/24/2017	15:40	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	08/02/2017	13:37	EST-5	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	08/22/2017	18:54	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	05/10/2018	16:48	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
WEST SCRANTON	LACKAWANNA CO.	PA	05/15/2018	14:06	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
BUSH PATCH	LACKAWANNA CO.	PA	05/15/2018	14:16	EST-5	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
ARCHBALD	LACKAWANNA CO.	PA	05/15/2018	14:17	EST-5	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
CLARKS GREEN	LACKAWANNA CO.	PA	05/15/2018	14:29	EST-5	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	06/18/2018	16:27	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
WAVERLY	LACKAWANNA CO.	PA	08/07/2018	14:09	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
CORTEZ	LACKAWANNA CO.	PA	08/07/2018	14:43	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
MILWAUKEE KEYSE	LACKAWANNA CO.	PA	09/03/2018	17:42	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
HILLSIDE JCT	LACKAWANNA CO.	PA	10/02/2018	17:01	EST-5	Tornado	EF0	0	0	5.00K	0.00K
SPRINGBROOK CORNERS	LACKAWANNA CO.	PA	10/02/2018	17:11	EST-5	Tornado	EF0	0	0	25.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	04/15/2019	00:45	EST-5	Tornado	EF0	0	0	25.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	04/15/2019	00:48	EST-5	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	04/15/2019	00:48	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	04/15/2019	00:49	EST-5	Thunderstorm Wind	60 kts. EG	0	0	10.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	04/15/2019	00:49	EST-5	Thunderstorm Wind	60 kts. EG	0	0	5.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	04/15/2019	00:51	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
CLARKS SUMMIT	LACKAWANNA CO.	PA	05/19/2019	19:38	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
WAVERLY	LACKAWANNA CO.	PA	05/19/2019	19:39	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
NEWTON	LACKAWANNA CO.	PA	05/28/2019	17:18	EST-5	Tornado	EF1	0	0	25.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	05/28/2019	17:33	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
NAY AUG	LACKAWANNA CO.	PA	05/28/2019	17:36	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
MOSCOW	LACKAWANNA CO.	PA	05/28/2019	17:44	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
MADISONVILLE	LACKAWANNA CO.	PA	05/28/2019	17:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
QUICKTOWN	LACKAWANNA CO.	PA	05/28/2019	17:48	EST-5	Thunderstorm Wind	70 kts. EG	0	0	20.00K	0.00K
CARBONDALE ARPT	LACKAWANNA CO.	PA	05/29/2019	14:26	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
CARBONDALE ARPT	LACKAWANNA CO.	PA	05/29/2019	14:26	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
RICHMONDALE	LACKAWANNA CO.	PA	05/29/2019	14:27	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
RICHMONDALE	LACKAWANNA CO.	PA	05/29/2019	14:29	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
FLEETVILLE	LACKAWANNA CO.	PA	06/29/2019	15:05	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	06/29/2019	15:44	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
SPRINGBROOK CORNERS	LACKAWANNA CO.	PA	07/21/2019	15:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
DALEVILLE	LACKAWANNA CO.	PA	07/21/2019	15:45	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
TAYLOR	LACKAWANNA CO.	PA	07/30/2019	16:02	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K

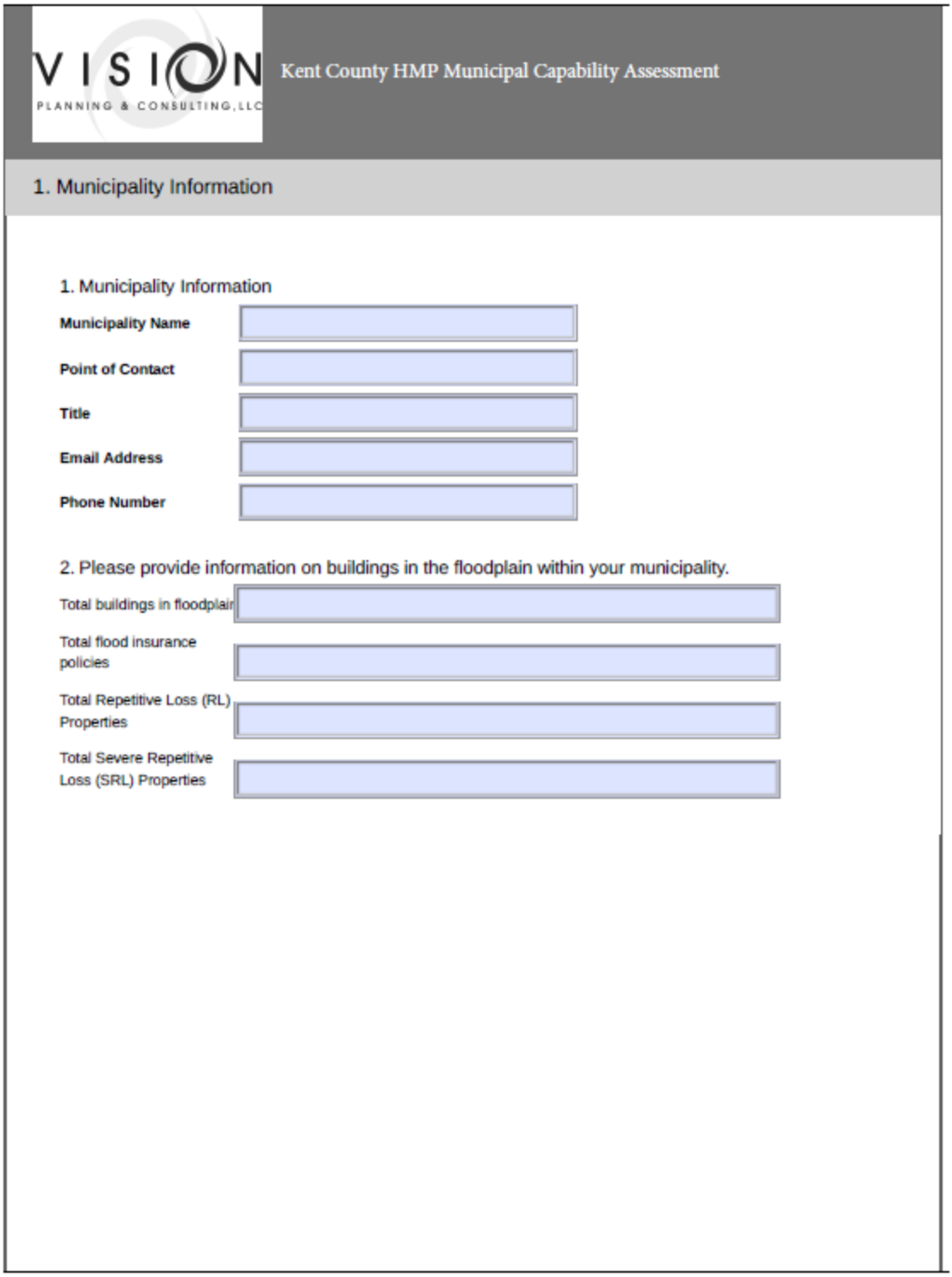
Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
SCRANTON	LACKAWANNA CO.	PA	07/30/2019	16:10	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
BUSH PATCH	LACKAWANNA CO.	PA	08/08/2019	16:05	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
SCRANTON	LACKAWANNA CO.	PA	08/08/2019	16:11	EST-5	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
DUNMORE	LACKAWANNA CO.	PA	08/17/2019	15:47	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
SPRINGBROOK CORNERS	LACKAWANNA CO.	PA	10/31/2019	19:54	EST-5	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
LA PLUME	LACKAWANNA CO.	PA	10/31/2019	20:10	EST-5	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
LACKAWANNA (ZONE)	LACKAWANNA (ZONE)	PA	04/13/2020	06:59	EST-5	High Wind	54 kts. MG	0	0	0.00K	0.00K
Totals:								0	2	3.381M	0.00K

APPENDIX F – MUNICIPAL PARTICIPATION AND INFORMATION FORMS

Each municipality was contacted and provided a municipal specific worksheets/questionnaires to help inform different components of the Plan update, including the HIRA, Capability Assessment, and Mitigation Strategy. Each municipality were provided five specific worksheets/questionnaires to fill out and return for inclusion in the Plan update. Copies of each of these documents are included in this Appendix. The worksheets/questionnaires provided to each jurisdiction are identified below, followed by all municipal responses:

1. Municipal Capability Survey
2. NFIP Questionnaire
3. Municipal Hazard Areas Worksheet
4. Status of Past Hazard Mitigation Actions Worksheet
5. New Hazard Mitigation Actions Worksheet

Municipal Capability Survey



Kent County HMP Municipal Capability Assessment

1. Municipality Information

1. Municipality Information

Municipality Name

Point of Contact

Title

Email Address

Phone Number

2. Please provide information on buildings in the floodplain within your municipality.

Total buildings in floodplain

Total flood insurance policies

Total Repetitive Loss (RL) Properties

Total Severe Repetitive Loss (SRL) Properties

VISION PLANNING & CONSULTING, LLC

Kent County HMP Municipal Capability Assessment

2. Critical Facilities

* 3. Do any critical facilities (police station, fire stations, hospitals, schools, etc.) fall within flood hazard areas?

- ◯ Yes
- ◯ No

4. Please indicate the name of each facility and location.

Facility #1 Name and Location	
Facility #2 Name and Location	
Facility #3 Name and Location	
Facility #4 Name and Location	
Facility #5 Name and Location	

* 5. How many critical facilities have been damaged in the past five years from natural hazards?

- ◯ 0
- ◯ 1
- ◯ 2
- ◯ 3 or more

6. Please indicate details of each facility damaged.

Facility #1 - Name, Hazard Event, Damage Description

Facility #2 - Name, Hazard Event, Damage Description

Facility #3 - Name, Hazard Event, Damage Description

Facility #4 - Name, Hazard Event, Damage Description

Facility #5 - Name, Hazard Event, Damage Description

VISION PLANNING & CONSULTING, LLC

Kent County HMP Municipal Capability Assessment

3. Existing Plans and Ordinances

* 7. Do any of your plans and ordinances contain the following policies? (Check all that apply)

- ☐ Freeboard requirement?
- ☐ A policy preventing new development or substantial improvements to structures in floodplains?
- ☐ A regulation prohibiting fill in the floodplain?
- ☐ A requirement that critical facilities be protected from higher flood levels?
- ☐ A policy encouraging cluster development near floodplains, wetlands?

Please Indicate Name and Year of each Plan/Ordinance

8. Are there any other policies that mitigate/reduce risk? (If yes, please include plan/ordinance name and year)

* 9. Are any restrictions on floodplain use enforced through the municipality's subdivision and building permit process? (If yes, please explain)

* 10. Do all proposed developments require plans to go through the Municipality's subdivision approval process or to acquire a building permit for new structures? (If yes, please explain)

VISION PLANNING & CONSULTING, LLC

Kent County HMP Municipal Capability Assessment

4. Emergency Services

* 11. What types of emergency response services does your municipality have in place? (Check all that apply)

- [ ] Municipal Police Force
- [ ] County Police Force
- [ ] Volunteer Fire Department
- [ ] Paid Fire Department
- [ ] Paid Emergency Medical Services (EMS)
- [ ] Volunteer ALS/BLS (Ambulance Service)
- [ ] Local Emergency Management Coordinator
- [ ] Specialized Response Teams (Dive Team, USAR, High-Angle Rescue, etc.)
- [ ] Other (please specify)

VISION PLANNING & CONSULTING, LLC

Kent County HMP Municipal Capability Assessment

5. Mitigation Projects

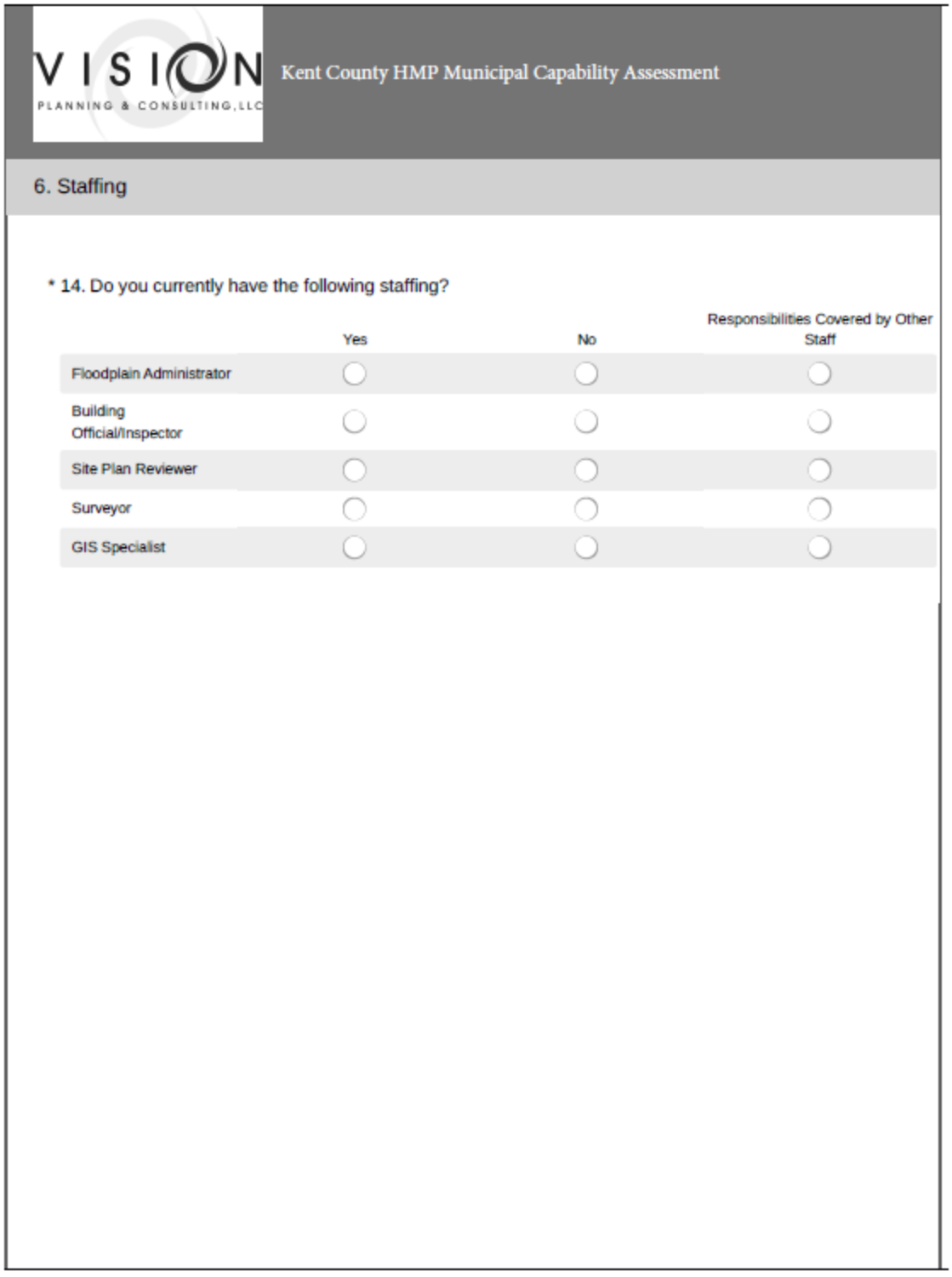
* 12. Has your municipality completed any mitigation projects in the past five years?

- ○ Yes
- ○ No

* 13. Please indicate the type of projects undertaken in the past five years. (Check all that apply)

- ☐ Buy-outs (acquisition and relocation)
- ☐ Elevation of structures
- ☐ Floodproofing
- ☐ Berms/floodwalls
- ☐ Levees
- ☐ Retrofit projects for critical facility structures
- ☐ Retention/detention basins
- ☐ Hazard warning (sirens, reverse 911)
- ☐ Hazard response (EOC activation, evacuation orders)
- ☐ Post disaster recovery (clearing streets, debris removal)
- ☐ Critical Facilities Protection (power stations, water/sewer facilities, police, fire, EMS, hospitals)
- ☐ Wetlands protection
- ☐ Erosion and sedimentation control
- ☐ Outreach projects (newsletters, brochures)
- ☐ Environmental education programs
- ☐ Promotion of flood insurance sales

Please provide project type, location, and year completed for each checked project



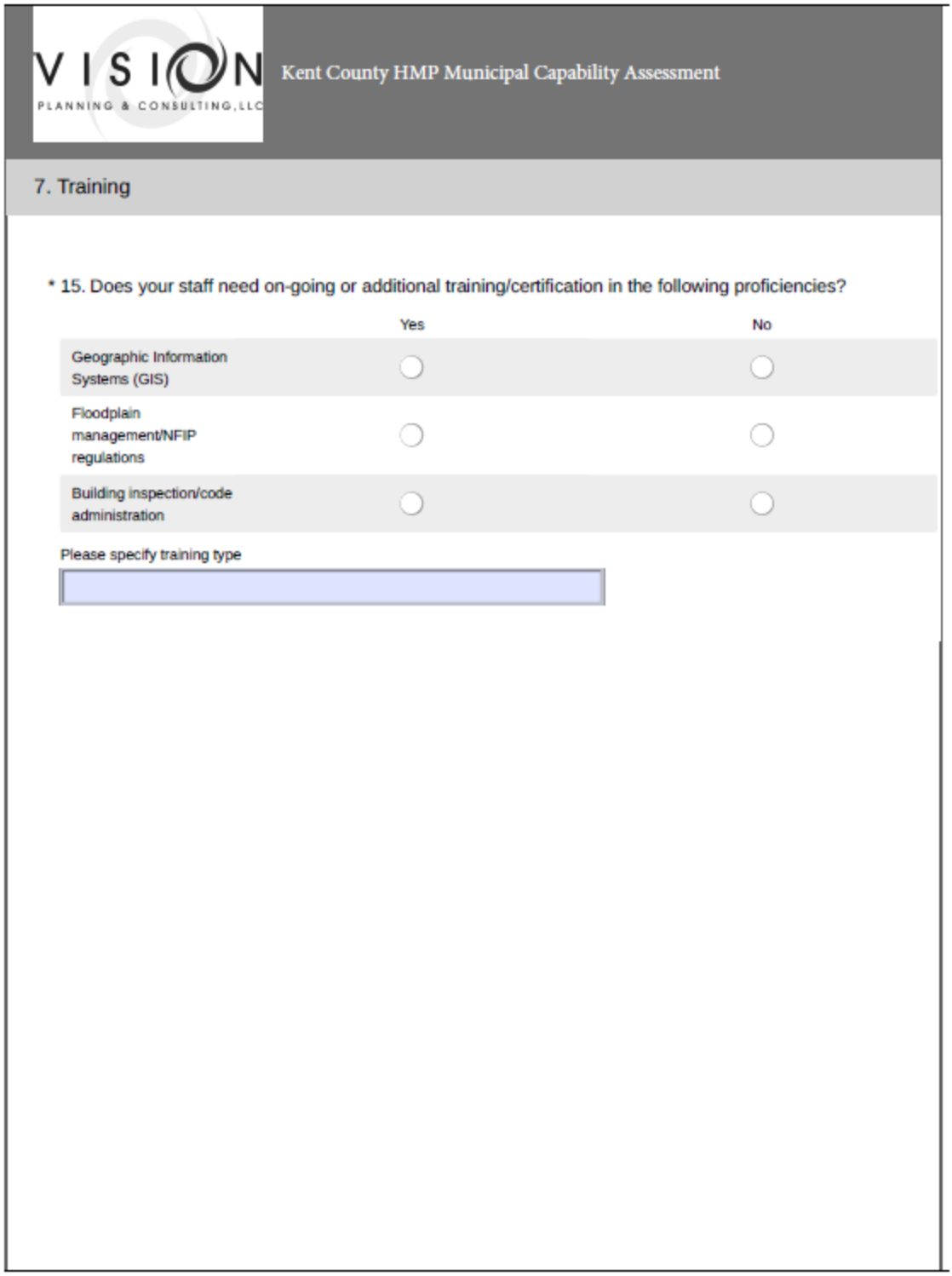
VISION PLANNING & CONSULTING, LLC

Kent County HMP Municipal Capability Assessment

6. Staffing

* 14. Do you currently have the following staffing?

	Yes	No	Responsibilities Covered by Other Staff
Floodplain Administrator	○	○	○
Building Official/Inspector	○	○	○
Site Plan Reviewer	○	○	○
Surveyor	○	○	○
GIS Specialist	○	○	○



VISION PLANNING & CONSULTING, LLC

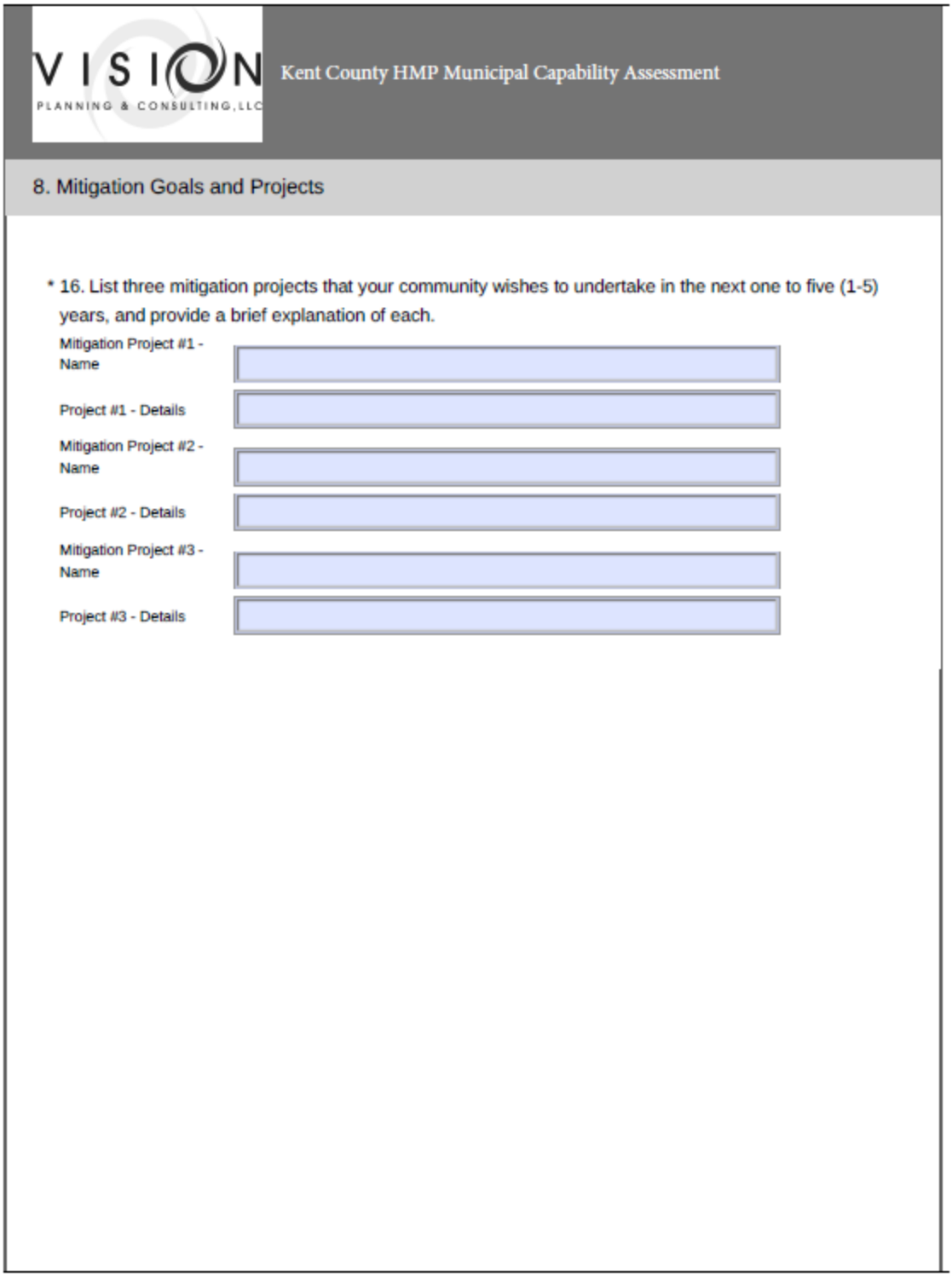
Kent County HMP Municipal Capability Assessment

7. Training

* 15. Does your staff need on-going or additional training/certification in the following proficiencies?

	Yes	No
Geographic Information Systems (GIS)	○	○
Floodplain management/NFIP regulations	○	○
Building inspection/code administration	○	○

Please specify training type


VISION
PLANNING & CONSULTING, LLC
Kent County HMP Municipal Capability Assessment
8. Mitigation Goals and Projects
* 16. List three mitigation projects that your community wishes to undertake in the next one to five (1-5) years, and provide a brief explanation of each.
Mitigation Project #1 - Name
Project #1 - Details
Mitigation Project #2 - Name
Project #2 - Details
Mitigation Project #3 - Name
Project #3 - Details

NFIP Questionnaire

Flood Identification and Mapping	County	Municipalities
Does the County make the Flood Insurance Rate Map and Flood Insurance Studies available to the public? Where are these documents housed within the County?		
Will the recently developed Digital Flood Insurance Rate Maps be made available to the public as well? How?		
A) Are Letters of Map Revisions (LOMRs) reviewed and signed by County officials. B) If during the subdivision review process a new development determines a reduction in the floodplain delineation of the FIRM floodplain, is the developer required to submit a LOMR submission to FEMA?		
Does the County provide advice to community residents regarding elevation certificates and Letter of Map Amendment (LOMA) applications?		
Does the County maintain records of approved letters of map change?		
Does the County assist residents in interpreting the FIRM and County flood studies to determine the property's status in the floodplain? If yes, which department?		
Are any restrictions on floodplain use enforced through the subdivision and building permit process?		
Do all proposed developments require plans to go through the County's subdivision approval process or to acquire a building permit for new structures?		
Are all new structures required to be at least 1.5 feet above the 100-year base flood elevation?		
Is the County committed to educating residents about the value and availability of flood insurance? Is an annual letter sent to residents in the floodplain explaining the importance of flood insurance and where it may be obtained?		
Does the County assist residents in interpreting the FIRM and County flood studies to determine the resident's property's flood plain status, and offer advice regarding elevation certificates and LOMA applications?		
When was the last Community Assistance Visit conducted and, as of that date, was Lackawanna County found to meet the requirements for continued participation in the NFIP?		

Municipal Hazard Areas Worksheet

Hazard Area Identification

Municipality:

Contact Name:

Contact Email:

Contact Phone Number:

Please identify problem/hazard areas within the municipality along with a brief description of the hazard and any past occurrences.

Hazard Areas:

Hazard Area #1:

Location (ex. – address, cross streets, or road segments.):

Hazard type (ex. – flood area):

Hazard Description (ex. – no stormwater pipes along roadway, rainwater washes out roads):

Notes:

_____

Hazard Area #2:

Location (ex. - address, cross streets, or road segments):

Hazard type (ex. - flood, pipeline, land subsidence):

Hazard Description:

Notes:

_____

Hazard Area #3:

Location (ex. - address, cross streets, or road segments):

Hazard type (ex. - flood, pipeline, land subsidence):

Hazard Description:

Notes:

Status of Past Hazard Mitigation Action Worksheet

Please fill out the table below by identifying if each action from the 2015 HMP has been completed, cancelled, is in progress, ongoing, or is not applicable. Please provide any notes to accompany each actions status. A sample action update has been completed in orange.

LA County Municipal Hazard Mitigation Actions					
Municipality	**Hazard Mitigated**	**Mitigation Action**	**Lead Agency**	**Status (In Progress, On-going, Not Applicable, Completed, Cancelled)**	**Notes**
Sample	Flood	Sample Action	Municipal Utilities (MUC)	On-Going	Backflow prevention devices are being installed throughout the township. Four of seven have been installed. Expected completion by Fall 2019
XXXX Township					

New Municipal Hazard Mitigation Actions Worksheet

Please fill out the table below by identifying new mitigation actions for your municipality, identifying the hazard mitigation for each actions, and identifying the lead agency for each action. A sample new action has been completed in orange.

Lackawanna County Municipal Hazard Mitigation Actions			
Municipality	**Hazard Mitigated**	**Mitigation Action**	**Lead Agency**
Sample	Flood	Conduct streambank stabilization at <INSERT LOCATION/NAME OF STREAM/WATER BODY> on <INSERT ROAD NAME/ROUTE #/INTERSECTION> to prevent further damage.	Local Watershed Organization
<ENTER MUNICIPALITY NAME>			

APPENDIX G – HAZUS SUMMARY REPORTS

This Appendix provides the results from the Hazus-MH, which was performed as part of the Risk Assessment. Included in this Appendix are the Hazus Summary Reports for a simulated 100-year, 200-year, 500-year, and 1000-year wind events, and for a 1000-year earthquake event.

Hazus-MH: Hurricane Global Risk Report

Region Name: LackawannaCounty

Hurricane Scenario: Probabilistic 100-year Return Period

Print Date: Tuesday, May 19, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Pennsylvania

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 464.91 square miles and contains 59 census tracts. There are over 87 thousand households in the region and a total population of 214,437 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 86 thousand buildings in the region with a total building replacement value (excluding contents) of 27,060 million dollars (2014 dollars). Approximately 90% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 86,014 buildings in the region which have an aggregate total replacement value of 27,060 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

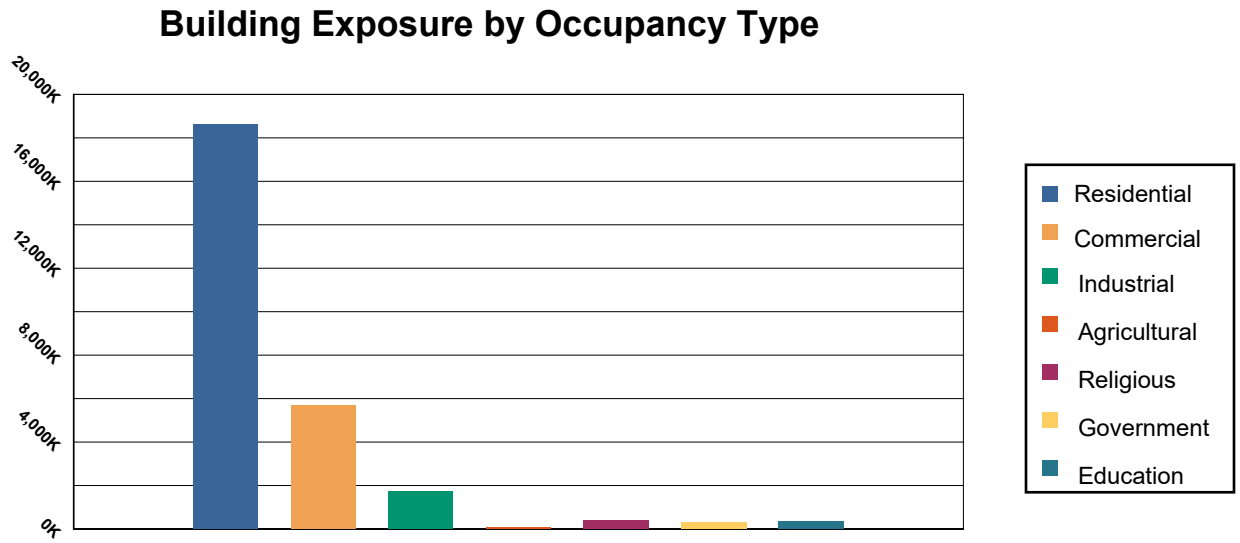


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	18,620,745	68.81%
Commercial	5,656,060	20.90%
Industrial	1,724,448	6.37%
Agricultural	51,636	0.19%
Religious	380,887	1.41%
Government	292,387	1.08%
Education	333,380	1.23%
Total	**27,059,543**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 1,079 beds. There are 95 schools, 61 fire stations, 28 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

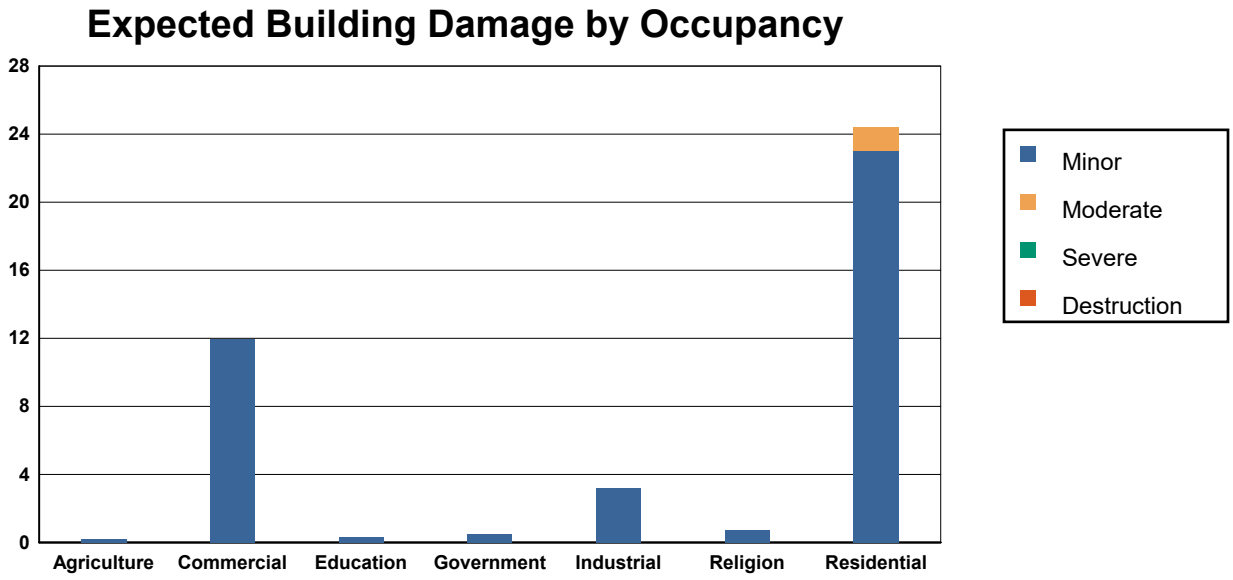


Table 2: Expected Building Damage by Occupancy : 100 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	156.80	99.87	0.20	0.13	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	5,932.03	99.80	11.97	0.20	0.00	0.00	0.00	0.00	0.00	0.00
Education	152.67	99.78	0.33	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Government	220.50	99.77	0.50	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	1,419.82	99.78	3.18	0.22	0.00	0.00	0.00	0.00	0.00	0.00
Religion	433.30	99.84	0.70	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Residential	77,657.59	99.97	23.03	0.03	1.38	0.00	0.00	0.00	0.00	0.00
Total	**85,972.70**		**39.91**		**1.38**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 100 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	432	99.71	1	0.29	0	0.00	0	0.00	0	0.00
Masonry	25,848	99.90	26	0.10	1	0.00	0	0.00	0	0.00
MH	1,613	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	3,591	99.76	9	0.24	0	0.00	0	0.00	0	0.00
Wood	49,561	100.00	0	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 1079 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

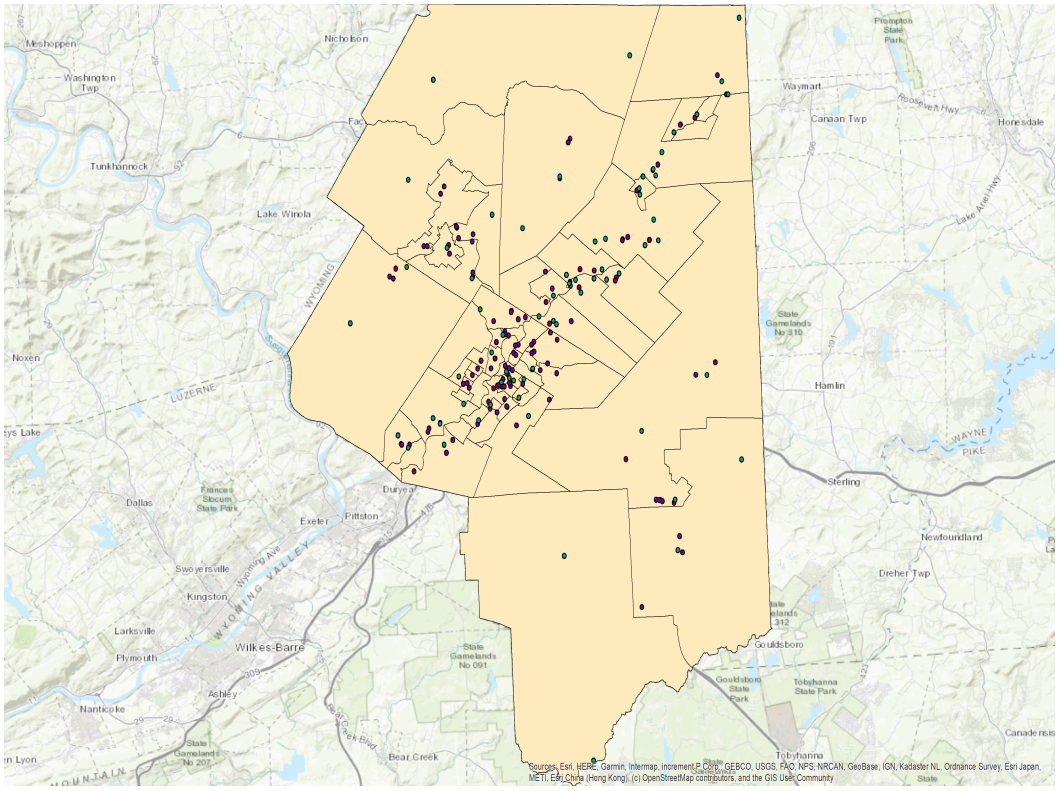
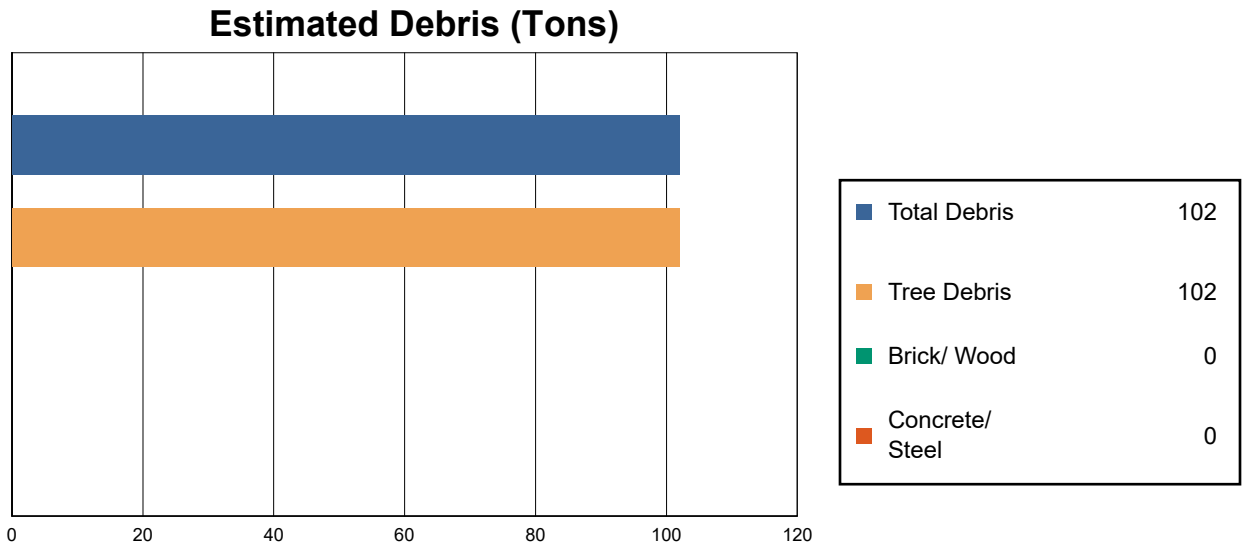


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	61	0	0	61
Hospitals	6	0	0	6
Police Stations	28	0	0	28
Schools	95	0	0	95

Induced Hurricane Damage

Debris Generation

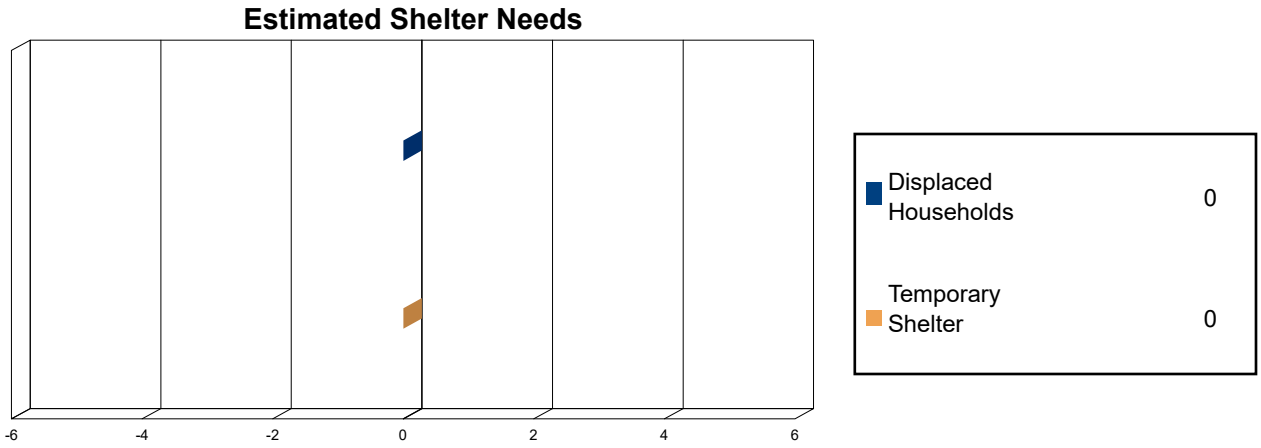


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 102 tons of debris will be generated. Of the total amount, 90 tons (88%) is Other Tree Debris. Of the remaining 12 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 12 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 214,437) will seek temporary shelter in public shelters.

Economic Loss

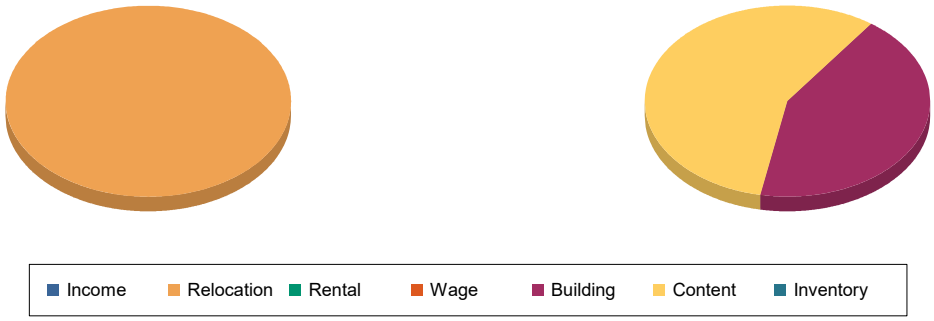
The total economic loss estimated for the hurricane is 0.1 million dollars, which represents 0.00 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 0 million dollars. 2% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Total Loss by General Occupancy



Loss Type by General Occupancy

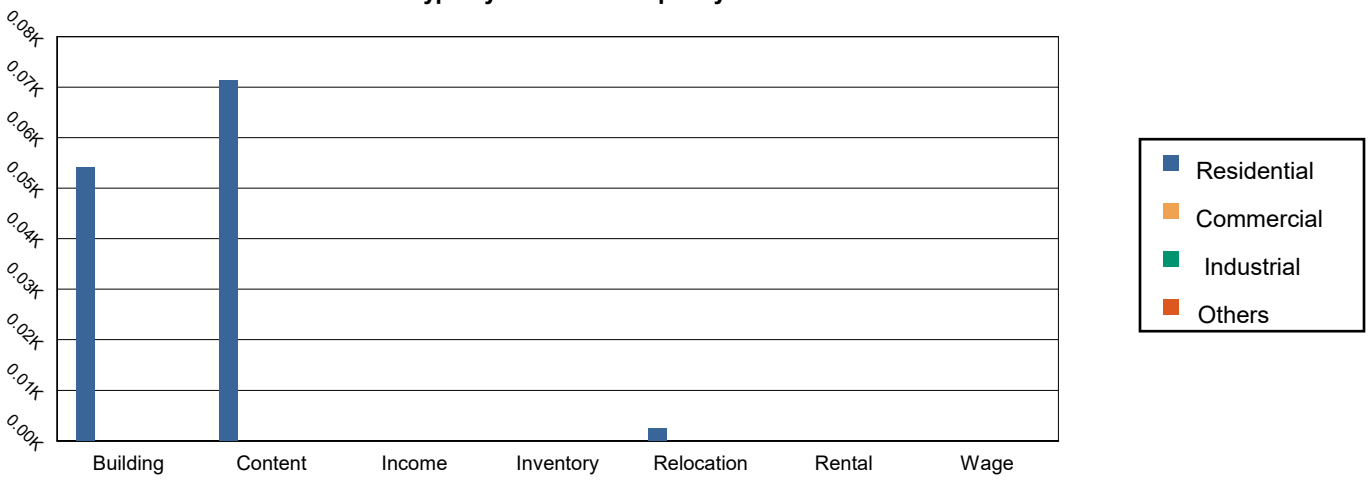


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	54.06	0.00	0.00	0.00	54.06
	Content	71.23	0.00	0.00	0.00	71.23
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**125.29**	**0.00**	**0.00**	**0.00**	**125.29**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	2.36	0.00	0.00	0.00	2.36
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2.36**	**0.00**	**0.00**	**0.00**	**2.36**

Total

Total	**127.65**	**0.00**	**0.00**	**0.00**	**127.65**

Appendix A: County Listing for the Region

Pennsylvania
- Lackawanna

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Pennsylvania				
Lackawanna	214,437	18,620,745	8,438,798	27,059,543
Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**
Study Region Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**

Hazus-MH: Hurricane Global Risk Report

Region Name: LackawannaCounty

Hurricane Scenario: Probabilistic 200-year Return Period

Print Date: Tuesday, May 19, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Pennsylvania

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 464.91 square miles and contains 59 census tracts. There are over 87 thousand households in the region and a total population of 214,437 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 86 thousand buildings in the region with a total building replacement value (excluding contents) of 27,060 million dollars (2014 dollars). Approximately 90% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 86,014 buildings in the region which have an aggregate total replacement value of 27,060 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

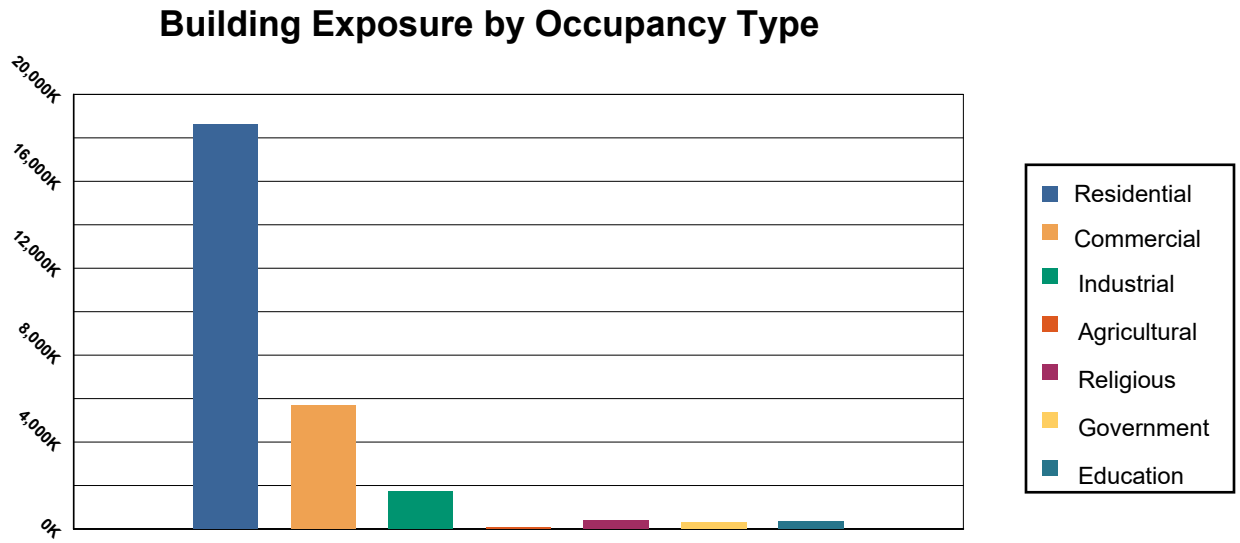


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	18,620,745	68.81%
Commercial	5,656,060	20.90%
Industrial	1,724,448	6.37%
Agricultural	51,636	0.19%
Religious	380,887	1.41%
Government	292,387	1.08%
Education	333,380	1.23%
Total	**27,059,543**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 1,079 beds. There are 95 schools, 61 fire stations, 28 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 1 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

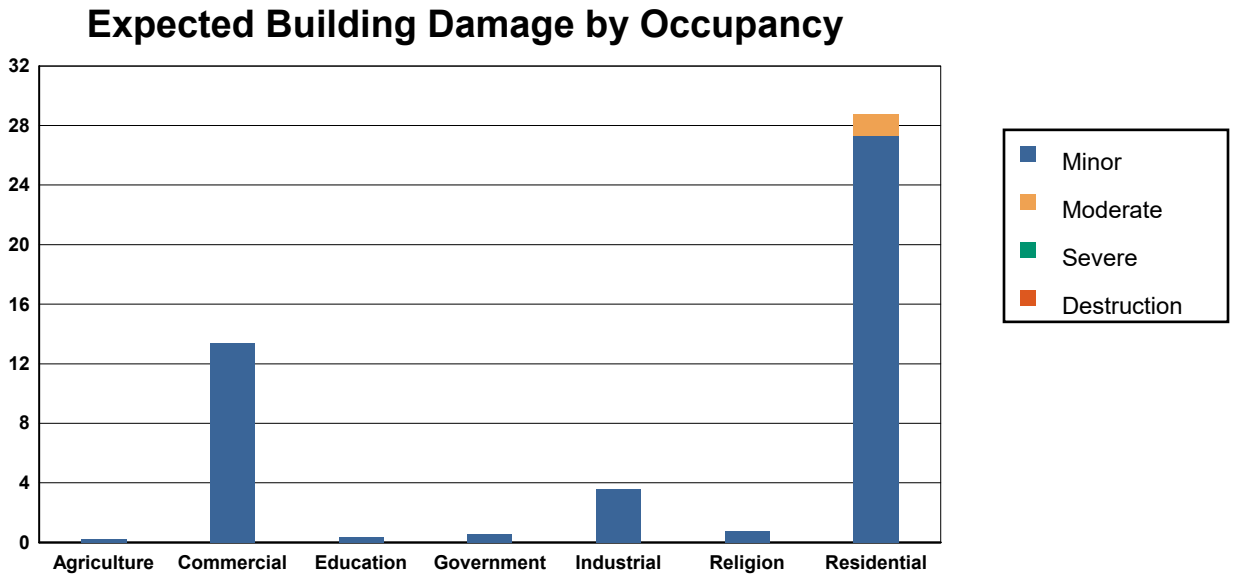


Table 2: Expected Building Damage by Occupancy : 200 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	156.74	99.84	0.26	0.16	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	5,930.59	99.77	13.41	0.23	0.00	0.00	0.00	0.00	0.00	0.00
Education	152.62	99.75	0.38	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Government	220.43	99.74	0.57	0.26	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	1,419.41	99.75	3.59	0.25	0.00	0.00	0.00	0.00	0.00	0.00
Religion	433.22	99.82	0.78	0.18	0.00	0.00	0.00	0.00	0.00	0.00
Residential	77,653.25	99.96	27.32	0.04	1.43	0.00	0.00	0.00	0.00	0.00
Total	**85,966.26**		**46.31**		**1.43**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 200 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	432	99.68	1	0.32	0	0.00	0	0.00	0	0.00
Masonry	25,844	99.88	29	0.11	1	0.00	0	0.00	0	0.00
MH	1,613	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	3,590	99.73	10	0.27	0	0.00	0	0.00	0	0.00
Wood	49,560	100.00	1	0.00	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 1079 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

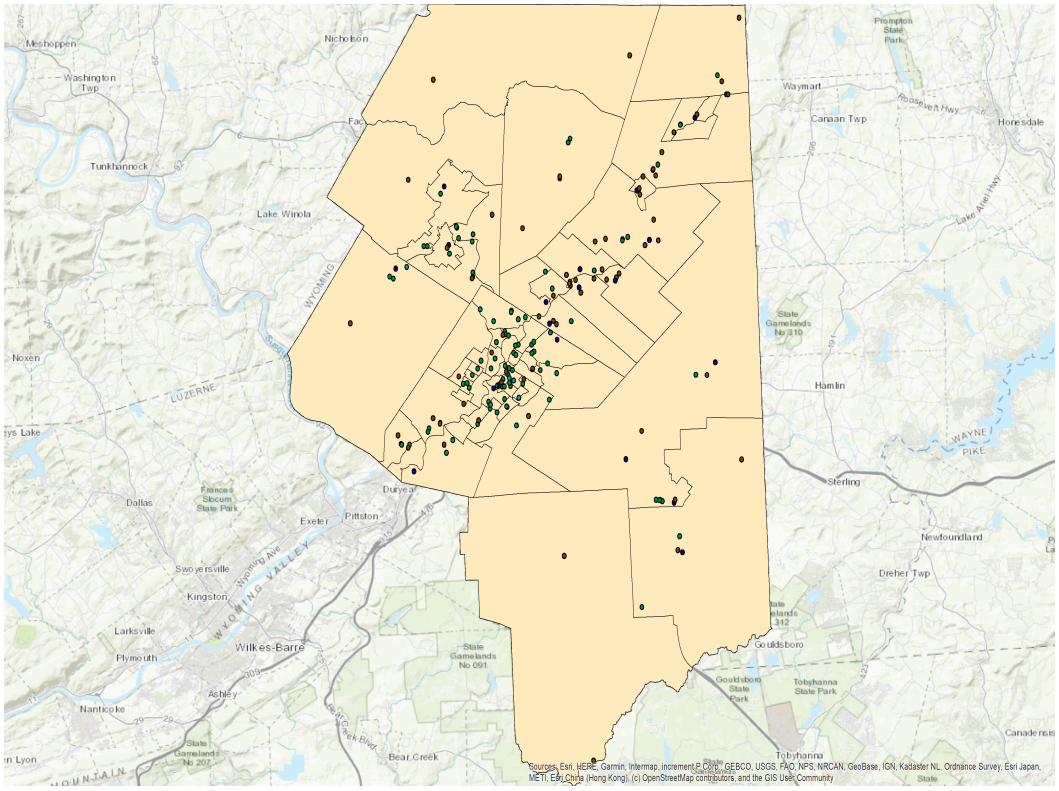
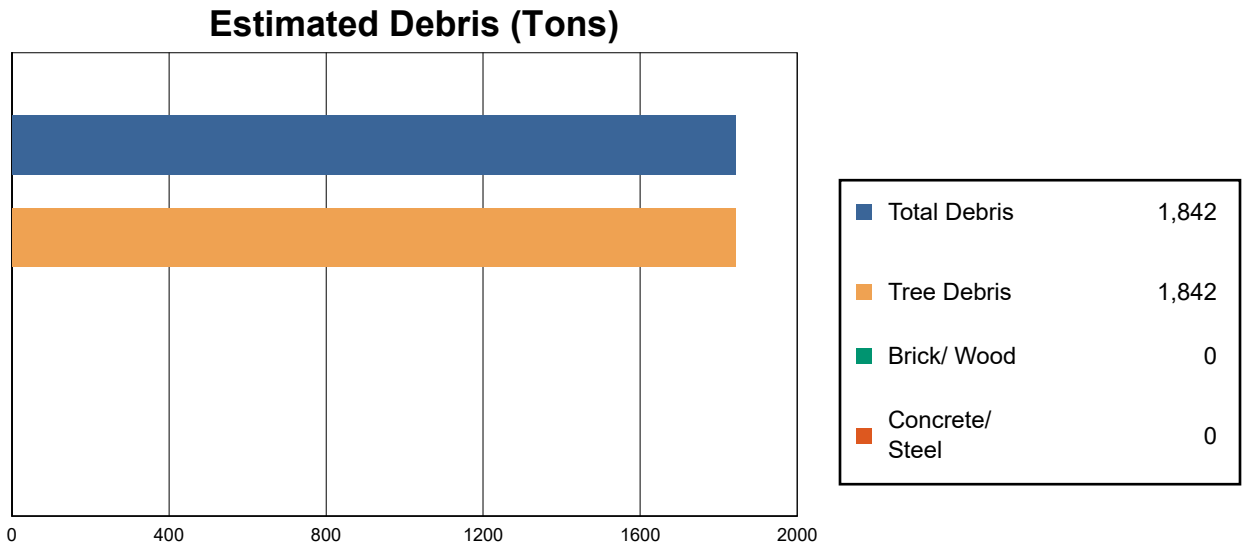


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	61	0	0	61
Hospitals	6	0	0	6
Police Stations	28	0	0	28
Schools	95	0	0	95

Induced Hurricane Damage

Debris Generation

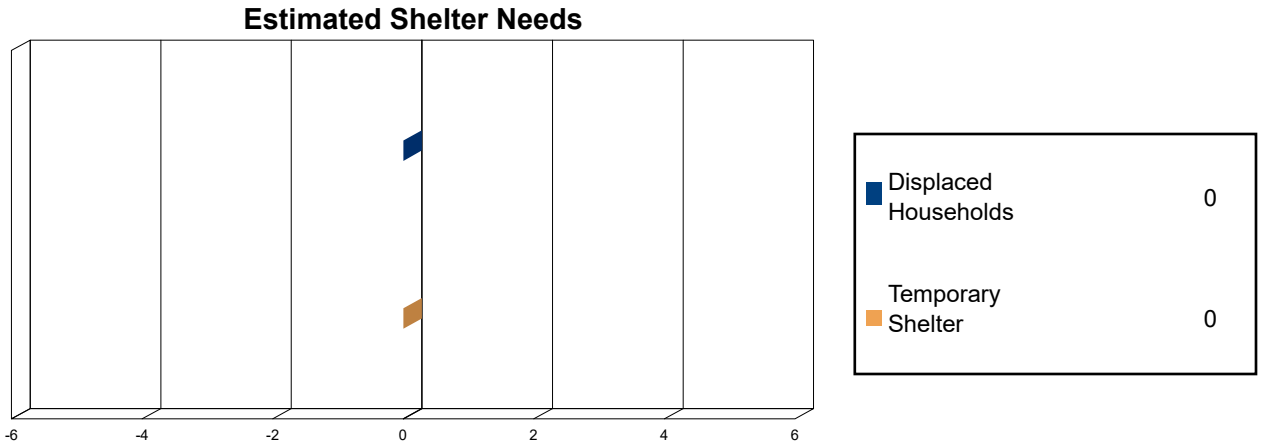


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 1,842 tons of debris will be generated. Of the total amount, 1,432 tons (78%) is Other Tree Debris. Of the remaining 410 tons, Brick/Wood comprises 0% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 0 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 410 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 214,437) will seek temporary shelter in public shelters.

Economic Loss

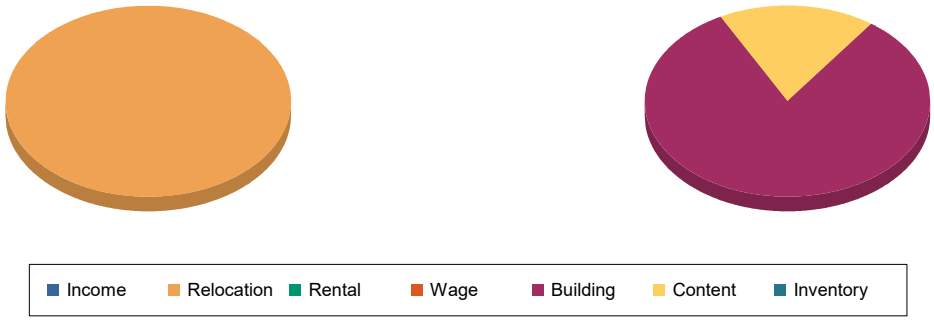
The total economic loss estimated for the hurricane is 2.3 million dollars, which represents 0.01 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 2 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 100% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Total Loss by General Occupancy



Loss Type by General Occupancy

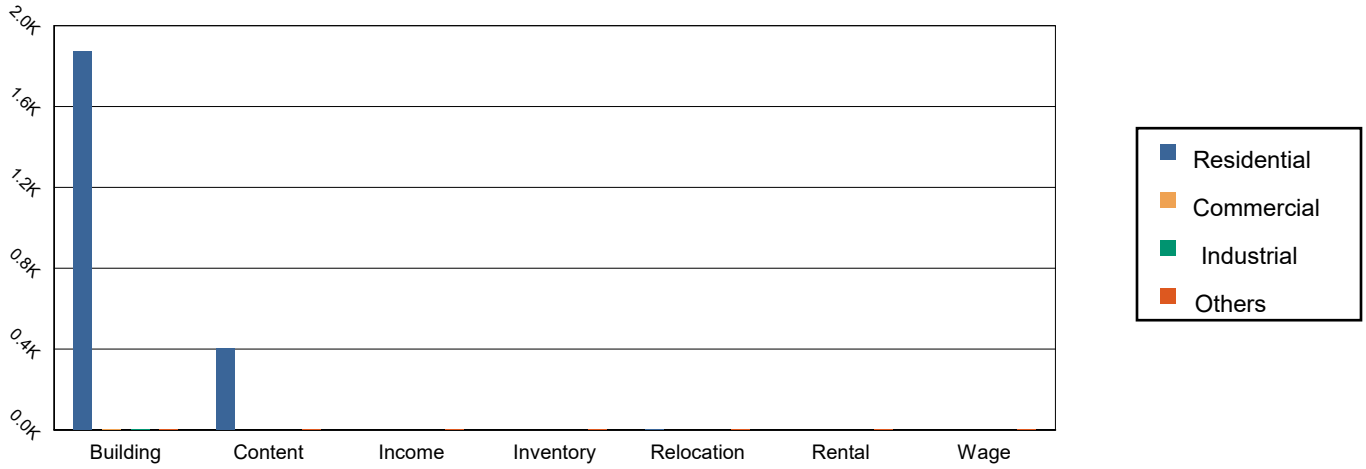


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	1,872.20	4.46	0.90	0.63	1,878.19
	Content	403.40	0.00	0.00	0.00	403.40
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2,275.59**	**4.46**	**0.90**	**0.63**	**2,281.59**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	2.53	0.00	0.00	0.00	2.53
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**2.53**	**0.00**	**0.00**	**0.00**	**2.53**

Total

Total	**2,278.13**	**4.46**	**0.90**	**0.63**	**2,284.12**

Appendix A: County Listing for the Region

Pennsylvania
- Lackawanna

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Pennsylvania				
Lackawanna	214,437	18,620,745	8,438,798	27,059,543
Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**
Study Region Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**

Hazus-MH: Hurricane Global Risk Report

Region Name: LackawannaCounty

Hurricane Scenario: Probabilistic 500-year Return Period

Print Date: Tuesday, May 19, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Pennsylvania

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 464.91 square miles and contains 59 census tracts. There are over 87 thousand households in the region and a total population of 214,437 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 86 thousand buildings in the region with a total building replacement value (excluding contents) of 27,060 million dollars (2014 dollars). Approximately 90% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 86,014 buildings in the region which have an aggregate total replacement value of 27,060 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

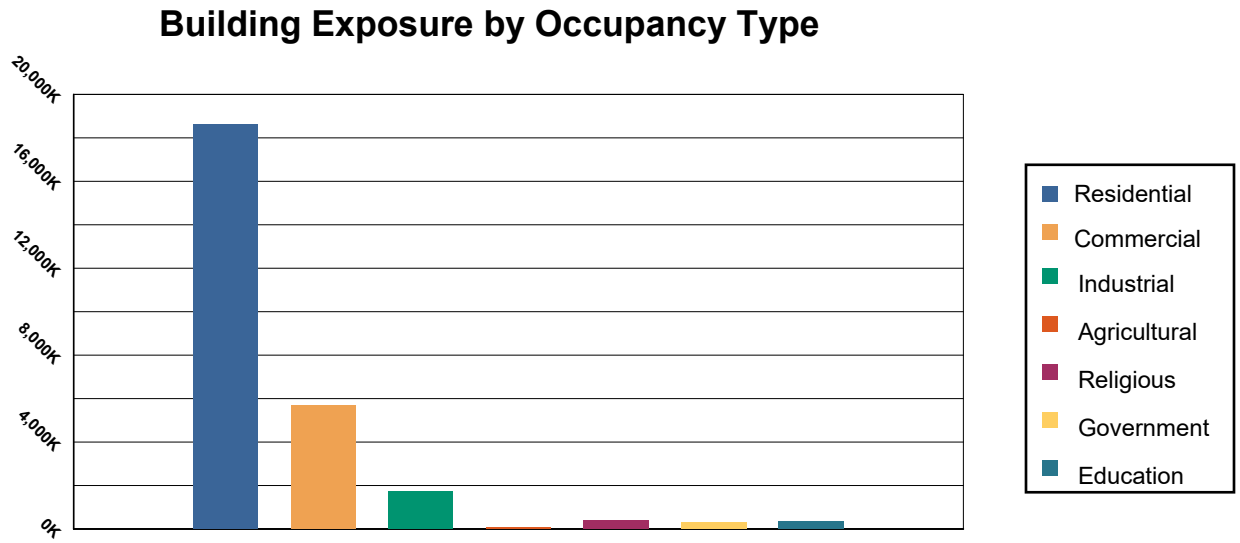


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	18,620,745	68.81%
Commercial	5,656,060	20.90%
Industrial	1,724,448	6.37%
Agricultural	51,636	0.19%
Religious	380,887	1.41%
Government	292,387	1.08%
Education	333,380	1.23%
Total	**27,059,543**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 1,079 beds. There are 95 schools, 61 fire stations, 28 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 4 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

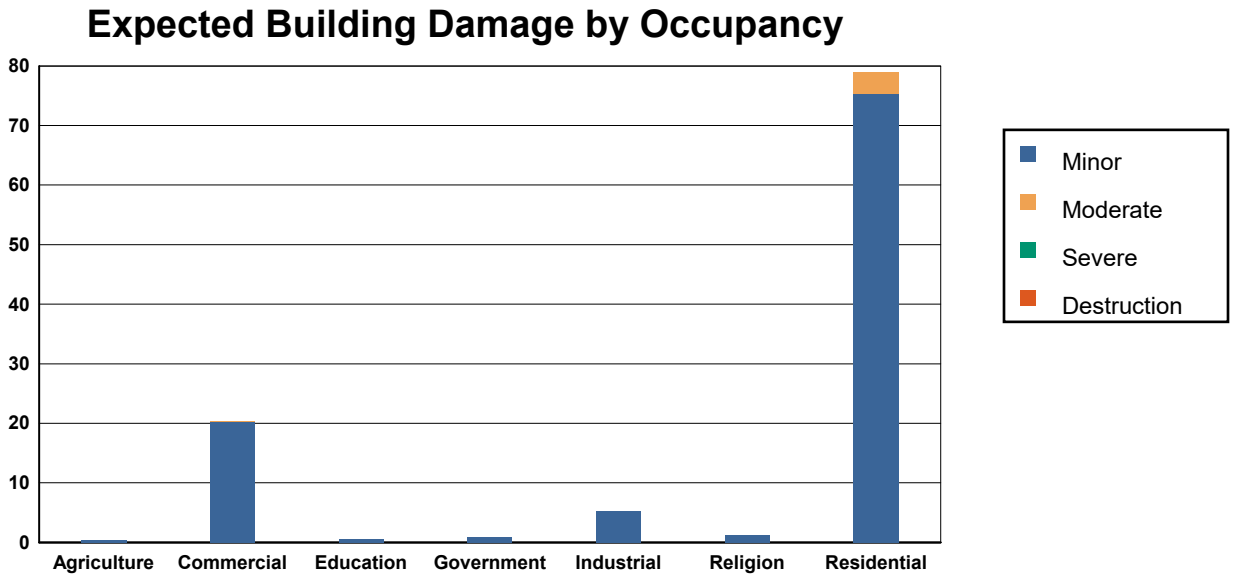


Table 2: Expected Building Damage by Occupancy : 500 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	156.58	99.73	0.42	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Commercial	5,923.70	99.66	20.28	0.34	0.03	0.00	0.00	0.00	0.00	0.00
Education	152.43	99.63	0.57	0.37	0.00	0.00	0.00	0.00	0.00	0.00
Government	220.15	99.62	0.85	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	1,417.63	99.62	5.37	0.38	0.00	0.00	0.00	0.00	0.00	0.00
Religion	432.84	99.73	1.16	0.27	0.00	0.00	0.00	0.00	0.00	0.00
Residential	77,603.04	99.90	75.35	0.10	3.61	0.00	0.00	0.00	0.00	0.00
Total	**85,906.36**		**104.00**		**3.64**		**0.00**		**0.00**	

Table 3: Expected Building Damage by Building Type : 500 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	431	99.51	2	0.49	0	0.00	0	0.00	0	0.00
Masonry	25,814	99.77	57	0.22	3	0.01	0	0.00	0	0.00
MH	1,613	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Steel	3,586	99.60	14	0.40	0	0.00	0	0.00	0	0.00
Wood	49,542	99.96	19	0.04	0	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 1079 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

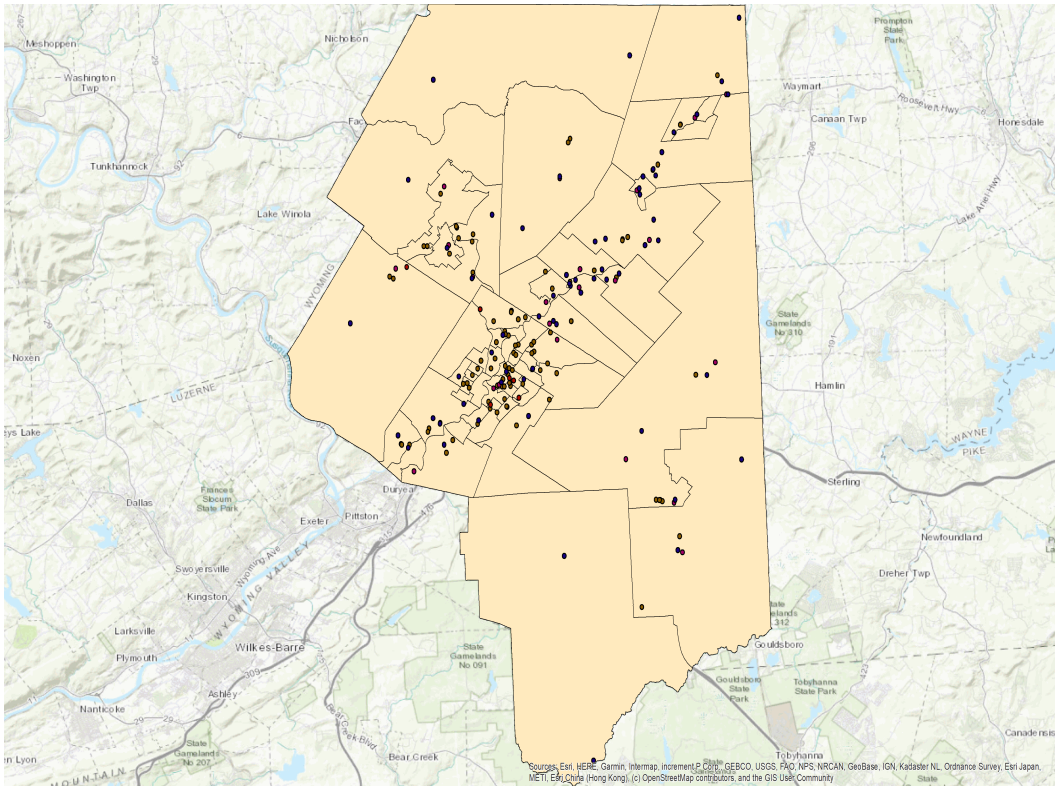
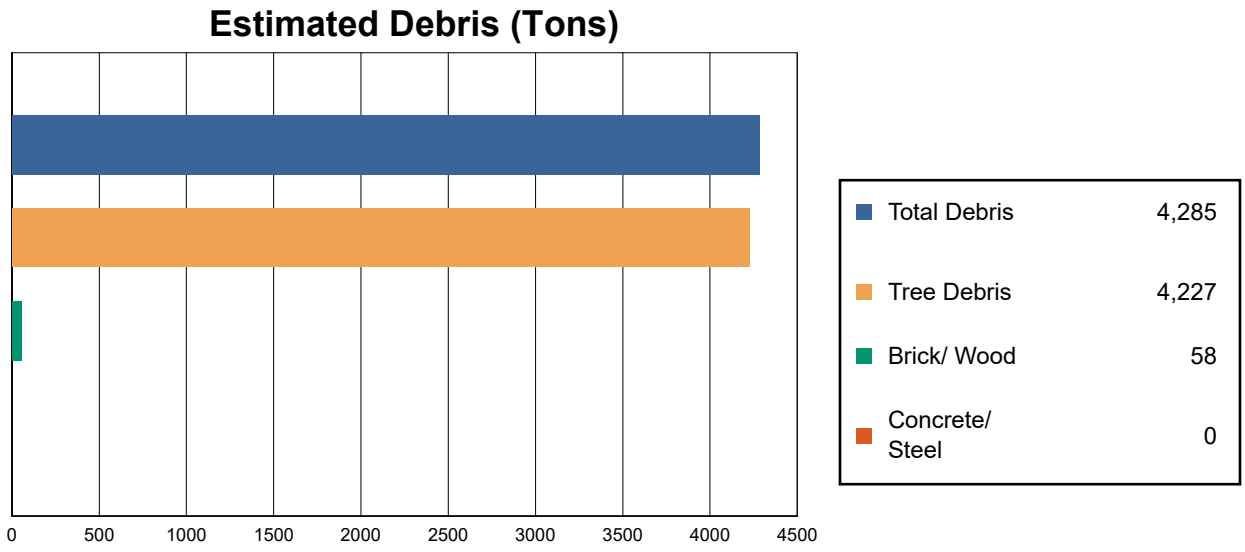


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	61	0	0	61
Hospitals	6	0	0	6
Police Stations	28	0	0	28
Schools	95	0	0	95

Induced Hurricane Damage

Debris Generation

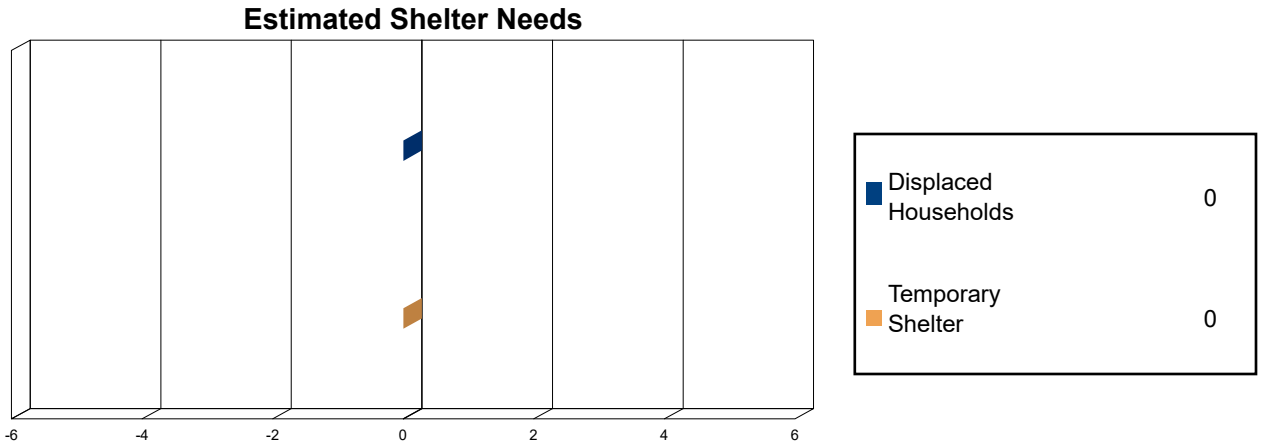


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 4,285 tons of debris will be generated. Of the total amount, 3,279 tons (77%) is Other Tree Debris. Of the remaining 1,006 tons, Brick/Wood comprises 6% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 2 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 948 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 214,437) will seek temporary shelter in public shelters.

Economic Loss

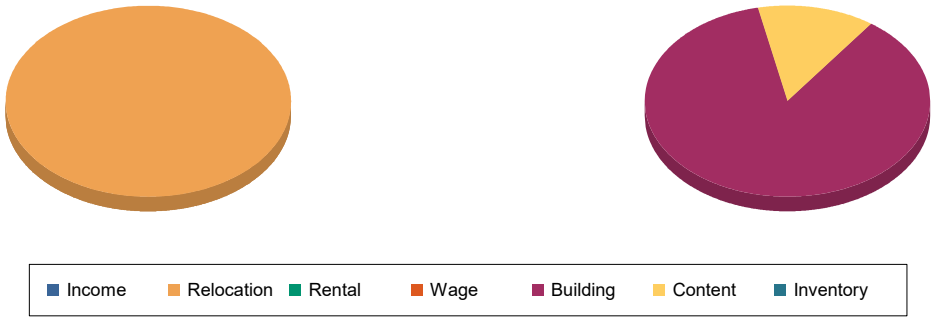
The total economic loss estimated for the hurricane is 10.5 million dollars, which represents 0.04 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 11 million dollars. 0% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 92% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Total Loss by General Occupancy



Loss Type by General Occupancy

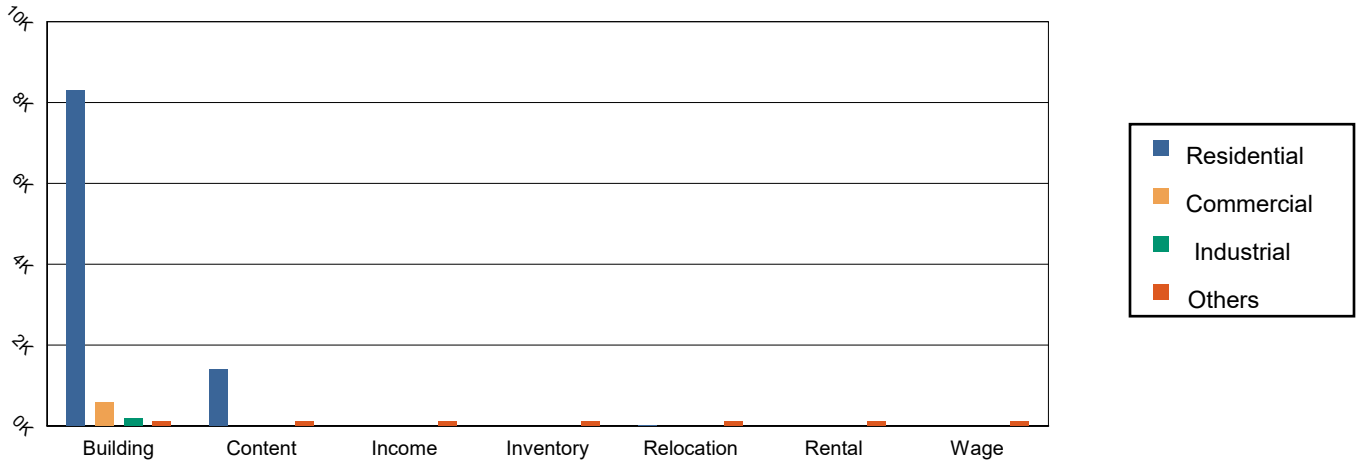


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	8,294.30	565.61	172.44	101.23	9,133.58
	Content	1,395.07	0.00	0.00	0.00	1,395.07
	Inventory	0.00	0.00	0.00	0.00	0.00
	Subtotal	**9,689.37**	**565.61**	**172.44**	**101.23**	**10,528.65**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	7.03	0.30	0.00	0.00	7.34
	Rental	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**7.04**	**0.30**	**0.00**	**0.00**	**7.34**

Total

Total	**9,696.40**	**565.91**	**172.44**	**101.24**	**10,535.99**

Appendix A: County Listing for the Region

Pennsylvania
- Lackawanna

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Pennsylvania				
Lackawanna	214,437	18,620,745	8,438,798	27,059,543
Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**
Study Region Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**

Hazus-MH: Hurricane Global Risk Report

Region Name: LackawannaCounty

Hurricane Scenario: Probabilistic 1000-year Return Period

Print Date: Tuesday, May 19, 2020

Disclaimer:
This version of Hazus utilizes 2010 Census Data.
Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific Hurricane. These results can be improved by using enhanced inventory data.

Table of Contents

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The hurricane loss estimates provided in this report are based on a region that includes 1 county(ies) from the following state(s):

- Pennsylvania

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 464.91 square miles and contains 59 census tracts. There are over 87 thousand households in the region and a total population of 214,437 people (2010 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 86 thousand buildings in the region with a total building replacement value (excluding contents) of 27,060 million dollars (2014 dollars). Approximately 90% of the buildings (and 69% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 86,014 buildings in the region which have an aggregate total replacement value of 27,060 million (2014 dollars). Table 1 presents the relative distribution of the value with respect to the general occupancies. Appendix B provides a general distribution of the building value by State and County.

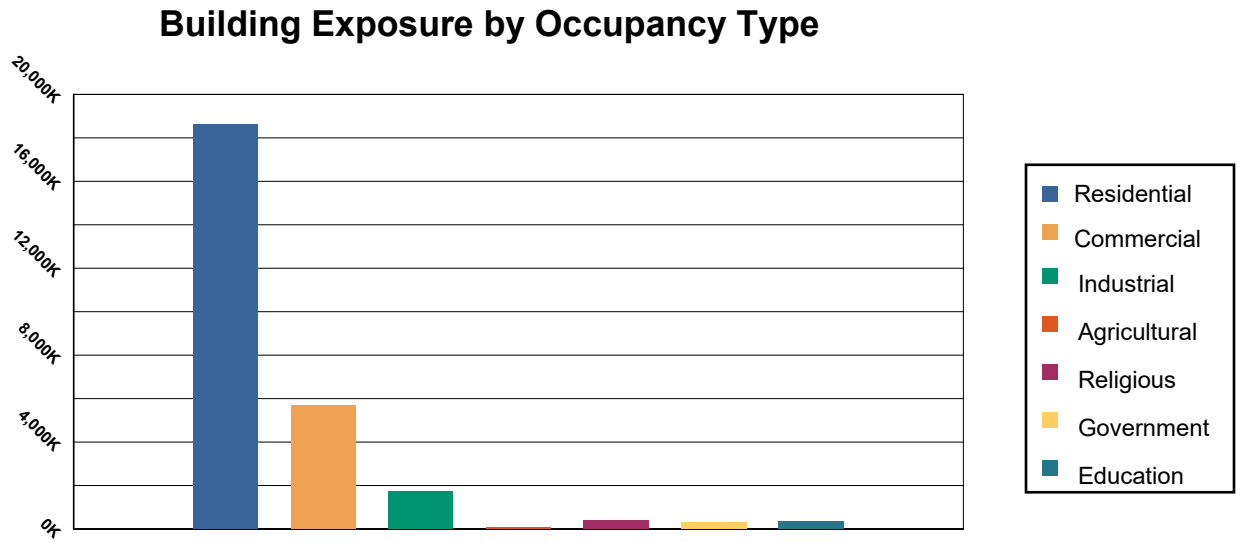


Table 1: Building Exposure by Occupancy Type

Occupancy	Exposure ($1000)	Percent of Tot
Residential	18,620,745	68.81%
Commercial	5,656,060	20.90%
Industrial	1,724,448	6.37%
Agricultural	51,636	0.19%
Religious	380,887	1.41%
Government	292,387	1.08%
Education	333,380	1.23%
Total	**27,059,543**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 1,079 beds. There are 95 schools, 61 fire stations, 28 police stations and 1 emergency operation facilities.

Hurricane Scenario

Hazus used the following set of information to define the hurricane parameters for the hurricane loss estimate provided in this report.

Scenario Name:	Probabilistic
Type:	Probabilistic

Building Damage

General Building Stock Damage

Hazus estimates that about 12 buildings will be at least moderately damaged. This is over 0% of the total number of buildings in the region. There are an estimated 0 buildings that will be completely destroyed. The definition of the 'damage states' is provided in the Hazus Hurricane technical manual. Table 2 below summarizes the expected damage by general occupancy for the buildings in the region. Table 3 summarizes the expected damage by general building type.

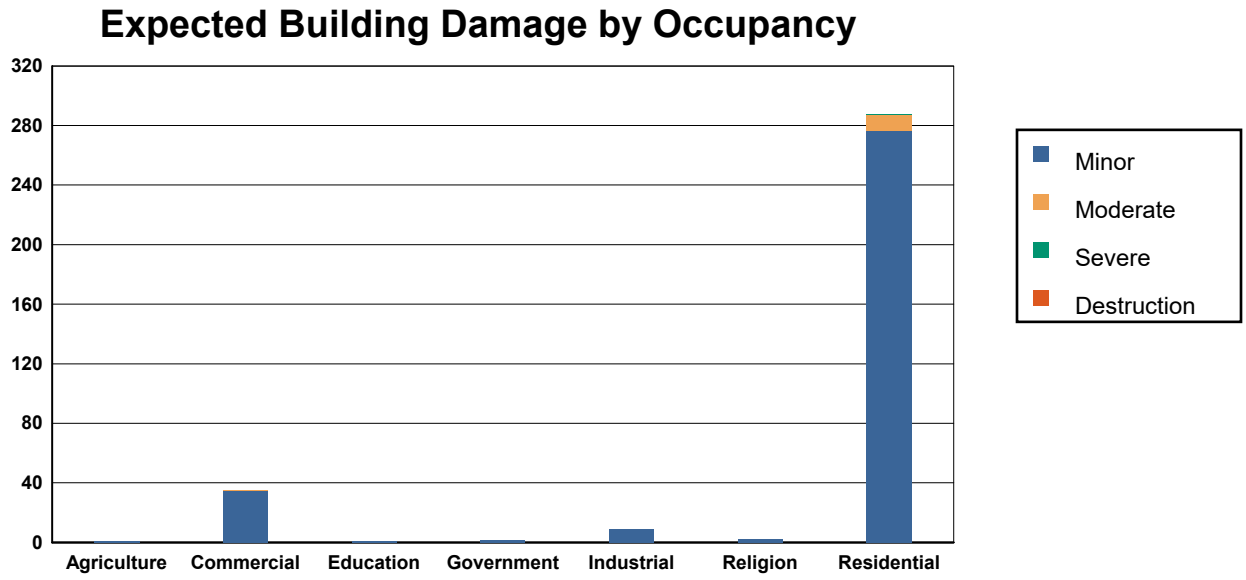


Table 2: Expected Building Damage by Occupancy : 1000 - year Event

	None		Minor		Moderate		Severe		Destruction	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	156.18	99.48	0.79	0.51	0.02	0.01	0.00	0.00	0.00	0.00
Commercial	5,908.89	99.41	34.40	0.58	0.72	0.01	0.00	0.00	0.00	0.00
Education	152.05	99.38	0.95	0.62	0.00	0.00	0.00	0.00	0.00	0.00
Government	219.60	99.37	1.40	0.63	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	1,413.98	99.37	8.97	0.63	0.04	0.00	0.01	0.00	0.00	0.00
Religion	431.99	99.54	2.01	0.46	0.00	0.00	0.00	0.00	0.00	0.00
Residential	77,394.24	99.63	276.62	0.36	10.45	0.01	0.69	0.00	0.00	0.00
Total	**85,676.93**		**325.14**		**11.22**		**0.70**		**0.00**	

Table 3: Expected Building Damage by Building Type : 1000 - year Event

Building Type	None		Minor		Moderate		Severe		Destruction	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Concrete	429	99.17	4	0.83	0	0.00	0	0.00	0	0.00
Masonry	25,722	99.41	143	0.55	10	0.04	1	0.00	0	0.00
MH	1,613	99.99	0	0.00	0	0.00	0	0.00	0	0.00
Steel	3,576	99.33	24	0.66	0	0.01	0	0.00	0	0.00
Wood	49,432	99.74	128	0.26	1	0.00	0	0.00	0	0.00

Essential Facility Damage

Before the hurricane, the region had no hospital beds available for use. On the day of the hurricane, the model estimates that 1079 hospital beds (0%) are available for use by patients already in the hospital and those injured by the hurricane. After one week, none of the beds will be in service. By 30 days, none will be operational.

Thematic Map of Essential Facilities with greater than 50% moderate

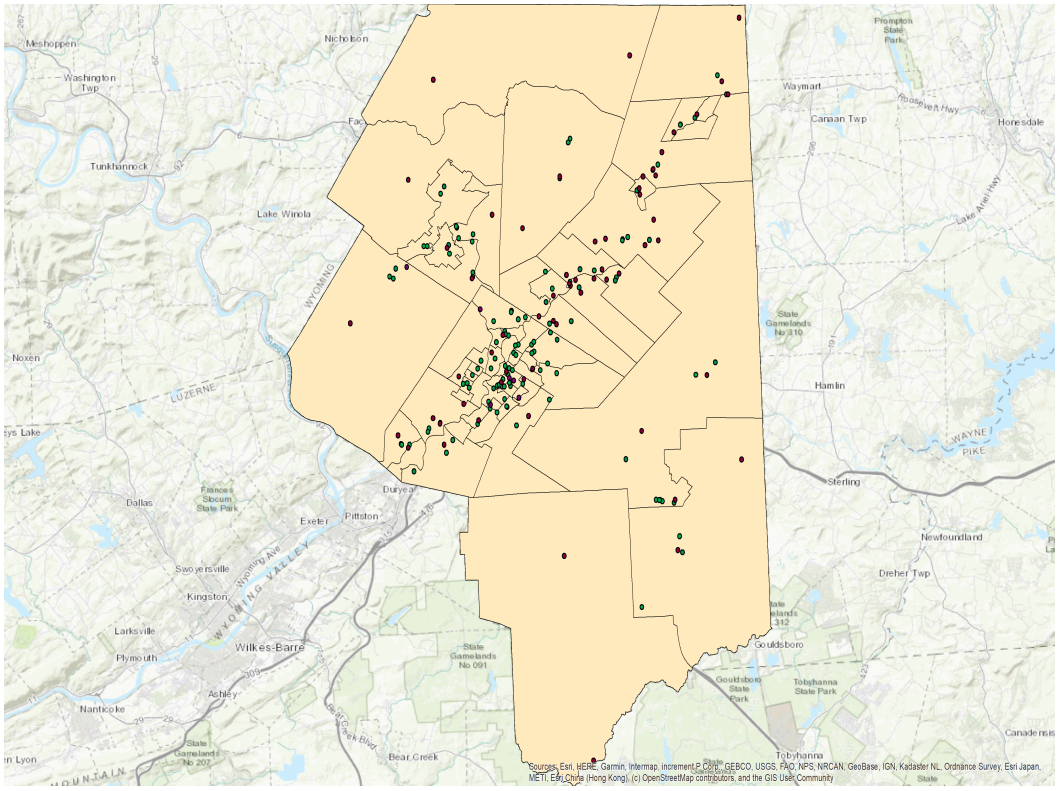
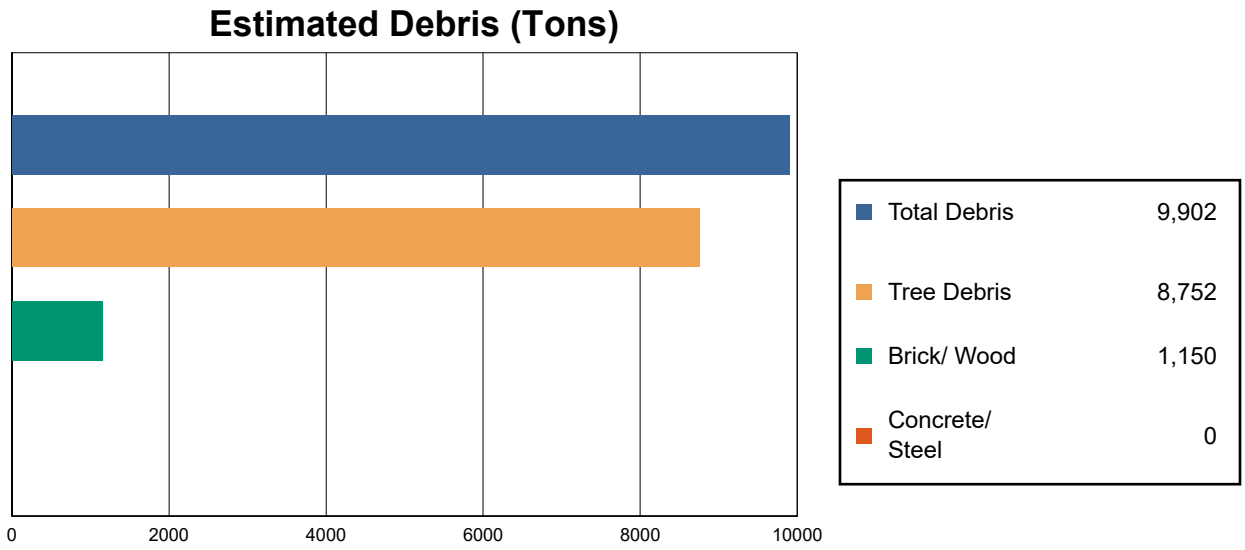


Table 4: Expected Damage to Essential Facilities

		# Facilities		
Classification	**Total**	**Probability of at Least Moderate Damage > 50%**	**Probability of Complete Damage > 50%**	**Expected Loss of Use < 1 day**
EOCs	1	0	0	1
Fire Stations	61	0	0	61
Hospitals	6	0	0	6
Police Stations	28	0	0	28
Schools	95	0	0	95

Induced Hurricane Damage

Debris Generation

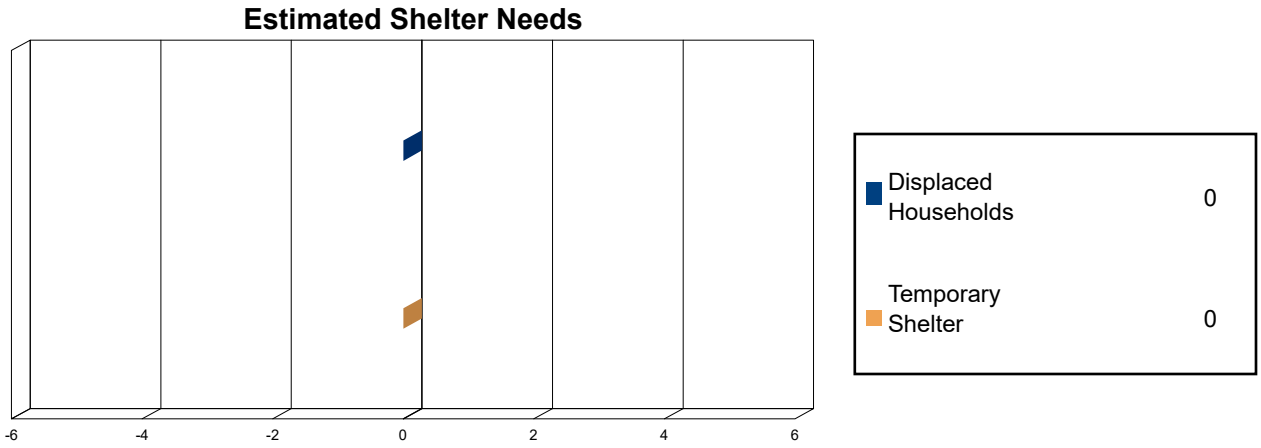


Hazus estimates the amount of debris that will be generated by the hurricane. The model breaks the debris into four general categories: a) Brick/Wood, b) Reinforced Concrete/Steel, c) Eligible Tree Debris, and d) Other Tree Debris. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 9,902 tons of debris will be generated. Of the total amount, 6,536 tons (66%) is Other Tree Debris. Of the remaining 3,366 tons, Brick/Wood comprises 34% of the total, Reinforced Concrete/Steel comprises of 0% of the total, with the remainder being Eligible Tree Debris. If the building debris tonnage is converted to an estimated number of truckloads, it will require 46 truckloads (@25 tons/truck) to remove the building debris generated by the hurricane. The number of Eligible Tree Debris truckloads will depend on how the 2,216 tons of Eligible Tree Debris are collected and processed. The volume of tree debris generally ranges from about 4 cubic yards per ton for chipped or compacted tree debris to about 10 cubic yards per ton for bulkier, uncompacted debris.

Social Impact

Shelter Requirement



Hazus estimates the number of households that are expected to be displaced from their homes due to the hurricane and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 0 households to be displaced due to the hurricane. Of these, 0 people (out of a total population of 214,437) will seek temporary shelter in public shelters.

Economic Loss

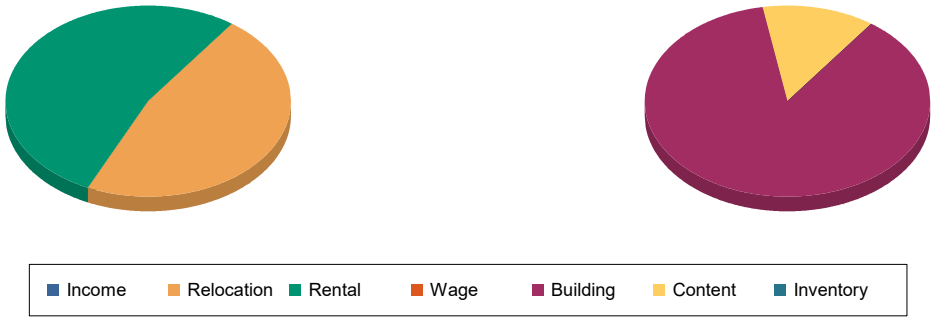
The total economic loss estimated for the hurricane is 24.2 million dollars, which represents 0.09 % of the total replacement value of the region's buildings.

Building-Related Losses

The building related losses are broken into two categories: direct property damage losses and business interruption losses. The direct property damage losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the hurricane. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the hurricane.

The total property damage losses were 24 million dollars. 1% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 96% of the total loss. Table 5 below provides a summary of the losses associated with the building damage.

Total Loss by General Occupancy



Loss Type by General Occupancy

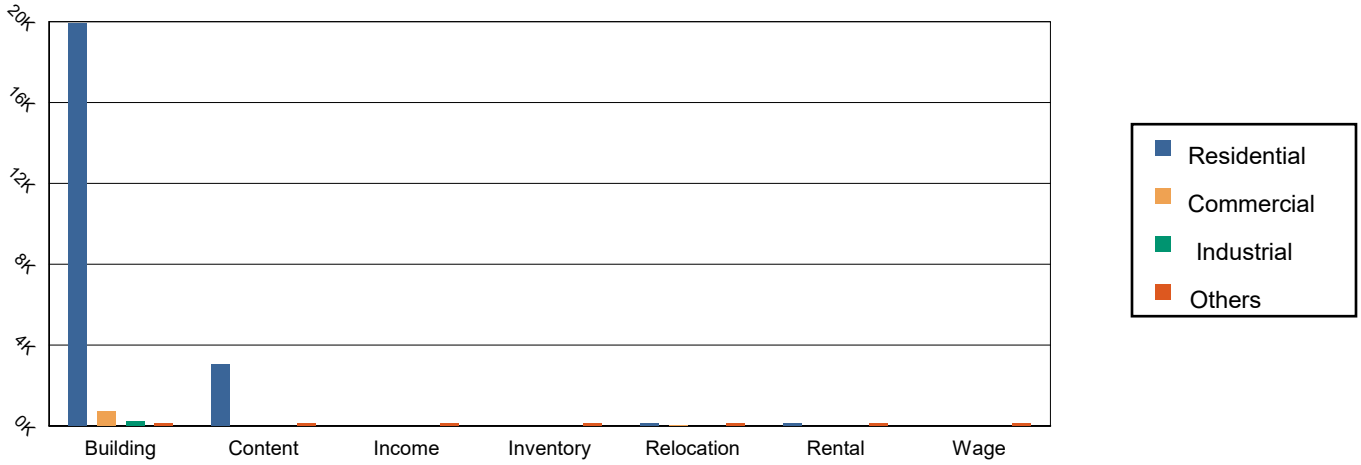


Table 5: Building-Related Economic Loss Estimates

(Thousands of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Property Damage						
	Building	19,903.80	693.52	209.15	138.96	20,945.42
	Content	3,058.18	0.00	0.00	0.49	3,058.67
	Inventory	0.00	0.00	0.00	0.05	0.05
	Subtotal	**22,961.98**	**693.52**	**209.15**	**139.50**	**24,004.15**
Business Interruption Loss						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	103.15	7.49	0.01	0.08	110.74
	Rental	125.76	0.00	0.00	0.00	125.76
	Wage	0.00	0.00	0.00	0.00	0.00
	Subtotal	**228.91**	**7.49**	**0.01**	**0.08**	**236.49**

Total

Total	**23,190.89**	**701.01**	**209.16**	**139.58**	**24,240.64**

Appendix A: County Listing for the Region

Pennsylvania
- Lackawanna

Appendix B: Regional Population and Building Value Data

		Building Value (thousands of dollars)		
	Population	Residential	Non-Residential	Total
Pennsylvania				
Lackawanna	214,437	18,620,745	8,438,798	27,059,543
Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**
Study Region Total	**214,437**	**18,620,745**	**8,438,798**	**27,059,543**

Hazus-MH: Earthquake Global Risk Report

Region Name: LackawannaCounty

Earthquake Scenario: 1000-yr_Earthquake

Print Date: May 19, 2020

Disclaimer:

This version of Hazus utilizes 2010 Census Data.

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

Table of Contents

General Description of the Region

Hazus-MH is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Pennsylvania

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 464.79 square miles and contains 59 census tracts. There are over 87 thousand households in the region which has a total population of 214,437 people (2010 Census Bureau data). The distribution of population by Total Region and County is provided in Appendix B.

There are an estimated 86 thousand buildings in the region with a total building replacement value (excluding contents) of 27,059 (millions of dollars). Approximately 90.00 % of the buildings (and 69.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 3,848 and 2,502 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 86 thousand buildings in the region which have an aggregate total replacement value of 27,059 (millions of dollars) . Appendix B provides a general distribution of the building value by Total Region and County.

In terms of building construction types found in the region, wood frame construction makes up 59% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 6 hospitals in the region with a total bed capacity of 1,079 beds. There are 95 schools, 61 fire stations, 28 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are no dams identified within the inventory. The inventory also includes 67 hazardous material sites, no military installations and no nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 6,350.00 (millions of dollars). This inventory includes over 218.10 miles of highways, 340 bridges, 7,558.36 miles of pipes.

Table 1: Transportation System Lifeline Inventory

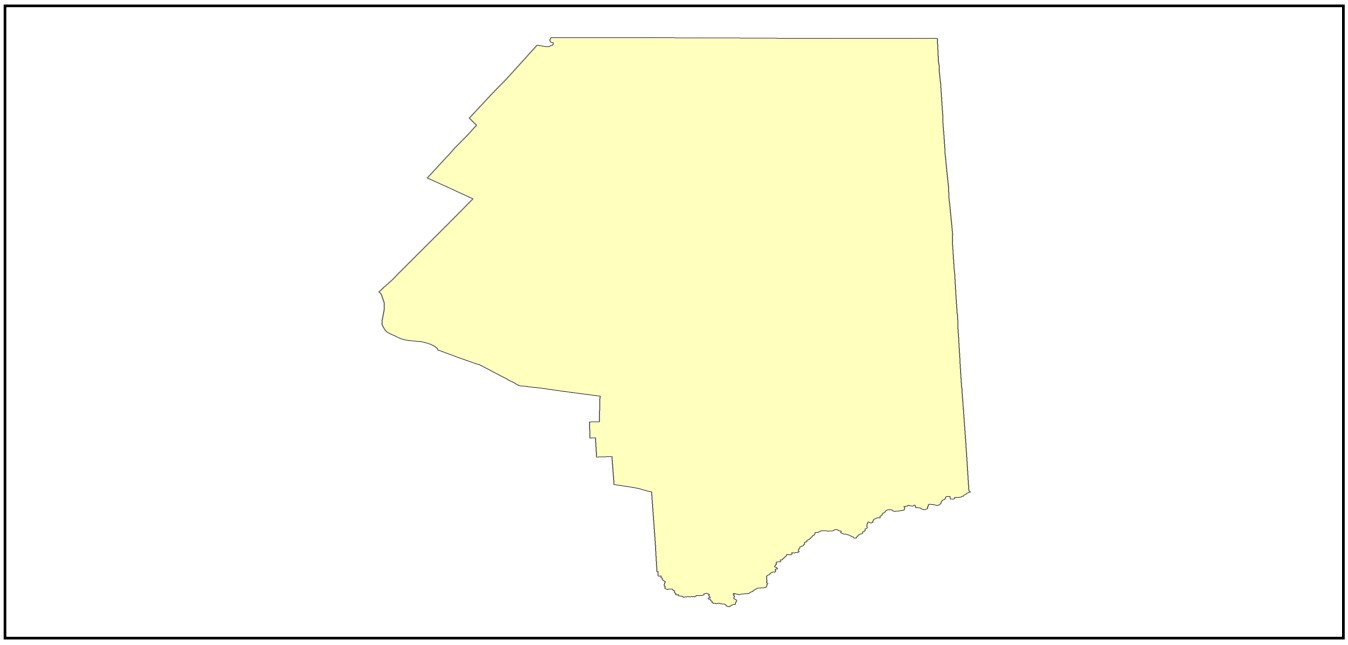
System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	340	1114.2770
	Segments	173	2208.2247
	Tunnels	0	0.0000
		Subtotal	**3322.5017**
Railways	Bridges	51	248.7201
	Facilities	2	5.3260
	Segments	159	256.1472
	Tunnels	0	0.0000
		Subtotal	**510.1933**
Light Rail	Bridges	0	0.0000
	Facilities	0	0.0000
	Segments	0	0.0000
	Tunnels	0	0.0000
		Subtotal	**0.0000**
Bus	Facilities	3	4.6817
		Subtotal	**4.6817**
Ferry	Facilities	0	0.0000
		Subtotal	**0.0000**
Port	Facilities	0	0.0000
		Subtotal	**0.0000**
Airport	Facilities	0	0.0000
	Runways	1	11.5825
		Subtotal	**11.5825**
		Total	**3,849.00**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	152.0202
	Facilities	2	72.5940
	Pipelines	0	0.0000
		Subtotal	**224.6142**
Waste Water	Distribution Lines	NA	91.2121
	Facilities	14	1952.6970
	Pipelines	0	0.0000
		Subtotal	**2043.9091**
Natural Gas	Distribution Lines	NA	60.8081
	Facilities	0	0.0000
	Pipelines	2	2.0037
		Subtotal	**62.8118**
Oil Systems	Facilities	0	0.0000
	Pipelines	0	0.0000
		Subtotal	**0.0000**
Electrical Power	Facilities	1	169.7149
		Subtotal	**169.7149**
Communication	Facilities	14	1.5260
		Subtotal	**1.5260**
		Total	**2,502.60**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.



Scenario Name	1000-yr_Earthquake
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	1,000.00
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	5.00
Depth (km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Direct Earthquake Damage

Building Damage

Hazus estimates that about 1,273 buildings will be at least moderately damaged. This is over 1.00 % of the buildings in the region. There are an estimated 15 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Damage Categories by General Occupancy Type

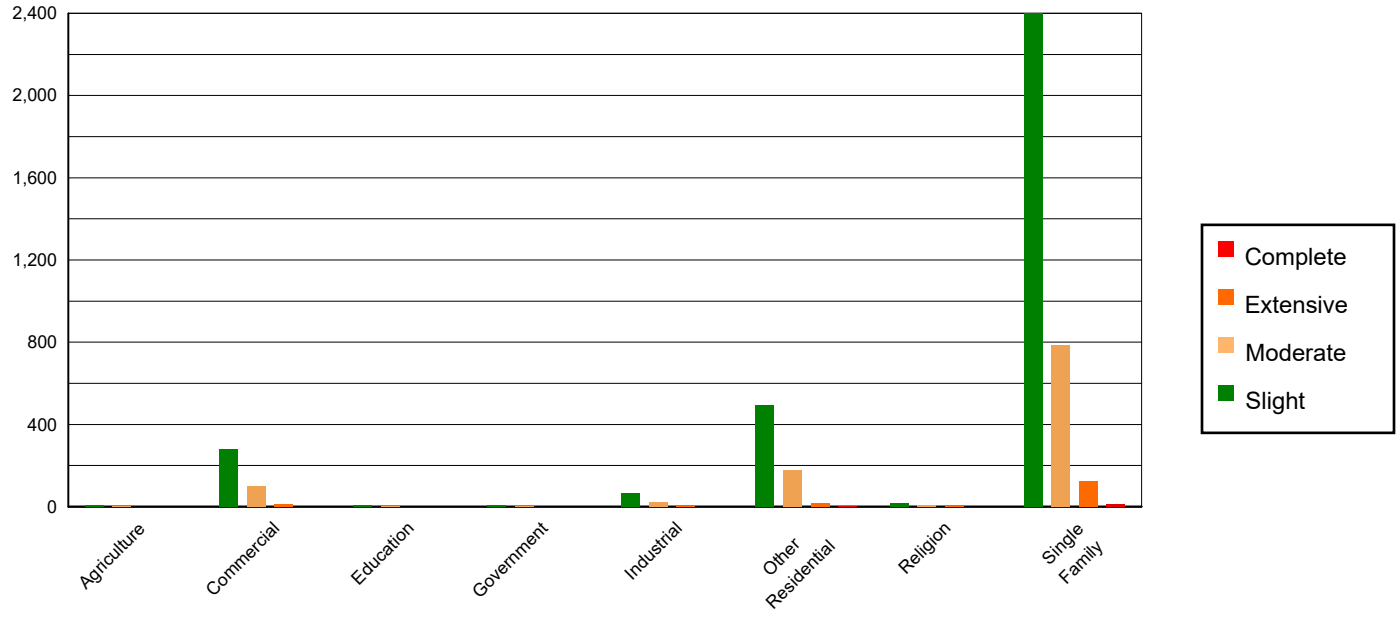


Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	147.58	0.18	7.04	0.21	2.09	0.19	0.28	0.18	0.01	0.09
Commercial	5550.65	6.81	278.69	8.50	100.25	9.12	13.50	8.52	0.91	5.73
Education	143.65	0.18	6.69	0.20	2.34	0.21	0.29	0.18	0.02	0.16
Government	207.35	0.25	9.75	0.30	3.46	0.32	0.41	0.26	0.03	0.17
Industrial	1332.64	1.64	63.79	1.94	23.48	2.14	2.92	1.84	0.17	1.09
Other Residential	10783.84	13.24	495.45	15.11	176.87	16.10	15.66	9.88	1.18	7.39
Religion	407.00	0.50	18.62	0.57	7.19	0.65	1.09	0.69	0.10	0.61
Single Family	62888.15	77.20	2399.97	73.17	783.04	71.27	124.36	78.45	13.49	84.77
Total	**81,461**		**3,280**		**1,099**		**159**		**16**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	49662.75	60.97	923.89	28.17	85.62	7.79	4.93	3.11	0.00	0.00
Steel	3836.42	4.71	164.71	5.02	57.11	5.20	5.41	3.42	0.16	0.98
Concrete	866.43	1.06	35.83	1.09	11.22	1.02	0.59	0.37	0.00	0.00
Precast	253.30	0.31	14.65	0.45	9.58	0.87	1.79	1.13	0.02	0.13
RM	1402.33	1.72	48.46	1.48	25.46	2.32	3.57	2.25	0.00	0.00
URM	23288.38	28.59	1890.44	57.64	827.22	75.29	139.97	88.30	15.73	98.89
MH	2151.23	2.64	202.02	6.16	82.50	7.51	2.25	1.42	0.00	0.00
Total	**81,461**		**3,280**		**1,099**		**159**		**16**	

*Note:

RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 1,079 hospital beds available for use. On the day of the earthquake, the model estimates that only 935 hospital beds (87.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 95.00% of the beds will be back in service. By 30 days, 99.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	6	0	0	6
Schools	95	0	0	95
EOCs	1	0	0	1
PoliceStations	28	0	0	28
FireStations	61	0	0	61

Transportation Lifeline Damage

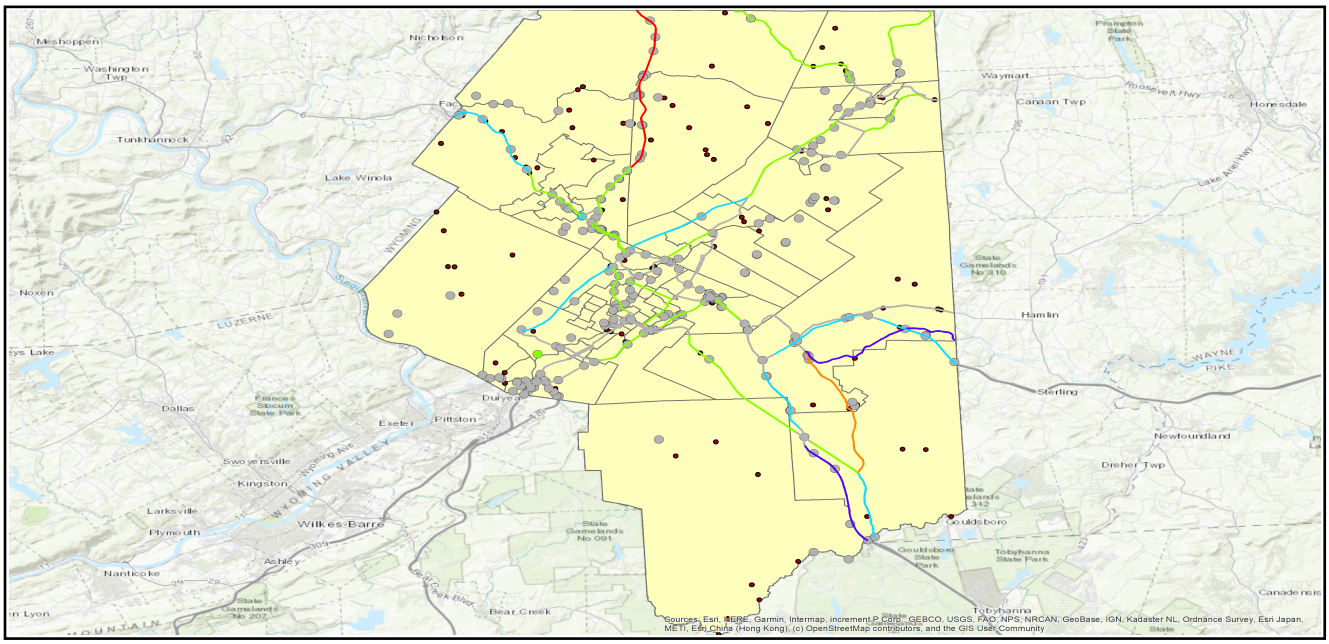


Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 % After Day 1	With Functionality > 50 % After Day 7
Highway	Segments	173	0	0	173	173
	Bridges	340	0	0	340	340
	Tunnels	0	0	0	0	0
Railways	Segments	159	0	0	159	159
	Bridges	51	0	0	51	51
	Tunnels	0	0	0	0	0
	Facilities	2	0	0	2	2
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	3	0	0	3	3
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	1	0	0	1	1

Table 6 provides damage estimates for the transportation system.

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	2	0	0	2	2
Waste Water	14	0	0	14	14
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	1	0	0	1	1
Communication	14	0	0	14	14

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (miles)	Number of Leaks	Number of Breaks
Potable Water	4,723	25	6
Waste Water	2,834	12	3
Natural Gas	2	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	87,226	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

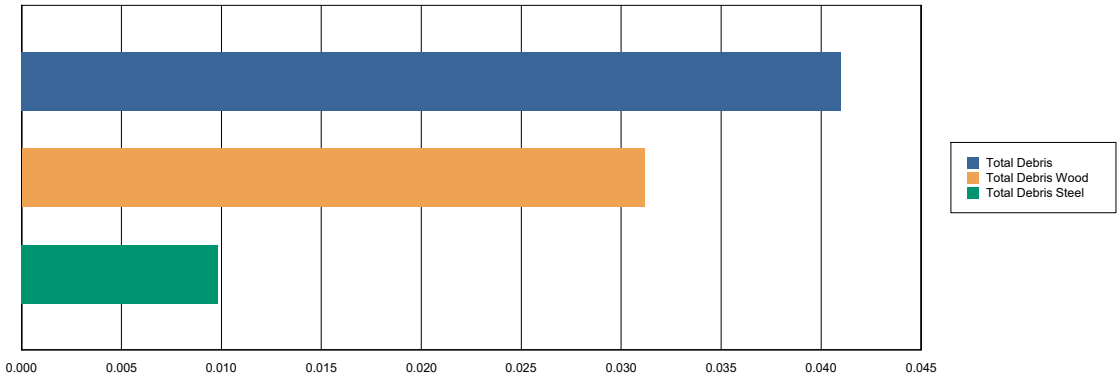
Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 41,000 tons of debris will be generated. Of the total amount, Brick/Wood comprises 76.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 1,640 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Earthquake Debris (millions of tons)



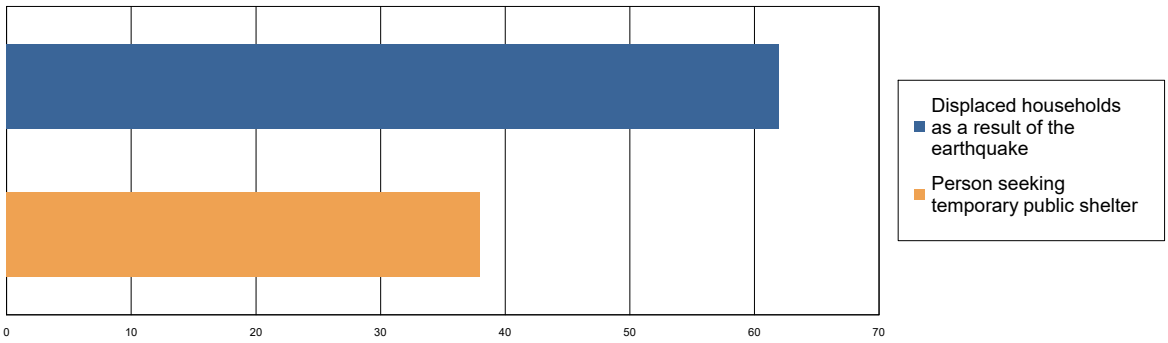
Brick/ Wood	Reinforced Concrete/Steel	Total Debris	Truck Load
0.03	0.01	0.04	1,640 (@25 tons/truck)

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 62 households to be displaced due to the earthquake. Of these, 38 people (out of a total population of 214,437) will seek temporary shelter in public shelters.

Displaced Households/ Persons Seeking Short Term Public Shelter



Displaced households as a result of the earthquake	Persons seeking temporary public shelter
62	38

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These 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 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0.16	0.02	0.00	0.00
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.00	0.00	0.00	0.00
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.19	0.02	0.00	0.00
	Other-Residential	6.27	0.81	0.07	0.12
	Single Family	17.65	2.53	0.24	0.46
	Total	**24**	**3**	**0**	**1**
2 PM	Commercial	9.50	1.20	0.09	0.18
	Commuting	0.00	0.00	0.00	0.00
	Educational	3.40	0.44	0.04	0.07
	Hotels	0.00	0.00	0.00	0.00
	Industrial	1.43	0.17	0.01	0.02
	Other-Residential	1.44	0.19	0.02	0.03
	Single Family	4.05	0.60	0.06	0.11
	Total	**20**	**3**	**0**	**0**
5 PM	Commercial	6.66	0.85	0.07	0.13
	Commuting	0.00	0.00	0.00	0.00
	Educational	0.56	0.07	0.01	0.01
	Hotels	0.00	0.00	0.00	0.00
	Industrial	0.89	0.11	0.01	0.01
	Other-Residential	2.46	0.33	0.03	0.05
	Single Family	7.06	1.04	0.10	0.19
	Total	**18**	**2**	**0**	**0**

Economic Loss

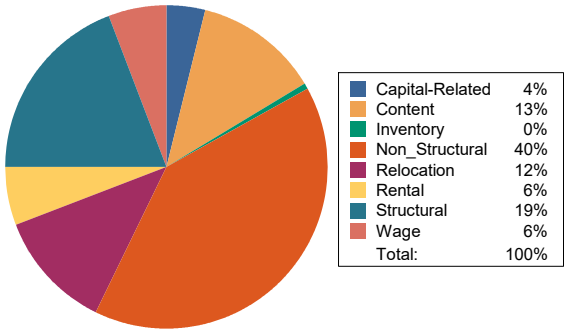
The total economic loss estimated for the earthquake is 102.30 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 93.74 (millions of dollars); 27 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 56 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Earthquake Losses by Loss Type ($ millions)



Earthquake Losses by Occupancy Type ($ millions)

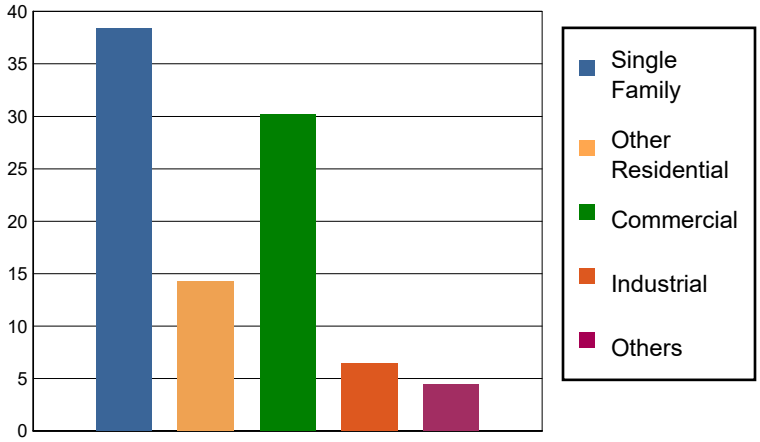


Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.0000	0.4389	4.3115	0.1501	0.4563	5.3568
	Capital-Related	0.0000	0.1862	3.2372	0.0923	0.0487	3.5644
	Rental	1.6525	1.4232	2.0703	0.0787	0.0951	5.3198
	Relocation	5.8389	1.0236	3.1969	0.4151	0.7111	11.1856
	Subtotal	**7.4914**	**3.0719**	**12.8159**	**0.7362**	**1.3112**	**25.4266**
Capital Stock Losses							
	Structural	9.5954	2.4111	4.2873	1.0894	0.7274	18.1106
	Non_Structural	17.6278	7.3045	8.7313	2.6315	1.6535	37.9486
	Content	3.6847	1.4872	4.1953	1.7118	0.7818	11.8608
	Inventory	0.0000	0.0000	0.1138	0.2757	0.0044	0.3939
	Subtotal	**30.9079**	**11.2028**	**17.3277**	**5.7084**	**3.1671**	**68.3139**
	Total	**38.40**	**14.27**	**30.14**	**6.44**	**4.48**	**93.74**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	2208.2247	0.0000	0.00
	Bridges	1114.2770	0.0835	0.01
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**3322.5017**	**0.0835**	
Railways	Segments	256.1472	0.0000	0.00
	Bridges	248.7201	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	5.3260	0.1305	2.45
	Subtotal	**510.1933**	**0.1305**	
Light Rail	Segments	0.0000	0.0000	0.00
	Bridges	0.0000	0.0000	0.00
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Bus	Facilities	4.6817	0.1163	2.48
	Subtotal	**4.6817**	**0.1163**	
Ferry	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Port	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Airport	Facilities	0.0000	0.0000	0.00
	Runways	11.5825	0.0000	0.00
	Subtotal	**11.5825**	**0.0000**	
	Total	**3,848.96**	**0.33**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	72.5940	0.2655	0.37
	Distribution Lines	152.0202	0.1104	0.07
	Subtotal	**224.6142**	**0.3759**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	1952.6970	7.1259	0.36
	Distribution Lines	91.2121	0.0555	0.06
	Subtotal	**2043.9091**	**7.1814**	
Natural Gas	Pipelines	2.0037	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution Lines	60.8081	0.0190	0.03
	Subtotal	**62.8118**	**0.0190**	
Oil Systems	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**0.0000**	**0.0000**	
Electrical Power	Facilities	169.7149	0.6483	0.38
	Subtotal	**169.7149**	**0.6483**	
Communication	Facilities	1.5260	0.0055	0.36
	Subtotal	**1.5260**	**0.0055**	
	Total	**2,502.58**	**8.23**	

Appendix A: County Listing for the Region

Lackawanna,PA

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Pennsylvania					
	Lackawanna	214,437	18,620	8,438	27,059
Total Region		**214,437**	**18,620**	**8,438**	**27,059**