Fulton County 2010 Hazard Mitigation Plan

Prepared for:

Fulton County Planning Commission
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Prepared by:

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Approved on: <Month Day, Year>

Baker

Executive Summary

After suffering the effects of floods, tornadoes, winter storms, and other natural and man-made hazards, the citizens, business leaders, and officials of Fulton County recognized the need to develop a long-term approach to reducing their vulnerability to hazards. In 2003, the Fulton County Hazard Mitigation Steering Committee (Steering Committee), the local leadership for an initiative to promote communities' resistance to natural and human-caused hazards, began a hazard mitigation planning process to identify the hazards that can affect the County and create a strategy to reduce damage from these hazards. This process culminated in the development of the first version of this Fulton County Hazard Mitigation Plan (HMP), which was adopted by the County and several municipalities, and was approved by the Pennsylvania Emergency Management Agency (PEMA) and Federal Emergency Management Agency (FEMA) in 2005. This document represents the work of citizens, elected and appointed government officials, business leaders, and volunteer and nonprofit groups to protect community assets, preserve the economic viability of the community, and save lives.

In 2009, PEMA contracted the services of Michael Baker, Jr., Inc. (Baker) and its subcontractors to revise and update 14 HMPs across the Commonwealth of Pennsylvania. This document was among those 14, and the task of leading the County's Steering Committee through the mitigation planning process was given to Baker's subcontractor, Delta Development Group, Inc. (Delta). The planning process consisted of the following steps:

- Identification and prioritization of the hazards that may affect the County and its municipalities
- Assessment of the County's and municipalities' vulnerability to these hazards
- Identification of the mitigation actions that can reduce that vulnerability
- Development of a strategy for implementing those actions, including identifying the agency(ies) responsible for that implementation

Throughout the planning process, the general public was given the opportunity to comment on the existing HMP and provide suggestions for the updated version. Two public meetings were also conducted to give residents an opportunity to provide input on the HMP.

The following hazards were identified by the Steering Committee as presenting the highest risk to the County and its municipalities:

- Flood, flash flood, and ice jams
- Environmental hazards (e.g., hazardous materials spills)
- Transportation hazards
- Severe wind storms

This HMP also includes hazard profiles for the following hazards:

- Severe winter storms
- Drought
- Wildfires
- Subsidence and sinkholes
- Earthquakes
- Hailstorms

To mitigate against the effects of those hazards, the Steering Committee identified the following goals for hazard mitigation over the next five years:

- Prevent hazards from impacting the community.
- Protect the people, property, and environment in hazard areas.
- Maintain and enhance emergency services capabilities in the community.
- Protect natural resources within the hazards areas.
- Ensure that stakeholder groups have necessary information to mitigate against hazard impacts.

The individual objectives and actions that will be implemented are shown in Section 6.4.

Certification of Annual Review Meetings

The Fulton County Hazard Mitigation Steering Committee has reviewed this Hazard Mitigation Plan. See Section 8 of the Fulton County Hazard Mitigation Plan for further details regarding this form. The Director of the Fulton County Planning Commission hereby certifies the review.

YEAR	DATE OF MEETING	PUBLIC OUTREACH ADDRESSED?*	SIGNATURE
2011			
2012			
2013			
2014			
2015			

**Confirm yes here annually and describe on record of changes page.*

Record of Changes

DATE	DESCRIPTION OF CHANGE MADE, MITIGATION ACTION COMPLETED, OR PUBLIC OUTREACH PERFORMED	CHANGE MADE BY (PRINT NAME)	CHANGE MADE BY (SIGNATURE)
5/1/10	Added hazard profiles on wildfires, drought, subsidence and sinkholes, hailstorms, earthquakes, and winter storms; reprioritized mitigation actions based on PA-STEEL evaluation; revised mitigation action plans; completed other revisions required by FEMA for plan approval.	Tony Subbio (consultant)	
8/13/10	Added a number of properties in the 1%-chance floodplain to Section 4.4.3.1, changed actions 2.A.1 and 2.A.2 to reflect new structures as well	Tony Subbio (consultant)	

REMINDER: ***Please attach all associated meeting agendas, sign-in sheets, handouts, and minutes.***

Table of Contents

1. Introduction

1.1. Background

Across the United States, natural and human-caused disasters have led to increasing levels of deaths, injuries, property damage, and interruption of business and government services. The time, money, and efforts to recover from these disasters exhaust resources, diverting attention from important public programs and private agendas. With 101 statewide or county-specific gubernatorial and presidential disaster declarations since 1954, the emergency management community, citizens, elected officials, and other stakeholders in Fulton County, Pennsylvania, recognized the impact of disasters on their community and concluded that proactive efforts needed to be taken to reduce the impact of natural and human-caused hazards.

Hazard mitigation is a phrase that describes actions taken to prevent or reduce the long-term risks to life and property from hazards. Pre-disaster mitigation actions are taken in advance of a hazard event and are essential to breaking the typical disaster cycle of damage, reconstruction, and repeated damage. With careful selection, mitigation actions can be long-term, cost-effective means of reducing the risk of loss.

Accordingly, the Fulton County Hazard Mitigation Steering Committee (Steering Committee), composed of Fulton County officials, municipal representatives, emergency responders, and business leaders, has updated this Hazard Mitigation Plan (HMP). The update was sponsored by the Pennsylvania Emergency Management Agency (PEMA), which is using Emergency Management Performance Grant funds to update 14 county HMPs between July 2009 and May 2010. As part of this process, PEMA contracted with Michael Baker, Jr., Inc. (Baker), which in turn subcontracted the update of Fulton County's HMP to Delta Development Group, Inc. (Delta).

The HMP update is the result of six months of work by the citizens and officials of the County and representatives from Baker and Delta to develop a pre-disaster multi-hazard mitigation plan that will not only guide the County toward greater disaster resistance, but will also respect the character and needs of the community.

1.2. Purpose

The purpose of this HMP is to minimize the effects that natural, technological, and man-made hazards have on the people, property, environment, and business operations within Fulton County. This document exists to provide the background information and rationale for the mitigation actions that the Steering Committee and municipal representatives have chosen to implement.

The document is governed by the Disaster Mitigation Act of 2000 (DMA 2000) and it's implementing regulations (44 CFR §201.6, published February 26, 2002). Local jurisdictions must comply with the DMA 2000 and these regulations to remain eligible for funding and technical assistance from state and federal hazard mitigation programs.

1.3. Scope

The implementation actions within this HMP apply to Fulton County and any municipalities that adopt this HMP as their own. However, only those municipalities that have participated in the plan update process will remain eligible for state and federal hazard mitigation funding through the HMP. For the purpose of this plan update, municipal participation was defined as completion and submission of a Risk Assessment Update Worksheet and Capability Assessment Survey, and attendance by a municipal official at a planning or public meeting conducted as part of the planning process.

1.4. Authority and References

This section lists references used to prepare the Fulton County HMP. Existing plans and studies were reviewed and integrated into the HMP. The County Comprehensive Plan, located on the Fulton County Planning Commission's Web site, was incorporated into multiple aspects of this HMP. Information from the Comprehensive Plan and other documents was used to formulate the County profile, to identify the history of individual hazards, and to detail the population projections in Fulton County.

1.4.1. Federal

1. Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988, as amended by Public Law 106-390 (October 30, 2000).
2. *Disaster Mitigation Act of 2000*, Public Law 106-390, 106th Cong., (October 30, 2000).
3. Department of Homeland Security, *National Infrastructure Protection Plan*, 2006.
4. Federal Emergency Management Agency, http://www.fema.gov.
5. ———. *State and Local Mitigation Planning How-to Guide (FEMA 386-Series).*
6. ———. *Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments.*
7. ———. *Planning for Post-Disaster Recovery and Reconstruction (FEMA, American Planning Association).*
8. ———. *Multi-Hazard Identification and Risk Assessment Report.*
9. ———. *FEMA's Local Hazard Mitigation Plan Review Crosswalk.*
10. ———. Federal Insurance and Mitigation Administration. *National Flood Insurance Program.* Program description, August 01, 2002, www.fema.gov/business/nfipl.
11. Bureau of Transportation Statistics, http://www.bts.gov.
12. United States Environmental Protection Agency, http://www.epa.gov.
13. National Climatic Data Center, National Oceanic and Atmospheric Administration (NOOA), http://www.ncdc.noaa.gov/oa/ncdc.html.
14. United States Department of Commerce, Bureau of the Census, http://www.census.gov.
15. United States Geological Survey, www.usgs.gov.
16. Federal Aviation Administration, http://www.faa.gov.

1.4.2. State

1. *Pennsylvania Municipalities Planning Code of 1968*, Act 247 as reenacted and amended by Act 170 of 1988.
2. Pennsylvania Department of Environmental Protection, http://www.depweb.state.pa.us/dep/site/default.asp.
3. Pennsylvania Department of Conservation and Natural Resources, http://www.dcnr.state.pa.us.
4. ———. "2007 Pennsylvania Annual Pest Conditions Report," http://www.dcnr.state.pa.us/FORESTRY/leaflets/2007_PestConditions.pdf.
5. Pennsylvania Emergency Management Agency, http://www.pema.state.pa.us.
6. ———. Pennsylvania Emergency Incident Reporting System (PEIRS), https://www.peirs.state.pa.us/.
7. ———. *Pennsylvania Emergency Management Services Code*. Title 35, Pa C.S. Section 101.
8. Pennsylvania State Data Center, http://www.pasdc.hbg.psu.edu.
9. Pennsylvania Stormwater Management Act of October 4, 1978. P.L. 864, No. 167.
10. PENNDOT Bureau of Highway Safety and Traffic Engineering. "2006 Pennsylvania Crash Facts and Statistics; Pennsylvania County Crashes." http://www.dot.state.pa.us/Internet/Bureaus/pdBHSTE.nsf/InfoF606?OpenForm
11. Temple University, University of Pittsburgh, Pennsylvania State University. *The Atlas of Pennsylvania* (Temple University Press: Philadelphia, 1989).

1.4.3. Local

1. Fulton County Board of Commissioners. "Fulton County Hazardous Materials Transportation Commodity Flow Study," February 28, 1997.
2. Fulton County Emergency Management Agency. "Hazard Vulnerability Analysis," March 2004.
3. Fulton County Planning Commission. "Fulton County, Pennsylvania Comprehensive Plan: A Planning Guide for the 21st Century," May 16, 2000.
4. Fulton County Planning Commission. "Moving Fulton Forward: A Joint Comprehensive Plan for Fulton County," January 2007.

1.4.4. Other

1. Henry, Greg. Valley Rural Electric. Interview. April 7, 2003.
2. Hixon, Christopher D. Allegheny Power. Interview. June 3, 2003.

3. Interstate Commission on the Potomac River Basin. http://www.potomacriver.org. June 2004.
4. Kurtz, Thomas. *Intergovernmental Cooperation Handbook*. 4th ed. Pennsylvania: Department of Community and Economic Development, 1997.
5. Michael Baker, Jr., Inc. Standard Operating Guide. Philadelphia, PA, 2009.
6. National Fire Protection Association (NFPA). *NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs*, 2004.
7. Replogle, William. PennDOT. Interview. May 9, 2003.
8. Smith, Richard. Frontier Communications. Interview. April 16, 2003.
9. So, Frank S., and Judith Getzels, eds. The Practice of Local Government Planning, 2nd ed. Washington, D.C.: International City Management Association, 1988.
10. South Central Mountains Counter Terrorism Task Force. Regional Response Plan. 2002.
11. Southern Alleghenies Planning and Development Commission. "Long Range Transportation Policy Document for Bedford, Huntingdon, and Fulton Counties," 2003.
12. Sprint. Interview. April 3, 2003.
13. Strait, Doris. McConnellsburg Sewerage Authority. Interview. April 3, 2003.
14. Susquehanna River Basin Commission. "2003 Annual Report," June 2004.
15. ———. Web site. www.srbc.net. June 2004.

2. Community Profile

2.1. Geography and Environment

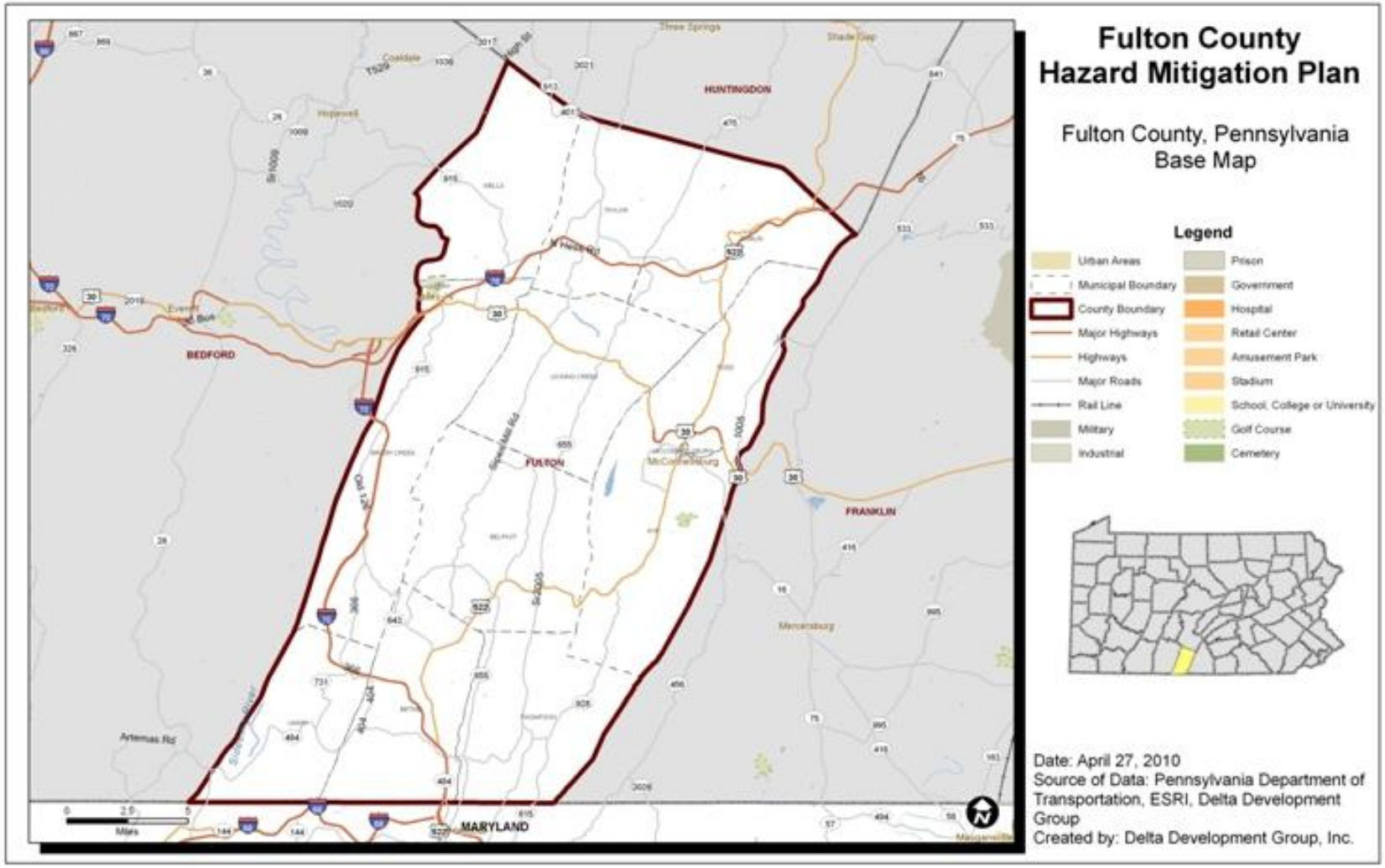
Fulton County is a small rural county located in south-central Pennsylvania. It is bordered to the west by Bedford County, to the north by Huntington County, to the east by Franklin County, and to the south by Maryland. It is 437.6 square miles, making it one of the smallest counties in the state.

The County is mountainous, with numerous high ridges separating narrow valleys. These valleys are fertile and productive enough to support the primarily rural lifestyle of the County's residents. Over 68 percent of the land area is forest land. Several of the large streams within the County flow southward into Maryland and drain into the Potomac River. The streams in the western and northern part of the county are tributaries of the Juniata River.

Fulton County has an extensive transportation network of roads, with 20 miles each of turnpike and interstate highways, 368.4 miles of state and federal highways, and 231.5 miles of secondary and municipal roads. The major routes are US 522, US 30, PA 16, I-70, and the Pennsylvania Turnpike (I-76).

A base map of Fulton County can be found on the next page.

Figure 1: Fulton County Base Map



2.2. Community Facts

Fulton County was created on April 19, 1850, from a portion of Bedford County. It consists of 13 municipalities – 11 townships and 2 boroughs. The County seat is McConnellsburg, which has a population of 1,073.

The County has a rich historical background dating back to pre-Revolutionary days. Because of its Mason-Dixon Line location, Fulton County was a significant area during the Civil War. Agriculture is the main industry.

2.3. Population and Demographics

Population and demographic data provide baseline information about residents. Changes in demographics or population may be used to identify higher-risk populations. Maintaining up-to-date data on demographics will allow the County to better assess magnitudes of hazards and develop more specific mitigation plans. Baseline demographic information for Fulton County is provided in Table 1.

Table 1: Demographics

Demographics	2000 Census
Total population	14,261
Male	7,133
Female	7,128
Median age (years)	38
Under 5 years	898
18 years and over	10,754
65 years and over	2,068
Household population	14,159
Group quarters population	102

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3), Fulton County

Fulton County has one of the smallest populations in the Commonwealth (14,261). The County is also one of the least densely populated, with a population density of only 33 people per square mile (The Center for Rural Pennsylvania, County Profile available at http://www.ruralpa2.org/county_profiles.cfm). A low population density means that people are spread throughout the County rather than clustered in groups. Dispersing information, instructions, and resources in a low-density area is more difficult than in a more densely populated area because individuals are not centralized.

However, a low population density also helps prevent hazards from affecting as many people. For examples, diseases may not spread as quickly because there is less contact between people. Similarly, fires are less likely to spread to other structures because of the large

distances between them. The magnitude of an event is typically smaller in a less populated area because each event affects fewer people and properties.

Over 14 percent of Fulton's population is 65 or older. These residents may have special needs. For example, many may be unable to drive; therefore, special evacuation plans may need to be created for them. They may also have hearing or vision impairments which could make receiving emergency instructions difficult. Both older and younger populations have higher risks for contracting certain diseases. Fulton's combined under-5-years-of-age and over-65 populations represent approximately 21 percent of its population.

Just less than 1 percent of Fulton's population is in group quarters. Group quarters refer to people living in communal settings, which can include inmates in a prison, students in a dorm, or elderly or mentally disabled in group care homes. Residents in group quarters are often special needs populations. It is important to ensure that each group quarter's facility has its own emergency plan that would account for its needs during an event.

The table below provides population estimates for each municipality in Fulton County and for the County as a whole. Fulton County is expected to grow very little in the next 20 years. By the year 2030, it is estimated that the entire County will have a population of 15,602. This represents a population increase of just over 1,000 people in a 30-year period. Many municipalities are actually expecting to deal with a population loss. This means that some structures may become vacant and infrastructure will age, since there will be little new development that would require infrastructure updates. It is important that the County properly maintain its existing infrastructure and have plans to manage or redevelop vacant properties.

Table 2: Population Estimates

Municipality Name	2000 Census	Annual Growth Rate (Percent)	2010 Projected	Annual Growth Rate (Percent)	2020 Projected	Annual Growth Rate (Percent)	2030 Projected
Ayr Township	1,982	0.56	2,094	-0.28	2,036	0.1	2,060
Belfast Township	1,341	0.67	1,431	0.80	1,545	-0.02	1,541
Bethel Township	1,420	0.41	1,478	0.57	1,562	-0.02	1,559
Brush Creek Township	730	1.32	826	1.10	917	0.01	918
Dublin Township	1,277	0.47	1,337	0.75	1,437	-0.04	1,431
Licking Creek Township	1,532	1.01	1,687	0.81	1,823	0.01	1,825
McConnellsburg Borough	1,073	-0.52	1,018	-0.42	975	-0.02	973

Municipality Name	2000 Census	Annual Growth Rate (Percent)	2010 Projected	Annual Growth Rate (Percent)	2020 Projected	Annual Growth Rate (Percent)	2030 Projected
Taylor Township	1,237	0.34	1,279	0.43	1,334	-0.01	1,332
Thompson Township	998	0.56	1,054	-0.04	1,049	0.08	1,058
Todd Township	1,488	0.74	1,599	0.49	1,677	0.03	1,681
Union Township	634	0.54	668	0.31	689	0.03	691
Valley-Hi Borough	20	1.07	22	0.67	24	0.04	24
Wells Township	529	-0.16	520	-0.24	508	0.01	508
FULTON	**14,261**	**0.5**	**15,011**	**0.4**	**15,575**	**0.02**	**15,602**

Source: Pennsylvania Department of Environmental Protection, 2006.

Table 3: Race and Ethnicity

Race and Ethnicity	2000 Census
One race	14,158
White	14,012
Black or African American	94
American Indian and Alaska Native	29
Asian	15
Pacific Islander	2
Some other race	6
Two or more races	103
Hispanic or Latino	52
Speak a language other than English	231

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3), Fulton County

Approximately 2 percent of Fulton's population speaks a language other than English. Hazard mitigation strategies will need to address language barriers to ensure that all residents can receive emergency instructions.

Table 4: Housing Characteristics

Housing Characteristics	2000 Census
Total housing units	6,790
Owner-occupied housing units	4,462
Renter-occupied housing units	1,198
Vacant housing units	1,130
Median value (dollars)	83,900
With a mortgage (dollars)	786
Not mortgaged (dollars)	263

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3), Fulton County

Fulton County has 6,790 residential properties. These properties may be vulnerable to various natural hazards, in particular, flooding and windstorms. Damage to residential properties is not only expensive to repair or rebuild, but also devastating to the displaced family.

Approximately 17 percent of the County's residential properties are vacant. Vacant buildings are particularly vulnerable to arson and criminal activity. Since vacant properties have not been maintained, many are structurally deficient and at risk of collapsing.

Approximately 21 percent of the County's population rents their home. Renters are more transient than home owners; therefore, communicating with renters may be more difficult than communicating with home owners. Similarly, tourists would be a harder population to communicate with during an emergency event. Communication strategies should be developed to ensure that these populations can be given proper notification.

Table 5: Economic Characteristics

Economic Characteristics	2000 Census
Median household income in 1999	$34,882.00
Median family income in 1999	$40,341.00
Per capita income in 1999	$16,409.00
Families below poverty level	334
Individuals below poverty level	1,529

Source: U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3), Fulton County

In 1999, the median household income in the County was $34,882, which was lower than the Commonwealth of Pennsylvania's 1999 median household income ($53,220). The County's per capita income of $16,409 was also lower than the Commonwealth's per capita income of $27,722. Over 8 percent of Fulton's families were below poverty level and almost 11 percent of its individuals were below poverty level. It may be more difficult to send emergency instructions

to people below the poverty level. They most likely do not have access to the Internet. Additionally, many may not own vehicles; therefore, they could be a special needs population during an evacuation.

2.4. Land Use and Development

The following information was excerpted from the 2005 Land Use & Growth Management Report, Community and Regional Profiles, Fulton County. Pennsylvania Department of Community and Economic Development.

Fulton County's existing land use patterns are greatly influenced and shaped by surrounding natural features such as mountain ranges, valleys, and waterways, as well as its transportation features. These features have largely determined the location of transportation corridors and development activities, as well as agricultural practices. A network of high-capacity transportation systems traverses Fulton County.

These systems include the Pennsylvania Turnpike, Interstate 70, U.S. Route 30, and U.S. Route 522. In addition, Fulton County is in close proximity to the juncture of I-70 and I-68 in Maryland. These transportation systems have greatly contributed to Fulton County's accessibility and land development patterns. Of the County's total land area, only 4 percent is considered developed, while the bulk of the undeveloped resides in forested and agricultural uses.

McConnellsburg Borough has remained the population center and the industrial and commercial nucleus of Fulton County. Consequently, a natural pattern of development has occurred as a concentric ring of growth has expanded outward from the Borough into the neighboring rural townships.

Fulton County's commercial and industrial land development patterns are largely influenced by the transportation network and availability of public sewer services. As a result, future growth in the County is expected to occur in five distinct geographic areas: (1) McConnellsburg, (2) Warfordsburg, (3) Hustontown, (4) Ft. Littleton, and (5) Crystal Spring.

Fulton County's future population growth and land use development patterns will be largely influenced by in-migration patterns of people from the east and south. Data gathered from the Internal Revenue Service reveals that Fulton County's greatest population inflows originated in Franklin County, Pennsylvania, and Washington County, Maryland.

Fulton County's rural character is being jeopardized as its agricultural lands are slowly being converted to low-density, scattered residential development. From 1990 to 2000, U.S. Census enumerations show that the increase in housing units (9.8 percent) outpaced the County's population growth (4.6 percent).

Land use regulations are not prevalent in Fulton County. For example, Fulton County does not have a county zoning ordinance nor a subdivision and land development ordinance. In addition, of the 13 municipalities, only McConnellsburg Borough has adopted a zoning ordinance. Moreover, municipal subdivision and land development ordinances lack the regulations necessary to support the preservation of the County's existing rural character.

Agricultural use of land is in long-term decline. According to the U.S. Department of Agriculture, 18 farms and 5,635 farmland acres were lost between 1987 and 1997. Less than one-tenth of one percent (95 acres) of the County's total farmland is enrolled in its agricultural easement program. The primary reason here is that very little to no money exists to support this program and the additional purchase of agricultural easements it entails.

Access management is an increasing concern as residential land development patterns continue to develop in a linear fashion along local roadways (e.g., U.S. 522) and each property obtains an individual highway occupancy permit from PennDOT.

2.5. Data Sources

Information for the Community Profile was developed by using information from the following sources:

- U.S. Census Bureau, Summary File 1 (SF 1) and Summary File 3 (SF 3), Fulton County
- The Center for Rural Pennsylvania, County Profile available at http://www.ruralpa2.org/county_profiles.cfm
- Pennsylvania Department of Environmental Protection, 2006
- 2005 Land Use & Growth Management Report, Community and Regional Profiles, Fulton County. Pennsylvania Department of Community and Economic Development

3. Planning Process

A successful planning process builds partnerships and brings together members representing government agencies, the public, and other stakeholders to reach consensus on how the community will prepare for and respond to hazards that are most likely to occur. Applying a comprehensive and transparent process adds validity to the Plan. Those involved gain a better understanding of the problem or issue and how solutions and actions were devised. The result is a revised set of common community values and widespread support for directing financial, technical, and human resources to an agreed-upon action. The planning process was an integral part of updating the Fulton County Hazard Mitigation Plan (HMP). This section describes Fulton County's update process and how the HMP evolved since it was first approved by the Federal Emergency Management Agency (FEMA).

3.1. Update Process and Participation Summary

To facilitate the update of this and 13 other HMPs across the Commonwealth of Pennsylvania, the Pennsylvania Emergency Management Agency (PEMA) utilized Emergency Management Performance Grant funding to contract with Michael Baker, Jr., Inc. (Baker), a Philadelphia, Pennsylvania, firm, to update 14 counties' HMPs and provide related services. Baker in turn subcontracted Delta Development Group, Inc. (Delta), a Mechanicsburg, Pennsylvania, firm, to lead the update of four of those HMPs, including the Fulton County HMP.

In accordance with the Disaster Mitigation Act of 2000 (DMA 2000) requirements, this plan documents the following topics:

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

As part of the overall project, Baker was tasked by PEMA with developing a standardized planning process to guide HMP updates in Pennsylvania. This process is described in the *Standard Operating Guide* listed in Section 1.4.4 and was followed during the update of the Fulton County HMP. The review, analysis, and update of each of the hazard identification, risk assessment, and mitigation strategy sections are described in Sections 4.2, 4.1, and 6.1, respectively.

Public participation and Hazard Mitigation Steering Committee (Steering Committee) meetings served as the main forums for gathering information to update the current HMP. The Steering Committee and consultants were afforded access to the knowledge of relevant, and approved, plans, policies, and procedures for Fulton County. Opportunities for public participation included attending public meetings, completing written surveys, and reviewing and commenting on the existing plan and other documents. Through this process, the County was able to develop a comprehensive approach to reducing the effects of hazards to the County and its municipalities.

3.2. The Hazard Mitigation Steering Committee

The County's Steering Committee consists of:

- Dave Hoover, Fulton County Commissioner
- Bonnie Keefer, Fulton County Commissioner
- Craig Cutchall, Fulton County Commissioner
- Dan Swain, Fulton County Chief Clerk
- Mary K. Seville, Fulton County Planning Commission
- Pat Berkstresser, Fulton County Planning Commission
- Vincent Joyce, Fulton County EMA
- Seleen Shives, Fulton County Conservation District
- Karole Barton, Wells Township
- Carl Boyer, Mellott Company
- Deb Buterbaugh, American Red Cross
- Darius DeShong, Hustontown Vol. Fire Co.
- Roger DeShong, PennDOT
- Jack Fields, McConnellsburg Borough
- Jeremy Fletcher, Fulton County Planning Commission
- Nelson Gothie, Valley-Hi Borough
- Denise Grissinger, Ayr Township
- Dixie Henry, Dublin Township
- LuAnne Keebaugh, Licking Creek Township
- Joel Kissinger, PEMA Central Area
- Helen Layton, Brush Creek Township
- Donna Lynch, Bethel Township
- Pete Lynch, McConnellsburg Vol. Fire Co.
- Gene Mellott, Thompson Township
- Marcie Mellott, Todd Township
- Monica Mellott, Taylor Township
- Sgt. Troy Park, Pennsylvania State Police
- Jason Sharpe, JLG Industries
- Paula Shives, Belfast Township
- J.R. Sigel, Needmore Vol. Fire Co.
- Donna Welsh, LEPC
- Carolyn Wills, Union Township

Mary K. Seville serves as chair of the committee.

The Steering Committee acknowledged that identifying hazards that specifically affect Fulton County and assessing their likelihood of occurrence, and the potential damage to the people, property, and environment of the County, was one of the most important steps in developing a comprehensive HMP. The Steering Committee chose to focus on an all-hazards approach as opposed to narrowing the focus to human-caused or natural disasters only.

3.3. Meetings and Documentation

The County Steering Committee held the following meetings during the update process of the County HMP:

Table 6: Public and Planning Meetings

Date	Description of Meeting
September 8, 2009	Kick-off meeting with Steering Committee members, including five-year plan review
October 20, 2009	Public meeting to review updated risk assessment
October 29, 2009	Steering Committee meeting was held to review the status of the HMP update
November 9, 2009	Mitigation Solutions Workshop to identify mitigation goals, objectives, and actions
December 10, 2009	Approve the draft HMP for formal review
January 26, 2010	Public meeting to review the draft. HMP adoption by County Commissioners

Each meeting was followed by detailed meeting minutes that documented all discussion, decisions, and unmet needs identified during the meetings. These minutes were shared among the Steering Committee, contractors, and attendees of the meeting. Documentation from all meetings can be found in Appendix B. County residents were informed of public meetings through various sources, including newspapers and announcements.

The Steering Committee partnered with Baker and Delta to aid in the development of the updated Plan. The contractors assisted the County in drafting planning documents, preparing meeting materials, and facilitating meetings. The Steering Committee reviewed any documentation produced by Baker and Delta, provided validation, and acted as an advocate for the Plan update.

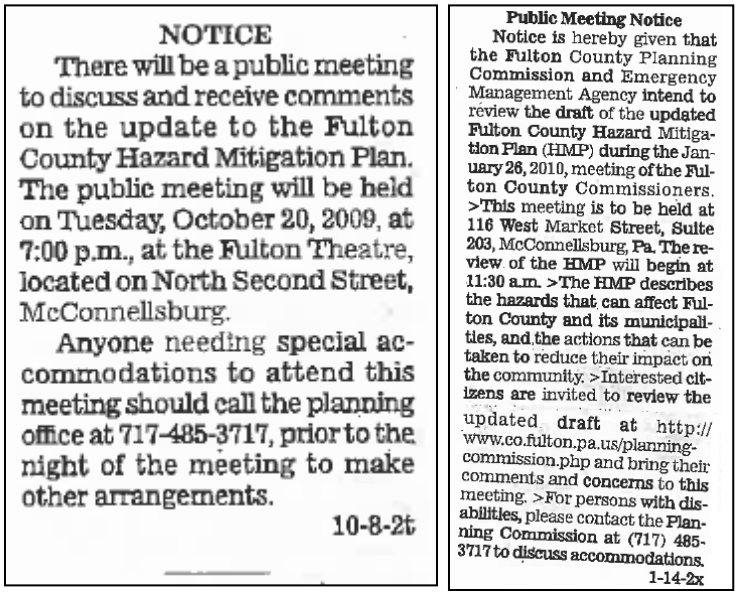
3.4. Public & Stakeholder Participation

To maximize the effectiveness of the HMP, the Steering Committee sought continual public and stakeholder engagement. Public input was encouraged and collected through a variety of methods. A Risk Assessment Survey and a Capabilities Assessment Survey were sent out to each municipality in Fulton County. A total of 12 municipalities in Fulton County returned the Risk Assessment Survey and Capabilities Assessment Survey so that their findings could be reviewed and incorporated into the updated County HMP.

Local, state, and federal agencies, neighboring jurisdictions (e.g., Bedford, Huntingdon, and Franklin Counties), local businesses, community leaders, educators, and other relevant private and nonprofit groups that had a vested interest in the development of the updated Plan were given the opportunity to participate in the planning process by attending a planning or public meeting, or offering comment on the Web site posting the existing HMP. Invitations to serve on the Steering Committee were sent to municipal officials, fire departments, the American Red Cross, County and municipal emergency management and/or planning representatives, the County Commissioners, the Conservation District, the Pennsylvania Department of Transportation (PENNDOT), the Pennsylvania State Police, the local Chamber of Commerce and Tourism, JLG Industries, and Mellott Company. Another letter was sent to each municipality with a copy of the two surveys described above; this letter also encouraged participation in the planning process. A third letter was sent to municipal officials advising them of and inviting them to the October 20, 2009, public meeting and the October 29, 2009, Steering Committee Meeting.

Twelve municipalities' representatives attended at least one of these meetings. Through service on the Steering Committee itself or attendance at a Steering Committee meeting, the Fulton County Commissioners, the American Red Cross, PennDOT, private industry (e.g., JLG), the Pennsylvania State Police, and PEMA were provided the opportunity to guide the HMP's development.

Through public notices published in the local newspaper, the above groups and the general public were invited to review the Plan on the County's Web site and send comments to the Fulton County Planning Commission. In addition, public meetings were held during the planning process as listed in section 3.3 above. Each of these meetings was preceded by a public notice inviting the general public to review and comment on the Plan, as well as to attend the meeting itself. Copies of the actual public notices are found in Appendix B, immediately following the copy of materials used at the respective meetings, and are shown below.



NOTICE

There will be a public meeting to discuss and receive comments on the update to the Fulton County Hazard Mitigation Plan. The public meeting will be held on Tuesday, October 20, 2009, at 7:00 p.m., at the Fulton Theatre, located on North Second Street, McConnellsburg.

Anyone needing special accommodations to attend this meeting should call the planning office at 717-485-3717, prior to the night of the meeting to make other arrangements.

10-8-2t

Public Meeting Notice

Notice is hereby given that the Fulton County Planning Commission and Emergency Management Agency intend to review the draft of the updated Fulton County Hazard Mitigation Plan (HMP) during the January 26, 2010, meeting of the Fulton County Commissioners. >This meeting is to be held at 116 West Market Street, Suite 203, McConnellsburg, Pa. The review of the HMP will begin at 11:30 a.m. >The HMP describes the hazards that can affect Fulton County and its municipalities, and the actions that can be taken to reduce their impact on the community. >Interested citizens are invited to review the updated draft at http://www.co.fulton.pa.us/planning-commission.php and bring their comments and concerns to this meeting. >For persons with disabilities, please contact the Planning Commission at (717) 485-3717 to discuss accommodations.

1-14-2x

Section 3.5 includes a table showing overall municipal participation in the planning process.

3.5. Multi-Jurisdictional Planning

Fulton County took a multi-jurisdictional approach to preparing its HMP, in that the HMP will apply to the County and all participating municipalities. The County was able to provide resources (e.g., funding, data, GIS, etc.) to which the municipalities may not have had access. However, the County was dependent on the municipal buy-in since the municipalities have the legal authority to enforce compliance of land use planning and development issues. The County, together with the Baker team, undertook an intensive effort to involve all 11 Townships and two Boroughs in the update process.

Each municipality was given the opportunity to participate in this process. Municipal officials and representatives were invited to attend Steering Committee meetings, sent a copy of the existing Plan for comment, and asked to review and prioritize the mitigation actions. Participation culminates in formal adoption of the HMP; copies of municipal adoption resolutions are found in Appendix A. The table on the following page reflects the municipalities that met the planning participation requirements that applied to this HMP.

Table 7: Planning Participation Requirements

Municipality	Participated in 2005 Plan	Risk Assessment Survey Received	Capabilities Assessment Survey Received	Attended Meeting	Adopted 2010 Plan	2010 Plan Adoption Date
Fulton County	X	X	X	X	X	9/14/10
Ayr Township	X	X	X	X	X	9/27/10
Belfast Township	X	X	X	X	X	9/20/10
Bethel Township	X	X	X	X		
Brush Creek Township	X	X	X	X		
Dublin Township	X	X	X	X	X	9/28/10
Licking Creek Township	X	X	X	X	X	9/23/10
McConnellsburg Borough	X	X	X	X		
Taylor Township	X	X	X	X		
Thompson Township	X	X	X	X		
Todd Township	X	X	X	X		
Union Township	X	X	X	X		
Valley-Hi Borough	X					
Wells Township	X	X	X	X		

3.6. Existing Planning Mechanisms

The planning process also allowed for the review and incorporation, if appropriate, of existing plans, studies, reports, and other information that aid in the mitigation of hazards across the County. Fulton County will use existing plans and/or programs to implement the decided-upon hazard mitigation actions. Based on the capability assessments of the participating municipalities, the County will continue to plan and implement programs to reduce the effects to people, places, and the environment from hazards. This updated Plan builds upon the momentum developed through previous related planning efforts and mitigation programs, and recommends implementing actions, where possible.

4. Risk Assessment

4.1. Update Process Summary

The Risk Assessment section of the Fulton County HMP update utilizes existing data and analysis from the previous Federal Emergency Management Agency (FEMA)-approved HMP as well as more recent data and analysis on hazards occurring during the last five years.

For the 2005 version of the County's HMP, the following hazards were identified as posing the most risk to the County and its municipalities:

- Flooding
- Hazmat Spills
- Drought
- Transportation issues

A comprehensive, all-hazards list of events that have occurred or could occur in Fulton County was developed for this HMP update. This section of the HMP update aims to identify all potential hazards that could affect Fulton County, confirm the top four hazards that present the greatest risk to the County, and provide a detailed profile of each of the top hazards. Each hazard profile describes and analyzes vulnerabilities and risks each of the top hazards creates for Fulton County.

Based on updated hazard and risk research, the top hazards that could affect the County and its municipalities now include the following:

- Flood, flash flood, and ice jams
- Environmental hazards (e.g., hazardous materials spills)
- Transportation hazards
- Severe wind storms

4.1.1. Data Sources and Limitations

4.1.1.1. Geospatial Data from Pennsylvania Spatial Data Access (PASDA)

Title: *Impervious Surface Area for Southwest Pennsylvania, 1985*

Short Title: pa1985isaa_sw
Edition: Revision 2003
Type of Data: Raster Digital Data
Publication Information:

Publication Place: University Park, PA
Publisher: Penn State University, Department of Meteorology

Description:

Abstract: Impervious surface area for Pennsylvania was estimated from Thematic Mapper data using algorithms developed by Dr. Toby Carlson. The Value attribute indicates percentage of the 25-meter grid cell that is impervious and ranges from 0 to 100 and uses integer rather than decimal values for reduced storage volume. Date of the imagery ranged from 1985 to 1987, and availability depended on extent of cloud cover at time of acquisition. All images were collected for the late spring or summer months (May-August).

Purpose:

The impervious surface data was generated to support hydrologic investigations. Impervious surfaces promote runoff during and following precipitation events. Runoff impacts both quantity and quality of receiving waters. Excessive quantities of runoff promote erosion and flooding. Runoff water acquires pollutants from the impervious surface over which it flows. Pollutants can then be transported to a receiving water body. Impervious surface area is also a useful tool in assessing urbanization and urban sprawl, including the effect of urbanization on surface microclimate.

Title: *Impervious Surface Area for Southwest Pennsylvania, 2000*

Short Title: pa2000isaa_sw
Edition: Revision 2003
Type of Data: Raster Digital Data
Publication Information:

Publication Place: University Park, PA
Publisher: Penn State University, Department of Meteorology

Description:

Abstract: Impervious surface area for Pennsylvania was estimated from Thematic Mapper data using algorithms developed by Dr. Toby Carlson. The Value attribute indicates percentage of the 25-meter grid cell that is impervious and ranges from 0 to 100 and uses integer rather than decimal values for reduced storage volume. Date of the imagery ranged from 1999 to 2002, and availability depended on extent of cloud cover at time of acquisition. All images were collected for the late spring or summer months (May-August).

Purpose:

The impervious surface data was generated to support hydrologic investigations. Impervious surfaces promote runoff during and following precipitation events. Runoff impacts both quantity and quality of receiving waters. Excessive quantities of runoff promote erosion and flooding. Runoff water acquires pollutants from the impervious surface over which it flows. Pollutants can then be transported to a receiving water body. Impervious surface area is also a useful tool in assessing urbanization and urban sprawl, including the effect of urbanization on surface microclimate.

Title: *Pennsylvania County Boundaries, 2007*

Short Title: PennDOT – Pennsylvania County Boundaries 2007
Type of Data: Vector Digital Data
Publication Information:

Publication Place: Harrisburg, PA
Publisher: Pennsylvania Department of Transportation

Description:

County boundaries within Pennsylvania as delineated for the PennDOT Type 10 general highway map.

Purpose:

Public information and support for transportation planning, design, and development.

Title: *Floodplains of Pennsylvania*

Type of Data: Vector Digital Data
Publication Information:

Publication Place: Harrisburg, PA
Publisher: Pennsylvania Department of Environmental Protection (DEP)

Description:

In an effort to expedite the permit review process for Water Obstruction and Encroachment Applications, the Pennsylvania Department of Environmental Protection has initiated a plan to replace hard copy maps with digital GIS sets. The project is referred to as the 105 Spatial Data System /8105SDS/9. Pennsylvania river floodplains and coastal floodplains are two of many spatial data sets that were used in the 105SDS project. As a result of work completed by Law Environmental, Inc., on the statewide low-level radioactive waste siting project, DEP received two coverages depicting river and coastal floodplains. However, due to the process used in constructing these data sets, there were many areas throughout the state in which floodplains were not digitized. The primary purpose of this task was to complete the digital floodplain mapping in these areas.

Purpose:

Created to do permit reviews for Water Obstruction and Encroachment Applications.

Limitations of Data:

Due to the nature of transferring the floodplains from the FEMA maps to the plotted 1:24000 scale maps, this coverage should be considered to be the “best representation” of the data but not as accurate as, for example, a map of Global Positioning System’s floodplain coordinates.

Title: *Streets and Highways, 2006*

Short Title: streetscarto.sdc
Type of Data: Vector Digital Data
Publication Information:

Publication Place: Redlands, CA
Publisher: ESRI

Description:

U.S. Streets Cartographic represents detailed streets, interstate highways, and major roads within the United States.

Purpose:

U.S. Streets Cartographic provides streets with a reduced number of attributes and features that are designed to support cartographic display.

Title: *Pennsylvania Active Railroads, 1996*

Short Title: Active Railroads
Type of Data: Vector Digital Data
Publication Information:

Publication Place: Harrisburg, PA
Publisher: Pennsylvania Department of Environmental Protection (DEP)

Description:

Location of active rail lines in Pennsylvania digitized from 1:24,000 USGS topographic maps on a stable mylar base.

Purpose:

Educational

4.1.1.2. County-Provided Data

In addition to the data listed above, Fulton County also provided prepared geospatial data used in the Geographic Information Systems (GIS) analysis. Information about the location of Fulton County Superfund Amendments and Reauthorization Act (SARA) facilities was provided by the Fulton County Emergency Management Agency. For details on the form and publication of this data, please contact the Fulton County Planning Commission.

Description:

1. **Critical Infrastructure**
    - County buildings (owned or leased)
    - Municipal buildings

- Police stations
- Ambulance stations/EMS stations
- Fire departments
- Dams
- Hospitals
- Nursing homes and long-term care facilities
- Day care centers
- Churches
- Telecommunication facilities (e.g., towers)
- Utilities, electric substations (e.g., electric facilities, etc.)
- Emergency Operation Centers
- SARA facilities (see #3 below)
- Superfund sites
- Schools (public and private)
- Public works facilities
- Surface water intakes
- Water treatment facilities
- Sewer treatment facilities
- Other applicable facilities
- Transportation
  - Airports
  - Train stations
  - Public transit services
  - County pipeline information (Note: for HMP purposes, pipeline information is contained under Transportation.)

2. **Tax Parcels** – A GIS dataset containing the digital tax parcels of each municipality throughout the County.

3. **SARA Facilities** – A GIS dataset for all SARA facilities located in the County.

4. **Potential Loss Estimation** – A key component to the HMP product is the potential loss estimation. This analysis involves selecting structures in the county that are located within the 1% chance floodplain and then taking the assessed or market value of each of those structures and compiling them as totals on both the municipal and the County levels. The potential loss estimation has a significant GIS component and the data essential to perform this analysis is included in Section 4.1.1.

5. **Structures** – A GIS-ready dataset showing locations of all structures located throughout the County. To perform the potential loss estimation, the “structures” dataset must have the assessed or market value for each structure contained within the database.

The severe wind vulnerability analysis depended upon limited data. During the development of this plan, the ability to ascertain information from the property database, necessary to determine which structures were aged/dilapidated or which had basements, was affected by the lack of data. Subsequent versions of this plan will need to incorporate and respond to this data deficiency or need.

Determining the probability of terrorist attacks is difficult, as discussed above. Methods for calculating such probabilities are being developed or, when available, are not widely accessible to communities. Having such methods would allow to better focus mitigation resources, particularly with regards to critical facilities.

4.2. Hazard Identification

In order to identify all the hazards that present a risk to Fulton County, and to confirm the top four hazards that presented the greatest risk to the County, Fulton County began by considering all natural and human-made hazards listed in NFPA 1600: *Standard on Disaster/Emergency Management and Business Continuity Programs*, 2004 edition.

According to Section A.5.3.2 of NFPA 1600, hazard identification should include, but is not limited to, the following types of potential hazards:

1. Naturally occurring hazards that can happen without the influence of people and have a potential direct or indirect impact on the entity (people, property, the environment)
    a. Geological hazards (does not include asteroids, comets, meteors)
        i. Earthquake
        ii. Tsunami
        iii. Volcano
        iv. Landslide, mudslide, subsidence
        v. Glacier, iceberg
    b. Meteorological hazards
        i. Flood, flash flood, seiche, tidal surge
        ii. Drought
        iii. Fire (forest, range, urban)
        iv. Snow, ice, hail, sleet, avalanche
        v. Windstorm, tropical cyclone, hurricane, tornado, water spout, dust/sand storm
        vi. Extreme temperatures (heat, cold)
        vii. Lightning strikes
        viii. Famine

c. Biological hazards
    i. Diseases that impact humans and animals (plague, smallpox, anthrax, West Nile virus, foot and mouth disease)
    ii. Animal or insect infestation

2. Human-caused events
    a. Accidental
        i. Hazardous material (chemical, radiological, biological) spill or release
        ii. Explosion/fire
        iii. Transportation accident
        iv. Building/structure collapse
        v. Energy/power/utility failure
        vi. Fuel/resource shortage
        vii. Air/water pollution, contamination
        viii. Water control structure/dam/levee failure
        ix. Financial issues, economic depression, inflation, financial system collapse
        x. Communications systems interruptions
    b. Intentional
        i. Terrorism (conventional, chemical, radiological, biological, cyber)
        ii. Sabotage
        iii. Civil disturbance, public unrest, mass hysteria, riot
        iv. Enemy attack, war
        v. Insurrection
        vi. Strike
        vii. Misinformation
        viii. Crime
        ix. Arson
        x. Electromagnetic pulse

To focus this list on the hazards that pose the greatest risk to Fulton County, the emergency declarations for the County over the last five years were documented and analyzed. The table in section 4.2.1 presents a comprehensive list of all natural disaster declarations that have occurred in Fulton County from 1956 to 2009, according to the Pennsylvania Emergency Management Agency. This list presents the foundation for identifying what hazards pose the greatest risk within Fulton County.

According to Fulton County's 2005 FEMA-approved HMP, the top four hazards affecting the County were flooding, hazardous materials spills, drought, and severe wind storms. Municipalities were surveyed and asked to identify any changes over the last five years in the natural and human-made hazards that affect their municipalities. In addition, online research and examination of the Pennsylvania Emergency Incident Reporting System (PEIRS) records were conducted to identify those natural and man-made hazards that have affected or could affect Fulton County and its municipalities.

Based on that research, the Steering Committee identified those hazards that pose little risk to the County and its communities, either because they rarely/never affected the County or their impacts were so minor that they did not warrant additional attention. A quantitative analysis of the risk posed by each hazard is described in Section 4.4. The Steering Committee identified the following hazards as posing the greatest threat: flood, flash flood, and ice jams, environmental hazards (e.g., hazardous materials spills), transportation hazards, and severe wind storms. Updated research and analysis supports those findings as the top four hazards in Fulton County. While the Risk Assessment in this HMP update focuses on the top four hazards, the analysis illustrates how often these hazards are interrelated, causing or being caused by other hazards. The vulnerability of critical facilities due to social, economic, and environmental factors is analyzed by the threat each hazard proposes.

The following list describes the vulnerability of Fulton County's municipalities to the hazards addressed in this HMP:

- Flood, flash flood, and ice jams
  - Ayr Township
  - Belfast Township
  - Bethel Township
  - Brush Creek Township
  - Dublin Township
  - Licking Creek Township
  - Taylor Township
  - Thompson Township
  - Todd Township
  - Union Township
  - Wells Township
- Severe wind storms
  - All 13 municipalities are vulnerable to severe wind storms.
- Environmental hazards (e.g., hazardous materials spills)
  - Ayr Township
  - Belfast Township
  - Bethel Township
  - Brush Creek Township

  - Dublin Township
  - Licking Creek Township
  - McConnellsburg Borough
  - Taylor Township
  - Todd Township
  - Union Township
  - Wells Township
- Transportation hazards
  - All 13 municipalities are vulnerable to transportation accidents.
- Severe winter storms
  - All 13 municipalities are vulnerable to severe winter storms.
- Drought
  - All 13 municipalities are vulnerable to drought.
- Wildfires
  - Ayr Township
  - Brush Creek Township
  - Dublin Township
  - Licking Creek Township
  - Taylor Township
  - Todd Township
  - Wells Township
- Subsidence and Sinkholes
  - Ayr Township
  - Bethel Township
  - Dublin Township
  - McConnellsburg Borough
  - Todd Township
  - Thompson Township
- Hailstorms
  - All 13 municipalities are vulnerable to hailstorms.
- Earthquake
  - All 13 municipalities are vulnerable to earthquakes.

4.2.1. Table of Presidential Disaster Declarations

The following table lists the Presidential Disaster Declarations that have (or may have) been issued for Fulton County since 1955.

Table 8: Presidential Disaster Declarations

Year	Date	Disaster Types	Disaster Number	Public Assistance Assistance to State and local governments and certain private nonprofit organizations for emergency work and the repair or replacement of disaster-damaged facilities	Individual Assistance Assistance to individuals and households
2004	09/19	Tropical Depression Ivan	1557	Allegheny, Armstrong, Beaver, Bedford, Blair, Bradford, Bucks, Butler, Cameron, Carbon, Centre, Clarion, Clearfield, Clinton, Columbia, Cumberland, Dauphin, Elk, Franklin, Fulton, Green, Huntingdon, Indiana, Jefferson, Juniata, Lackawanna, Lawrence, Lebanon, Lehigh, Luzerne, Lycoming, Mifflin, Monroe, Montour, Northampton, Northumberland, Perry, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Washington, Wayne, Westmoreland, Wyoming and York for debris removal and emergency protective measures and Allegheny, Armstrong, Beaver, Bedford, Blair, Bradford, Bucks, Butler, Cameron, Carbon, Centre, Clarion, Clearfield, Clinton, Columbia, Cumberland, Dauphin, Fulton, Greene, Huntingdon, Indiana, Jefferson, Juniata, Lackawanna, Lebanon, Luzerne, Lycoming, Mifflin, Monroe, Montour, Northampton, Northumberland, Perry, Pike, Schuylkill, Snyder, Susquehanna, Tioga, Union, Washington, Wayne, Westmoreland, Wyoming, York	Allegheny, Armstrong, Beaver, Bedford, Blair, Bradford, Bucks, Butler, Cameron, Carbon, Centre, Chester, Clarion, Clearfield, Clinton, Columbia, Crawford, Cumberland, Dauphin, Delaware, Elk, Franklin, Fulton, Green, Huntingdon, Indiana, Jefferson, Juniata, Lackawanna, Lawrence, Lebanon, Lehigh, Luzerne, Lycoming, Mifflin, Monroe, Montgomery, Montour, Northampton, Northumberland, Perry, Philadelphia, Pike, Potter, Schuylkill, Snyder, Somerset, Sullivan, Susquehanna, Tioga, Union, Washington, Wayne, Westmoreland, Wyoming, York
Public Assistance/Individual Assistance data not available prior to 1998					
1996	01/21	Flooding	1093	Statewide	
1996	01/13	Blizzard	1085	Statewide	
1972	06/23	Tropical Storm Agnes	340	All 67 Counties	

Sources: FEMA, PEMA

4.2.2. Summary of Hazards

Most of the hazards listed in Section 4.2 either have not affected Fulton County's communities, or have affected them in such a minor way that the Steering Committee considers them of such low risk that they will not be addressed in this HMP. Several of these hazards are described in Table 9, below.

Table 9: Natural Hazards Not Applicable to Somerset County

Hazard	Description	Reason for Dismissal
Avalanche	An avalanche is a mass of snow sliding down a mountainside. It occurs when the stress (from gravity) trying to pull the snow downhill exceeds the strength of bonds that form between snow grains within the snow cover. Temperature, precipitation, wind, depth of snow cover, slope, and vegetation density all influence the frequency and intensity of avalanches. Conditions do not exist for avalanches to occur within Pennsylvania (FEMA, 1997).	They are present in North America, but have not existed in Pennsylvania for approximately 17,000 years (DCNR, 1999).
Coastal Erosion	Coastal erosion is a natural coastal process in which sediment outflow exceeds sediment inflow at a particular location. These sediments are typically transported from one location to another by wind, waves, currents, tides, wind-driven water, waterborne ice, runoff of surface waters, or groundwater seepage. Depending on the location and processes in place, coastal erosion can take place very slowly, whereby the shoreline shifts only inches to a foot per year; or more rapidly, whereby changes can exceed ten feet per year. Intense storms and human interference can result in avulsive events where large portions of a beach or dune are washed away by strong currents and large waves (FEMA, 1997).	Fulton County is not along a coastline.
Coastal Storm	Hurricanes, tropical storms, and nor'easters are classified as cyclones and are any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise (in the Northern Hemisphere) and whose diameter averages 10-30 miles across. While most of Pennsylvania is not directly affected by the devastating impacts cyclonic systems can have on coastal regions, many areas in the state are subject to the primary damaging forces associated with these storms including high-level sustained winds, heavy precipitation, and tornadoes. Areas in southeastern Pennsylvania could be susceptible to storm surge and tidal flooding. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season (June through November) (FEMA, 1997).	Fulton County is not along a coastline.

Hazard	Description	Reason for Dismissal
Hurricane	Hurricanes, tropical storms, and nor'easters are classified as cyclones and are any closed circulation developing around a low-pressure center in which the winds rotate counter-clockwise (in the Northern Hemisphere) and whose diameter averages 10-30 miles across. While most of Pennsylvania is not directly affected by the devastating impacts cyclonic systems can have on coastal regions, many areas in the state are subject to the primary damaging forces associated with these storms including high-level sustained winds, heavy precipitation, and tornadoes. Areas in southeastern Pennsylvania could be susceptible to storm surge and tidal flooding. The majority of hurricanes and tropical storms form in the Atlantic Ocean, Caribbean Sea, and Gulf of Mexico during the official Atlantic hurricane season (June through November) (FEMA, 1997).	Fulton County is not along a coastline, and is therefore not vulnerable to storm surge. Flooding and severe wind, both aspects of hurricanes, are profiled separately.
Tsunami	A tsunami is a series of ocean waves generated by sudden displacements in the sea floor, landslides, or volcanic activity. In the deep ocean, the tsunami wave may only be a few inches high. The tsunami wave may come gently ashore or may increase in height to become a fast moving wall of turbulent water several meters high. Worldwide, unusual wave heights have been known to be over 100 feet high and depending on a number of factors, some low-lying areas could experience severe inland inundation of water and debris of more than 1,000 feet. No known tsunami events have been documented in Pennsylvania over the past 200 years (Dunbar & Weaver, 2007).	Fulton County is not along a coastline.
Volcano	A volcano is a vent in the earth's crust through which magma, rock fragments, gases, and ash are ejected from the earth's interior. Over time, accumulation of these erupted materials on the earth's surface creates a volcanic mountain. Hazards associated with the eruption of volcanoes endanger people, buildings, and infrastructure. Volcanoes can lie dormant for centuries between eruptions and the risk posed by volcanic activity is not always apparent.	There are no active or dormant volcanoes in Pennsylvania (FEMA, 1997).

The Steering Committee has identified four hazards, two of them natural and two man-made, that affect the County and its communities to a sufficient degree to warrant formal profiling and the creation of mitigation actions to minimize their impacts. These hazards are briefly summarized below, and profiled in Section 4.3. Section 4.3 also contains profiles of severe winter storms, droughts, wildfires, subsidence and sinkholes, earthquakes, and hailstorms. The methodology used to prioritize these hazards is described in Section 4.4.

Fulton County, like the majority of the Commonwealth of Pennsylvania, is most vulnerable to flood events that may be due to heavy rains or snow/ice melt. There have been about eight recorded flood events in the County between 1972 and 2009, ranging from individual roads

being washed out to large-scale river and stream flooding. The County is also susceptible to high winds, with numerous instances of straight-line winds or tornadoes causing death, injury, and/or property damage. All of the county's 13 municipalities are vulnerable to flooding; though McConnellsburg Borough is not in the 1% chance floodplain, it is still vulnerable to flash flooding. All 13 of the county's 13 municipalities are vulnerable to severe wind.

The County is also vulnerable to the effects of two major man-made hazards: environmental hazards and transportation issues. Environmental hazards encompass hazardous materials releases and the resulting contamination of air, water, and/or soil. There have been 23 spills of petroleum products or releases of natural gas or propane into the environment in the last five years, along with two releases/spills of more serious chemicals or discoveries of explosives. Eleven of the county's 13 municipalities (all except Thompson Township and Valley-Hi Borough) are vulnerable to hazmat spills or releases from fixed facilities.

Transportation issues include incidents involving air, rail, road, and water transportation networks. There have been about 24 recorded transportation events in the County between 2004 and 2009. All of the 13 municipalities are vulnerable to traffic accidents, but 11 of the 13 are especially vulnerable if the traffic accident involves the release of a hazardous material.

4.3. Hazard Profiles

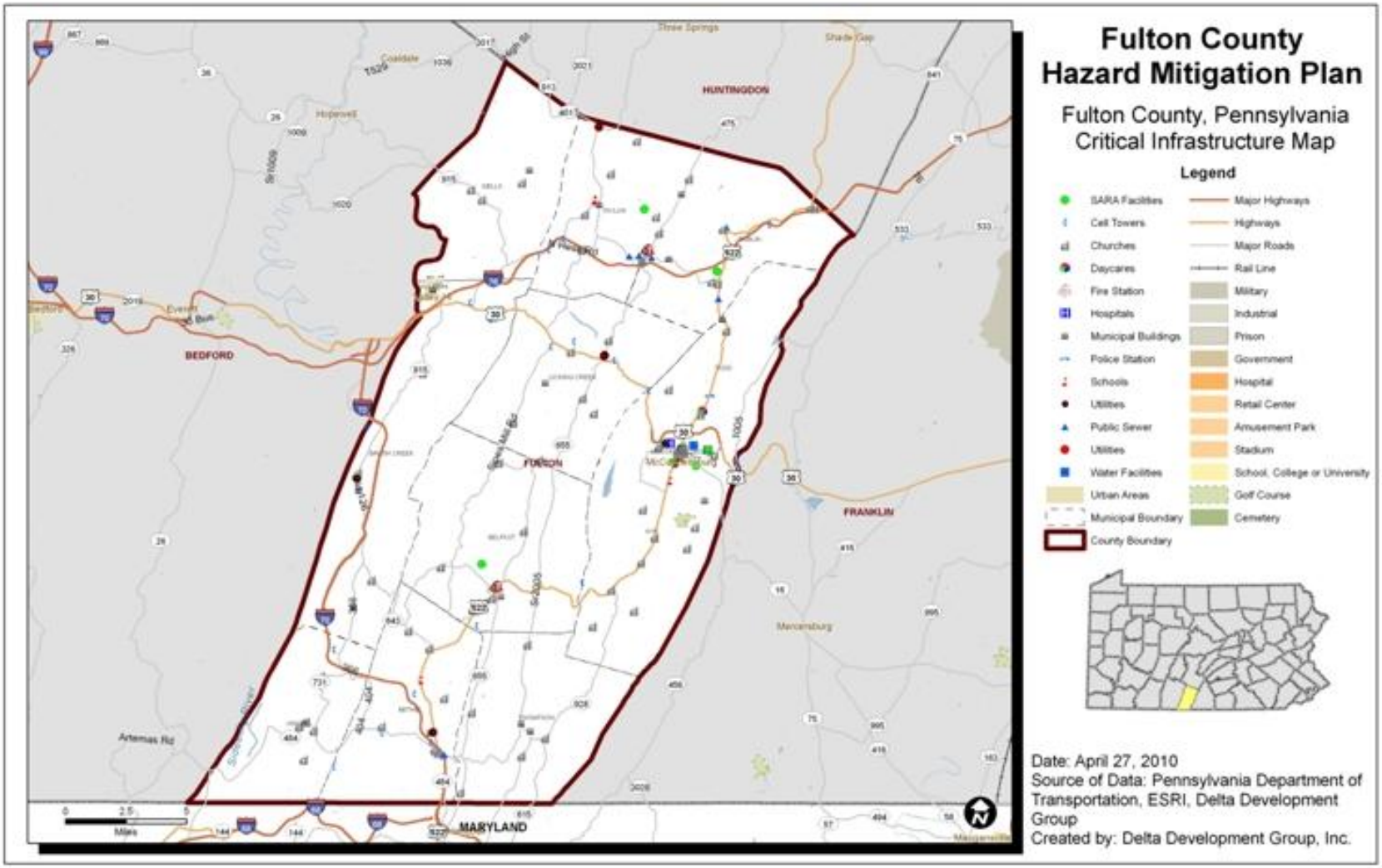
Disaster frequency and its effects or severity are an important basis for planning emergency response and mitigation. Natural hazards tend to reoccur on a predictable seasonal basis, whereas human-caused or technological events tend to change over time with advancements in technology and methods of operation.

Five criteria were selected to assure a systematic and comprehensive approach to hazard analysis:

- **Location and Extent**: The location and extent of the County's vulnerability to a certain hazard can vary throughout the County. The maximum threat or worst-case disaster should be considered for each hazard. However, secondary effects of many hazards can be just as devastating. These secondary effects cause many hazards to be regional hazards affecting many areas with differing impacts.
- **Range and Magnitude**: Each individual hazard poses certain threats to the County and its municipalities. It is important to identify what hazards pose the greatest threat and focus mitigation actions toward those hazards.
- **Past Occurrences**: A record of past events is particularly helpful to evaluate hazards. Past records of the County's hazards also offer valuable information when tempered with the knowledge of preventative efforts, changes in preventative efforts, and advancements in technology that may reduce the frequency or severity of such an event.
- **Future Occurrences**: The probability of an occurrence in the future is another important factor to consider when preparing for an all-hazards response. An event that occurs annually with relatively minor impact may deserve more emphasis than a major event that occurs once every 50 to 100 years.

- **Vulnerability Assessment**: The susceptibility of a community to destruction, injury, or death resulting from a hazard event defines the degree of vulnerability. The degree of vulnerability may be related to geographic location, as with floodplains, the type of facilities or structure, or the socioeconomics of a given area. Additionally, certain population groups may be more vulnerable to some hazards because of immobility or their inability to take protective action. The vulnerability assessment section of each hazard profile lists the critical infrastructure within the respective hazard areas. Maps showing the locations of this infrastructure in the 1% chance floodplain are shown in Appendix D. A map showing the critical infrastructure throughout the County (i.e., the critical infrastructure in the vulnerable areas for hazards equally affecting the entire county) is shown on the next page. These hazards include severe wind storms, severe winter storms, drought, earthquakes, and hailstorms.

Figure 2: Critical Infrastructure in Fulton County



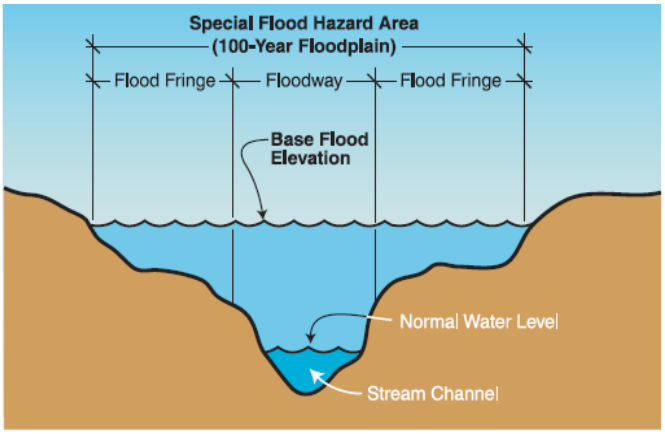
Fulton County relied heavily on existing data sources developed by County departments, including the County Comprehensive Plan, the existing FEMA-approved County HMP, County Subdivision, and Land Development Ordinances, and municipal ordinances obtained through the County Planning Commission. In addition, digital tax assessment data and Geographic Information Systems (GIS) data were critical in analysis. Potential losses to flooding were analyzed with existing Fulton County tax assessment data overlaid with the 1% chance floodplain.

Information was gathered from a variety of sources to develop hazard profiles. State agency sources included the Pennsylvania Department of Environmental Protection, the Pennsylvania Department of Conservation and Natural Resources, and the Pennsylvania Emergency Management Agency. Federal agency sources included the Bureau of Transportation Statistics, the Environmental Protection Agency, the National Climatic Data Center, and FEMA.

4.3.1. Floods, Flash Floods, and Ice Jams

A flood is a natural event for rivers and streams. For inland areas like Southcentral Pennsylvania, excess water from snowmelt or rainfall accumulates and overflows onto the stream banks and adjacent floodplains. As illustrated in Figure 3, floodplains are lowlands, adjacent to rivers, streams, and creeks that are subject to recurring floods.

Figure 3: Floodplain Terminology



Floods are considered hazards when people and property are affected. Nationwide, hundreds of floods occur each year, making it one of the most common hazards in all 50 states and U.S. territories. In Pennsylvania, flooding occurs commonly and can occur during any season of the year from a variety of sources. Every two to three years, serious flooding occurs along one or more of Pennsylvania's major rivers or streams, and it is not unusual for this to occur several years in succession. Most injuries and deaths from flooding happen when people are swept away by flood currents and most property damage results from inundation by sediment-filled water.

Several factors determine the severity of floods, including rainfall intensity and duration, topography and ground cover. A large amount of rainfall over a short time span can result in flash flood conditions. A small amount of rain can also result in floods in locations where the soil is frozen or saturated from a previous wet period or if the rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, or other impervious developed areas.

In Southcentral Pennsylvania, including Fulton County, there are seasonal differences in the causes for floods. In the winter and early spring (February to April), major flooding has occurred as a result of heavy rainfall on dense snowpack throughout contributing watersheds, although the snowpack is generally moderate during most winters. Winter floods also have resulted from runoff of intense rainfall on frozen ground, and local flooding has been exacerbated by ice jams in rivers, streams, and creeks.

Summer floods have occurred from intense rainfall on previously saturated soils. Summer thunderstorms that deposited large quantities of rainfall over a short period of time have also produced flash flooding. In addition, the Commonwealth occasionally receives intense rainfall from tropical storms in late summer and early fall.

About one-third of the County's streams flow into the Juniata River, which is a subbasin of the Susquehanna River Basin. The Juniata subbasin encompasses a 3,406-square-mile area and includes Huntingdon and Blair Counties, and portions of Somerset, Bedford, Franklin, Perry, Juniata, Snyder, Mifflin, Centre, Cambria, and Fulton Counties. Figure 4 shows the Juniata subbasin.

The other two-thirds of Fulton County's streams flow into the Potomac River Basin. The Potomac drainage area includes 14,679 square miles in four states: Maryland, Pennsylvania, Virginia, and West Virginia, as well as the District of Columbia. Fulton County lies in the Conococheague/Antietam subbasin of the Potomac River. A map of this subbasin is shown in Figure 5.

A very small portion of the County is also contained in the Wills Creek/Evitts Creek/Town Creek subbasin.

Figure 4: Juniata Subbasin

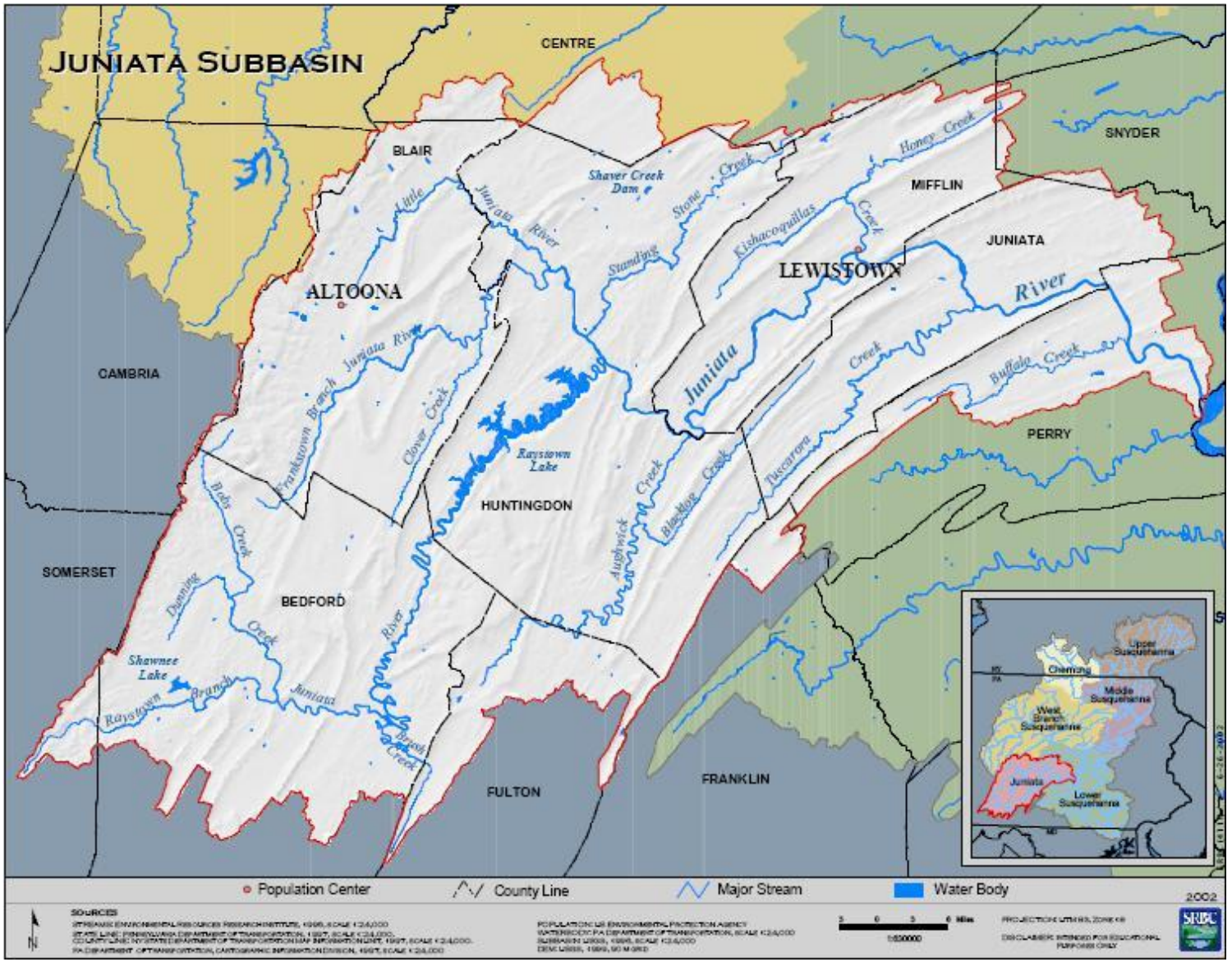
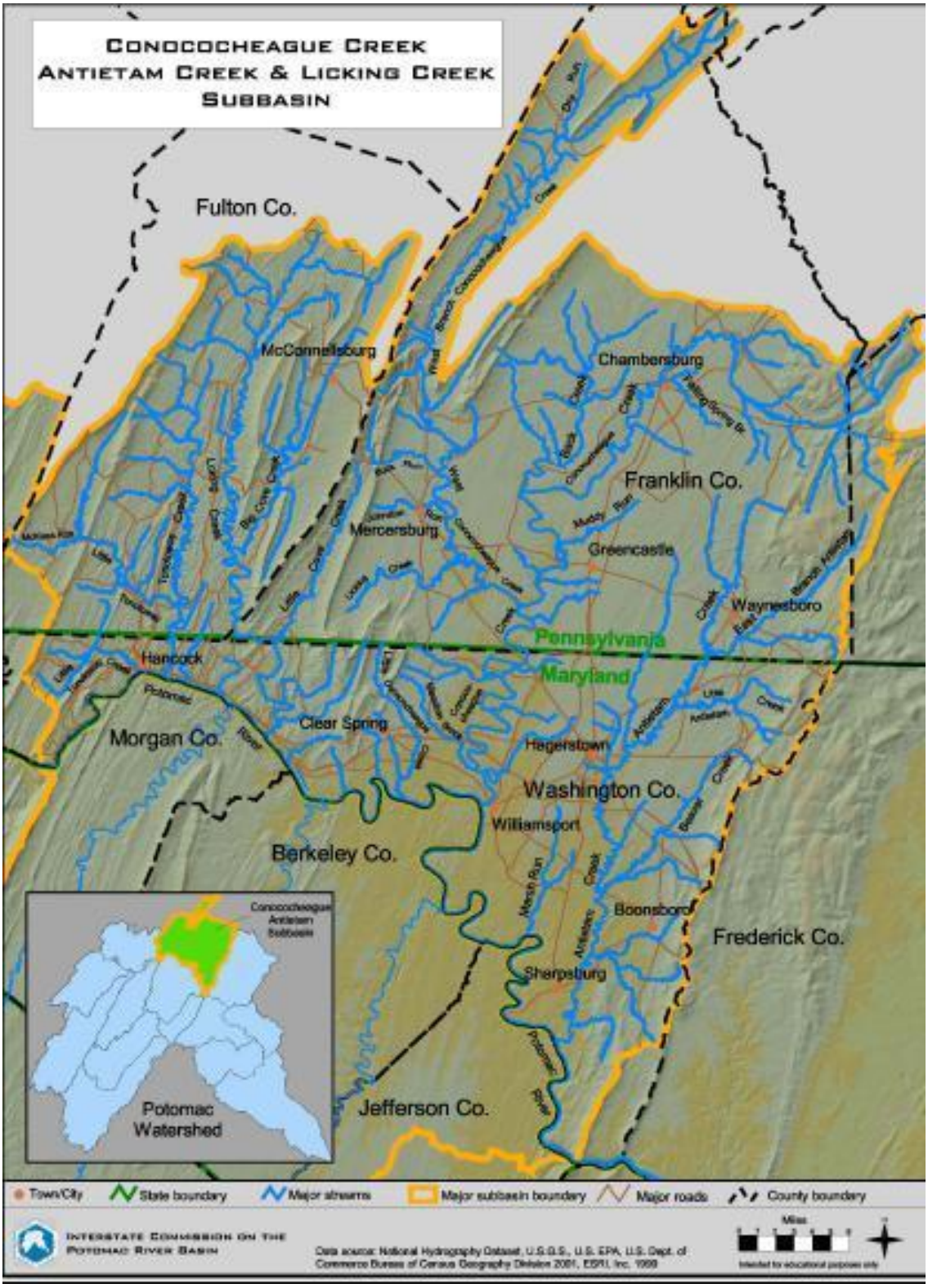


Figure 5: Conococheague Creek, Antietiam Creek, and Licking Creek Subbasin



4.3.1.1. Location and Extent

Maps depicting the 1% chance floodplain within Fulton County and each municipality are shown in Appendix D. These maps are based on digitized floodplain information from the Pennsylvania Department of Environmental Protection (PA DEP). The PA DEP created a digital floodplain map layer for the entire Commonwealth, including Fulton County's 13 municipalities.

4.3.1.2. Range of Magnitude

Several factors determine the extent or "severity" of floods, including rainfall intensity and duration or volume and rate of snowmelt. The County also has conditions that may exacerbate the effects of floods:

- Topography and ground cover contribute to the location and severity of floods, e.g., water runoff is greater in areas with steep slopes and little or no vegetative ground cover.
  - Steep slopes: the County has sloping terrain which can contribute to increased flooding, since runoff reaches the receiving creeks, streams, and rivers more rapidly over steeper terrain.
  - Paved surfaces: urbanization leads to replacement of vegetative ground cover with asphalt and concrete, increasing surface runoff of stormwater. This effect may be exacerbated by poorly planned stormwater drainage systems.
- Hazardous materials facilities: As discussed later in this report under the Human-caused Hazards portion of this section, several facilities that handle or store hazardous materials are located in the 0.2% chance floodplains, presenting potential sources of contamination during flood events.

Fulton County's worst flood was associated with Hurricane Agnes in 1972. The County experienced widespread flooding and flash flooding. The damage was so severe that the County was declared a major disaster area in June of 1972. Specific information on the damages experienced due to Agnes were unavailable for this update. Another significant flooding scenario mirrors the January 1995 flooding. Several inches of rain poured down on several inches of snow that had already fallen. Many homes reported basement and first-floor flooding. Some homes were severely damaged, one of which could not be repaired. Several businesses were damaged as well. A local car dealership had most of its inventory of vehicles floating down the creek. The County Commissioners filed a Declaration of Disaster for this incident. As a result, municipalities and homeowners gained assistance through low-interest loans offered by FEMA.

Information on the impact of additional flood events is provided in Section 5.3.1.3, below.

4.3.1.3. Past Occurrence

Fulton County has a long history of flooding problems, suffering damage from numerous major floods and localized flash flooding. Like other counties within the state, Fulton County

experienced major damage during Hurricane Agnes. The President declared the County a major disaster area on June 22, 1972. On July 6, 1974, a flash flood damaged the Fort Littleton Boy Scout Camp and other areas in Fulton County, but no declaration occurred.

More recently, in January of 1995, flooding occurred in several areas of the County. The damage came after several inches of rain poured down on several inches of snow that had already fallen. Many homes reported basement and first floor flooding. Some homes were severely damaged, one of which could not be repaired. Several businesses were damaged as well. A local car dealership had most of its inventory of vehicles floating down the creek. The County Commissioners filed a Declaration of Disaster for this incident. As a result, municipalities and homeowners gained assistance through low-interest loans offered by FEMA.

In September 1996, a fast-moving storm carrying large amounts of rainfall hit Fulton County. Homes were damaged and the County Commissioners filed a Disaster Declaration, but no formal declaration was passed by the President.

In September 2003, the eye of Hurricane Isabel was expected to go directly through Fulton County. The National Weather Service issued a hurricane and flood warning for up to nine inches of rain. The Emergency Operations Center was activated on September 18 and 19. Although a significant amount of rain was predicted, Fulton County missed the brunt of the storm and received only one to two inches of rain.

Seasonal flash floods occur along US 30 in Harrisonville and about 10 homes are adversely affected. Licking Creek, which flows under US 30, accounts for this flooding.

The following table contains information on flooding-related events since 2004 that impacted Fulton County.

Table 10: History of Flooding in Fulton County Since 2004

Location	Municipality	Date	Type	Death	Injury	Environmental/ Property Damage
SR 484, SR 2004, SR 4008, US 522	Countywide	9/9/2004	4½" of rainfall at the northern tier of the County to 8" in Buck Valley, resulting in road closures, fallen branches, and sporadic telephone interruptions.	0	0	Unknown
Parks Rd. & Sinoquipe Rd.	Dublin Township	3/5/2008	Heavy rain and flooding caused several road closures: PA 655 N & S of US 30 - Licking Creek Township - Thompson Township - Todd Township Water rescue activated.	0	0	Unknown
Pleasant Ridge Rd. (RT 655) 1 mile off Great Cove Rd. (RT 522)	Belfast Township	5/23/2009	Severe weather/flooding - vehicle with/ 2 occupants stranded.	0	0	Unknown

4.3.1.4. Future Occurrence

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. The National Flood Insurance Program (NFIP) uses historical records to determine the probability of occurrence for different extents of flooding. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in any given year.

A specific flood that is used for a number of purposes is called the “base flood,” which has a one percent chance of occurring in any particular year. The base flood is often referred to as the “100-year flood” since its probability of occurrence suggests it should reoccur once every 100 years, although this is not the case in practice. Experiencing a 100-year flood does not mean a similar flood cannot happen for the next 99 years; rather it reflects the probability that over a long period of time, a flood of that magnitude has a one percent chance of occurring in any give year.

Smaller floods occur more often than larger (deeper and more widespread) floods. Thus, a "10-year" flood has a greater likelihood of occurring than a "100-year" flood. Table 11 shows a range of flood recurrence intervals and their probabilities of occurrence.

The extent of flooding associated with a one percent probability of occurrence – the base flood – is used as a regulatory boundary by a number of federal, state, and local agencies. Also referred to as the "special flood hazard area," this boundary is a convenient tool for assessing vulnerability and risk in flood-prone communities, since many communities like Fulton County have maps available that show the extent of the base flood and the likely depths that will be experienced.

Table 11: Flood Probability Terms

Flood Recurrence Intervals	Chance of Occurrence in Any Given Year, %
10 year	10
50 year	2
100 year	1
500 year	0.2

4.3.1.5. Vulnerability Assessment

The flood hazard vulnerability assessment for the County focused on the community assets that are located in the 1% chance floodplain. While greater and smaller floods are possible, information about the extent and depth for the 1% chance floodplain is available in a similar format for all 13 Fulton County municipalities, providing a consistent basis for analysis.

The following table lists the Critical Infrastructure within the 1% chance floodplain. It includes two sewer treatment facilities, a church, and two telecommunications facilities. Maps showing the Critical Infrastructure within the 1% chance floodplain can be found in Appendix D.

Table 12: Critical Infrastructure in the 1% Chance Floodplain

Municipality	Facility
Bethel Township	AT&T Wireless Cell Tower
Bethel Township	Bethel Township Sewer Authority
Dublin Township	Fort Littleton Sewer Treatment Plant
Licking Creek Township	Siloam Church
Taylor Township	Valley Rural Electric

Information on the numbers and types of buildings in the 1% chance floodplain can be found in Appendix E.

Flood events are also a major cause for road closures in the County and its municipalities. Affected areas of roadway may vary from a few feet for only a few hours (as in the case of flash flooding) to several hundred feet for a few days (as in the case of riverine flooding). Road closures limit accessibility to certain areas of the County, which in turn delays the provision of emergency services to the residents in those areas. In addition, despite posted signs warning drivers to stay out of floodwaters, inevitably there are individuals who must be rescued from their cars that become stranded in floodwaters.

4.3.2. Severe Wind Storms

Straight-line winds are the movement of air from areas of higher pressure to areas of lower pressure – the greater the difference in pressure, the stronger the winds. Wind storms are generally defined as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration.

A tornado, a violently rotating funnel-like vortex, is an extraordinary feature of severe thunderstorms. A condensation funnel does not need to reach to the ground for a tornado to be present; a debris cloud beneath a thunderstorm is all that is needed to confirm the presence of a tornado, even in the total absence of a funnel. While the extent of tornado damage is usually localized, the extreme winds of this vortex can be among the most destructive on earth when they move through populated, developed areas.

The Enhanced Fujita Tornado Scale (or the “EF-Scale”) classifies U.S. tornadoes into six intensity categories, named EF0 to EF5, based upon the damage caused and the associated estimated maximum winds occurring within the funnel. The EF-Scale has subsequently become the definitive metric for estimating wind speeds within tornadoes based upon the damage done to buildings and structures.

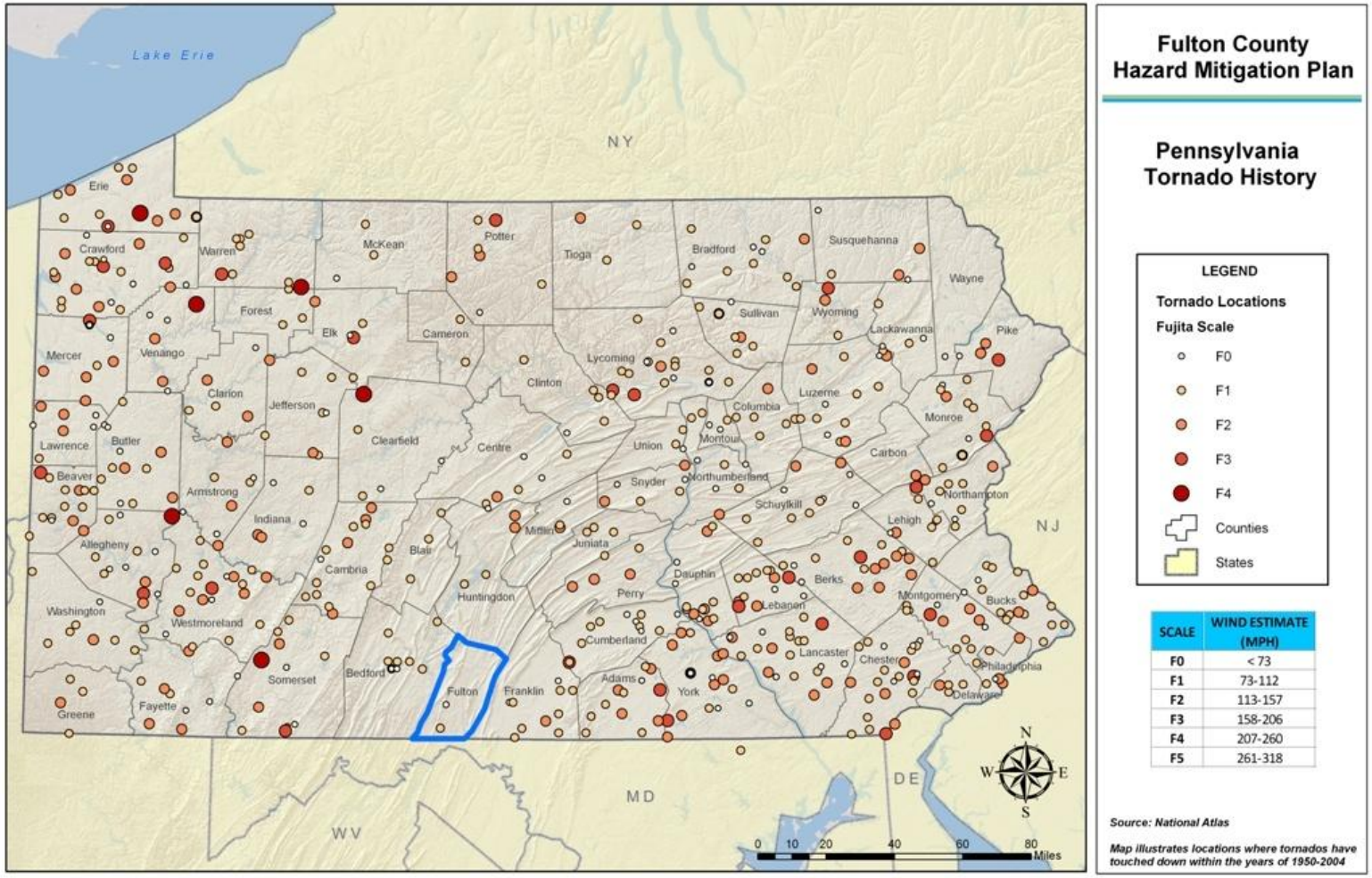
Tornadoes can occur at any time during the day or night, but are most frequent during late afternoon into early evening, the warmest hours of the day. Tornado movement is characterized in two ways: direction and speed of the spinning winds, and forward movement of the tornado/storm track. Rotational wind speeds of the vortex can range from 100 mph to more than 250 mph. In addition, the speed of forward motion can be zero to 45 or 50 mph. Therefore, some estimates place the maximum velocity (combination of ground speed, wind speed, and upper winds) of tornadoes at about 300 mph.

The forward motion of the tornado path can be a few hundred yards or several hundred miles in length. The width of tornadoes can vary greatly, but generally range in size from less than 100 feet to over a mile in width. Some tornadoes never touch the ground and are short-lived, while others may touch the ground several times.

4.3.2.1. Location and Extent

High winds and tornadoes can affect any area of the County. A map of tornadoes that have affected the Commonwealth is shown below in Figure 6.

Figure 6: Pennsylvania Tornado History



4.3.2.2. Range of Magnitude

Wind storms are generally defined as sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration. A tornado's magnitude is classified using the Enhanced Fujita Scale, shown below.

Table 13: Enhanced Fujita Scale and Associated Damage

Tornado EF-Scale	Wind Speed, mph	Expected Damage
EF0	65-85	Light damage: Some damage to chimneys; branches break from trees and show-rooted trees pushed over; damage to sign boards.
EF1	86-110	Moderate damage: Peel surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off road.
EF2	111-135	Considerable damage: Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.
EF3	136-165	Severe damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.
EF4	166-200	Devastating damage: Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	Over 200	Incredible damage: Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100 yards; trees debarked; incredible phenomena will occur.

As shown in Figure 7, Fulton County can expect winds up to 200 miles per hour, and should implement construction regulations requiring structures be designed to withstand winds of that magnitude.

The worst tornado to affect the County was the May 1985 storm in which 6 people were killed and 60 were injured as campers, manufactured homes, homes, and businesses were destroyed across Lycoming, Union, and Northumberland Counties.

4.3.2.3. Past Occurrence

Tornadoes have occurred in Pennsylvania in all seasons and in all parts of the state, but the western and southeastern portions have been more frequently struck. However, one of the deadliest in recent memory was the May 1985 storm in which 6 people were killed and 60 were injured as campers, manufactured homes, homes, and businesses were destroyed across Lycoming, Union, and Northumberland Counties. Since 2004 there has been one recorded tornado in Fulton County.

Table 14: History of High Winds in Fulton County 2004-2009

Location	Municipality	Date	Detail	Death	Injury	Damage
UNK	Taylor Township	3/17/2004	High winds resulting in several downed trees and arced electric lines.	0	0	Downed trees
UNK	Near Crystal Spring	9/8/2004	Trees and wires down due to thunderstorm winds.	0	0	Unknown
UNK	Region	9/17/2004	35-45 mph winds associated with remnants of Hurricane Ivan.	0	0	Unknown
17 miles southwest of McConnellsburg	Warfordsburg	9/17/2004	Tornado occurred 3.5 E of McKees Gap Road; wind speeds around 75 MPH.	0	0	Several trees down, damaging the roof of a house, part of a barn, and leveling a tractor barn. Also flattened tall grass and corn.
UNK	County	7/5/2005	Trees knocked down in County.	0	0	Unknown
UNK	Region	12/1/2006	Tree damage regionwide due to strong gradient winds behind a cold front.	0	0	Unknown
MP 181.9, I 76 WB	Dublin Township	2/27/2007	Trees down due to thunderstorm winds.	0	0	Unknown
UNK	McConnellsburg	6/8/2007	Trees and powerlines downed due to intense squall line.	0	0	Unknown
UNK	Region	2/12/2009	50-65 mph winds across region due to strong cold front	0	0	Knocked out power and toppled trees regionwide; 400,000 without power regionwide; damage regionwide nearly $1 million.

4.3.2.4. Future Occurrence

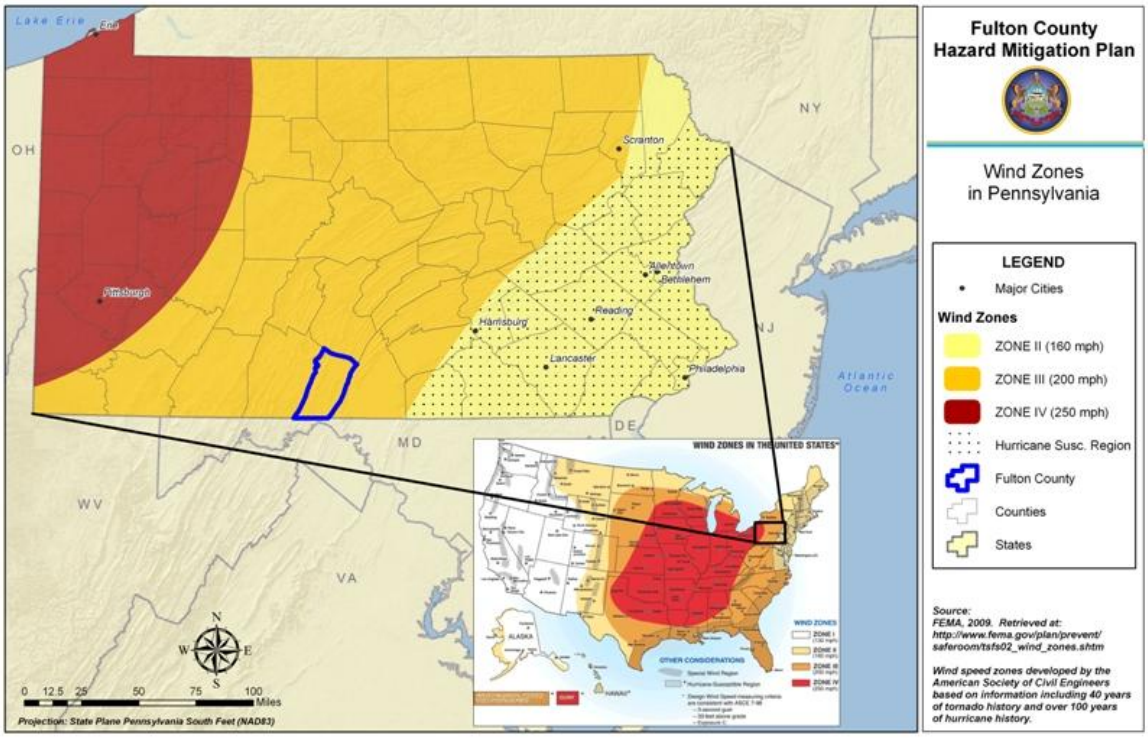
The probability of the County and its municipalities experiencing severe winds is difficult to quantify. The County experiences strong winds on an infrequent basis, but when those winds do strike, it can result in significant property damage, trees down, and utility outages.

The probability of a tornado striking the County is very low, with only two occurring since 1950. Those that have occurred were relatively weak and caused little destruction. Most of Pennsylvania is susceptible to tornadoes of a magnitude of at most an EF-3. It can reasonably be assumed that future tornadoes will be similar in nature to those that have affected the County in the past, and will strike the County once every 25 years (i.e., a 4% probability each year).

4.3.2.5. Vulnerability Assessment

A useful tool for determining vulnerability to the winds that result from hazard events like severe winds and tornadoes is depicted in Figure 7.

Figure 7: Wind Speed Map



This map is based on the map of design wind speeds, developed by the American Society of Civil Engineers, and identifies wind speeds that could occur in different parts of the United States to be used as the basis for design and evaluation of the structural integrity of shelters and critical facilities.

Figure 7 shows that three different wind speed zones cover the Commonwealth of Pennsylvania: Zones II, III, and IV with design wind speeds for community shelters (and other facilities, by extension) of 160, 200, and 250 miles per hour, respectively.

All critical infrastructures in the County are vulnerable to the effects of severe wind. Since high wind events may affect the entire County, it is important to identify specific critical facilities and assets that are most vulnerable to the hazard. Evaluation criteria include age of the building (and what building codes may have been in effect at the time), type of construction, and condition of the structure (i.e., how well has the structure been maintained). Individual structure data was not available for this study, so it was difficult to determine the exact number and types of structures within Fulton County that have heightened vulnerability to wind hazards. However, mobile homes and commercial trailers are extremely vulnerable to high winds (especially if they are not well anchored).

4.3.3. Environmental Hazards

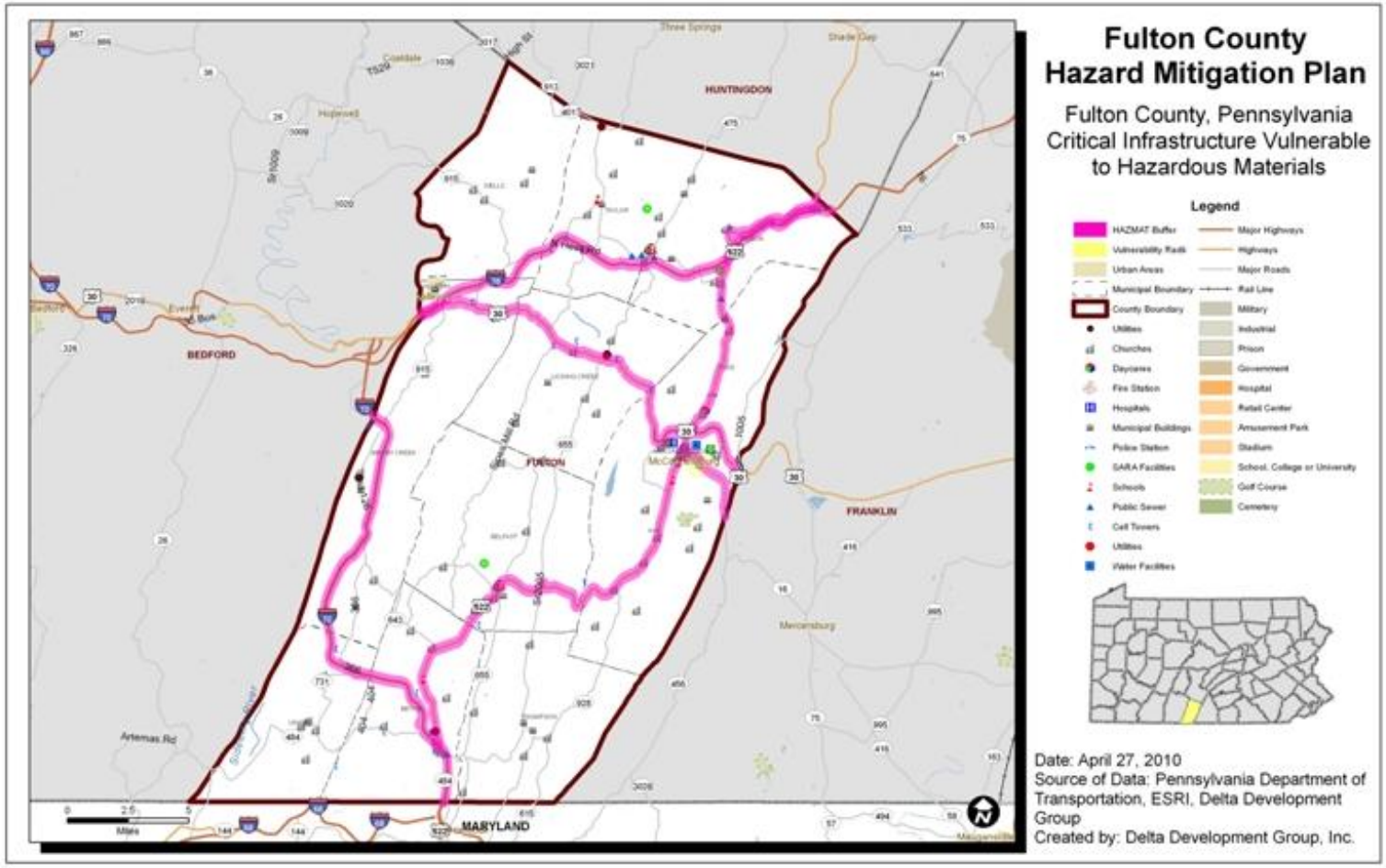
Hazardous material releases can occur at facilities (fixed sites) or along transportation routes. Hazardous material releases can create direct injuries and death and contaminate air, water, and soils. They can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary hazards. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances, and hazardous wastes. An accidental hazardous material release can occur wherever hazardous materials are manufactured, used, stored, or transported. Such releases can affect the nearby population and contaminate critical or sensitive environmental areas.

Facilities that use, manufacture, or store hazardous materials in Pennsylvania must comply with Title III of the federal Superfund Amendments and Reauthorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), and the Commonwealth's reporting requirements under the Hazardous Materials Emergency Planning and Response Act (1990-165), as amended. The community right-to-know reporting requirements keep communities abreast of the presence and release of chemicals at individual facilities.

4.3.3.1. Location and Extent

The following map shows the vulnerability radii of the County's SARA Title III Planning Facilities. Areas within each radius may be evacuated if there is a release of the hazardous materials at those facilities.

Figure 8: Environmental Hazard Vulnerability Map



4.3.3.2. Range of Magnitude

With a hazardous material release, whether accidental or intentional, there are several potentially exacerbating or mitigating circumstances that will affect its severity or impact. Exacerbating conditions are characteristics that can enhance or magnify the effects of a hazard. Mitigating conditions, on the other hand, are characteristics of the target and its physical environment that can reduce the effects of a hazard. These conditions include:

- Weather conditions – affects how the hazard develops;
- Micro-meteorological effects of buildings and terrain – alters dispersion of materials;
- Shielding in the form of sheltering-in-place – protects people and property from harmful effects; and
- Non-compliance with applicable codes (e.g. fire and building codes) and maintenance failures (e.g. fire protection and containment features) – can substantially increase the damage to the facility itself and to surrounding buildings.

The severity of the incident varies with type of material released and the distance and related response time for emergency response teams. The areas within closest proximity to the releases are generally at greatest risk, yet depending on the agent, a release can travel great distances or exist over a long time (e.g., nuclear radiation), resulting in far-reaching effects to people and the environment.

The worst possible hazardous materials incident would be an accident and major rupture of a tanker hauling a toxic or flammable gas in or near McConnellsburg Borough. While little physical property damage is likely from this type of event, the potential to cause injury and death to residents and visitors up to ¼ mile from the scene is significant. The population vulnerable to a release such as this is 605 people in McConnellsburg Borough alone. Other municipalities are vulnerable to hazardous materials releases along US 522 and other routes, as shown in Table 17. In addition, an event such as this would likely close the County offices, causing a major disruption to government operations.

4.3.3.3. Past Occurrence

There are few facilities in Fulton County that manufacture, use, and/or store hazardous materials. There are also four pipelines within the County owned by Sun Cessna (Sunoco), Texas Eastern, and Columbia Gas Company.

Because of the mountainous terrain, Fulton County is susceptible to hazardous materials accidents. Extremely toxic chemicals are being transported through the County and too many farms. Fulton County's Commodity Flow Study (1997) provides a detailed assessment of the transport of hazardous chemicals into, out of, and through the County, and analyzes the possible public safety risks that may occur from this activity. However, no County routes are being used to transport nuclear material.

Fulton County Medical Center is the only hospital in the County. It is located one-half mile from US 522 and 1½ miles from US 30, and therefore is vulnerable to hazardous materials incidents. The hospital-based, long-term care facility for the elderly is also at risk.

The County has experienced hazardous materials release accidents at facilities and along roadways. Most incidents have involved the spill of petroleum products (22 incidents since January 2004 alone) or release of natural gas or propane (one since January 2003) and have easily been contained. At least one chemical spill of unknown substance was documented in Thompson Township in 2007, and one call for an abandoned explosive detonation cord was made in Bethel Township in 2004. Fulton County has an annual contract with Cumberland County's Special Hazards Operation Team (SHOT) for cleanup of larger hazmat incidents.

4.3.3.4. Future Occurrence

There are several SARA Title III facilities in Fulton County, many near population centers. Though they follow applicable safety and health regulations and best practices, accidents resulting in the release of hazardous substances may occur at these facilities at any time.

Hazardous materials are also transported along I-70, I-76, US 522, US 30, and PA 16. Transportation of hazardous materials on highways involves tanker trucks or trailers; not surprisingly, trucks are responsible for the greatest number of hazmat incidents. There are several points where these transportation routes cross streams within the watersheds that are part of the County's domestic water supply.

While hazardous material release incidents in Fulton County have occurred in the past, they are generally considered difficult to predict. Smaller incidents, such as fuel spills, will affect the County many times each year, most likely during the refilling of home heating oil tanks. Though the County does not anticipate more severe hazmat releases on any regular basis, they should not be discounted. Based on the past five years, the County can expect five hazardous materials incidents each year. An occurrence is largely dependent upon the accidental or intentional actions of a person or group.

4.3.3.5. Vulnerability Assessment

Vulnerability to environmental hazards focuses on the people in the hazard area, as opposed to other hazards which focus on the property damage as well. Tables 15-17 present a breakdown of the population within the vulnerability radius of a SARA Title III facility that stores extremely hazardous substances (EHS), or within ¼ mile of a major transportation route on which hazardous materials are transported. Critical infrastructure within each hazard area is listed in Tables 18-23; these facilities may be required to evacuate due to a hazardous materials release, thereby disrupting vital services. There are no significant water bodies within any of the above hazard areas.

Table 15: Population within Vulnerability Radii of Each SARA Title III Planning Facility

Facility	Population
McConnellsburg Sewerage Authority	9
JLG Industries	318
Sprint/Embarq	74
Total	**401**

Table 16: Population by Municipality within SARA Title III Planning Facility Vulnerability Radii

Municipality	Population
Ayr Township	288
McConnellsburg Borough	105
Todd Township	8
Total	**401**

Table 17: Population by Municipality within ¼ Mile of Major Transportation Corridors

Transportation Corridor	Municipality	Population
Interstate 70	Bethel Township	74
	Brush Creek Township	10
	Union Township	21
	Total	**105**
Interstate 76	Brush Creek Township	20
	Dublin Township	249
	Taylor Township	93
	Wells Township	2
	Total	**364**
US 522	Ayr Township	70
	Belfast Township	218
	Bethel Township	20
	Dublin Township	289
	McConnellsburg Borough	605
	Todd Township	252
	Total	**1,454**
US 30	Ayr Township	51
	Brush Creek Township	33
	Licking Creek Township	60
	Todd Township	73
	Total	**217**
PA 16	Ayr Township	401
	McConnellsburg Borough	399
	Todd Township	299
	Total	**1,099**

The critical infrastructure vulnerable to environmental hazards is summarized as follows. There are two churches, one fire station, two water or sewer facilities, and four power and telecommunications facilities vulnerable to releases of hazardous materials from the County's SARA Title III Planning Facilities.

The entirety of McConnellsburg Borough, and therefore all of the major County offices, are vulnerable to the effects of hazardous materials releases along US 30 or US 522. In addition, two churches, one school, and several industrial sites are vulnerable to releases of hazardous materials on I-70. Three churches, four communications facilities, and one sewer facility are vulnerable to releases along I-76. Releases from traffic on US 522 may affect 15 churches, one police station, the Fulton County Offices (as mentioned above), and several power, sewer, or telecommunications facilities. Incidents along US 30 can affect nine power or telecommunications facilities and three churches. Along PA 16, two churches, a senior center, a fire department, and two industrial facilities are vulnerable to hazardous materials releases.

Table 18: Critical Infrastructure within SARA Title III Planning Facilities Vulnerability Radii

Municipality	Facility
Ayr Township	Allegheny Power
Ayr Township	JLG Industries
Ayr Township	McConnellsburg Senior Center
Ayr Township	McConnellsburg Sewerage Authority
Belfast Township	Mellott Wood Preserving
Dublin Township	Crown Castle Usa Cell Tower
McConnellsburg Borough	McConnellsburg Catholic Church
McConnellsburg Borough	McConnellsburg Firehall
McConnellsburg Borough	Sprint/Embarq
Taylor Township	Huston Hollow Farms
Todd Township	Allegheny Power
Todd Township	McConnellsburg Water Authority
Todd Township	Mountain View Mennonite Church

Table 19: Critical Infrastructure within ¼ Mile of I-70

Municipality	Facility
Bethel Township	AT&T Wireless Cell Tower
Bethel Township	Bethel Township Sewer Authority
Bethel Township	Church
Bethel Township	Frontier Telephone Company
Bethel Township	Southern Fulton High School
Bethel Township	Warfordsburg Pres. Church

Table 20: Critical Infrastructure within ¼ Mile of I-76

Municipality	Facility
Dublin Township	Burnt Cabins Church
Dublin Township	Crown Castle Usa Cell Tower
Dublin Township	Hustontown Joint Sewer Authority
Dublin Township	Hustontown Methodist Church
Dublin Township	Leisure Living Retirement Home
Dublin Township	Shentel Cell Tower
Taylor Township	Cell Tower
Taylor Township	Fairview Methodist Church
Taylor Township	Hustontown Community Building
Taylor Township	Shentel Cell Tower

Table 21: Critical Infrastructure within ¼ Mile of US 522

Municipality	Facility
Ayr Township	Allegheny Power
Ayr Township	Free Brethren Church
Ayr Township	McConnellsburg Sewerage Authority
Ayr Township	Mountain View Mennonite School
Ayr Township	St Pauls Lutheran Church
Ayr Township	Union Church
Belfast Township	Needmore Bible Church
Belfast Township	Needmore Firehall
Belfast Township	Seventh Day Adventist Church
Bethel Township	Allegheny Power Substation
Bethel Township	At&T Wireless Cell Tower
Bethel Township	Bethel Township Building
Bethel Township	Cedar Grove Church
Bethel Township	Southern Fulton Elementary School
Bethel Township	Warfordsburg Pres. Church
Dublin Township	Burnt Cabins Church
Dublin Township	Crown Castle Usa Cell Tower
Dublin Township	Fort Littleton Sewer Pump Station
Dublin Township	Fort Littleton Sewer Treatment Plant
Dublin Township	Freedom Worship Center
Dublin Township	Leisure Living Retirement Home
Dublin Township	Shentel Cell Tower
McConnellsburg Borough	Evangel Assembly Of God
McConnellsburg Borough	Fulton Co Commissioners Building
McConnellsburg Borough	Fulton Co Courthouse

Municipality	Facility
McConnellsburg Borough	Fulton Co Courthouse Annex
McConnellsburg Borough	Fulton Co Probation
McConnellsburg Borough	Fulton Co Services For Children Bldg
McConnellsburg Borough	Fulton Co Sheriff
McConnellsburg Borough	Fulton House - Mccbg Boro Office
McConnellsburg Borough	Koontz Office Bldg - County Rents
McConnellsburg Borough	McConnellsburg Catholic Church
McConnellsburg Borough	McConnellsburg Elementary School
McConnellsburg Borough	McConnellsburg Fire Hall
McConnellsburg Borough	McConnellsburg High School
McConnellsburg Borough	McConnellsburg Methodist Church
McConnellsburg Borough	McConnellsburg Presbyterian Church
McConnellsburg Borough	Sprint/Embarq
McConnellsburg Borough	St Paul Lutheran Church
McConnellsburg Borough	St Pauls Church Of Christ
Todd Township	Calvary Independent Baptist
Todd Township	Center For Families Day Care
Todd Township	Knobsville Church Of Brethren
Todd Township	Pa State Police
Todd Township	Todd Township Building

Table 22: Critical Infrastructure within ¼ Mile of US 30

Municipality	Facility
Ayr Township	Shentel Cell Tower
Brush Creek Township	At&T Cell Tower
Brush Creek Township	Crown Communications Tower
Brush Creek Township	MCI Cell Tower
Licking Creek Township	Allegheny Power
Licking Creek Township	Asbury Church
Licking Creek Township	Sprint Shentel Cell Tower
Licking Creek Township	Valley Rural Electric
Licking Creek Township	Verizon Wireless Cell Tower
Todd Township	At&T Cell Tower
Todd Township	Jehovahs Witness
Todd Township	Mountain View Mennonite Church

Table 23: Critical Infrastructure within ¼ Mile of PA 16

Municipality	Facility
Ayr Township	JLG Industries
Ayr Township	McConnellsburg Senior Center
McConnellsburg Borough	McConnellsburg Catholic Church
McConnellsburg Borough	McConnellsburg Firehall
McConnellsburg Borough	Sprint/Embarq
McConnellsburg Borough	St Paul Lutheran Church

4.3.4. Transportation Hazards

Transportation hazards, for the purposes of this County HMP, are categorized as those hazards emanating from incidents caused by or impacting all forms of air, land, and sea transportation modes. Transportation events in the County may involve automobile accidents or aircraft crashes (there are no railways in the County). These events may occur due to human error, criminal actions, technological failure (i.e., mechanical or computer-related failures), or weather-related events. The most common transportation hazard would involve automobile accidents. Since 2004 there have been 24 motor vehicle accidents in Fulton County that were reported to PEMA, resulting in 22 injuries but no deaths.

While there are no airports and have been no aircraft-related events in Fulton County since 2004, it should be noted that Fulton County is in the flight path for many major commercial and regional airports. As aircraft events occur unpredictably, consideration for these events should be included in any emergency planning.

4.3.4.1. Location and Extent

Transportation events can occur in any part of the County. With a mountainous terrain, Fulton County has several “blind curves” and other hazardous sections of roadway that are prone to accidents. As development increases within the County, it can reasonably be assumed that traffic accidents will increase in frequency and magnitude as well.

4.3.4.2. Range of Magnitude

Motor vehicle accidents are measured two ways. First, insurance companies look at the level of damage sustained to the vehicle. They identify them as undamaged; damage has occurred which is cost-effective to repair; or the vehicle is considered a complete loss, as it would cost more to fix than it is currently worth. Secondly, deaths or injuries that have occurred as a result of the event must be considered. For the purpose of this community-oriented analysis, consideration of what damage has occurred to the motor vehicle is not included. Secondary impacts such as environmental damage or property damage other than the automobiles involved are included, because these types of problems will involve the community and may require a wider community response.

Though there is no record of a large-scale traffic accident, the worst-case transportation accident within Fulton County would be a tractor trailer carrying an extremely hazardous substance (see the Environmental Hazards profile) overturning, blocking traffic, and leaking its cargo on the Pennsylvania Turnpike. Such an accident carries with it the potential to cause significant death or injury, close critical facilities, and bring transportation along major roadways to a standstill.

4.3.4.3. Past Occurrence

The following table breaks down automobile-related incidents in Fulton County between 2004 and 2009.

Table 24: History of Vehicle Accidents in Fulton County Since 2004

Location	Date	Event	Death	Injury	Environmental/ Property Damage
Brush Creek Township	6/20/2006	Commercial truck hauling 42,000 lbs of solid chocolate overturned blocking 2 lanes, Dept. of Ag. called.	0	0	0
Wells Township	9/30/2006	Single T/T overturned onto median; 1 EB lane closed.	0	0	0
Brush Creek Township	11/8/2006	Single T/T accident; minor fuel spill; no injuries reported.	0	0	Unknown
Dublin Township	11/29/2006	Single T/T accident; approx 75 gal diesel fuel spilled (sprayed and collected); no injuries reported.	0	0	Unknown
Wells Township	12/7/2006	Single T/T accident; approx 50-100 gal diesel fuel spilled; minor injury.	0	1	Unknown
Dublin Township	1/10/2007	Jackknifed T/T on Sideling Hill utility pole blocking all lanes.	0	0	Unknown
Taylor Township	2/13/2007	Commercial US mail truck struck median: severe damage to power unit, minor injuries, and approx 10 gal fuel spilled.	0	1	Unknown
Taylor Township	5/17/2007	Single vehicle accident in construction zone, no injuries reported.	0	0	0
Brush Creek Township	7/24/2007	Multi-vehicle accident involving T/T; no injuries or spills reported; one lane of I 70 EB closed.	0	0	0

Location	Date	Event	Death	Injury	Environmental/ Property Damage
Taylor Township	8/6/2007	Commercial truck overturned blocking 2 EB lanes and 1 WB lane of PA Turnpike causing 2nd vehicle accident on WB lanes. Confirmed 1 gal of diesel spilled, unconfirmed amount approx 29 gal spilled.	0	2	Unknown
Bethel Township	8/9/2007	Milk truck overturned; 4000 gal load spilled.	0	0	0
Taylor Township	9/13/2007	T/T swerved into closed lane of construction striking occupied T/T (construction equipment)	0	0	0
Brush Creek Township	9/23/2007	Single vehicle accident involving jersey barrier, resulting in multiple rolls and extensive injuries.	0	4	Unknown
Brush Creek Township	10/30/2007	Multi T/T accident, entrapment, blocking EB/WB left lanes of PA Turnpike. Approx 85-160 gal of diesel fuel spilled.	0	1	Ground contamination and drainage concerns
Todd Township/ McConnellsburg	11/22/2007	Vehicle struck utility pole; downed wires and pole. Incident involved entrapment.	0	1	Downed utility pole/wires
Dublin Township	11/29/2007	T/T struck center median resulting in 2 injuries. FedEx truck ruptured saddle tanks when it drove through accident. Damage to reefer portion of T/T carrying frozen beef. Department of Agriculture contacted.	0	2	Unknown
Thompson Township	1/17/2008	Automobile/school bus accident resulting in overturned school bus.	0	2	Unknown
Ayr Township/ McConnellsburg	1/17/2008	Automobile/smaller-sized school bus accident resulting in overturned school bus. Ambulance swerved off road while responding.	0	0	Unknown
Dublin Township	5/22/2008	DUI resulting in vehicle striking PSP car.	0	0	Unknown

Location	Date	Event	Death	Injury	Environmental/ Property Damage
Taylor Township	8/18/2008	T/T overturned on ramp entering Plaza. Produce load spill; no major incidents. EB ramp closure.	0	0	Unknown
Dublin Township	11/2/2008	Overturned vehicle in EB lane of PA Turnpike.	0	4	Unknown
Taylor Township	11/17/2008	T/T struck deer resulting in unknown quantity diesel fuel spill.	0	UNK	Unknown
Ayr Township	11/25/2008	Multi-vehicle accident (MVA) (molasses tanker and pick-up truck) with approx 140 gal of diesel fuel spilled.	0	1	Unknown
Taylor Township	5/28/2009	Hustontown Fire Company tanker involved in accident while responding to call.	0	2	Unknown
Totals			0	22	

4.3.4.4. Future Occurrence

Motor vehicle accidents are difficult to predict. While some roads or intersections may gain a reputation as dangerous, and others are quantitatively shown to be so, this does not necessarily mean an accident will occur with any frequency or guarantee. It represents an elevation in the probability that an accident may occur. As such, it can be said with certainty that if no changes occur in the County then motor vehicle accidents are as likely to occur in the future as they were in the past; based on the last five years, the County can expect five major accidents each year.

It must also be taken into account that with the increase in development in Fulton County, there will be more motor vehicles using its road network. This increase in traffic will also cause an increase in motor vehicle accidents. The areas with the greatest level of development, and those along major transportation routes, are likely to see an increase in both traffic and motor vehicle accidents as a secondary effect of that development.

4.3.4.5. Vulnerability Assessment

Fulton County's future population growth and land use will be significantly impacted by the safety and capacity of the transportation systems traversing the County. Because its location is removed from major rail and air transportation networks, most residents, visitors, and tourists will use automobiles as their primary transportation throughout the community. Immigration and commercial development are also largely dependent on motor vehicle transportation systems.

Given the importance of motor vehicle traffic to the future of Fulton County, traffic and road infrastructure planning must be a high priority for community planners and development officials. Given the opportunity to establish long-term traffic planning programs and mitigate accidents by

improving the safety at dangerous intersections, Fulton County can greatly enhance the safety of its residents and visitors alike. Furthermore, taking the opportunity to learn from other high-growth areas, Fulton County can take steps now to promote the proper balance between development and road infrastructure growth, to mitigate future problems.

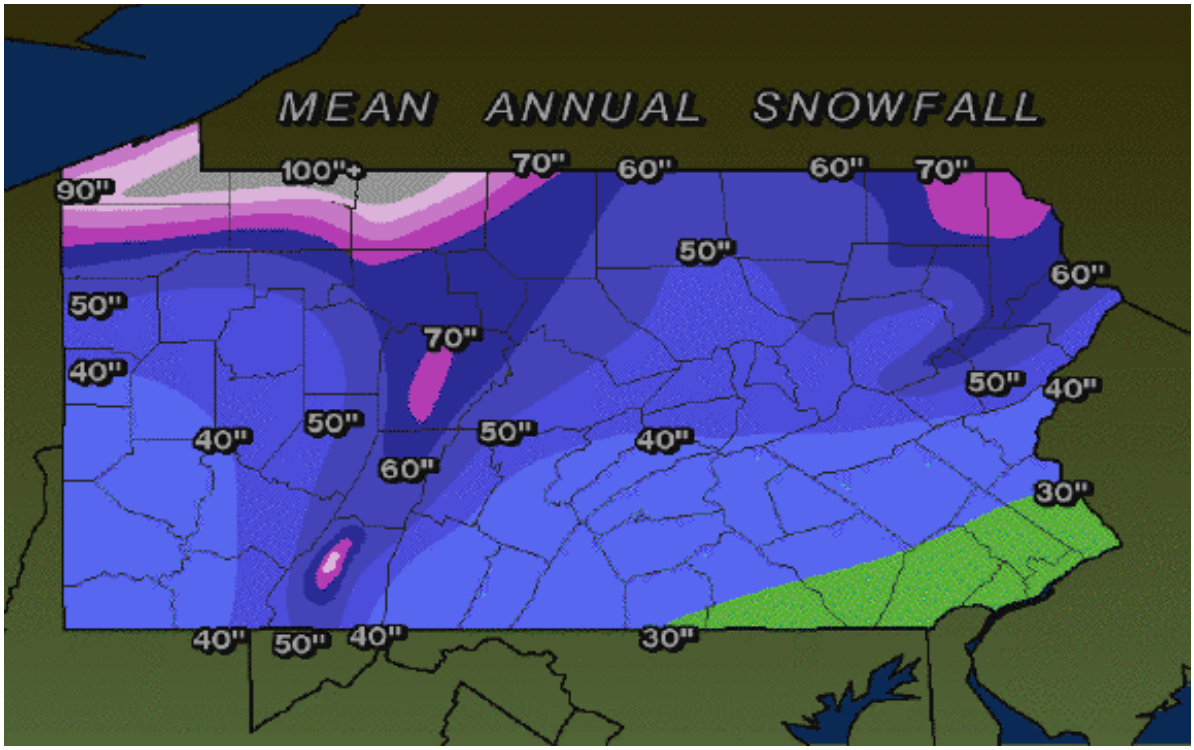
4.3.5. Severe Winter Storms

Winter storms consist of cold temperatures and heavy snow or ice. Because winter storms are regular, annual occurrences in Pennsylvania, they are considered hazards only when they result in damage to specific structures and/or overwhelm local capabilities to handle disruptions to traffic, communications, and electric power.

4.3.5.1. Location and Extent

Average annual snowfall in Fulton County ranges from 30″ to 40″. A map[1] displaying annual snowfall totals throughout Pennsylvania is shown below.

Figure 9: Mean Annual Snowfall in Pennsylvania



[1] National Weather Service State College Office, "Seasonal Snowfall Maps" http://www.erh.noaa.gov/ctp/features/snowmaps/index.php?tab=norms.

4.3.5.2. Range of Magnitude

A winter storm can adversely affect roadways, utilities, and business activities, and can cause loss of life, frostbite, or freezing. Winter storms may contain one or more of the following hazardous weather events:

- Heavy Snowstorm: Accumulations of four inches or more in a six-hour period, or six inches or more in a twelve-hour period.
- Sleet Storm: Significant accumulations of solid pellets that form from the freezing of raindrops or partially melted snowflakes, causing slippery surfaces that create hazards for pedestrians and motorists.
- Ice Storm: Significant accumulations of rain or drizzle freezing on objects (trees, power lines, roadways, etc.) as it strikes them, causing slippery surfaces, and damage from the sheer weight of ice accumulation.
- Blizzard: Wind velocity of 35 miles per hour or more, temperatures below freezing, considerable blowing snow with visibility frequently below one-quarter mile prevailing over an extended period of time.
- Severe Blizzard: Wind velocity of 45 miles per hour, temperatures of 10 degrees Fahrenheit or lower, a high density of blowing snow with visibility frequently measured in feet prevailing over an extended period time.

Fulton County's worst winter storm occurred in January 1994. Specific snowfall totals for that storm were not available, but snowfall in the southwest portions of Pennsylvania exceeded 30 inches in one day. The Pennsylvania Turnpike (I-76) as well as I-70 (a major north-south highway in Fulton County) were closed or shut down because of the snow. The storm brought with it strong winds and sleet/freezing rains. Numerous storm-related power outages were reported, and as many as 600,000 residents throughout Pennsylvania were without electricity, in some cases for several days at a time. The storm caused 185 injuries and approximately $5 million in damages across the state.

4.3.5.3. Past Occurrence

Fulton County and the rest of the Commonwealth of Pennsylvania has a long history of severe winter weather. In the winter of 1993-1994, the state, including Fulton County, was hit by a series of protracted winter storms. The severity and nature of these storms combined with accompanying record-breaking frigid temperatures posed a major threat to the lives, safety, and well-being of Commonwealth residents and caused major disruptions to the activities of schools, businesses, hospitals, and nursing homes.

The first of these devastating winter storms occurred in early January with record snowfall depths (in excess of 33 inches in the southwest and south-central portions of the Commonwealth), strong winds, and sleet/freezing rains. Numerous storm-related power outages were reported, and as many as 600,000 residents were without electricity, in some cases for several days at a time. A ravaging ice storm followed, affecting the southeastern portion of the Commonwealth. This ice storm closed major arterial roads and downed trees and power lines. Utility crews from a five-state area were called to assist in power restoration repairs. Officials from PP&L stated that this was the worst winter storm in the history of the company, and related damage-repair costs exceeded $5,000,000.

Serious power supply shortages continued through mid-January because of record cold temperatures in many places, causing sporadic power generation outages across the Commonwealth. The entire Pennsylvania-New Jersey-Maryland grid and its partners in the District of Columbia, New York, and Virginia experienced 15- to 30-minute rolling blackouts, threatening the lives of people and the safety of the facilities in which they resided. Power and fuel shortages affecting Pennsylvania and the East Coast power grid system required the Governor to recommend power conservation measures be taken by all commercial, residential, and industrial power consumers.

The record cold conditions resulted in numerous water-main breaks and interruptions of service to thousands of municipal and city water customers throughout the Commonwealth. Additionally, the extreme cold in conjunction with accumulations of frozen precipitation resulted in acute shortages of road salt. As a result, trucks were dispatched to haul salt from New York to expedite deliveries to PennDOT's storage sites.

During January and February 1994, Pennsylvania experienced at least 17 regional or statewide winter storms. The consequences of these disasters resulted in the need for intervention by the President in an effort to alleviate the severity of the hardship and to aid the recovery of the hardest-hit counties.

In January 1996, another series of severe winter storms with 27- and 24-inch accumulated snow depths was followed by 50 to 60 degree temperatures resulting in rapid melting and flooding

.

Table 25: History of Winter Storms in Fulton County

Location or County	Date	Type	Deaths	Injuries	Property Damage	Crop Damage
Statewide	1/4/1994	Heavy Snow	0	185	5 M	0
Statewide	1/17/1994	Ice	0	0	500 K	0
Southern PA; Central PA	1/24/1994	Ice	0	62	50 K	0
Statewide	3/2/1994	Heavy Snow/ Blizzard	0	1	5 M	0
Multiple Counties	3/10/1994	Ice	0	0	500 K	0
Western PA	1/4/1995	Heavy Snow	0	0	0	0
Western PA	1/7/1995	Ice	0	0	0	0
Central PA	11/14/1995	Winter Storm	0	0	0	0
Southern PA	11/29/1995	Snow	0	0	0	0
Central PA	12/19/1995	Winter Storm	0	0	0	0
Central PA	1/12/1996	Heavy Snow	0	0	0	0
Central PA	12/29/1997	Heavy Snow	0	0	0	0
Statewide	1/15/1998	Ice Storm	0	0	0	0
Bedford, Fulton, and Somerset Counties	2/4/1998	Heavy Snow	0	0	0	0
Central PA	1/2/1999	Winter Storm	0	0	0	0
Central PA	1/8/1999	Winter Storm	0	0	0	0
Central PA	1/14/1999	Winter Storm	0	0	0	0
Central PA	3/14/1999	Heavy Snow	0	0	0	0
Central PA	1/30/2000	Heavy Snow	0	0	0	0
Central and Southeast PA	2/18/2000	Winter Storm	0	0	0	0
Statewide	12/13/2000	Winter Storm	0	0	0	0
Statewide	3/4/2001	Heavy Snow	0	0	150 K	0
Central PA	1/6/2002	Heavy Snow	0	0	0	0
Multiple Counties	10/29/2002	Ice Storm	0	0	1 M	0
Statewide	12/5/2002	Heavy Snow	0	0	0	0
Statewide	12/10/2002	Ice Storm	0	0	0	0
Statewide	12/25/2002	Heavy Snow	0	0	0	0
Statewide	2/16/2003	Heavy Snow	0	2	0	0
Central PA	12/5/2003	Heavy Snow	0	0	0	0
Southwest-Central PA	1/25/2004	Heavy Snow	0	0	0	0
Central PA	2/3/2004	Heavy Snow	0	0	0	0
Central PA	2/6/2004	Ice Storm	0	0	0	0
Central PA	2/24/2005	Heavy Snow	0	0	0	0
Central PA	12/9/2005	Heavy Snow	0	0	0	0
Statewide	12/16/2005	Winter Storm	0	0	0	0
Adams, Fulton Counties	2/13/2007	Winter Storm	0	0	0	0
Southwest and Central PA	2/1/2008	Winter Storm	0	0	0	0
Western PA	1/6/2009	Ice Storm	0	0	2K	0
Totals			**0**	**250**	**12.202 M**	**0**

4.3.5.4. Future Occurrence

Winter storms occur on the average of 35 times a year in Pennsylvania. The County can expect to be affected by a winter storm every year, and the severity and frequency of major winter storms is expected to remain fairly constant. However, due to increased dependence on various modes of transportation and use of public utilities for light, heat, and power, the disruption from these storms is more significant today than in the past.

As noted in the table above, the County has been affected by zero to five winter storm events each year from 1994 to 2009. Given this record of reported events, it is safe for planning purposes to assume that in an average year the County can expect to experience two to three winter storm events.

4.3.5.5. Vulnerability Assessment

In Fulton County, wintertime snow accumulations are expected and normal. The most common, but potentially serious, effect of very heavy snowstorms with accumulations exceeding six or more inches in a 12-hour period are traffic accidents, interruptions in power supply and communications, and the failure of inadequately designed and/or maintained roofing systems. All critical infrastructures are vulnerable to the effects of severe winter storms. Similar to the discussion under severe wind storms, vulnerability to the effects of winter storms on buildings (including critical infrastructure) is dependent on the age of the building (and what building codes may have been in effect at the time), type of construction, and condition of the structure (i.e., how well the structure has been maintained).

4.3.6. Drought

For layman's purposes, a drought is defined as a prolonged period of insufficient precipitation. However, drought conditions are qualified in different ways, depending upon the group impacted. A soil moisture deficit that inhibits crop production is typically referred to as an "agricultural drought." Whereas agricultural droughts may result from a rapid depletion of soil moisture, hydrological droughts often take months to fully materialize, as groundwater levels slowly decline and water storage decreases. Clearly, operational definitions are necessary to develop a common understanding of drought and its impacts. Operational definitions help hydrologists determine the onset, severity, and impact of droughts, which vary with the type of moisture deficit. Although climate is a primary contributor to hydrological drought, the construction of dams, deforestation, and land degradation all affect the hydrological system.

Drought can be broadly defined as a time period of prolonged dryness that contributes to the depletion of ground and surface water. There are three types:

Meteorological Drought – A deficiency of moisture in the atmosphere. This will have very little effect on the crops and water supply, depending on the preceding conditions.

Agricultural Drought – Inhibits the growth of crops, because of a moisture deficiency in the soil. This type of drought, if persistent, can lead to a hydrologic drought.

Hydrologic Drought – A prolonged period of time without rainfall that can have adverse effects on agriculture, streams, lakes, and groundwater levels.

Leaving areas with little moisture, droughts are often one of the leading contributing factors to wildfires.

Droughts have several effects:

- Depletion of consumable water supply
- Depletion of agricultural water supply
- Depletion of forest water and water used to fight forest fires
- Depletion of water for navigational and recreational purposes
- Depletion of water for natural irrigation (besides crops and forests)
- Poor water quality

Droughts can have adverse effects on farms and other water-dependent industries. This can result in a local economic loss. From a citizen's perspective, public safety is an issue in terms of consumable water not being available, as well as water for fire protection and emergency services.

4.3.6.1. Location and Extent

Droughts are regional in nature and will affect the entire County or several counties, as opposed to individual municipalities. Areas along waterways will show drought conditions later than those areas away from waterways.

4.3.6.2. Range of Magnitude

A drought is a period of prolonged dryness that contributes to depletion of groundwater and surface-water yields. When droughts occur, they can have significant adverse consequences for the following:

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

Drought preparation includes three phases: drought watch, drought warning, and drought emergency.

- Drought Watch: A period to alert government agencies, public water suppliers, industrial water users, and the public regarding the potential for future drought-related problems. The focus is on increased monitoring, awareness, and preparation for response if conditions worsen. A request for voluntary water conservation is made. The objective of

voluntary water conservation measures during a drought watch is to reduce water use by 5 percent in the affected areas. Because of varying conditions, individual water suppliers or municipalities may ask for more stringent conservation actions.

- Drought Warning: This phase involves a coordinated response to imminent drought conditions and potential water supply shortages through concerted voluntary conservation measures to avoid or reduce shortages, relieve stressed sources, develop new sources, and if possible, forestall the need to impose mandatory water use restrictions. The objective of voluntary water conservation measures during a drought warning is to reduce overall water use by 10 to 15 percent in the affected areas. Because of varying conditions, individual water suppliers or municipalities may ask for more stringent conservation actions.
- Drought Emergency: This stage is a phase of concerted management operations to marshal all available resources to respond to actual emergency conditions, to avoid depletion of water sources, to ensure at least minimum water supplies to protect public health and safety, to support essential and high-priority water uses, and to avoid unnecessary economic dislocations. It is possible during this phase to impose mandatory restrictions on nonessential water uses as provided for in 4 Pa. Code Chapter 119, if deemed necessary, and if ordered by the Governor. The objective of water use restrictions (mandatory or voluntary) and other conservation measures during this phase is to reduce consumptive water use in the affected areas by 15 percent, and to reduce total use to the extent necessary to preserve public water system supplies, to avoid or mitigate local or area shortages, and to ensure equitable sharing of limited supplies.
- Local Water Rationing: Although not a drought phase, local municipalities may, with the approval of the Pennsylvania Emergency Management Council, implement local water rationing to share a rapidly dwindling or severely depleted water supply in designated water supply service areas. These individual water rationing plans, authorized through provisions of 4 Pa. Code Chapter 120, will require specific limits on individual water consumption to achieve significant reductions in use. Under both mandatory restrictions imposed by the Commonwealth and local water rationing, procedures are provided for granting of variances to consider individual hardships and economic dislocations.

The drought of 1991 had a significant impact on Fulton County's agricultural production. During the drought, Fulton County's farmers felt the negative impact. Specific data is limited, but the Governor's Proclamation of Disaster Emergency stated that the drought caused "millions of dollars" in damages to crops and agricultural businesses.

4.3.6.3. Past Occurrence

Between 1980 and 2008, the County experienced four significant droughts: 1980-1982, 1991-1992, summer 1999, and February 2002-Novemer 2002. Fulton County drought data is shown in Table 26.

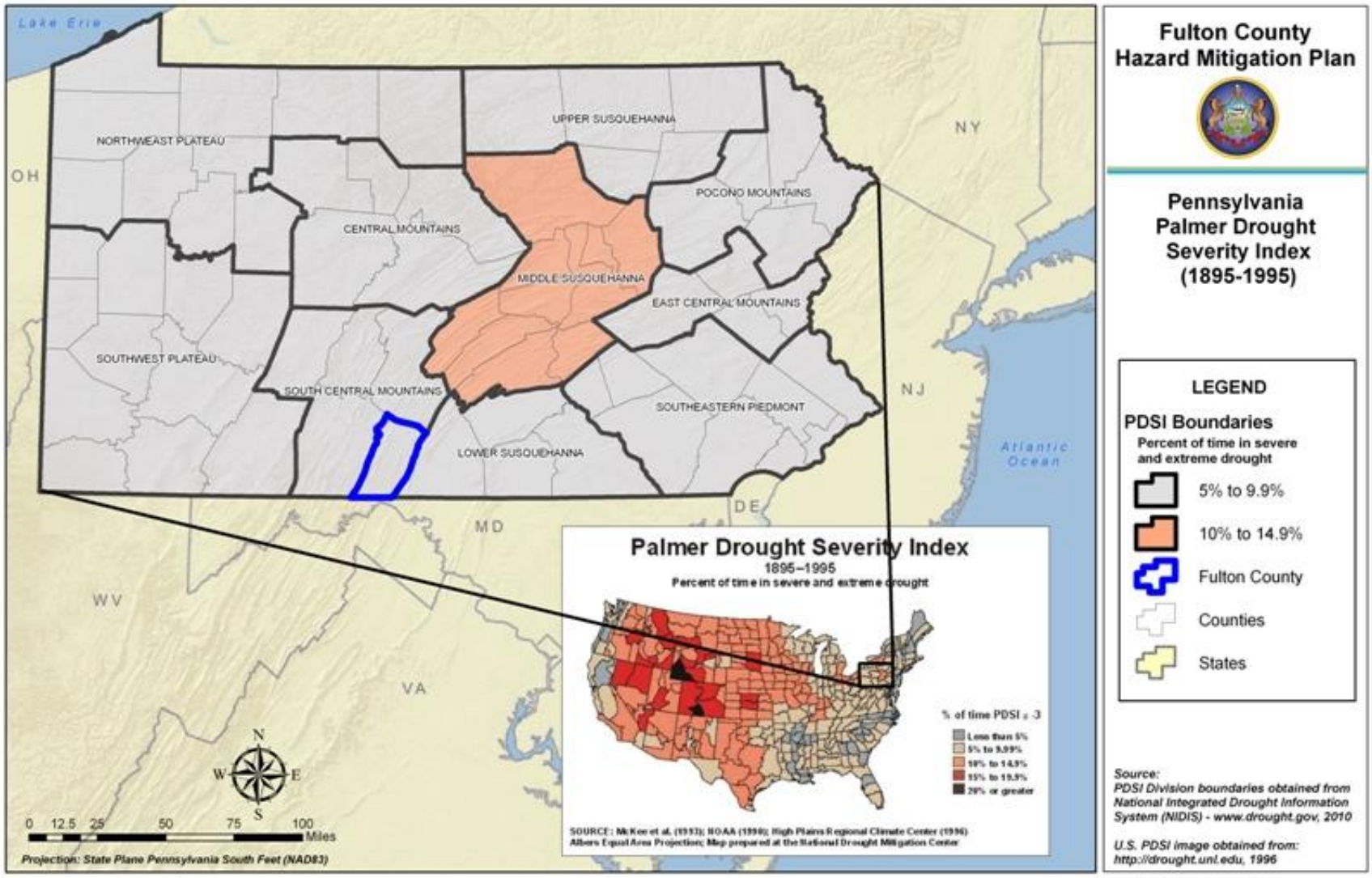
Table 26: History of Drought in Fulton County from 1980-2008

Start	End	Status
11/18/1980	4/20/1982	Emergency
4/26/1985	12/19/1985	Watch
7/7/1988	8/24/1988	Watch
8/24/1988	12/12/1988	Warning
3/3/1989	5/15/1989	Watch
6/28/1991	7/24/1991	Warning
7/24/1991	4/20/1992	Emergency
4/20/1992	9/11/1992	Warning
9/1/1995	12/18/1995	Watch
7/17/1997	11/13/1997	Watch
12/3/1998	12/14/1998	Watch
1/15/1999	3/15/1999	Warning
3/15/1999	6/10/1999	Watch
6/10/1999	7/20/1999	Warning
7/20/1999	9/30/1999	Emergency
9/30/1999	5/5/2000	Watch
8/8/2001	12/5/2001	Watch
12/5/2001	2/12/2002	Warning
2/12/2002	11/7/2002	Emergency
11/7/2002	12/19/2002	Watch
4/11/2006	6/30/2006	Watch
8/8/2007	1/11/2008	Watch

Source: PA Department of Environmental Protection Watershed Management Drought Information Center

According to the Palmer Drought Severity Index map on the next page, Fulton County spent 5% to 9.9% of the time between 1895 and 1995 in a severe and extreme drought.

Figure 10: Pennsylvania Palmer Drought Severity Index (1895-1995) Highlighting Fulton County



4.3.6.4. Future Occurrence

The potential for a drought to occur in Fulton County is high. Given the frequency of drought watches and warnings being issued for Fulton County and its municipalities, the County can reasonably expect to be under a drought watch, warning, or emergency at least every two years. While some form of drought condition frequently exists in Fulton County, the impact depends on the duration of the event, severity of conditions, and area affected. The Palmer Drought Severity Index map shown above indicates that Fulton County spent 5% to 9.9% of the time between 1895 and 1995 in a severe and extreme drought; it is likely that Fulton County will spend the same amount of time in a severe and extreme drought in the future.

4.3.6.5. Vulnerability Assessment

Drought vulnerability depends on the duration and area of impact. However, other factors contribute to the severity of a drought. Unseasonably high temperatures, prolonged winds, and low humidity can heighten the impact of a drought.

Extended periods of drought can lead to lowered stream levels, altering the delicate balance of riverine ecosystems. Certain tree species are susceptible to fungal infections during prolonged periods of soil moisture deficit. Fall droughts pose a particular threat because groundwater levels are typically at their lowest following the height of the summer growing season.

Wildfire (profiled below) is the most severe secondary effect associated with drought. Wildfires can devastate wooded and agricultural areas, threatening natural resources and farm production facilities. Prolonged drought conditions can cause major ecological changes, such as increases in scrub growth, flash flooding, and soil erosion.

4.3.7. Wildfires

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. A wildland fire is a wildfire in an area in which development is essentially nonexistent, except for roads, railroads, power lines, and similar facilities. An urban-wildland interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

The U.S. Fire Administration (USFA) collects data from a variety of sources to provide a statistical analysis of fire incidents nationwide. According to the USFA, the number of fires, fire casualties, and economic losses has continued to decline over the last several years. From 1992 to 2001, fires per million population declined 204 percent, deaths per million declined 30 percent, and dollar loss per capita declined 6 percent. This data is confirmed by comparing it with the National Fire Protection Administration's (NFPA) data on national fire trends from 1977 to 2004. The NFPA data shows that in 1977, there was a total of 3,264,000 fires nationwide, resulting in 7,395 civilian deaths and 31,190 civilian injuries. In 2004, this number dropped to a total of 1,550,500 fires, 3,900 civilian deaths, and 17,785 civilian injuries nationwide. A 2001

study by the USFA showed the largest number of fires were classified as “outside/other” and accounted for 41 percent of all fires, while residential fires resulted in the highest percentage of fire deaths (77%), fire injuries (73%), and dollar loss (54%). Nonresidential properties, such as industrial and commercial establishments, institutions, and educational facilities, accounted for only 8 percent of all fires, but 28 percent of total dollar loss.

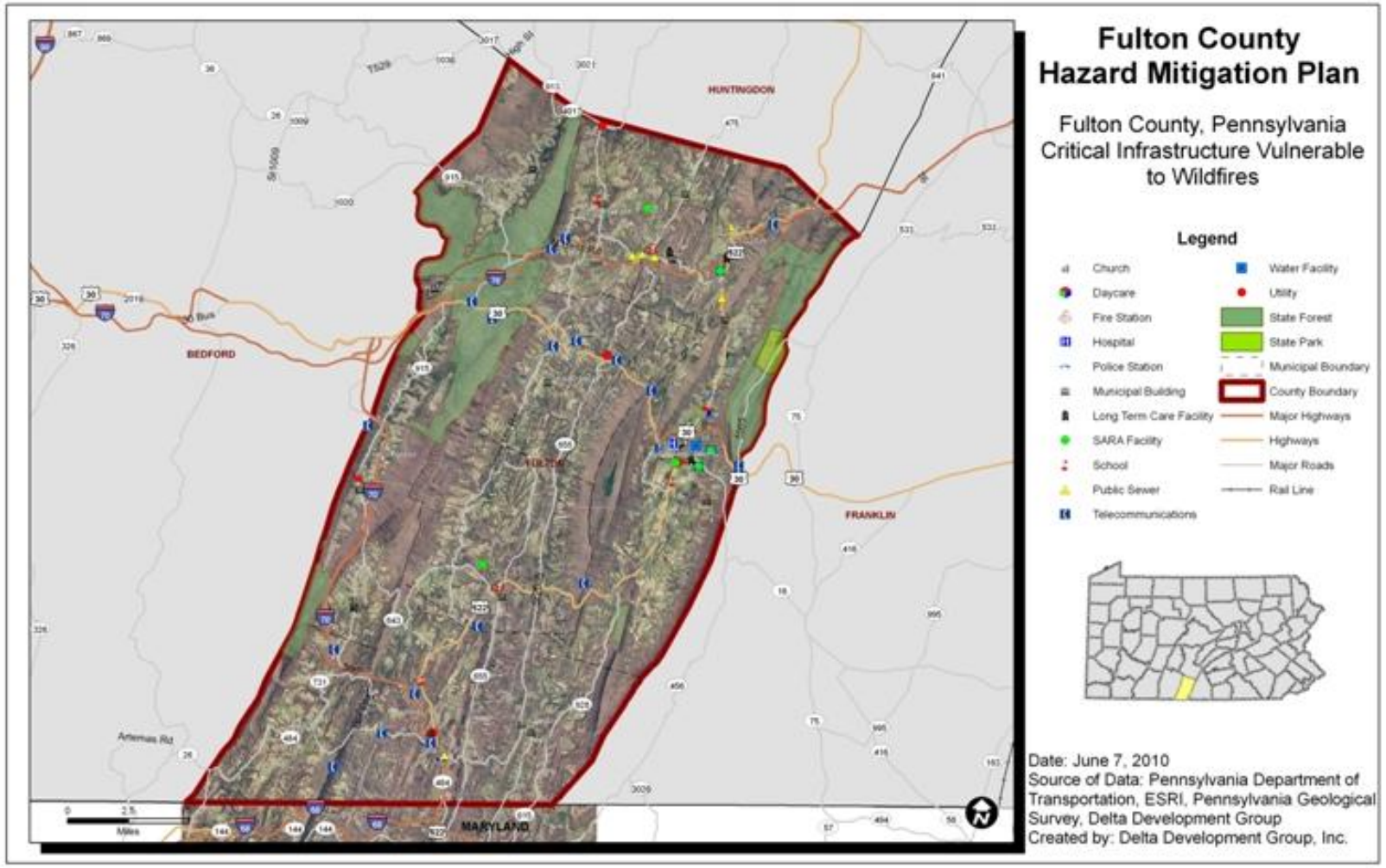
From 1992 to 2001, Pennsylvania had an average fire death rate above the national average, with an average between 11 to 17 per million population. This is due primarily to the state’s high population density. In 2001, Pennsylvania averaged 3.01 civilian deaths per 1,000 fires and $22,609 in property loss per fire. In 2003, the USFA recorded a fire death rate of 15.9 per million for Pennsylvania. This was above the 2003 national average of 14.4 per million and ranked the Commonwealth as the fifteenth highest state that year.

4.3.7.1. Location and Extent

Wildland fires can occur at any time of the year, but are most likely to occur in the County during a drought. Any small fire in a wooded area, if not quickly detected and suppressed, can get out of control. Most wildland fires are caused by human carelessness, negligence, and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion.

The map on the next page shows that the vast majority of the County is forestland, with several state parks and forests. Any area with forest or brush is vulnerable to wildfires.

Figure 11: Fulton County Wildfire Hazard Map



4.3.7.2. Range of Magnitude

Wildland fires in Fulton County have generally been small and easily contained. There have been a few that have burned over one acre, but most are confined to a smaller area. The fact that Fulton County's land use is mostly forest or agricultural has led to very little property damage being done by these fires. The worst wildfire to occur within the County burned 17 acres; data on property damage, injuries, or deaths caused by the fire was not available. The County recognizes that wildfires will continue to occur in Fulton County, and will have more devastating effects as development in or around wildlands increases.

4.3.7.3. Past Occurrence

The following table lists the reported wildfires that have occurred since January 2002.

Table 27: Fulton County Wildfires Since January 2004

Date	Municipality	Cause	Acres Burned
2/13/2002	Brush Creek Twp	Miscellaneous	1.5
3/31/2002	Thompson Twp	Incendiary	1.5
4/18/2002	Ayr Twp	Lightning	0.1
4/19/2002	Belfast Twp	Lightning	2.2
4/19/2002	Bethel Twp	Lightning	0.4
5/3/2002	Thompson Twp	Incendiary	0.1
7/23/2002	Todd Twp	Lightning	< 0.1
7/24/2002	Belfast Twp	Lightning	< 0.1
8/14/2002	Taylor Twp	Lightning	< 0.1
4/25/2003	Licking Creek Twp	Debris Burning	0.5
12/3/2003	Wells Twp	Incendiary	0.1
4/7/2004	Todd Twp	Debris Burning	17
11/9/2004	Dublin Twp	Debris Burning	0.2
11/11/2004	Brush Creek Twp	Equipment Use	0.9
4/15/2005	Bethel Twp	Miscellaneous	0.2
4/18/2005	Brush Creek Twp	Incendiary	0.2
4/26/2005	Brush Creek Twp	Debris Burning	0.9
11/7/2005	Belfast Twp	Miscellaneous	1
2/25/2006	Brush Creek Twp	Debris Burning	1.6
3/7/2006	Taylor Twp	Debris Burning	4
3/24/2006	Brush Creek Twp	False Alarm	< 0.1
4/2/2006	Brush Creek Twp	Camp Fire	0.1
4/2/2006	Brush Creek Twp	Incendiary	0.1
12/18/2006	Thompson Twp	Incendiary	1.8
4/2/2007	Brush Creek Twp	Miscellaneous	0.3

Date	Municipality	Cause	Acres Burned
4/23/2007	Licking Creek Twp	Equipment Use	1.4
6/12/2007	Dublin Twp	Lightning	1
8/16/2007	Dublin Twp	Lightning	< 0.1
10/13/2007	Licking Creek Twp	Miscellaneous	0.1
3/26/2008	Brush Creek Twp	Equipment Use	2
4/2/2008	Wells Twp	Debris Burning	0.8
10/5/2008	Wells Twp	Equipment Use	0.1
10/24/2008	Belfast Twp	Incendiary	0.4

4.3.7.4. Future Occurrence

Wildland fires are most common in the spring (March – May) and fall (October – November) months. During spring months, the lack of leaves on the trees allows the sunlight to heat the existing leaves on the ground from the previous fall. The same theory applies for the fall; however, the dryer conditions are a more crucial factor. Based on the available data, it is likely that the County will experience between four and five wildfires each year.

4.3.7.5. Vulnerability Assessment

Wildfires have the potential to destroy huge areas of vegetation with no regard to the man-made structures within those areas. The rural areas in which these fires occur generally have little firefighting infrastructure such as hydrants, and the fire departments servicing those areas may take extended times to reach and ultimately extinguish the fire. Recognizing that these fires have the potential to spread relatively unopposed, the most vulnerable people and property are those within a short distance of the interface between the built environment and the wildland environment. For the purpose of this document, that distance is defined as 100 feet. The table below shows the critical infrastructure, consisting of a 911 radio communications tower and three private telecommunications towers, within that area. This critical infrastructure is shown in Figure 11. Estimates of potential loss due to wildfires are presented in Section 4.4.3.2.

Table 28: Critical Infrastructure by Municipality within 100 Feet of Parks or Wildlands

Municipality	Facility
Brush Creek Township	AT&T Cell Tower
Brush Creek Township	Crown Communications Tower
Brush Creek Township	MCI Cell Tower
Todd Township	Fulton County 911 Tower

4.3.8. Subsidence and Sinkholes

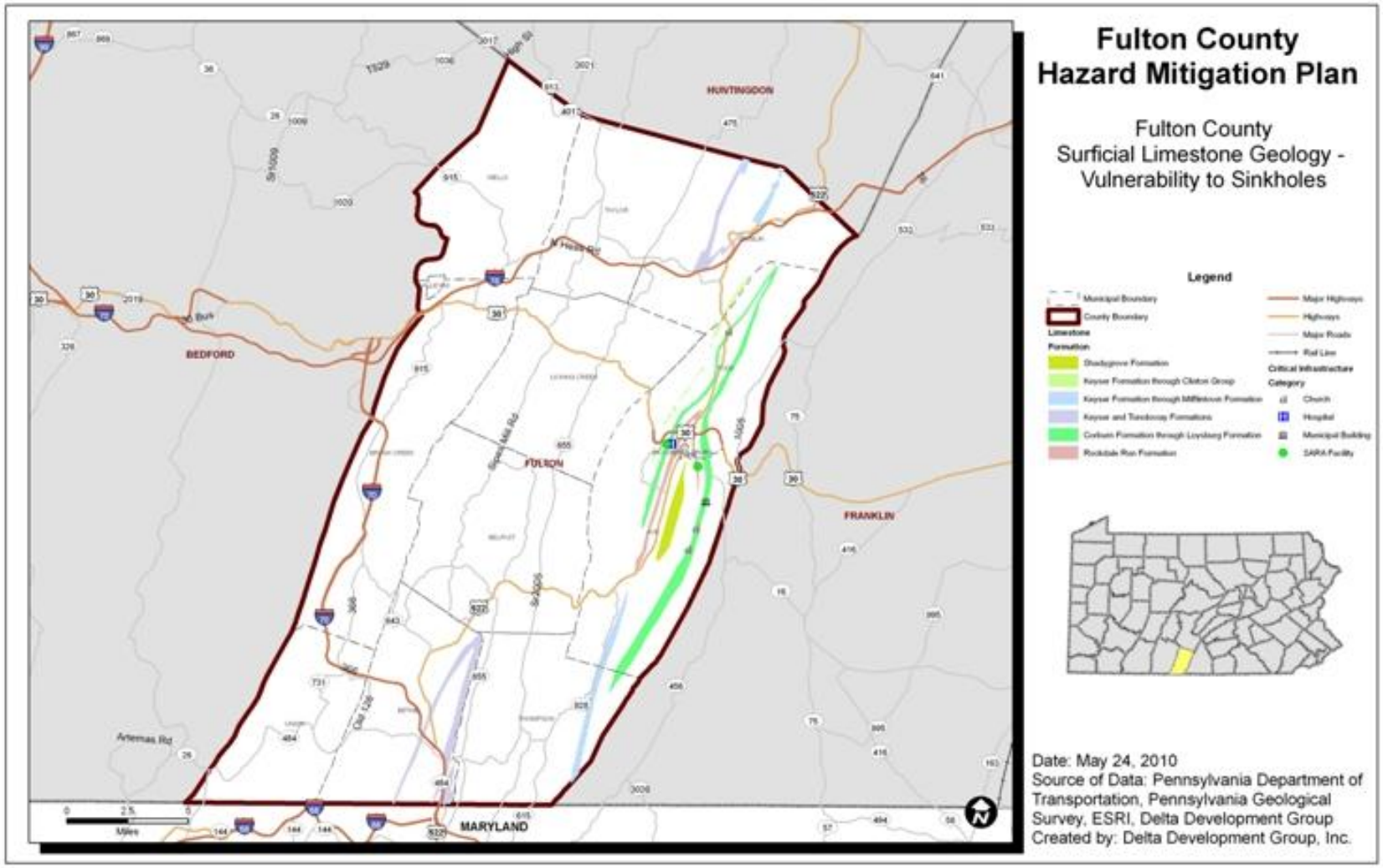
4.3.8.1. Location and Extent

Subsidence potential in Fulton County is primarily associated with the solution of carbonate bedrock, such as limestone and dolomite, by water. Water passing through naturally occurring fractures and bedding planes dissolves the bedrock, leaving voids below the surface. Eventually, overburden on top of the voids collapses, leaving surface depressions resulting in karst topography. Characteristic structures associated with karst topography include sinkholes, linear depressions, and caves. Often, sub-surface solution of limestone will not result in the immediate formation of karst features. Collapse sometimes occurs only after a large amount of activity, or when a heavy burden is placed on the overlying material. Abrupt or long-term changes in the ground surface may also occur following sub-surface fluid extraction (e.g., natural gas, water, oil). Figure 12 shows that a small portion of Fulton County lies in an area of Pennsylvania where limestone, dolomite, or both are present near ground surface, thus making it slightly susceptible to natural sinkhole development.

The following municipalities have identified near-surface limestone:

- Ayr Township
- Bethel Township
- Dublin Township
- McConnellsburg Borough
- Thompson Township
- Todd Township

Figure 12: Area Vulnerable to Subsidence



4.3.8.2. Range of Magnitude

Based on the geologic formations underlying some of Fulton County, subsidence and sinkhole events may occur gradually or abruptly. Events could result in minor elevation changes or deep, gaping holes in the ground surface. Subsidence and sinkhole events can cause severe damage in urban environments, although gradual events can be addressed before significant damage occurs. If long-term subsidence or sinkhole formation is not recognized and mitigation measures are not implemented, fractures or complete collapse of building foundations and roadways may result. While the photograph shown in Figure 13 was taken at a location outside of Fulton County, it provides an example of the severe damage sinkholes can inflict on buildings. General recommendations have been published for site investigations prior to construction of buildings due to the potential for karst subsidence. These recommendations vary depending on the rock type immediately underlying soil cover. The recommendations include thorough geotechnical investigations to identify un-collapsed karst features and potential excavation to solid rock prior to construction.

Figure 13: Sinkhole at Corporate Plaza Building in Allentown, Lehigh County, PA in February, 1994 (Photograph by William E. Kochanov - DCNR, 2009)

Groundwater in limestone and other similar carbonate rock formations can be easily polluted, because water moves readily from the earth's surface down through solution cavities and fractures, thus undergoing very little filtration. Contaminants such as sewage, fertilizers, herbicides, pesticides, or industrial products are of concern.

The worst case scenario for sinkholes in Fulton County would be a series of large sinkholes opening in Ayr Township. As shown in Figure 12, long swaths of the township have near-surface limestone, making it vulnerable to sinkholes. This series of sinkholes could close roads, cause power outages, prevent the delivery of emergency services, cause injuries or death to the township's residents, and could cause nearly $27 million in property damage.

4.3.8.3. Past Occurrence

According to the Pennsylvania Department of Conservation and Natural Resources' Sinkhole Inventory Online Database (http://www.dcnr.state.pa.us/topogeo/hazards/sinkhole/default.asp), there have been no recorded sinkholes in Fulton County.

4.3.8.4. Future Occurrence

Based on geological conditions, subsidence events may possibly occur in the future for the areas of Fulton County underlain by carbonate rock such as limestone. That none have occurred makes accurate prediction of the likelihood of future events difficult.

4.3.8.5. Vulnerability Assessment

Based on geology, the following municipalities are vulnerable to sinkholes:

- Ayr Township
- Bethel Township
- Dublin Township
- McConnellsburg Borough
- Thompson Township
- Todd Township

The critical infrastructure vulnerable to sinkholes is shown in the following table. It includes one municipal office, a medical center, four churches, and two major industrial sites.

Table 29: Critical Infrastructure Vulnerable to Sinkholes

Municipality	Facility
Ayr Township	Ayr Township Building
Ayr Township	Bethel A M E Church
Ayr Township	Cito Methodist Church
Ayr Township	JLG Industries
Bethel Township	Church
Todd Township	Allegheny Power
Todd Township	Fulton County Medical Center
Todd Township	Knobsville Church of the Brethren

4.3.9. Hailstorms

Hail is produced when an ice crystal collects additional water in the lower part of the storm but is pushed upward by the storm's updraft. The liquid water freezes in the upper regions of the storm, making the ice crystal (i.e., hailstone) larger. The hail will continue to grow in this manner until its weight exceeds the force of the updraft.

4.3.9.1. Location and Extent

Hailstorms are not limited to any particular geographic area of the County, and neither the duration of the storm nor the extent of area affected by such an occurrence can be predicted.

4.3.9.2. Range of Magnitude

Hail can vary in size from one-half of an inch to several inches in diameter. Fulton County has experienced hail ranging in size from 0.75″ to 2.75″ in diameter. The worst damage from hail recorded in the County occurred in July 2000, when $2,000 worth of crops were damaged by 1.75″ diameter hail. No deaths, injuries, or property damage due to hail in Fulton County have been recorded.

4.3.9.3. Past Occurrence

The NCDC report contains several references to hail as a reported incident in the County from 1950 to 2009. Eight incidents are listed.

Table 30: History of Hailstorms in Fulton County

Location	Date	Mag. (in.)	Deaths	Injuries	Property Damage	Crop Damage
Countywide	5/16/1988	1	0	0	0	0
Town Hill	7/10/1995	1	0	0	0	0
Big Cove Tannery	6/4/1996	0.75	0	0	0	0
Gracey	7/30/1996	1.75	0	0	0	0
Big Cove Tannery	7/14/2000	1.75	0	0	$2,000	0
Buck Vly	5/26/2002	2.75	0	0	0	0
Needmore	5/26/2002	1.5	0	0	0	0
Akersville	6/13/2007	0.75	0	0	0	0
		Totals	0	0	$2,000	0

Source: National Climatic Data Center

4.3.9.4. Future Occurrence

It is not possible to predict the formation of a hailstorm with more than a few days' lead time. The past occurrences in the County that are described above, however, indicate that this event is one that can happen several times in any given year, most likely during the late spring and summer months. Based on prior occurrences, the County can expect a recordable hailstorm at least every four to five years (i.e., there is a 20% to 25% chance of a recordable hailstorm each year).

4.3.9.5. Vulnerability Assessment

All of Fulton County, including all critical infrastructure, is vulnerable to the effects of hail, as the storm cells that produce this hazard are spread over a large (multi-county) area. The area of damage due to these storms is relatively small, in that a single storm does not cause widespread devastation, but may cause damage in a focused area of the storm.

Hail can cause serious damage to automobiles, aircraft, skylights, livestock, and crops – most notably corn and soybeans. The National Weather Service reports that hail causes $1 billion in damage to property and crops each year.

4.3.10. Earthquakes

4.3.10.1. Location and Extent

Earthquake events in the Pennsylvania region including Fulton County are mild. When events occur, they impact very small areas less than 100 kilometers in diameter.

4.3.10.2. Range of Magnitude

Earthquake magnitude is often measured using the Richter Scale, an open-ended logarithmic scale that describes the energy release of an earthquake. Table 31 summarizes Richter Scale magnitudes as they relate to the spatial extent of impacted areas. Based on historical events, earthquakes in the Pennsylvania region do not exceed magnitudes greater than 6.0. The worst-case earthquake in Fulton County would therefore only result in trees swaying and objects falling off the walls.

Table 31: Richter Scale Magnitudes

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
Under 6.0	At most, slight damage to well-designed buildings; can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas where people live that are up to about 100 kilometers across.
7.0-7.9	Major earthquake; can cause serious damage over large areas.
8.0 or greater	Great earthquake; can cause serious damage in areas several hundred kilometers across.

The impact an earthquake event has on an area is typically measured in terms of earthquake intensity. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale based on direct and indirect measurements of seismic effects. A detailed description of the MMI Scale is shown in Table 32. The earthquakes that occur in Pennsylvania originate deep with the Earth's crust, not on an active fault. Therefore, little or no damage is expected. No injury or severe damage from earthquake events has been reported in Fulton County.

Table 32: Modified Mercalli Intensity Scale with Associated Impacts

SCALE	INTENSITY	DESCRIPTION OF EFFECTS	CORRESPONDING RICHTER SCALE MAGNITUDE
I	Instrumental	Detected only on seismographs	<4.2
II	Feeble	Some people feel it	
III	Slight	Felt by people resting; like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	<4.8
VI	Strong	Trees sway; suspended objects swing; objects fall off shelves	<5.4
VII	Very Strong	Mild alarm, walls crack, plaster falls	<6.1
VIII	Destructive	Moving cars uncontrollable, masonry fractures, poorly constructed buildings damaged	<6.9
IX	Ruinous	Some houses collapse, ground cracks, pipes break open	
X	Disastrous	Ground cracks profusely, many buildings destroyed, liquefaction and landslides widespread	<7.3
XI	Very Disastrous	Most buildings and bridges collapse, roads, railways, pipes and cables destroyed, general triggering of other hazards	<8.1
XII	Catastrophic	Total destruction, trees fall, ground rises and falls in waves	>8.1

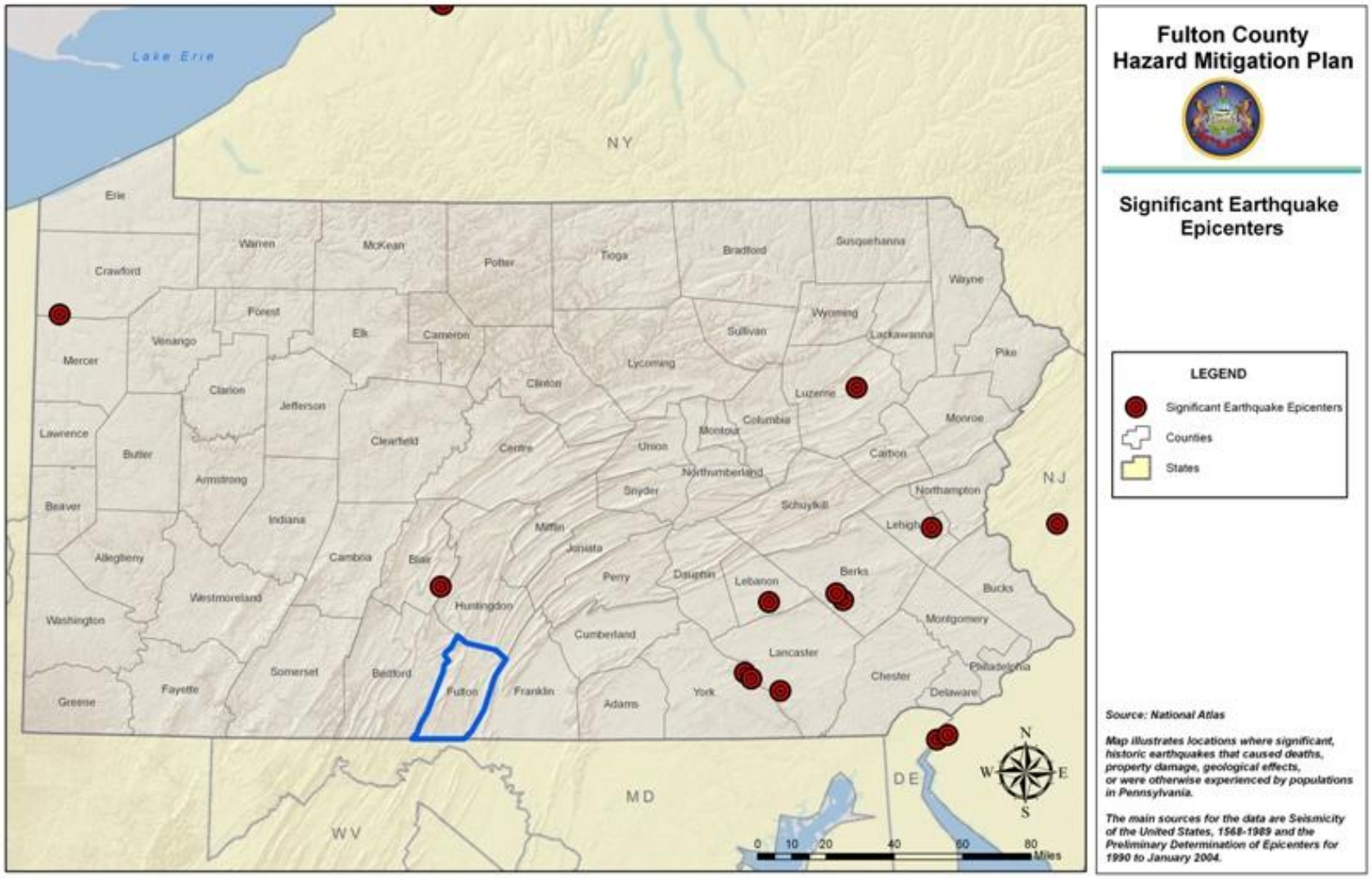
Environmental impacts of earthquakes can be numerous, widespread, and devastating, particularly if indirect impacts are considered. Some examples are shown below, but are unlikely to occur in Fulton County:

- Induced tsunamis and flooding or landslides and avalanches
- Poor water quality
- Damage to vegetation
- Breakage in sewage or toxic material containments

4.3.10.3. Past Occurrence

No earthquake epicenters have been measured in Fulton County. Figure 14 shows recorded earthquake events in Pennsylvania between 1990 and 2006. Earthquake events are shown in other areas of Pennsylvania, with a particular concentration of events occurring in the eastern part of the Commonwealth between Lancaster and Reading. One event is shown in nearby Blair County. Prior to 1960, an earthquake event occurred on the eastern border of York County which had a magnitude measured greater than four on the Richter Scale.

Figure 14: Significant Earthquake Epicenters in Pennsylvania

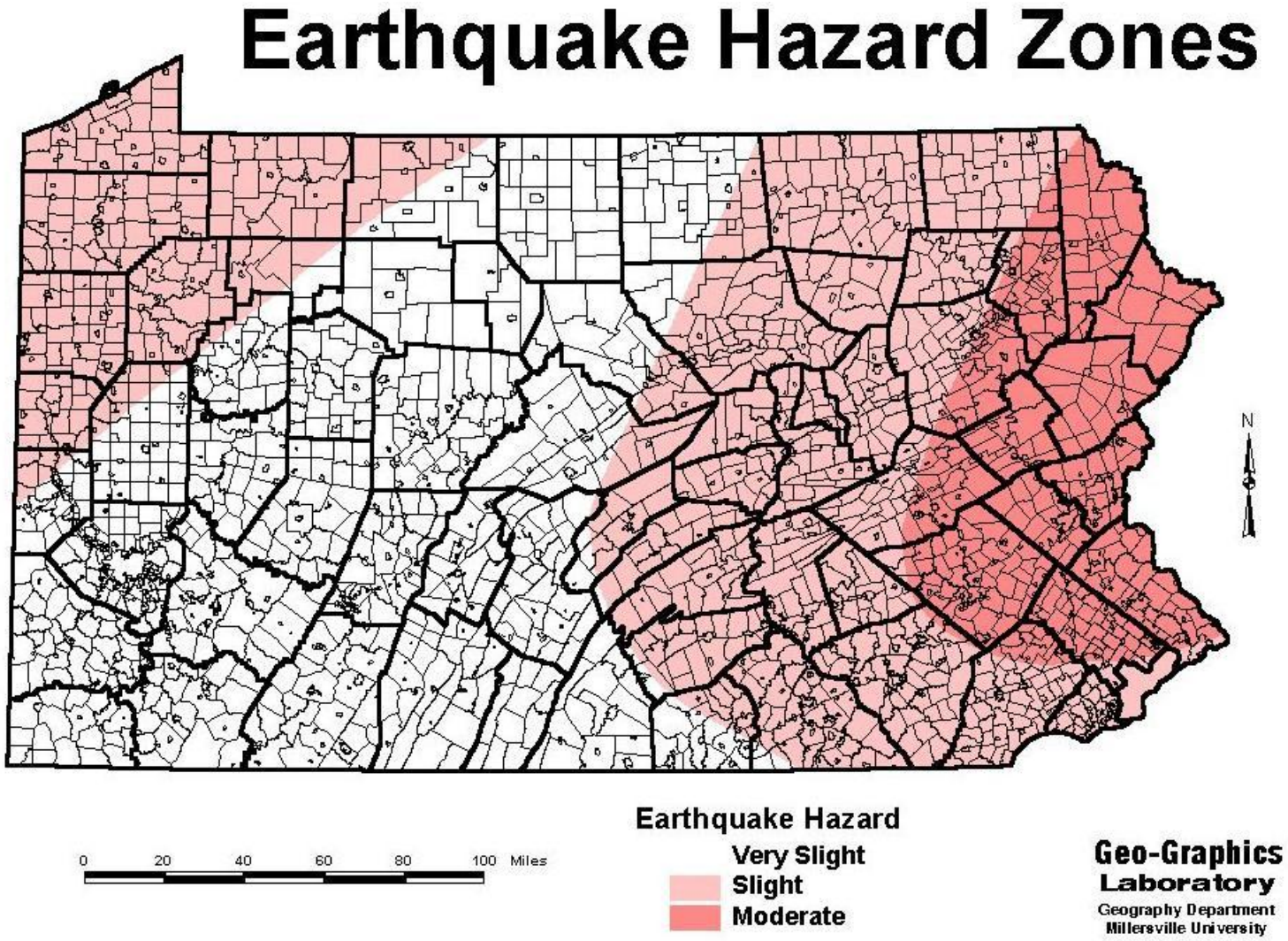


4.3.10.4. Future Occurrence

One way to express an earthquake's severity is to compare its acceleration to the normal acceleration due to gravity. Peak ground acceleration (PGA) measures the strength of ground movements in this manner. PGA represents the rate in change of motion of the earth's surface during an earthquake as a percent of the established rate of acceleration due to gravity.

Figure 15 shows the relative earthquake hazard zones in Pennsylvania identified by the Department of Earth Sciences at Millersville University. According to this map, earthquake hazards are “very slight” for all of Fulton County, meaning the PGA of 10% probability of exceedance over a 50-year period equals 0-5 PGA. In general, ground acceleration must exceed 15 PGA for significant damage to occur, although soil conditions at local sites are extremely important in controlling how much damage will occur as a consequence of a given amount of ground acceleration.

Figure 15: Pennsylvania Earthquake Hazard Zones



4.3.10.5. Vulnerability Assessment

Fulton County is located in a zone where minor earthquake damage is expected. No damage or casualties have been reported from earthquake events. Therefore, it is reasonable to state that Fulton County is not vulnerable to the effects of earthquakes.

4.4. Hazard Vulnerability Summary

Ranking hazards helps communities set goals and priorities for mitigation based on their vulnerabilities. For the 2005 HMP, the Steering Committee researched the hazards that affect Fulton County through gathering input from residents, state agencies (e.g., PEMA and the Pennsylvania Department of Conservation and Natural Resources [DCNR]), federal agencies (e.g., United States Geological Survey [USGS], National Weather Service), and other sources. The Steering Committee then ranked the hazards that impacted the County based on individual input.

For this update, a quantitative method known as the Risk Factor (RF) calculation was used to rank hazards that affect the County. The RF calculation described in this section is a tool used to measure the degree of risk for identified hazards in a particular planning area. The RF can also be used to assist local community officials in ranking and prioritizing those hazards that pose the most significant threat to their area based on a variety of factors deemed important by the Hazard Mitigation Steering Committee in the hazard mitigation planning process.

4.4.1. Methodology

The RF calculation relies heavily on historical data, local knowledge, and general consensus opinions among the Steering Committee and the public during the hazard mitigation planning process. The hazard profiles in Section 4.3, along with the disaster declaration history for Fulton County, provide the basis for this analysis.

The RF approach produces numerical values that allow identified hazards to be ranked against one another, where the higher the RF value, the greater the hazard risk. RF values were obtained by assigning varying degrees of risk to the five categories of each hazard: probability, impact, spatial extent, warning time, and duration. The degree of risk for each risk assessment category was weighted by significance. For instance, a high probability that a hazard will occur and a hazard having a strong impact were weighted most heavily. Each degree of risk is assigned a value ranging from 1 to 4. A summary table of the RF approach can be found below[2].

[2] Michael Baker, Jr., Inc. *Standard Operating Guide*. Philadelphia, PA, 2009.

Summary of Risk Factor (RF) Approach				
Risk Assessment Category	Degree of Risk			Weight Value
	Level	Criteria	Index	
PROBABILITY *What is the likelihood of a hazard event occurring in a given year?*	UNLIKELY	LESS THAN 1% ANNUAL PROBABILITY	1	30% (DEFAULT), but can be re-defined by CMPT
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 &100% ANNUAL PROBABILITY	3	
	HIGHLY UNLIKELY	100% ANNUAL PROBABILTY	4	
IMPACT *In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?*	MINOR	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30% (DEFAULT), but can be re-defined by CMPT
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	
SPATIAL EXTENT *How large of an area could be impacted by a hazard event? Are impacts localized or regional?*	NEGLIGIBLE	LESS THAN 1% OF AREA AFFECTED	1	20% (DEFAULT), but can be re-defined by CMPT
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	2	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	3	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	4	
WARNING TIME *Is there usually some lead time associated with the hazard event? Have warning measures been implemented?*	MORE THAN 24 HRS	SELF DEFINED	1	10% (DEFAULT), but can be re-defined by CMPT
	12 TO 24 HRS	SELF DEFINED	2	
	6 TO 12 HRS	SELF DEFINED	3	
	LESS THAN 6 HRS	SELF DEFINED	4	
DURATION *How long does the hazard event usually last?*	LESS THAN 6 HRS	SELF DEFINED	1	10% (DEFAULT), but can be re-defined by CMPT
	LESS THAN 24 HRS	SELF DEFINED	2	
	LESS THAN 1 WEEK	SELF DEFINED	3	
	MORE THAN 1 WEEK	SELF DEFINED	4	

According to the RF formula, the highest possible RF value is 4.0. An example RF value formula is illustrated below:

RF Value = [(Probability x .30) + (Impact x .30) +
(Spatial Extent x .20) + (Warning Time x .10) + (Duration x .10)]

RF Value = [(4 x .30) + (4 x .30) + (4 x .20) + (4 x .10) + (4 x .10)]
RF Value = 4.0

4.4.2. Ranking Results

The individual hazards that can affect the County were each assigned values in the above criteria. The average Risk Factor value for the hazards was 1.9; the standard deviation was 0.61. The four hazards profiled in Section 4.3 received Risk Factors above 2.51 (one standard deviation above the average) and are considered by the Steering Committee to present the most risk to the County and its municipalities. Their scores are shown in Table 33, below. A table showing the values for all hazards examined can be found in Appendix C.

Table 33: Risk Factor Values for Highest-Risk Hazards

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	Risk Factor
Floods, Flash Floods, and Ice Jams	4	4	4	3	4	3.900
Severe Wind Storms	4	1	4	3	4	3.000
Environmental Hazards	4	2	2	4	3	2.900
Transportation Hazards	4	2	2	4	2	2.800

4.4.3. Potential Loss Estimates

Of the hazards profiled in Section 4.3, potential loss estimates can feasibly be obtained for floods, flash floods, and ice jams; wildfires; and subsidence and sinkholes, as these hazards' vulnerability depends on geography more so than the others. Severe wind storms, severe winter storms, drought, earthquakes, and hailstorms will affect the entire County, or at least large portions of it. Potential losses were calculated for floods, flash floods, and ice jams by determining the value of properties within the 1% chance floodplain. Severe wind storms will affect the entire County, or at least large portions of it. Environmental hazards affect the residents far more than the property within the County; impacts of these hazards are described in the environmental hazards profile, above. Transportation-related events can happen at any location in the County.

For each hazard below, estimated potential losses were calculated by determining the value of properties situated as follows:

- Floods, Flash Floods, and Ice Jams – within the 1% chance floodplain
- Wildfires – within 100 feet of forests or parks
- Subsidence and Sinkholes – located above near-surface limestone

The assessed value of these properties was calculated from the Fulton County Tax Assessment Database for each of the 13 municipalities. The end result of the analysis will allow reasonable determinations of the estimated potential loss in each of the 13 municipalities. The results are presented in a table below. The estimated losses can only be presented as potential, based on the random occurrence of hazard conditions and limited data.

The structures in a hazard area include those based on a point within a two-dimensional (longitude and latitude) plane. This data, however, does not include attribute information such as first-floor flood elevations, which is essential to assess the base flood elevation's impact on the County's infrastructure. As a result of this limitation, the estimates are likely overstated, but to what degree the potential losses are overstated cannot be determined.

4.4.3.1. Flood, Flash Floods, and Ice Jams

Flooding is the most significant hazard in Fulton County, both as a direct and secondary hazard. The estimation of potential loss in this assessment focuses on the monetary damage that could result from flooding. The County has a data layer available that shows the locations of structures, however, this layer does not include structure values. Though potential loss due to flooding is generally based on damage to structures, the loss analysis presented below is based on total assessed property values (i.e., land plus structures). Therefore, the numbers provided below represent an overestimation of the potential loss due to flooding, but the extent of the overestimation cannot be determined. The estimated potential loss in property from flood damage was determined for each municipality and the entire County.

Table 34: Estimated Potential Flood Loss

Municipality	Structures	Structures in Floodplain					Properties in Floodplain	Estimated Potential Loss
		Single family	Multi-family	Business	Public	Other		
Ayr Township	1,102	12		1		1	86	$514,270.00
Belfast Township	707	3					116	$138,220.00
Bethel Township	803	12		4	1		117	$596,670.00
Brush Creek Township	478	5					88	$58,560.00
Dublin Township	667	6	1				110	$119,840.00
Licking Creek Township	827	32	1	3	2		177	$1,356,090.00
Taylor Township	655	12		2			94	$466,080.00
Thompson Township	539	4					127	$84,560.00
Todd Township	884	4					36	$93,350.00
Wells Township	282	11		1			75	$210,580.00
Total	**7,388**	**101**	**2**	**11**	**3**	**1**	**1,026**	**$3,638,220.00**

In addition to the above analysis (which is based on local data), the flood loss estimates were determined using FEMA's HAZUS software. The results of that analysis are provided in Appendix E.

In 2007, PEMA conducted a Statewide Flood Study using Hazards U.S. Multi-Hazard (HAZUS-MH), a standardized loss estimation software package available from FEMA. The flood study provided estimates of total economic loss, building damage, content damage, and other economic impacts that can be used in local flood response and mitigation planning activities. While this information is extremely valuable, potential loss estimates due to flooding were recalculated using HAZUS-MH during development of the updated HMP for two reasons:

1) Since 2007, an updated version of HAZUS-MH has been released (i.e., version MR-3 replaced version MR-2). Several improvements to data and methodology were made to version MR-3 (the version that was used for this HMP update), including new Dun & Bradstreet 2006 commercial data, updated building valuations, revised building counts based on census housing units for *RES1* (i.e., single-family dwellings) and *RES2* (i.e., manufactured housing) structures, and an optimized building analysis methodology.
2) The economic loss GIS data available from PEMA includes total damage (in thousands of dollars), building damage, content damage, and a host of other economic loss estimates for each affected census block. However, the data is limited to *Residential* occupancy type, omitting *Commercial*, *Industrial*, *Agriculture*, *Religious/Non-Profit*, *Government,* and *Education* occupancy types. While losses from these occupancy types were included in the Community Summary Report's total economic loss, they were not captured in the GIS data needed for mapping.

The HAZUS analysis shows $12.85 million in potential losses due to flooding. The methodology used in this section is described in Section 4.4.3. The difference between the value shown in this section and the value shown in HAZUS may be based on methodology or data set.

Another critical factor in determining potential loss related to flooding is the identification of repetitive loss structures throughout the County. FEMA defines a repetitive loss property as any insurable building that has experienced two losses in a 10-year period where each loss is $1,000.00 or more. A repetitive loss property may or may not be currently insured by the National Flood Insurance Program (NFIP).

The Fulton County HMP update aims to reduce the loss of life and property caused by natural and human-made disasters and serves as an essential component of the County's overall emergency management planning program. After natural disasters, repairs and reconstruction are often completed in such a way as to simply restore damaged property to pre-disaster conditions. Replication of pre-disaster conditions results in a repetitive loss cycle of damage, reconstruction, and repeated damage. Hazard mitigation is needed to ensure that such cycles are broken, that post-disaster repairs and reconstruction take place after damages are analyzed, and that sounder, less vulnerable conditions are produced. Additionally, other mitigation actions such as (voluntary) buy-out programs are considered.

Flooding is the most common cause of repetitive loss in Fulton County. Fulton County has one repetitive loss property, a single family home in Licking Creek Township. It is not a Severe

Repetitive Loss property. Due to privacy concerns, detailed information on this property is retained by the Fulton County Emergency Management Agency.

4.4.3.2. Wildfires

The following table presents the assessed value of the properties within 100 feet of a park or wildland. Data on the individual structures on these properties was not available.

Table 35: Fulton County Potential Loss Due to Wildfires

Municipality	Estimated Potential Loss
Ayr Township	$563,820.00
Brush Creek Township	$351,660.00
Dublin Township	$1,840.00
Licking Creek Township	$80,190.00
Taylor Township	$58,650.00
Todd Township	$227,590.00
Wells Township	$564,460.00
Total	**$1,848,210.00**

Over $1.8 million of property lies within this hazard area. Wells Township, Ayr Township, Brush Creek Township, and Todd Township are the most vulnerable to wildfires, each with over $225,000 in potential loss.

4.4.3.3. Subsidence and Sinkholes

The following table shows the assessed value of properties vulnerable to sinkholes. Data on the individual structures represented was not available.

Table 36: Fulton County Potential Loss Due to Sinkholes

Municipality	Estimated Potential Loss
Ayr Township	$27,109,220
Bethel Township	$8,626,800
Dublin Township	$3,230,200
McConnellsburg Borough	$298,390
Thompson Township	$958,300
Todd Township	$15,122,760
Total	**$55,345,670**

4.4.4. Future Development and Vulnerability

An examination of recent development trends helps to identify and anticipate future vulnerabilities to hazards that may affect the County's growth and development. Analysis of changes in population and demographics is provided in Section 2.3.

Impervious surface coverage data from 1985 and 2000 was analyzed to determine static development trends and developing areas in relation to floodplain proximity. This combined information produces a more accurate depiction of the County's historical growth trends.

A comparison of impervious surface coverage data provides another method of detecting change in Fulton County's growth and development patterns. Impervious surface data, estimated from Thematic Mapper data using algorithms developed by Dr. Toby Carlson at University Park, Pennsylvania, was originally generated to support hydrologic investigations. This data is also useful for assessing urbanization and development patterns over time. Impervious surfaces primarily reflect the urban and built environments and include rooftops, sidewalks, roads, and parking lots.

By examining impervious surface coverage data, recent development trends in relation to floodplain proximity can be ascertained. This may generate recommendations to examine certain areas in more detail to better mitigate specific hazardous threats, such as flooding or transportation accidents, or hazardous material spills.

Development can often change the hazard threat level of an area by placing additional critical facilities, businesses, transportation networks, and populations within vulnerable areas. Any development along transportation routes can increase the vulnerability to transportation incidents and hazardous material spills. Most often, development occurs along these transportation networks because of access and increased demand for travel and access to services. Therefore, the impact of these hazards can increase along with their frequency. While it can be difficult to curb development, it is to the municipality's advantage to be aware of development trends in order to successfully mitigate future hazards as risks increase.

The following maps (Figures 16 and 17) illustrate the change in impervious surface coverage from 1985 to 2000 across Fulton County. According to the graphics, in 1985 the focus of most development in Fulton County was in the immediate area of McConnellsburg Borough and along I-70 in Brush Creek Township, and in Taylor Township in Hustontown and along the Pennsylvania Turnpike (I-76).

The 2000 impervious surface coverage, shown in Figure 17, illustrates expanded development in each of those areas, as well as in Ayr Township, Todd Township, Dublin Township, Belfast Township and Bethel Township. Specific data to describe the types and numbers of future buildings, infrastructure, and critical facilities in the hazard areas was not available. However, any planned development of these structures should include an examination of the hazard areas identified in this HMP.

Figure 16: Fulton County Impervious Surface Coverage 1985

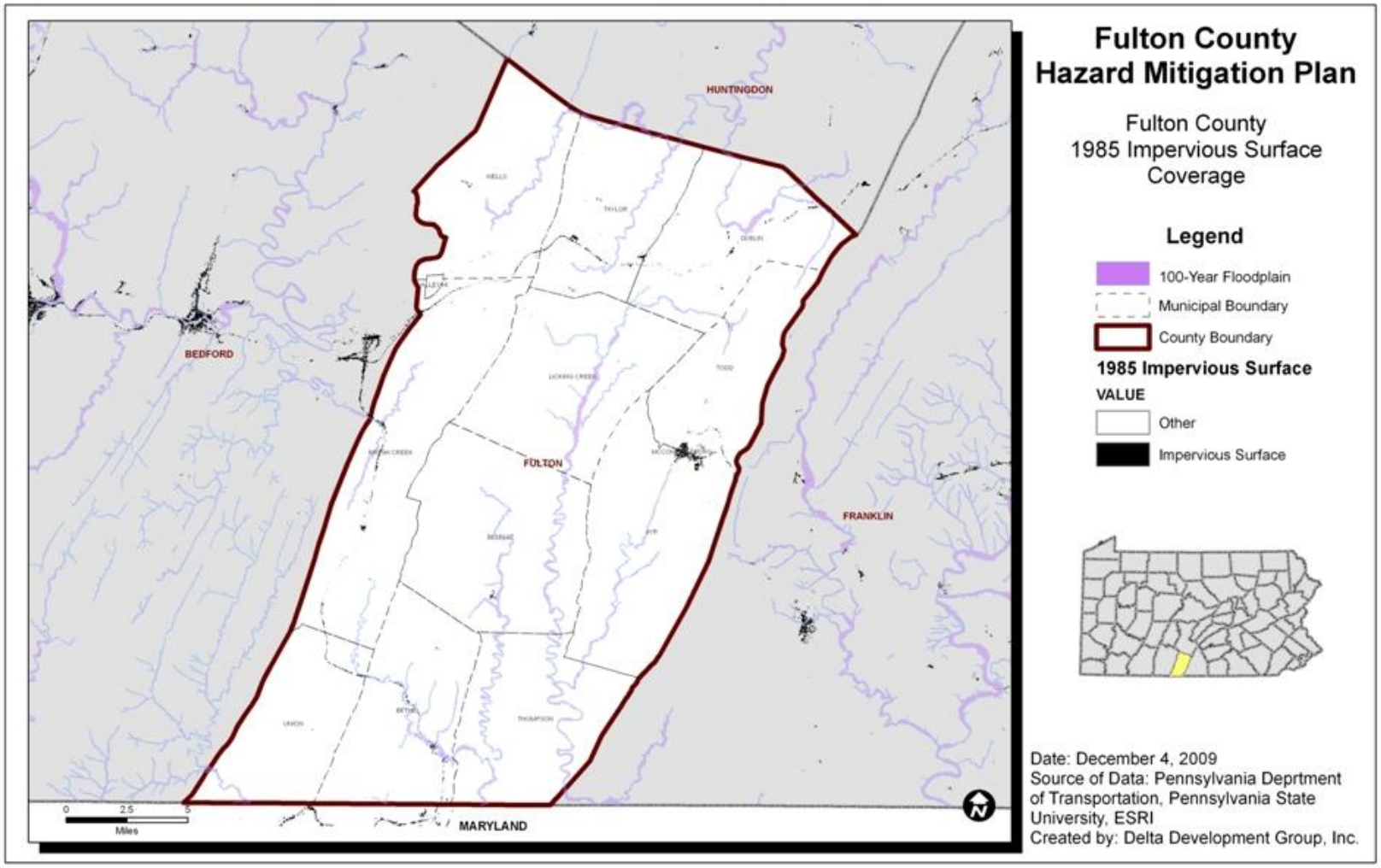
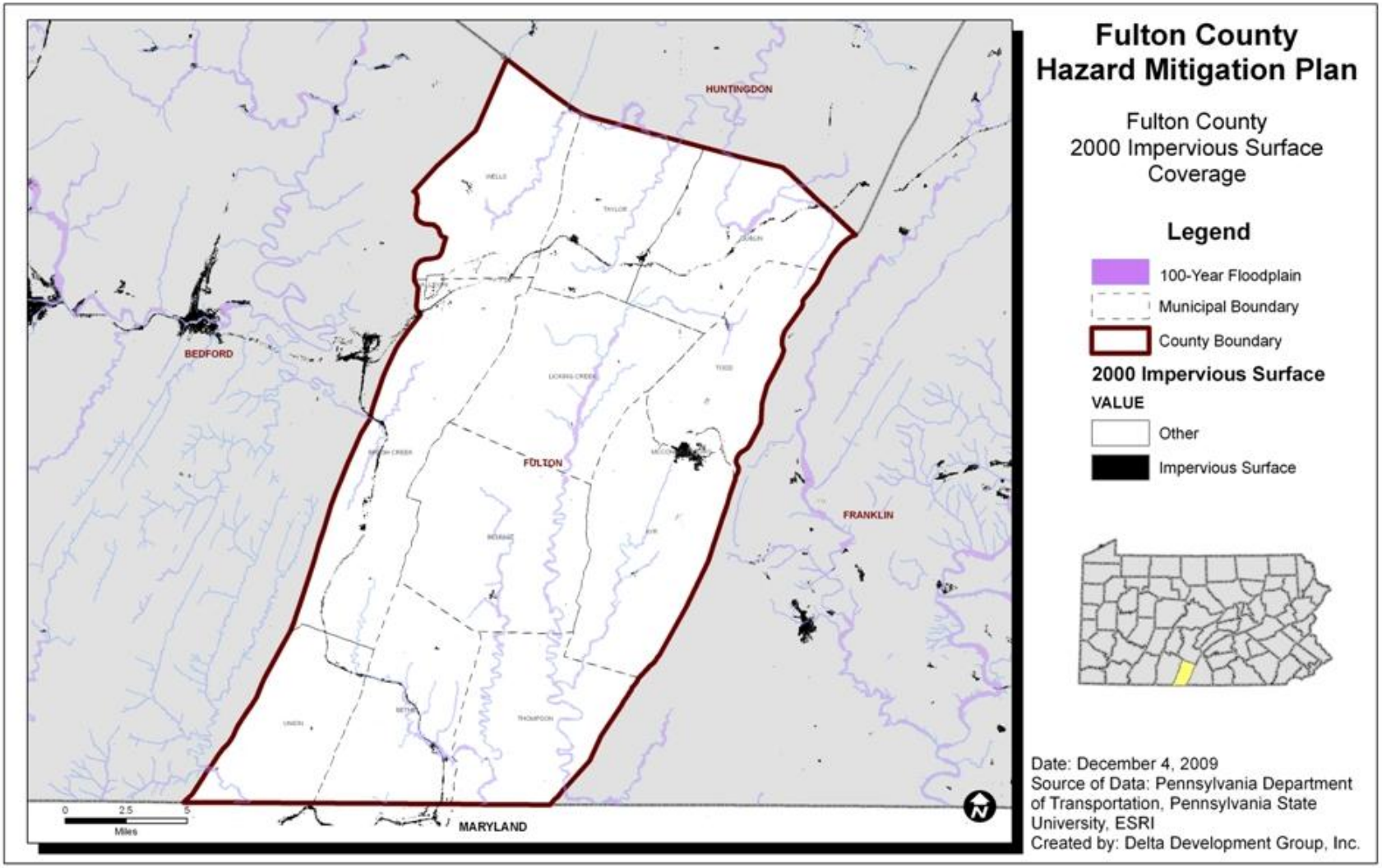


Figure 17: Fulton County Impervious Surface Coverage 2000



5. Capability Assessment

Performing the Capability Assessment is important to formulate a viable mitigation strategy later in the planning process. A Capability Assessment has two components: an inventory of a jurisdiction's existing planning and regulatory tools and an analysis of its capacity to use them effectively. The assessment process helps identify existing gaps, conflicts, and/or weaknesses that may need to be addressed through future mitigation planning goals, objectives, and actions. It also highlights the measures in place or already undertaken that merit continued support and enhancement through future mitigation efforts. The Capability Assessment also helps to ensure that proposed mitigation actions are practical, considering the local ability to implement them.

The Capability Assessment is an evaluation of Fulton County's governmental structure, political framework, legal jurisdiction, fiscal status, policies and programs, regulations and ordinances, and resource availability. Each category is evaluated for its strengths and weaknesses in responding to, preparing for, and mitigating the effects of the identified hazards. The Capability Assessment has two components: (1) an inventory of the County's and municipalities' mission, programs, and policies; and (2) an analysis of their capacity to execute them. A Capability Assessment is an integral part of the hazard mitigation planning process. Here, the County and municipalities identify, review, and analyze what they are currently doing to reduce losses and to identify the framework necessary to implement new mitigation actions. This information will help the County and municipalities evaluate alternative mitigation actions and address shortfalls in the mitigation plan.

The evaluation of the categories listed above – governmental structure, political framework, legal jurisdiction, fiscal status, policies and programs, and regulations and ordinances – allows the mitigation Steering Committee to determine the viability of certain mitigation actions. The Capability Assessment analyzes what Fulton County and its municipalities have the capacity to do and provides an understanding of what must be changed to mitigate loss.

Throughout the planning process the mitigation Steering Committee considered the County's 13 individual municipalities. Pennsylvania municipalities have their own governing bodies, pass and enforce their own ordinances and regulations, purchase equipment, and manage their own resources, including critical infrastructure. Therefore, this Capability Assessment must consider the various characteristics and capabilities of each municipality under study.

5.1. Update Process Summary

The 2005 version of the HMP summarized the County's and municipalities' capabilities to facilitate implementation of the mitigation strategy. Those capabilities are shown in the table below.

Table 37: Capabilities Listed in the 2005 HMP

Municipality	Comp. Plan	Subdivision and Land Development Ordinance	Zoning Ordinance	NFIP Participation	Bldg Code
Fulton County	X	X		X	X
Ayr Township	X*	X		X	X
Belfast Township	X	X		X	X
Bethel Township	X	X		X	X
Brush Creek Township	X	X		X	X
Dublin Township	X*	X		X	X
Licking Creek Township	X	X		X	X
McConnellsburg Borough	X*		X	X	X
Taylor Township	X	X		X	X
Thompson Township	X	X		X	X
Todd Township	X*	X		X	X
Union Township	X	X		X	X
Valley-Hi Borough	X				X
Wells Township	X	X		X	X

*Ayr, Dublin, and Todd Townships, along with McConnellsburg Borough, had a joint Comprehensive Plan. The other municipalities were included in the County Comprehensive Plan.

A new Capability Assessment survey was developed at the beginning of the plan update process. The municipalities' submitted surveys are presented in Appendix B. Copies of the survey were distributed at the Kick-off Meeting and sent to each municipal secretary for completion. Survey recipients were given a period of about one month to complete the surveys and return them to the planning team. Follow-up contacts were made as necessary to achieve the highest level of municipal participation as possible. The results were compiled, and are presented in section 5.2.

5.2. Capability Assessment Findings

Below are descriptions of the items listed in the Capabilities Assessment survey. The County's and each municipality's response to the survey can be found in Table 39 on page 80.

5.2.1. Emergency Management

Emergency management is a comprehensive, integrated program of mitigation, preparedness, response, and recovery for emergencies/disasters of any kind. No public or private entity is immune to disasters, and no single segment of society can meet the complex needs of a major emergency or disaster on its own.

5.2.1.1. Emergency Operations Plan

The Pennsylvania Emergency Management Services Code, Title 35, requires all political jurisdictions in the Commonwealth to have an Emergency Operations Plan (EOP), an Emergency Management Coordinator (EMC), and an Emergency Operations Center (EOC).

Fulton County's EOP, updated and adopted in 2009, is an all-hazards plan that complies with the National Incident Management System (NIMS) and is the basis for a coordinated and effective response to any disaster that may affect lives and property in Fulton County. The EOP, or portions thereof, would be implemented when emergency circumstances warrant it.

5.2.1.2. Continuity of Operations Plan

Continuity of Operations (COOP) is a critically important planning principle for emergency managers as well as for municipal officials. NFPA 1600 provides those with the responsibility for disaster and emergency management and COOP planning programs with the criteria to assess current programs or to develop, implement, and maintain a program to mitigate, prepare for, respond to, and recover from disasters and emergencies.

5.2.1.3. Evacuation Plan

Evacuation is one of the most widely used methods of protecting the public from hazard impacts. The easiest way to minimize death and injury due to a hazard event is to remove as many people as possible from its path. Evacuation plans include descriptions of the area(s) being evacuated, the demographics and characteristics of people within those area(s), transportation routes to safe areas, and how the community will support those individuals who do not have access to their own transportation.

5.2.1.4. Disaster Recovery Plan

A Disaster Recovery Plan (DRP) is a comprehensive set of measures and procedures that ensure essential, mission-critical resources and infrastructure are maintained or backed up by alternatives during various stages of a disaster. The DRP is another step to ensure the preparedness and ability to respond quickly and effectively to restore the community's essential services. The DRP addresses the public sector's responsibilities, including temporary shelter, refuse disposal, overall damage assessment, restoration of utility services, reconstruction priorities, financial assistance, and dealing with demands.

5.2.1.5. StormReady

StormReady is a program administered by the National Weather Service (NWS). To be certified as StormReady, a community must establish links to the NWS's warning systems and relationships with NWS staff, establish a 24-hour warning point, ensure sufficient capability to respond to severe weather events, and provide public outreach and education.

5.2.2. Participation in the National Flood Insurance Program (NFIP)

5.2.2.1. National Flood Insurance Program

The Pennsylvania Floodplain Management Act (Act 166 of 1978) requires every municipality identified by the Federal Emergency Management Agency (FEMA) to participate in the NFIP and permits all municipalities to adopt floodplain management regulations. It is in the interest of all property owners in the floodplain to keep development and land usage within the scope of the floodplain regulations for their community. This helps keep insurance rates low and makes sure that the risk of flood damage is not increased by property development.

All of the County's municipalities except Valley-Hi Borough participate in the NFIP. Valley-Hi is not located in the 1% chance floodplain and has no identified flood hazard.

FEMA Region III makes available to communities an ordinance review checklist that lists required provisions for floodplain management ordinances. This checklist helps communities develop an effective floodplain management ordinance that meets federal requirements for participation in the NFIP. The Pennsylvania Department of Community and Economic Development (DCED) provides communities, based on their 44 CFR 60.3 level of regulations, with a suggested ordinance document to assist municipalities in meeting the minimum requirements of the NFIP and the Pennsylvania Flood Plain Management Act (Act 166). Act 166 mandates municipal participation in and compliance with the NFIP. It also establishes higher regulatory standards for hazardous materials and high-risk land uses. As new Digital Flood Insurance Rate Maps (DFIRMs) are published, the Pennsylvania State NFIP Coordinator at DCED works with communities to ensure the timely and successful adoption of an updated floodplain management ordinance by reviewing and providing feedback on existing and draft ordinances. In addition, DCED provides guidance and technical support through Community Assistance Contacts (CAC) and Community Assistance Visits (CAV).

The following table shows the number of NFIP policies and the date of the most recent official Flood Insurance Rate Map (FIRM).

Table 38: NFIP Participation

Municipality	# Policies	FIRM Date
Ayr Township	2	02/09/2001
Belfast Township	3	08/05/1985
Bethel Township	2	06/11/1982
Brush Creek Township	1	10/15/1985
Dublin Township	0	09/01/1986
Licking Creek Township	10	05/01/1986
McConnellsburg Borough	1	02/09/2001
Taylor Township	3	09/01/1986
Thompson Township	0	06/01/1986
Todd Township	1	02/09/2001
Union Township	0	02/25/1983
Wells Township	2	05/01/1986

There have been no NFIP sanctions against Fulton County's municipalities.

5.2.2.2. National Flood Insurance Program – CRS

The NFIP's Community Rating System (CRS) provides discounts on flood insurance premiums in those communities that establish floodplain management programs that go beyond NFIP minimum requirements. Under the CRS, communities receive credit for more restrictive regulations, acquisition, relocation, or flood-proofing of flood-prone buildings, preservation of open space, and other measures that reduce flood damage or protect the natural resources and functions of floodplains.

The CRS was implemented in 1990 to recognize and encourage community floodplain management activities that exceed the minimum NFIP standards. Section 541 of the 1994 Act amends Section 1315 of the 1968 Act to codify the CRS in the NFIP, and expands the CRS goals to specifically include incentives to reduce the risk of flood-related erosion and to encourage measures that protect natural and beneficial floodplain functions. These goals have been incorporated into the CRS, and communities now receive credit toward premium reductions for activities that contribute to them.

Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet a minimum of three of the following CRS goals:

- Reduce flood losses
- Reduce damage to property
- Protect public health and safety
- Prevent increases in flood damage from new construction
- Reduce the risk of erosion damage
- Protect natural and beneficial floodplain functions
- Facilitate accurate insurance rating
- Promote the awareness of flood insurance

There are 10 CRS classes that provide varied reduction in insurance premiums. Class 1 requires the most credit points and gives the largest premium reduction; Class 10 receives no premium reduction. CRS premium discounts on flood insurance range from 5 percent for Class 9 communities up to 45 percent for Class 1 communities. The CRS recognizes 18 creditable activities that are organized under four categories: Public Information, Mapping and Regulations, Flood Damage Reduction, and Flood Preparedness.[3]

No Fulton County municipalities participate in the CRS.

[3]Federal Emergency Management Agency, Federal Insurance and Mitigation Administration, *National Flood Insurance Program: Program Description* (August 2002).

5.2.3. Planning and Regulatory Capability

Pennsylvania municipalities have the authority to govern more restrictively than the state and County minimum requirements, assuming they are in compliance with all criteria established in the Pennsylvania Municipalities Planning Code (MPC) and their respective municipal codes. Municipalities can develop their own policies and programs and implement their own rules and regulations to protect and serve their local residents. Local policies and programs are typically identified in a Comprehensive Plan, implemented via a local ordinance, and enforced through the governmental body or its appointee.

Municipalities regulate land use via the adoption and enforcement of zoning, subdivision and land development ordinances, building codes, building permit ordinances, floodplain, and/or stormwater management ordinances. When effectively prepared and administered, these regulations can lead to hazard mitigation. For example, the adoption of the NFIP and the Pennsylvania Floodplain Management Act (Act 166 of 1978) established minimum floodplain management criteria. A municipality must adopt and enforce these minimum criteria to be eligible for participation in the NFIP. Municipalities have the option of adopting a single-purpose ordinance or incorporating these provisions into their zoning and/or subdivision and land development ordinances, or building codes, thereby mitigating the potential impacts of local flooding.

5.2.3.1. Hazard Mitigation Plan

Hazard Mitigation Plans (HMPs) describe in detail the hazards that may affect the community, the community's vulnerability to those hazards, and an action plan for how the community plans to minimize or eliminate that vulnerability. HMPs are governed by the DMA 2000, and having a FEMA-approved HMP makes the jurisdiction eligible for federal mitigation funding.

5.2.3.2. Comprehensive Land Use Plan (or General, Master, or Growth Management Plan)

A Comprehensive Plan is a policy document that states objectives and guides the future growth and physical development of a municipality. The Comprehensive Plan is a blueprint for housing, transportation, community facilities, utilities, and land use. It examines how the past led to the present and charts the community's future path. The MPC Act 247 of 1968, as reauthorized and amended, requires counties to prepare and maintain a county Comprehensive Plan. In addition, the MPC requires counties to update the Comprehensive Plan every 10 years.

With regard to hazard mitigation planning, Section 301a.(2) of the MPC requires Comprehensive Plans to include a plan for land use, which, among other provisions, suggests that the Plan should give consideration to floodplains and other areas of special hazards and other similar uses. The MPC also requires Comprehensive Plans to include a plan for community facilities and services, and recommends giving consideration to storm drainage and floodplain management. The Fulton County Comprehensive Plan was developed in 2000.

"Moving Fulton Forward: A Joint Comprehensive Plan for Fulton County" was adopted in 2007 for the County and twelve municipalities.

5.2.3.3. Floodplain Management Plan

Floodplain Management Plans describe how the community will reduce the impact of flood events through preventive and corrective actions. These actions may include mandated open space and prohibition of development in floodplains, property buyout, and other measures. Only Dublin and Todd Townships have adopted Floodplain Management Plans.

5.2.3.4. Open Space Management Plan (or Parks/Rec or Greenways Plan)

Open Space Management Plans are designed to protect the natural environment of the community. They describe how the community will manage woodlands, grasslands, and trails without sacrificing the economic goals of the community. These areas are most widely used for recreational purposes, but also serve as the primary habitat for a number of species of plants and animals.

5.2.3.5. Stormwater Management Plan/Ordinance

The proper management of stormwater runoff can improve conditions and decrease the chance of flooding. These ordinances are developed in conjunction with the guidelines established in the Pennsylvania Stormwater Management Act (Act 167 of 1978).

The Pennsylvania Department of Environmental Protection's Stormwater Management Program provides grant moneys to counties to develop stormwater management plans for designated watersheds. This planning effort, as required by the Stormwater Management Act of 1978 (Act 167), results in sound engineering standards and criteria being incorporated into local codes and ordinances in order to manage stormwater runoff from new development in a coordinated, watershed-wide approach. Without such planning, stormwater is either not controlled by municipal ordinances, or is addressed on a site-to-site or municipal boundary basis. Municipalities within the same watershed may require different levels of control of stormwater. The result is often the total disregard of downstream impacts or the compounding of existing flooding problems.

Municipalities have an obligation to implement the criteria and standards developed in each watershed stormwater management plan by amending or adopting laws and regulations for land use and development. The implementation of stormwater management criteria and standards at the local level is necessary, since municipalities are responsible for local land use decisions and planning. The degree of detail in the ordinances depends on the extent of existing and projected development. Municipalities within rapidly developing watersheds will benefit from the Watershed Stormwater Management Plan and will use the information for sound land use considerations. The Watershed Stormwater Management Plan is designed to aid the municipality in setting standards for the land uses it has proposed. A major goal of the Watershed Plan and the attendant municipal regulations is to prevent future drainage problems and avoid the aggravation of existing problems.

There are two main watersheds and several component watersheds within Fulton County:

- Susquehanna River Watershed:
  - Aughwick Creek
  - Wooden Bridge Creek
  - Sideling Hill Creek
  - Brush Creek
  - Great Trough Creek
- Potomac River Watershed:
  - Licking Creek
  - Little Tonoloway Creek
  - Tonoloway Creek
  - Cove Creek

5.2.3.6. Natural Resource Protection Plan

Natural Resource Protection Plans are designed to protect woodlands, steep slopes, waterways, floodplains, wetlands, and coastal buffers through prohibiting or severely limiting development in these areas. Emergency managers and community planners have been made more and more aware of the benefits of protecting these areas as mitigation measures over the last few decades.

5.2.3.7. Flood Response Plan

These plans describe how a community will respond to flood events. They include warning the public, evacuation and sheltering, emergency response, recovery, and mitigation of future events. Most communities in Pennsylvania have moved away from planning for individual hazards and now include flood response as part of their all-hazards EOPs.

5.2.3.8. Capital Improvement Plan

The Capital Improvements Plan is a multiyear policy guide that identifies needed capital projects and is used to coordinate the financing and timing of public improvements. Capital improvements relate to streets, stormwater systems, water distribution, sewage treatment, and other major public facilities. A Capital Improvement Plan should be prepared by the respective county's planning commission and should include a capital budget. This budget identifies the highest priority projects recommended for funding in the next annual budget. The Capital Improvements Plan is dynamic and can be tailored to specific circumstances.

5.2.3.9. Economic Development Plan

An Economic Development Plan serves as a road map for economic development decision making, based on the collection of statistical data, historical perspective, and human potential, and it does the following:

- Clearly defines realistic goals and objectives

- Establishes a defined time frame to implement goals and objectives
- Communicates those goals and objectives to the organization's constituents
- Ensures effective use of the organization's resources
- Provides a baseline from which progress can be measured
- Builds consensus around future goals and objectives

5.2.3.10. Historic Preservation Plan

These plans describe how the community will preserve the historic structures and areas within it. Since these structures pre-date building codes and modern community planning requirements, many of them are especially vulnerable to a variety of hazards. The Historic Preservation Plan may include measures to retrofit or relocate historic treasures out of hazard impact areas.

5.2.3.11. Floodplain Regulations

Through administration of the floodplain ordinances, the municipalities can ensure that all new construction or substantial improvements to existing structures that are located in the 1% chance floodplain are built with first-floor elevations above the Base Flood Elevation (BFE).

5.2.3.12. Zoning Regulations

Article VI of the MPC authorizes municipalities to prepare, enact, and enforce zoning to regulate land use. Its regulations can apply to the following:

- Permitted use of land
- Height and bulk of structures
- Percentage of a lot that may be occupied by buildings and other impervious surfaces
- Yard setbacks
- Density of development
- Height and size of signs

Zoning ordinances contain both a map that delineates zoning districts and text documenting the regulations that apply in each zoning district. Fulton County has not adopted a county zoning ordinance.

5.2.3.13. Subdivision Regulations

Article V of the MPC authorizes municipalities to prepare, enact, and enforce a subdivision and land development ordinance, including regulations to control the layout of streets, minimum lot sizes, and the provision of utilities. The objectives of a subdivision and land development ordinance are to do the following:

- Coordinate street patterns
- Assure adequate utilities and other improvements are provided in a manner that will not pollute streams, wells, and/or soils
- Reduce traffic congestion

- Provide sound design standards as a guide to developers, elected officials, planning commissions, and other municipal officials

The Fulton County Planning Commission has the authority to approve, approve with conditions, or disapprove all subdivisions and land developments that occur in municipalities that do not have an ordinance.

In cases where municipalities have their own Subdivision and Land Development Ordinance, plans must be submitted to the County Planning Commission for review, and the Planning Commission provides comments to the municipality within 30 days.

5.2.3.14. Unified Development Ordinance

Unified Development Ordinances combine all other development ordinances (e.g., subdivision management, zoning) into a single document reflecting the community's vision for its development. Combining these documents helps to deconflict any discrepancies among them, which may be due to the individual documents being required by separate legislation.

5.2.3.15. Post-Disaster Redevelopment/ Reconstruction Ordinance

These ordinances are passed by proactive communities that recognize the complexities of post-disaster recovery. They describe the organization of the redevelopment oversight body, damage assessment, and recovery policies related to making the community more sustainable and safer following a disaster.

5.2.3.16. Building Code

Building codes are important in mitigation, because codes are developed for regions of the country in consideration of the hazards present within that region. Consequently, structures that are built to applicable codes are inherently resistant to many hazards like strong winds, floods, and earthquakes, and can help mitigate regional hazards like wildfires. In 2003 the Commonwealth of Pennsylvania implemented the Uniform Construction Code (Act 45 of 1999), a comprehensive building code that establishes minimum regulations for most new construction, including additions and renovations to existing structures.

The code applies to almost all buildings, excluding manufactured and industrialized housing (which are covered by other laws), agricultural buildings, and certain utility and miscellaneous buildings. The Uniform Construction Code (UCC) has many advantages in requiring builders to use materials and methods that have been professionally evaluated for quality and safety, as well as requiring inspections of completed work to ensure compliance.

If a municipality has "opted in," all UCC enforcement is local, except where municipal (or third party) code officials lack the certification necessary to approve plans and inspect commercial construction for compliance with UCC accessibility requirements. If a municipality has "opted out," the Department of Labor and Industry is responsible for all commercial code enforcement in that municipality. The Department of Labor and Industry also has sole jurisdiction for all state-owned buildings no matter where they are located. All 13 of the municipalities in Fulton County did "opt in" to the UCC.

Local residential and nonresidential code officials were required to register and obtain certification within three and five years, respectively. While some municipalities in Fulton County had already instituted building codes prior to the mandate by the Commonwealth, all 13 municipalities and the County have spent considerable time and resources retraining and becoming certified in the new requirements and revamping their administrative and enforcement procedures.

5.2.3.17. Fire Code

Fire codes relate to both the construction and use of structures in terms of preventing fires from starting and minimizing their spread, and minimizing the injuries and deaths caused by a fire within a building. They govern such things as the following:

- Building materials that may be used
- The presence and number/type of fire extinguishers
- Means of egress
- Hazardous materials storage and use

5.2.3.18. Firewise

Firewise is a national program that brings together the response community, community planners, and homeowners to minimize the risk of wildfires. The program focuses on development that is compatible with the natural environment. Participation in the program is begun and maintained by groups of homeowners.

5.2.3.19. Farmland Preservation[4]

Farmland preservation measures are important to hazard mitigation. Preserved farms protect soil from erosion and prevent the contamination of local surface water. In addition, farms and forest land are important for recharging the community's aquifer, and provide habitat for local wildlife.

5.2.4. Administrative and Technical Capability

5.2.4.1. Planners with knowledge of land development/management practices

County Planning Commission

In Pennsylvania, planning responsibilities traditionally have been delegated to each county and local municipality through the MPC.

A planning agency acts as an advisor to the governing body on matters of community growth and development. A governing body may appoint individuals to serve as legal and engineering

[4] Pennsylvania Farmland Preservation Association, "Why Preserve Farmland?" http://www.pafarmland.org/why_preserve_farmland.htm (accessed November 13, 2009).

advisors to the planning agency. In addition to the duties and responsibilities authorized by Article II of the MPC, a governing body may, by ordinance, delegate approval authority to a planning agency for subdivision and land development applications. A governing body has considerable flexibility, not only as to which powers and duties are assigned to a planning agency, but also as to what form an agency will possess. A governing body can create a planning commission, a planning department, or both.

The purpose of the Fulton County Planning Commission is to receive and make recommendations on public and private proposals for development, and to prepare and administer planning regulations. Subdivision and land development plans are also reviewed and approved by the Fulton County Planning Commission, which works in conjunction with the municipal planning commissions, where applicable.

Municipal Planning Commission

The MPC conveys that the planning authority establishes the requirements that a municipality must follow.

5.2.4.2. Engineers or professionals trained in construction practices related to buildings and/or infrastructure (includes building inspectors)

A municipal engineer performs duties as directed in the areas of construction, reconstruction, maintenance and repair of streets, roads, pavements, sanitary sewers, bridges, culverts, and other engineering work. The municipal engineer reviews and/or prepares plans, specifications, and estimates of the work undertaken within the municipality.

5.2.4.3. Planners or engineers with an understanding of natural and/or human-caused hazards

When staff who are responsible for community planning or engineering the structures on which people rely are familiar with the hazards that can impact the community, there is a great potential for synergy. These staff members will design the communities and structures with hazard impacts in mind, resulting in more sustainable communities and stronger structures.

5.2.4.4. Emergency manager

A municipal Emergency Management Coordinator (EMC) is responsible for emergency management – preparedness, response, recovery, and mitigation within his/her respective Authority Having Jurisdiction (AHJ). The responsibilities of the EMCare outlined in PA Title 35 §7503:

- Prepare and maintain a current disaster emergency management plan
- Establish, equip, and staff an EOC
- Provide individual and organizational training programs
- Organize and coordinate all locally available manpower, materials, supplies, equipment, and services necessary for disaster emergency readiness, response, and recovery

- Adopt and implement precautionary measures to mitigate the anticipated effects of a disaster
- Cooperate and coordinate with any public and private agency or entity
- Provide prompt information regarding local disaster emergencies to appropriate Commonwealth and local officials or agencies and the general public
- Participate in all tests, drills, and exercises, including remedial drills and exercises, scheduled by the agency or by the federal government

5.2.4.5. Floodplain manager

Floodplain managers are experts in the rules and regulations of development in a floodplain, and can provide vast amounts of information on the risks and impacts of building within those hazard areas. They are an integral part of the mitigation planning team, and can make recommendations based on the needs and conditions of the community.

5.2.4.6. Land surveyors

Land surveyors determine, among other things, the elevation of a given point (e.g., a structure). This is especially useful in determining what development lies in the floodplain, but can also be useful in examining vulnerability to other hazards as well.

5.2.4.7. Scientist familiar with the hazards of the community

Natural and human-made hazards' characteristics and impacts can be highly technical. Meteorology, aerodynamics, fluid dynamics, physics and health physics, chemistry, and several other scientific fields are involved in determining the impacts of a hazard event. Having access to a scientist who can describe the technical aspects of hazards in lay terms is important to having a sound mitigation strategy.

5.2.4.8. Staff with the education or expertise to assess the community's vulnerability to hazards

The basis of hazard mitigation is hazard identification and vulnerability assessment. Conducting the vulnerability assessment is a complicated process. Planners must know where to find data on the hazards and their impacts, and the characteristics of the community. More importantly, they must be able to combine these two sets of knowledge to make the analysis useful.

5.2.4.9. Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program

Spatial and tabular data are linked in a computerized, visual format through the use of sophisticated Geographic Information Systems (GIS) technology. Through GIS projects it is possible to accomplish environmental restoration, economic development, "smart growth" land use planning, infrastructure development, and training to use GIS for decision support. Fulton County has GIS capabilities that can assist the municipalities.

5.2.4.10. Resource development staff or grant writers

Few communities have the financial resources that are required to implement all of its potential programs (e.g., mitigation measures). Therefore, they must rely on grants and other fundraising opportunities to obtain the money necessary to perform mitigation projects. Many grants are competitive, and individuals can provide donations to a vast array of causes, so the community must demonstrate that it can use those funds better than other applicants. This may be difficult, but having a specialist on staff will likely increase the community's chances of receiving funding.

5.2.4.11. Fiscal staff to handle large/complex grants

Many of the funding streams that can be used for hazard mitigation have substantial management and reporting requirements. Employing or having access to staff specializing in grants management will help the community ensure that it does not lose a grant opportunity because it did not meet the administrative requirements of that grant.

5.2.5. Fiscal Capability

Fiscal capability is important to the implementation of hazard mitigation activities. Every jurisdiction must operate within the constraints of limited financial resources. During the 1960s and 1970s, state and federal grants-in-aid were available to finance a large number of programs, including streets, water and sewer facilities, airports, and parks and playgrounds. During the early 1980s, there was a significant change in federal policy, based on rising deficits and a political philosophy that encouraged states and local governments to raise their own revenues for capital programs. The result has been a growing interest in "creative financing." [5]

The following information pertains to various financial assistance programs pertinent to hazard mitigation.

5.2.5.1. Capital improvement programming

Most capital improvement projects involve the outlay of substantial funds, and local government can seldom budget for these improvements in the annual operating budget. Therefore, numerous techniques have evolved to enable local governments to finance for capital improvements over a time period exceeding one year. Public finance literature and state laws governing local government finance classify techniques that are allowed to finance capital improvements. These techniques include revenue bonds; lease-purchase, authorities and special districts; current revenue (pay-as-you-go); reserve funds; and tax increment financing.

Some projects may be financed with general obligation bonds. With this method, the jurisdiction's taxing power is pledged to pay interest and principal to retire debt. General obligation bonds can be sold to finance permanent types of improvements, such as schools, municipal buildings, parks, and recreation facilities. Voter approval may be required.

[5] Frank S. So and Judith Getzels, eds., *The Practice of Local Government Planning*, 2nd ed. (Washington, D.C.: International City Management Association, 1988), 451.

Municipal Authorities

Municipal authorities are most often used when major capital investments are required. In addition to sewage treatment, municipal authorities have been formed for water supply, airports, bus transit systems, swimming pools, and other purposes. Municipal authorities have powers to receive grants, borrow money, and operate revenue-generating programs and are authorized to sell bonds, acquire property, sign contracts, and take similar actions. Authorities are governed by authority board members who are appointed by the elected officials of the member municipalities.

5.2.5.2. Community Development Block Grants (CDBGs)[6]

These grants are designed to assist the vulnerable populations within the community by ensuring affordable housing, creating jobs, and providing direct services. The amount of each grant is determined by a formula that accounts for the community's need, poverty, population, housing, and comparison to other areas. The annual appropriation is divided among the states and local jurisdictions (referred to as "non-entitlement communities" and "entitlement communities"). The following are entitlement communities:

- Central cities of Metropolitan Statistical Areas (MSAs)
- Cities with at least 50,000 people
- Some urban counties with at least 200,000 people

States provide CDBG funds to non-entitlement jurisdictions.

The majority of CDBG funds are required to be spent to benefit low- and moderate-income people. Also, there is a set of national objectives for the program, including addressing existing conditions that pose a threat to the health and welfare of the community (e.g., low-income housing in a floodplain).

5.2.5.3. Special purpose taxes

Communities may exercise their taxing authority to raise funds for any project they see fit. This includes special taxes to fund mitigation measures. Spreading the cost of a community project among the community's taxpayers helps provide the greatest public good for relatively little individual cost.

5.2.5.4. Gas/electric utility fees

In the same way that special taxes can be levied to fund mitigation projects, another avenue for financing a project that a community may utilize is to dedicate a portion of homeowners' gas and electric utilities fees to upgrade and maintain the related infrastructure. Burying transmission lines, thereby mitigating from the effects of winds and ice storms, is expensive. These fees help to offset that cost.

[6] U.S. Department of Housing and Urban Development, "Community Development Block Grant – CDBG," http://www.hud.gov/offices/cpd/communitydevelopment/programs/ (accessed September 21, 2009).

5.2.5.5. Water/sewer fees

Water Authorities and Fees

Water authorities are multipurpose authorities with water projects, many of which operate both water and sewer systems. The financing of water systems for lease back to the municipality is among the principal activities of the local government facilities financing authorities. An operating water authority issues bonds to purchase existing facilities or to construct, extend, or improve a system. The primary source of revenue is user fees based on metered usage. The cost of constructing or extending water supply lines can be funded by special assessments against abutting property owners. Tapping fees also help fund water system capital costs. Water utilities are directly operated by municipal governments and by privately owned public utilities regulated by the Pennsylvania Public Utility Commission. The Pennsylvania Department of Environmental Protection has a program to assist with consolidation of small individual water systems to make system upgrades more cost effective.

Sewer Authorities and Fees

Sewer authorities include multipurpose authorities with sewer projects. The authorities issue bonds to finance acquisition of existing systems or to finance construction, extension, and improvements. Sewer authority operating revenues originate from user fees. The fee frequently is based on the amount of water consumed, and payment is enforced by the ability to terminate service or the imposition of liens against real estate. In areas with no public water supply, flat rate charges are calculated on average use per dwelling unit.

5.2.5.6. Stormwater utility fees

Stormwater utility fees are assessed and collected to offset the cost of maintaining and upgrading stormwater management structures such as drains, retention ponds, and culverts.

5.2.5.7. Development impact fees

Development impact fees are one-time fees assessed to offset the cost of providing public services to a new development. They may be dedicated to providing the related new water or sewer infrastructure, roads, parks and recreational areas, libraries, schools, etc. The new infrastructure may be less vulnerable to hazard impacts.

5.2.5.8. General obligation, revenue, and/or special tax bonds

Jurisdictions may simply decide to dedicate general fund or similar financing to implement hazard mitigation projects.

5.2.5.9. Partnering arrangements or intergovernmental agreements

Intergovernmental cooperation is one manner of accomplishing common goals, solving mutual problems, and reducing expenditures. The 13 municipalities within Fulton County comprise two boroughs and 11 townships. Each of these municipalities conducts its daily operations and provides various community services according to local needs and limitations. Some adjacent municipalities have formed cooperative agreements and work jointly with their neighboring

municipalities to provide services such as police protection, fire and emergency response, infrastructure maintenance, and water supply management. Other municipalities have chosen to operate on their own. Each municipality varies in staff size, resource availability, fiscal status, service provision, constituent population, overall size, and vulnerability to the identified hazards.

Circuit Rider Program (Engineer)

The Circuit Rider Program is an example of intergovernmental cooperation. This program offers municipalities the ability to join together to accomplish a common goal. The Circuit Rider is a municipal engineer who serves several small municipalities simultaneously. These are municipalities that may be too small to hire a professional engineer for their own operations, yet need the skills and expertise the engineer can offer. Municipalities can jointly obtain what no single municipality could obtain on its own.

5.2.6. Political Capability

Political capability refers to a jurisdiction's incentive or willingness to accomplish hazard mitigation objectives. It is measured by the degree to which local political leadership (including appointed boards) is willing to enact policies and programs that reduce hazard vulnerabilities in the community, even if met with some opposition. Examples may include guiding development away from identified hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (e.g., building codes, floodplain management, etc.).

Local decision makers may not rank hazard mitigation as a high priority task if there are other, more immediate political concerns. Unfortunately, it often takes a disaster to get people thinking about hazard mitigation. Responding to and recovering from a disastrous event can exhaust local resources, thereby elevating hazard mitigation to the forefront.

Cooperation among planning commission officials, emergency management officials, and other officials is essential to achieving hazard mitigation objectives. Maintaining open lines of communication and sharing up-to-date information is key.

5.2.7. Self-Assessment

The Self-Assessment provided the County and each municipality with an opportunity to approximate the jurisdiction's capability to implement hazard mitigation strategies. The assessment reflects this capability in each of the major capability areas.

5.2.8. Existing Limitations

Of the 12 municipalities that completed the Capabilities Assessment survey as part of this planning process,

- only one has zoning regulations;
- only three reported having floodplain regulations;
- only one has a stormwater management plan/ordinance;

- none have a natural resources protection plan;
- only one has a historic preservation plan; and
- none have a post-disaster recovery plan.

With the exception of emergency managers, very few of the municipalities have staff or access to personnel with technical expertise.

Most respondents indicated that their communities' political leaders are moderately-to-definitely willing to adopt policies/programs that relate to hazard mitigation. Yet across all responses, the communities indicated a moderate level of resiliency to disasters. Individual municipalities' responses varied, but the mean of the responses was just under the value of "moderately impacted."

Self-assessments of the different areas of capability also varied by municipality, but the overall trend showed that the communities have moderate capability to implement hazard mitigation strategies, especially in terms of planning and regulatory capability; fiscal capability received the most "low" scores.

Table 39 shows which municipalities completed the Capabilities Assessment Survey and their responses.

Table 39: Capabilities Assessment Survey Results

Fulton County PA	Fulton County	Ayr Township	Belfast Township	Bethel Township	Brush Creek Township	Dublin Township	Licking Creek Township	McConnellsburg	Taylor Township	Thompson Township	Todd Township	Union Township	Valley-Hi	Wells Township
Planning and Regulatory Capability														
Hazard Mitigation Plan	X	X	X	X	X	X	X	X	X	X	X	X		X
Comprehensive Land Use Plan (or General, Master, or Growth Mgmt. Plan)	X	X	X	X	X	X	X	X	X	X	X	X		X
Floodplain Management Plan						X					X			
Open Space Management Plan (or Parks/Rec or Greenways Plan)	X	X	X	X	X	X	X	X	X	X	X	X		X
Stormwater Management Plan/Ordinance								X						
Natural Resource Protection Plan														
Flood Response Plan														
Emergency Operations Plan	X	X	X	X	X	X		X	X	X	X	X		X
Continuity of Operations Plan	X													
Evacuation Plan														
Disaster Recovery Plan														
Capital Improvement Plan														
Economic Development Plan								X						
Historic Preservation Plan								X						
Floodplain Regulations						X					X	X		
Zoning Regulations								X						
Subdivision Regulations		X	X	X	X	X	X		X	X	X	X		X
Unified Development Ordinance														
Post-Disaster Redevelopment/ Reconstruction Ordinance														
Building Code		X	X	X	X	X	X	X	X	X	X	X		X
Fire Code														
National Flood Insurance Program		X	X	X	X	X	X	X	X	X	X	X		X
National Flood Insurance Program – CRS														
Firewise														
Storm Ready	X	X	X	X	X	X	X	X	X	X	X	X		X
Farmland Preservation					X				X			X		
Other: Agricultural Security Areas			X			X	X			X				
Other														

Fulton County PA	Fulton County	Ayr Township	Belfast Township	Bethel Township	Brush Creek Township	Dublin Township	Licking Creek Township	McConnellsburg	Taylor Township	Thompson Township	Todd Township	Union Township	Valley-Hi	Wells Township
Administrative and Technical Capability														
Planners with knowledge of land development / management practices														
Engineers or professionals trained in construction practices related to buildings and/or infrastructure (includes building inspectors)			X	X	X	X	X	X	X	X				X
Planners or engineers with an understanding of natural and/or human-caused hazards														
Emergency manager				X	X			X	X		X			X
Floodplain manager					X									
Land surveyors														
Scientist familiar with the hazards of the community														
Staff with the education or expertise to assess the community's vulnerability to hazards											X			
Personnel skilled in Geographic Information Systems (GIS) and/or FEMA's HAZUS program														
Resource development staff or grant writers								X						
Fiscal staff to handle large/complex grants								X						
Other														
Fiscal Capability														
Capital improvement programming														
Community Development Block Grants (CDBGs)			X	X		X		X			X			
Special purpose taxes														
Gas/electric utility fees														
Water/sewer fees			X	X		X		X			X			
Stormwater utility fees														
Development impact fees														
General obligation, revenue, and/or special tax bonds											X			

Fulton County PA	Fulton County	Ayr Township	Belfast Township	Bethel Township	Brush Creek Township	Dublin Township	Licking Creek Township	McConnellsburg	Taylor Township	Thompson Township	Todd Township	Union Township	Valley-Hi	Wells Township
Partnering arrangements or intergovernmental agreements							X				X			
Other											X			
Other														
Community Political Capability														
5 - Definitely Willing			X					X						
4 - Very Willing						X				X	X			
3 - Moderately Willing		X		X	X		X		X			X		X
2 - Somewhat Willing														
1 - Not Very Willing														
0 - Unwilling to adopt policies/programs														
Community Resiliency Capability after an Event (Consequence Analysis)														
Public		1	3	3	3	3	1	3	3	3	3	3		3
Responders		1	4	3	3	5	2	3	3	3	4	2		3
Continuity of operations of local government, including continued delivery of services		3	3	3	3	3	1	2	3	3	3	3		2
Property, facilities, and infrastructure		3	3	3	3	3	1	3	3	3	2	3		
Environment		2	3	3	3	3	3	3	3	3	2	3		3
Economic condition of the jurisdiction		1	3	5	3	3	4	3	3	3	2	2		3
Public confidence in the jurisdiction's governance		1	4	3	3	4	3	2	3	3	1	3		3
Self Assessment of Capability														
Planning and Regulatory Capability		M	L	M	M	L	M	M	M	M	M	M		M
Administrative and Technical Capability		M	L	M	M	M	M	M	M	M	M	M		L
Fiscal Capability		M	L	L	L	L	L	L	M	L	M	M		L
Community Political Capability		M	L	M	M	L	M	M	M	M	M	L		M
Community Resiliency Capability		M	M	M	M	L	H	M	M	M	M	M		M

6. Mitigation Strategy

This section of the Fulton County Hazard Mitigation Plan (HMP) identifies the goals, objectives, actions, and mitigation action plan for mitigating against the impacts of hazards.

Goals are general guidelines that explain what you want to achieve. Goals are usually expressed as broad policy statements representing desired long-term results.

Objectives describe strategies or implementation steps to attain the identified goals. Objectives are more specific statements than goals; the described steps are usually measurable and can have a defined completion date.

Actions provide more detailed descriptions of specific work tasks to help a community achieve the goals and objectives. For each objective statement, there are alternatives for mitigation actions that must be evaluated to determine the best choices for each situation (see Section 3: Alternative Mitigation Actions).

The Mitigation Action Plan includes a listing and description of the preferred mitigation actions and the strategy for implementation (e.g., who is responsible, how will they proceed, when should action be initiated and/or completed, etc.).

6.1. Update Process Summary

The goals and objectives listed in the HMP were first examined during the five-year plan review held as part of the Kick-off Meeting. During this review, the Steering Committee members were afforded the opportunity to comment on the goals, objectives, and actions that were listed in the existing HMP. In addition, throughout the course of the plan update, the HMP was posted on the County's Web site. All correspondence that was distributed to the municipalities referenced the Web site and welcomed comments on the HMP to the County Emergency Management Agency or Planning Commission, or to Delta.

The following list shows the mitigation goals identified in the 2005 version of the HMP:

- Work with the municipalities to create and/or update some land use regulations (i.e. zoning, subdivision and land development).
- Complete and/or update stormwater management plans for all the watersheds in the County.
- EMA office will continue to have municipal coordinators trained on hazard protection and response. This will be a continual effort to work with municipal officials in obtaining full participation with EMA functions.
- Take a look at the hazard areas and determine if any of the methods would be feasible.
- Become more familiar with the property protection measures mentioned above.
- Money for dry hydrants is needed. Local businesses could be approached for funding, in addition to grant monies.

- Cell phones, pagers, and a local channel for radios are needed so that the different agencies can communicate during an emergency.
- PennDOT safety study is needed on I-70 between mile markers 162 and 163.
- Replace the bridge on Boy Scout Road that is flood-prone.
- Keep working with the Conservation District to ensure that the County's natural resources are protected.
- Complete the Fulton County Natural Heritage Inventory with the Western Pennsylvania Conservancy.

The municipalities implemented the 2005 version of the HMP by following the mitigation goals listed within it. Planning mechanisms such as land use regulations, zoning, and subdivision and land development regulations were put into effect and revised as necessary. Any planning decision made by participating municipalities was based on its adherence to these planning mechanisms. The municipal emergency management staff attended training conducted by the County EMA. Though listed as goals in the 2005 HMP, these items are mitigation actions. No overarching goals were listed in the 2005 HMP. The status of each of these actions is shown in the table below.

On November 9, 2009, the Steering Committee hosted a Mitigation Solutions Workshop, which was attended by several County and municipal representatives. The purpose of this workshop was to provide another opportunity to review the current goals, objectives, and actions listed in the HMP, and to determine what the revised HMP's goals, objectives, and actions would be. The goals, objectives, and mitigation techniques to be considered in the document were identified. Meeting minutes are provided in Appendix B. The Steering Committee then used the outcomes from the workshop to identify and prioritize the final mitigation actions that would be included in the HMP.

The Steering Committee determined that most of the actions listed in the 2005 version of the HMP will be continued (i.e., deferred) in the current version of the plan. Based on the revised and additional goals and objectives, however, the exact wording of the mitigation actions may have changed.

The following table shows the disposition of the mitigation actions listed in the 2005 version of the HMP:

Table 40: Disposition of Existing Mitigation Actions

Item	Disposition	Comments
Truck bypass between US 30 and PA 16	Deleted	Out of County's control. PennDOT will not construct a new road for this purpose.
Firewise programs	Deleted	Considered by Steering Committee to be of low priority

Item	Disposition	Comments
Timber Ridge Road, Great Cove Road (US 522) intersection	Deferred to 1.C.1	Listed in 12-year Plan for completion in 2012
Limited access on US 522	Deleted	Infeasible due to current development and permitting requirements.
Dry hydrants on PA 655	Deferred to 3.C.1	Lack of funding prevented implementation.
Johnstons Drive Project	Deferred to 1.C.3	Lack of funding prevented implementation.
Sipes Mill Road and Palmer Road intersection	Deferred to 1.C.2	Lack of funding prevented implementation.
Creek Road fording	Deferred to 1.C.4	Lack of funding prevented implementation.
Buck Road bridge area flooding	Completed	

6.2. Mitigation Goals and Objectives

6.2.1. Goals

The Steering Committee identified the following goals for hazard mitigation over the next five years:

- Prevent hazards from impacting the community.
- Protect the people, property, and environment in hazard areas.
- Maintain and enhance emergency services capabilities in the community.
- Protect natural resources within the hazard areas.
- Ensure that stakeholder groups have necessary information to mitigate against hazard impacts.

6.2.2. Objectives

The goals in Section 6.2.1 were used to develop objectives. These objectives addressed in more specific terms the results of the vulnerability assessment and reflected the nature of what can be mitigated for the identified hazards, as well as existing limitations in data and information. These draft objectives were presented to the Steering Committee for review and comment, and are listed below.

Goal 1: Prevent hazards from impacting the community.	
Objective 1.A	*Work with the municipalities to create and/or update land use regulations (e.g., zoning, subdivision, and land development).*[7]
Objective 1.B	*Complete and/or update stormwater management plans for all the watersheds in the County.*
Objective 1.C	*Address areas of roadways that are vulnerable to hazard impacts.*
Goal 2: Protect the people, property, and environment in hazard areas.	
Objective 2.A	*Examine property protection measures and their applicability to the community.*[7]
Objective 2.B	*Identify hazard areas in which property protection measures would be most effective.*
Goal 3: Maintain and enhance emergency services capabilities in the community.	
Objective 3.A	*Ensure adequate communications capabilities among emergency response organizations.*
Objective 3.B	*Continue to train municipal Emergency Management Coordinators on hazard protection and response.*
Objective 3.C	*Ensure adequate water supply to fight urban and wildland fires.*
Goal 4: Protect natural resources within the hazard areas.	
Objective 4.A	*Continue working with the Conservation District to ensure that the County's natural resources are protected.*
Objective 4.B	*Maintain environmental education programs that the conservation and extension offices conduct, and perhaps create new ones.*
Goal 5: Ensure that stakeholder groups have necessary information to mitigate against hazard impacts.	
Objective 5.A	*Continue StormReady program participation.*
Objective 5.B	*Update and maintain the County Web site with current information from all departments.*
Objective 5.C	*Maintain the linkage between the County GIS and tax assessment records to obtain information on condition, number of stories, and age of construction.*

[7] This objective and its actions relate to continued compliance with the National Flood Insurance Program (NFIP).

6.3. Identification and Analysis of Mitigation Techniques

This section includes an overview of alternative mitigation actions based on the goals and draft objectives identified in Section 6.2. There are six general techniques to reducing hazard risks:

- Prevention
- Property protection
- Emergency services measures
- Structural projects
- Natural resource protection
- Public education/awareness programs

Prevention measures keep problems from getting started or getting worse. The use of known hazard areas, like floodplains for example, can be limited through planning, land acquisition, or regulation. These activities are usually administered by building, zoning, planning, and/or code enforcement officials, and include the following:

- Planning and zoning
- Open space preservation
- Building codes and enforcement
- Stormwater management
- Drainage system maintenance

Property Protection measures are those actions that go directly to permanently getting people, property, and businesses out of unsafe areas where, in terms of wise disaster planning, they should not have been in the first place.

The first of these measures is property acquisition: public procurement and management of lands that are vulnerable to damage from hazards. For example, flood-damaged homes have been purchased by municipalities (using state, federal, and local funds) and removed from flood-prone areas (by demolition or relocation). The acquired land then becomes public property that can only be used as “open space” in the future. Open space use means that future development of the site is restricted to low-impact uses like parks, playing fields, gravel parking lots, or agriculture – no permanent or enclosed structures.

Relocation of at-risk structures also achieves the same result as acquisition. The home or business is moved to a safer location, but it remains the property of the individual owner while the original site is purchased and maintained by the local municipality.

Elevation of structures can be effective in-place mitigation for some flood-threatened homes. By raising the height of the structure’s living area above flood levels, damage and threat to life can be reduced. Retrofitting of homes is another in-place damage reduction method. Utilities, services, systems, and appliances in some homes can be raised above flood levels.

Construction techniques to improve structural resistance to high wind or heavy snow accumulation can be incorporated into new homes or retrofitted into existing structures.

Private home and business insurance policies and participation in the National Flood Insurance Program can also reduce uninsured losses to properties.

Emergency Services Measures are taken during a disaster to minimize its impact. The following measures are the responsibility of municipal or County emergency management staff, operators of major and critical facilities, and other local emergency service organizations:

- Alert warning systems
- Monitoring systems
- Emergency response planning
- Evacuation
- Critical facilities protection
- Preservation of health and safety

Structural Projects are usually designed by engineers and managed and maintained by public works staffs. They are designed to reduce or redirect the impact of natural disasters (especially floods) away from at-risk population areas. The following are examples:

- Reservoirs
- Levees and floodwalls
- Diversions
- Channel modifications (i.e., dredging)
- Storm sewers

Natural Resource Protection preserves or restores natural areas or their natural functions. Such measures are usually implemented by park and recreation organizations, conservation agencies, or wildlife groups. They include the following:

- Wetland protection
- Best management practices
- Erosion and sediment control
- Riverine protection

Public Education/Awareness Programs advise property owners, potential property owners, and others of hazards and ways to protect people and property from them. They are usually implemented by a public information office and can include the following:

- Flood maps and data
- Library resources

- Outreach projects
- Technical assistance
- Real estate disclosure information
- Environmental education programs

The participants of the Mitigation Solutions Workshop and the Steering Committee identified actions that relate to the techniques indicated in Table 41 for each high- and moderate-risk hazard.

Table 41: Mitigation Technique Matrix

Mitigation Technique Matrix				
Mitigation Technique	High- and Moderate-Risk Hazards			
	Flood, Flash Flood, and Ice Jams	Environmental Hazards	Transportation Hazards	Severe Wind Storms
Prevention	X	X	X	X
Property Protection	X			
Emergency Services	X	X	X	X
Structural Projects	X		X	
Natural Resource Protection	X			
Public Education / Awareness	X	X	X	X

6.4. Mitigation Action Plan

6.4.1. Identification of Mitigation Actions

The following table presents the set of Mitigation Actions for each goal and objective identified by the Steering Committee or municipalities.

Table 42: Mitigation Actions for Each Goal and Objective

ID	Goal	Objective	Action
1	Prevent hazards from impacting the community.		
	1.A	*Work with the municipalities to create and/or update land use regulations (e.g., zoning, subdivision, and land development).*	
		1.A.1	Conduct workshops and training for municipal officials on the benefits of land use regulations to protect new and existing structures and infrastructure.

ID	Goal	Objective	Action
	1.B	*Complete and/or update stormwater management plans for all the watersheds in the County.*	
		1.B.1	Create and maintain stormwater management plans for the County's watersheds.
	1.C	*Address areas of roadways that are vulnerable to hazard impacts.*	
		1.C.1	Redesign the Timber Ridge Road, Great Cove Road (US-522) intersection to provide adequate sight distance for motorists turning from Timber Ridge Road.
		1.C.2	Lower and slope the road bank at the intersection of Sipes Mill Road (SR 4001) and Palmer Road (T-383) to increase visibility when entering Sipes Mill Road.
		1.C.3	Replace three tiles on Johnstons Drive with one squash tile.
		1.C.4	Construct a bridge on Creek Road (T-388) in Licking Creek Township over the creek fording.
		1.C.5	Replace the road tile on Back Hollow Road in Harrisonville.
		1.C.6	Increase visibility at the intersection of Great Cove Road (US-522) and Alpine Road.
		1.C.7	Increase visibility at the intersection of Great Cove Road (US-522) and Bethel Church Road.
		1.C.8	Increase visibility at the intersection of State Route 643 and Spring Road.
		1.C.9	Increase visibility at the intersection of Stoney Break Road and Black Oak Road.
		1.C.10	Increase visibility at the intersection of Buck Valley Road and Mays Chapel Road.
2	Protect the people, property, and environment in hazard areas.		
	2.A	*Examine property protection measures and their applicability to the community.*	
		2.A.1	Obtain information on existing and proposed new structures in the areas with the highest relative vulnerability to determine the best property protection methods. The following information should be obtained: • Lowest-floor elevation • Number of stories • Presence of a basement • Market and/or replacement value
		2.A.2	Obtain information for all existing and proposed new structures in the 1% chance floodplain to determine the best property protection methods to promote with individual property owners.
		2.A.3	Examine the effects of requiring anchor straps and improved roofing shingles on new and existing manufactured homes and residences of the County.

ID	Goal	Objective	Action
	2.B	*Identify hazard areas in which property protection measures would be most effective.*	
		2.B.1	Establish a Firewise Program in the County, especially around the Meadow Grounds Lake, Cowans Gap State Park, and Breezewood Park.
3	Maintain and enhance emergency services capabilities in the community.		
	3.A	*Ensure adequate communications capabilities among emergency response organizations.*	
		3.A.1	Identify and apply for funding to enhance the County's radio system.
		3.A.2	Identify and apply for funding to upgrade the County's emergency responders' radio equipment.
		3.A.3	Identify and implement backup communications systems for emergency response organizations.
	3.B	*Continue to train municipal Emergency Management Coordinators on hazard protection and response.*	
		3.B.1	Include hazard mitigation periodically as a topic in the Quarterly Emergency Management Coordinator Training session(s).
	3.C	*Ensure adequate water supply to fight urban and wildland fires.*	
		3.C.1	Install dry hydrant locations along PA-655 to assist the Needmore Fire Company.
4	Protect natural resources within the hazard areas.		
	4.A	*Continue working with the Conservation District to ensure that the County's natural resources are protected.*	
		4.A.1	Protect natural wetlands that may absorb floodwaters.
		4.A.2	Implement programs deemed necessary by the Conservation District.
	4.B	*Maintain environmental education programs that the conservation and extension offices conduct, and perhaps create new ones.*	
		4.B.1	Coordinate with the conservation and extension offices to provide education and training to emergency responders, managers, and municipal officials.
5	Ensure that stakeholder groups have necessary information to mitigate against hazard impacts.		
	5.A	*Continue StormReady program participation.*	
		5.A.1	Recruit SkyWarn Spotters in the County.
		5.A.2	Encourage major employers and other facilities to participate in the subordinate StormReady programs.
	5.B	*Update and maintain the County Web site with current information from all departments.*	
		5.B.1	Seek relevant input from all departments during the pre-impact, impact, and post-impact phases of an emergency.

ID	Goal	Objective	Action
	5.C	*Maintain the linkage between the County GIS and tax assessment records to obtain information on condition, number of stories, and age of construction.*	
		5.C.1	Identify and fill gaps in information needed to conduct vulnerability analysis in hazard areas.
		5.C.2	Evaluate GIS and other software packages to find the ideal system for the County's use.

Actions 1.A.1, 2.A.1, and 2.A.2 relate to continued compliance with the NFIP. Training municipal officials on the benefits of land use regulations (Action 1.A.1) will lead to their adoption and/or maintenance of floodplain management regulations/ordinances. Obtaining information on structures in hazard areas (Action 2.A.1), including the 1% chance floodplain, will provide the communities with a more accurate idea of which structures lie in the floodplain and what their values are. This information directly affects the need for and amount of flood insurance on those structures. Action 2.A.2, obtaining information to determine the best property protection methods for individual properties in the floodplain, will lead to implementation of those methods. Property protection measures will impact the level of NFIP insurance required.

6.4.2. Evaluation of Mitigation Actions

The preceding list includes 24 action items, many of which will require substantial commitments of time by County and municipal staff. It is unrealistic to assume that the individuals working for these entities will have the time and resources to pursue all of these activities within the planning horizon for this Plan (i.e., over the next five years, which is the planning horizon for this Plan relative to the requirements of DMA 2000). To focus the energies of these individuals and related organizations, it was necessary to determine priorities for actions.

The first step in prioritizing these actions was to evaluate them based on their technical feasibility, social effects on the community, and the support of residents and local officials. The PA-STEEL evaluation method (see table below) categorizes the evaluation criteria into political, administrative, social, technical, economic, environmental, and legal areas.

Table 43: PA-STEEL Criteria

Criteria	Considerations
Political	Who are the stakeholders in this proposed action? Have all of the stakeholders been offered an opportunity to participate in the planning process? How can the mitigation goals be accomplished at the lowest cost to the stakeholders? Is there public support both to implement and maintain this measure? Is the political leadership willing to propose and support the favored measure?
Administrative	Does the community have the capability to accomplish the action (i.e., can it implement the mitigation action)? Can the community provide any necessary maintenance? Is there enough staff, technical experts, and funding? Can it be accomplished in a timely manner?
Social	Will it cause any one segment of the population to be treated unfairly? Will the action disrupt established neighborhoods, break up voting districts, or cause the relocation of low- and moderate-income people? Is the action compatible with present and future community values? Will the measures adversely affect cultural values or resources?

Criteria	Considerations
Technical	How effective is the measure in avoiding or reducing future losses? Will it create more problems than it solves? Does it solve a problem or only a symptom? In light of other community goals, is it the most useful?
Economic	What are the costs and benefits of this measure? How will the implementation of this measure affect the pocketbook of the community?
Environmental	Is the action consistent with the community's environmental goals?
Legal	Does the community have the authority to implement the proposed measure? Is there a clear legal basis for the mitigation action? Is an ordinance or resolution necessary? What are the legal side effects? Will the community be liable for the actions, or support of actions, or lack of action? Is it likely to be challenged?

Using PA-STEEL criteria, the mitigation alternatives were scored as shown in Table 44.

Table 44: PA-STEEL Evaluation of Mitigation Actions

Alternative Actions	PA-STEEL Criteria Considerations + Favorable - Less Favorable N Not Applicable																					Summary (Equal Weighting)	Summary (Benefits & Costs Prioritized)
	P Political			A Administrative			S Social		T Technical			E Economic				E Environmental					L Legal				
	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Environmental Goals Consistent w/ Community	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge		
1.C.1: Timber Ridge Road/Great Cove Road intersection.	+	+	+	+	N	+	+	+	+	+	+	+	-	+	+	N	N	N	N	+	+	+	+	17 (+) 1 (-) 5 (N)	19 (+) 3 (-) 5 (N)
3.A.1: Funding to enhance the County's radio system.	+	+	+	+	+	N	+	+	+	+	+	+	-	N	+	N	N	N	N	+	+	+	+	N	15 (+) 1 (-) 7 (N)	17 (+) 3 (-) 7 (N)
1.C.4: Bridge on Creek Road (T-388).	+	+	+	+	N	-	+	+	+	+	+	+	-	N	-	+	N	N	+	+	+	+	+	N	15 (+) 3 (-) 5 (N)	17 (+) 5 (-) 5 (N)
5.C.2: Evaluate GIS and other software packages.	+	+	+	-	N	N	+	+	+	+	+	+	-	+	N	N	N	N	+	+	+	+	+	N	14 (+) 2 (-) 7 (N)	16 (+) 4 (-) 7 (N)
1.A.1: Hazard mitigation training and workshops	+	+	+	N	N	N	+	+	+	+	+	+	-	+	-	N	N	N	+	+	+	+	+	N	14 (+) 2 (-) 7 (N)	16 (+) 4 (-) 7 (N)
1.B.1: Create/maintain stormwater management plans.	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	+	+	+	+	+	+	+	+	N	17 (+) 5 (-) 1 (N)	19 (+) 7 (-) 1 (N)

Alternative Actions	PA-STEEL Criteria Considerations + Favorable - Less Favorable N Not Applicable																					Summary (Equal Weighting)	Summary (Benefits & Costs Prioritized)
	P Political			A Administrative			S Social		T Technical			E Economic				E Environmental					L Legal				
	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge		
1.C.2: Sipes Mill Road/Palmer Road intersection.	+	+	+	+	-	+	+	+	+	+	+	+	-	N	-	-	N	N	N	+	+	+	+	15 (+) 4 (-) 4 (N)	17 (+) 6 (-) 4 (N)
1.C.3: Johnstons Drive tile.	+	+	+	+	N	-	+	+	+	+	+	+	-	N	-	+	N	N	N	+	+	+	N	14 (+) 3 (-) 6 (N)	16 (+) 5 (-) 6 (N)
1.C.5: Back Hollow Road tile.	+	+	+	+	N	-	+	+	+	+	+	+	-	N	-	+	N	N	N	+	+	+	N	14 (+) 3 (-) 6 (N)	16 (+) 5 (-) 6 (N)
1.C.6: Increase visibility at the intersection of Great Cove Road (US-522) and Alpine Road.	+	+	+	-	N	+	+	+	+	+	+	+	-	N	-	-	N	N	N	+	+	+	+	14 (+) 4 (-) 5 (N)	16 (+) 6 (-) 5 (N)
1.C.7: Increase visibility at the intersection of Great Cove Road (US-522) and Bethel Church Road.	+	+	+	-	N	+	+	+	+	+	+	+	-	N	-	-	N	N	N	+	+	+	+	14 (+) 4 (-) 5 (N)	16 (+) 6 (-) 5 (N)
1.C.8: Increase visibility at the intersection of State Route 643 and Spring Road.	+	+	+	-	N	+	+	+	+	+	+	+	-	N	-	-	N	N	N	+	+	+	+	14 (+) 4 (-) 5 (N)	16 (+) 6 (-) 5 (N)
1.C.9: Increase visibility at the intersection of Stoney Break Road and Black Oak Road.	+	+	+	-	N	+	+	+	+	+	+	+	-	N	-	-	N	N	N	+	+	+	+	14 (+) 4 (-) 5 (N)	16 (+) 6 (-) 5 (N)

Alternative Actions	*PA-STEEL Criteria Considerations* (+ Favorable - Less Favorable *N* Not Applicable)																					Summary (Equal Weighting)	Summary (Benefits & Costs Prioritized)
	P Political			***A*** Administrative			***S*** Social		***T*** Technical			***E*** Economic				***E*** Environmental					***L*** Legal				
	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge		
1.C.10: Increase visibility at the intersection of Buck Valley Road and Mays Chapel Road.	+	+	+	-	N	+	+	+	+	+	+	+	-	N	-	-	N	N	N	+	+	+	+	14 (+) 4 (-) 5 (N)	16 (+) 6 (-) 5 (N)
2.A.1: Info on structures most vuln. to hazards.	+	+	+	+	N	-	N	+	+	N	N	+	N	N	N	N	N	N	N	+	+	+	N	N	9 (+) 1 (-) 13 (N)	11 (+) 1 (-) 13 (N)
3.B.1: Hazard mitigation Quarterly Training session(s)	+	+	+	N	-	-	+	+	+	+	+	+	-	+	-	N	N	N	+	+	+	+	+	N	14 (+) 4 (-) 5 (N)	16 (+) 6 (-) 5 (N)
3.C.1: Dry hydrant along PA-655.	+	+	+	+	-	-	+	+	+	+	+	+	-	N	-	N	N	N	N	+	+	+	+	N	13 (+) 4 (-) 6 (N)	15 (+) 6 (-) 6 (N)
5.B.1: Input from departments.	+	+	+	-	-	-	+	+	+	+	+	+	-	+	-	N	N	N	+	+	+	+	+	N	14 (+) 5 (-) 4 (N)	16 (+) 7 (-) 4 (N)
2.A.2: Determine best protection method for flood.	+	+	+	N	N	N	N	N	+	N	N	N	N	N	N	+	+	N	N	+	+	+	N	N	8 (+) 0 (-) 15 (N)	8 (+) 0 (-) 15 (N)
2.B.1: Firewise Program.	+	N	+	N	N	N	+	+	+	+	N	+	-	N	N	+	+	N	N	N	N	N	N	N	9 (+) 1 (-) 13 (N)	11 (+) 3 (-) 13 (N)

Alternative Actions	PA-STEEL Criteria Considerations (+ Favorable - Less Favorable N Not Applicable)																					Summary (Equal Weighting)	Summary (Benefits & Costs Prioritized)
	P Political			A Administrative			S Social		T Technical			E Economic				E Environmental					L Legal			
	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge	
3.A.3: Backup communications systems.	+	+	+	+	-	-	+	N	+	+	+	+	-	N	-	N	N	N	N	+	+	+	N	12 (+) 4 (-) 7 (N)	14 (+) 6 (-) 7 (N)
4.A.1: Protect natural wetlands.	+	+	+	N	-	-	+	N	+	+	+	+	-	N	-	+	N	N	+	+	+	+	-	13 (+) 5 (-) 5 (N)	15 (+) 7 (-) 5 (N)
2.A.3: Anchor straps and roofing shingles.	-	+	-	-	N	N	+	N	+	+	+	+	N	N	N	N	N	N	N	+	+	+	-	9 (+) 4 (-) 10 (N)	11 (+) 4 (-) 10 (N)
4.B.1: Conservation/extension office education/ training.	+	+	N	-	-	-	N	+	+	+	+	+	-	-	-	+	+	+	+	+	+	+	-	14 (+) 7 (-) 2 (N)	16 (+) 9 (-) 2 (N)
3.A.2: Funding to upgrade radio equipment.	+	+	+	+	-	-	+	N	+	-	+	+	-	N	-	N	N	N	N	+	+	+	N	11 (+) 5 (-) 7 (N)	13 (+) 7 (-) 7 (N)
4.A.2: Implement Conservation District programs.	+	+	+	-	-	-	+	N	+	+	+	+	-	N	-	N	N	N	+	+	+	+	-	12 (+) 6 (-) 5 (N)	14 (+) 8 (-) 5 (N)
5.A.1: Recruit SkyWarn Spotters.	N	+	N	-	N	-	+	+	+	+	+	+	-	N	-	N	N	N	N	+	+	+	N	10 (+) 4 (-) 9 (N)	12 (+) 6 (-) 9 (N)

Alternative Actions	PA-STEEL Criteria Considerations (+ Favorable - Less Favorable N Not Applicable)																					Summary (Equal Weighting)	Summary (Benefits & Costs Prioritized)
	P Political			A Administrative			S Social		T Technical			E Economic				E Environmental					L Legal			
	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge	
5.A.2: Subordinate StormReady programs.	+	+	N	-	-	-	+	+	+	+	+	+	-	N	-	N	N	N	N	+	+	+	N	11 (+) 5 (-) 7 (N)	13 (+) 7 (-) 7 (N)
5.C.1: Information for vulnerability analysis.	+	+	-	-	-	-	-	+	+	+	+	+	-	+	-	N	N	N	+	+	+	+	N	12 (+) 7 (-) 4 (N)	14 (+) 9 (-) 4 (N)

6.4.3. Prioritization of Mitigation Actions

Once the mitigation actions were evaluated, the leadership of the Steering Committee set about prioritizing them to create an implementation strategy. FEMA mitigation planning requirements indicate that any prioritization system used shall include a special emphasis on the extent to which benefits are maximized according to a cost-benefit review of the proposed projects. Though the PA-STEEL values for each action are somewhat vague, all of the actions listed as having an economic impact indicated that that impact would be beneficial to the community. Whether the actions had associated costs or not, those mitigation actions could not be ruled out based on the benefit or cost values in the PA-STEEL evaluation. Implementation of any project will be based on a benefit-cost analysis as described in FEMA 386-5: Using Benefit Cost Review in Mitigation Planning (FEMA, 2007). The specific economic benefits and costs will be determined prior to application for funding of the mitigation project.

Those participating in the 2010 HMP update provided comments which allowed for the prioritization of the mitigation actions listed in Table 42 using the seven *PA-STEEL* criteria. In order to evaluate and prioritize the mitigation actions, the County identified *favorable* and *less favorable* factors for each action. Table 44 summarizes the evaluation methodology and provides the results of this evaluation for all 29 mitigation actions in two columns. The first results column includes a summary of the feasibility factors, placing equal weight on all factors. The second results column reflects feasibility scores with benefits and costs weighted more heavily; and therefore, given greater priority. A weighting factor of three was used for each benefit and cost element. Therefore, a “+” benefit factor rating equals three pluses and a “-“ benefit factor rating equals three minuses in the total prioritization score.

The results of the weighted PA-STEEL matrix were examined to prioritize the mitigation actions. The number of unfavorable ratings was subtracted from the number of favorable ratings to determine each action’s score. The average score was nine, with a standard deviation of three. Actions that received more than 12 points (one standard deviation above the average) were assigned high priority. Actions that received scores of 9 to 12, inclusive, were assigned medium priority. Other actions were assigned low priority.

The actions identified in Table 45 are listed in order of priority, with the high-priority actions first. This list of actions is the result of the planning effort led by the Steering Committee and represents what the County and communities consider most important. Any actions, including projects, to be implemented will have benefits outweighing their associated costs to the community(ies) (i.e., they will have a benefit-cost ratio greater than 1).

Table 45: Points Received for Mitigation Actions

Mitigation Action	Points
High Priority	
1.C.1: Timber Ridge Road/Great Cove Road intersection.	16
3.A.1: Funding to enhance the County's radio system.	14
Medium Priority	
1.A.1: Hazard mitigation training and workshops.	12
1.B.1: Create/maintain stormwater management plans.	12
1.C.4: Bridge on Creek Road (T-388).	12
5.C.2: Evaluate GIS and other software packages.	12
1.C.2: Sipes Mill Road/Palmer Road intersection.	11
1.C.3: Johnstons Drive tile.	11
1.C.5: Back Hollow Road tile.	11
1.C.6: Increase visibility at the intersection of Great Cove Road (US-522) and Alpine Road.	10
1.C.7: Increase visibility at the intersection of Great Cove Road (US-522) and Bethel Church Road.	10
1.C.8: Increase visibility at the intersection of State Route 643 and Spring Road.	10
1.C.9: Increase visibility at the intersection of Stoney Break Road and Black Oak Road.	10
1.C.10: Increase visibility at the intersection of Buck Valley Road and Mays Chapel Road.	10
2.A.1: Info on structures most vuln. to hazards.	10
3.B.1: Hazard mitigation Quarterly Training session(s).	10
3.C.1: Dry hydrant along PA-655.	9
5.B.1: Input from departments.	9
Low Priority	
2.A.2: Determine best protection method for flood.	8
2.B.1: Firewise Program.	8
3.A.3: Backup communications systems.	8
4.A.1: Protect natural wetlands.	8
2.A.3: Anchor straps and roofing shingles.	7
4.B.1: Conservation/extension office education/training.	7
3.A.2: Funding to upgrade radio equipment.	6
4.A.2: Implement Conservation District programs.	6
5.A.1: Recruit SkyWarn Spotters.	6
5.A.2: Subordinate StormReady programs.	6
5.C.1: Information for vulnerability analysis.	5

Mitigation Strategy Action Plans were then developed by municipal officials for each project that they wished to include in the HMP and for each of the actions rated high- and medium-priority by the Steering Committee.

The set of action plans and a table summarizing them are presented in Appendix F. A blank Mitigation Strategy Action Plan template is found in Appendix G.

7. Plan Maintenance

7.1. Update Process Summary

This update to Fulton County's Federal Emergency Management Agency (FEMA)-approved 2005 Hazard Mitigation Plan (HMP) was a comprehensive update that expanded the sources and amount of data for better trend analysis, updated the vulnerability and risk assessment for local hazards, created a more fluid process to streamline future updates to the HMP, and updated the hazard mitigation measures identified to limit the effects of local hazards.

7.2. Monitoring, Evaluating, and Updating the Plan

Hazard mitigation planning in Fulton County is the responsibility of all levels of government (i.e., county and local), as well as the citizens of the County. As listed in FEMA 386-4, the planning team (the Fulton County Hazard Mitigation Steering Committee) must continuously monitor and document the progress of the Plan's recommended actions. The Fulton County Hazard Mitigation Steering Committee (listed in Section 3.2), under the direction of the Fulton County Planning Commission, will be responsible for maintaining this Multi-Jurisdictional HMP. The Steering Committee will meet annually and following each emergency declaration, with the purpose of reviewing the Plan. Mary K. Seville, Planning and Mapping Director for the Fulton County Planning Commission, will lead the Steering Committee for annual reviews of the HMP. Each year, the County will solicit new projects from the municipalities by sending out Mitigation Action Template Forms and informing the municipalities of the opportunity to update their mitigation measures.

Each review process will ensure that the Hazard Vulnerability Analysis and Risk Assessment reflect current conditions in the County and the municipalities, the Capability Assessment accurately reflects local circumstances, and the hazard mitigation strategies are updated based on the County's damage assessment reports and local mitigation project priorities. The Steering Committee, led by Mary K. Seville, the Planning and Mapping Director for the Fulton County Planning Commission, will complete a Progress Report to evaluate the status and accuracy of the HMP and record the Steering Committee's findings. The Fulton County Planning Commission and EMA will maintain a copy of these records. The Progress Report template is found in Appendix H.

As directed by FEMA 386-4, the Progress Report will include the following information: the hazard mitigation action's objectives; who the lead and supporting agencies responsible for implementation are; how long the project should take, including a delineation of the various stages of work along with timelines (milestones should be included); whether the resources needed for implementation, funding, staff time, and technical assistance are available, or if other arrangements must be made to obtain them; the types of permits or approvals necessary to implement the action; details on the ways the actions will be accomplished within the organization, and whether the duties will be assigned to agency staff or contracted out; and the current status of the project, identifying any issues that may hinder implementation.

The HMP must be updated on a five-year cycle. This HMP will be updated within a five-year period and resubmitted to FEMA for reapproval. The monitoring, evaluating, and updating of the Plan every five years will rely heavily on the outcomes of the annual Steering Committee meetings.

7.3. Incorporation into Other Planning Mechanisms

7.3.1. Fulton County Comprehensive Plan

7.3.1.1. Method

The Fulton County Planning Commission is responsible for maintaining and updating the County Comprehensive Plan. The Planning Commission meets quarterly to review, discuss, and comment on municipal subdivision and land development plans. It uses this information to identify necessary revisions and to amend the Comprehensive Plan. The Planning Commission's meetings are open to the public and are advertised according to the Pennsylvania Sunshine Act (65 PA C.S.A.). Of the 12 municipalities that returned the Capabilities Assessment Survey, all have local comprehensive plans (see Section 5: Capabilities Assessment).

Technical assistance on community planning matters is provided by the Fulton County Planning Commission. The County Planning Commission administers the County Comprehensive Plan. The County Planning Commission also performs technical reviews of municipal subdivision and land development plans, municipal floodplain ordinances, municipal stormwater management plans and ordinances, and other community planning and development matters. Since the adoption of the existing HMP, these reviews have included informal cross-referencing of the planned development or regulatory activity with the provisions of the HMP. This practice will continue, using the information in the updated HMP.

7.3.1.2. Maintenance Schedule

Article III of the Pennsylvania Municipalities Planning Code (Act 247 of 1968, as reenacted and amended) requires all Pennsylvania counties (except Philadelphia) to adopt a comprehensive plan and update it at least every 10 years. Coupling this requirement with the DMA 2000-required five-year update cycle for HMPs, when possible, will allow the County to better integrate the County Comprehensive Plan and HMP planning processes and strengthen public participation for both efforts.

Fulton County's current Comprehensive Plan was adopted in January of 2007. This plan provides general direction and a blueprint for the future of Fulton County and constituent communities. As required by the Municipalities Planning Code, the Comprehensive Plan will need to be updated every 10 years. At that time, additional recommendations from the HMP can be incorporated into the document.

7.3.2. Fulton County Emergency Operations Plan

7.3.2.1. Method

The Pennsylvania Emergency Management Services Code (35 PA C.S. Sections 7701-7707, as amended) requires each county and municipality to prepare, maintain, and keep current an Emergency Operations Plan (EOP). The Fulton County Emergency Management Agency is responsible for preparing and maintaining the County EOP. The risk assessment information presented in the existing HMP was used to update the hazard vulnerability assessment section of the County EOP. The updated risk assessment information will affect subsequent updates to the EOP.

7.3.2.2. Maintenance Schedule

The EOP is reviewed at least biennially. Whenever portions of the plan are implemented in an emergency event or training exercise, a review is performed and changes are made where necessary. These changes are then distributed to the County's 13 local Emergency Management Coordinators (EMCs) for safekeeping.

The Fulton County Emergency Management Agency should consider the County's HMP during its biennial review of the County EOP. Recommended changes to the HMP will then be coordinated with the Steering Committee.

7.3.3. Plan Interrelationships

Figure 18 illustrates the interrelationships between the HMP, County Comprehensive Plan, County EOP, and other community planning mechanisms. Ensuring consistency between these planning mechanisms is critical. In fact, Section 301 (4.1) of the Pennsylvania Municipalities Planning Code requires that comprehensive plans include a discussion of the interrelationships among their various plan components, "which may include an estimate of the environmental, energy conservation, fiscal, economic development, and social consequences on the environment."

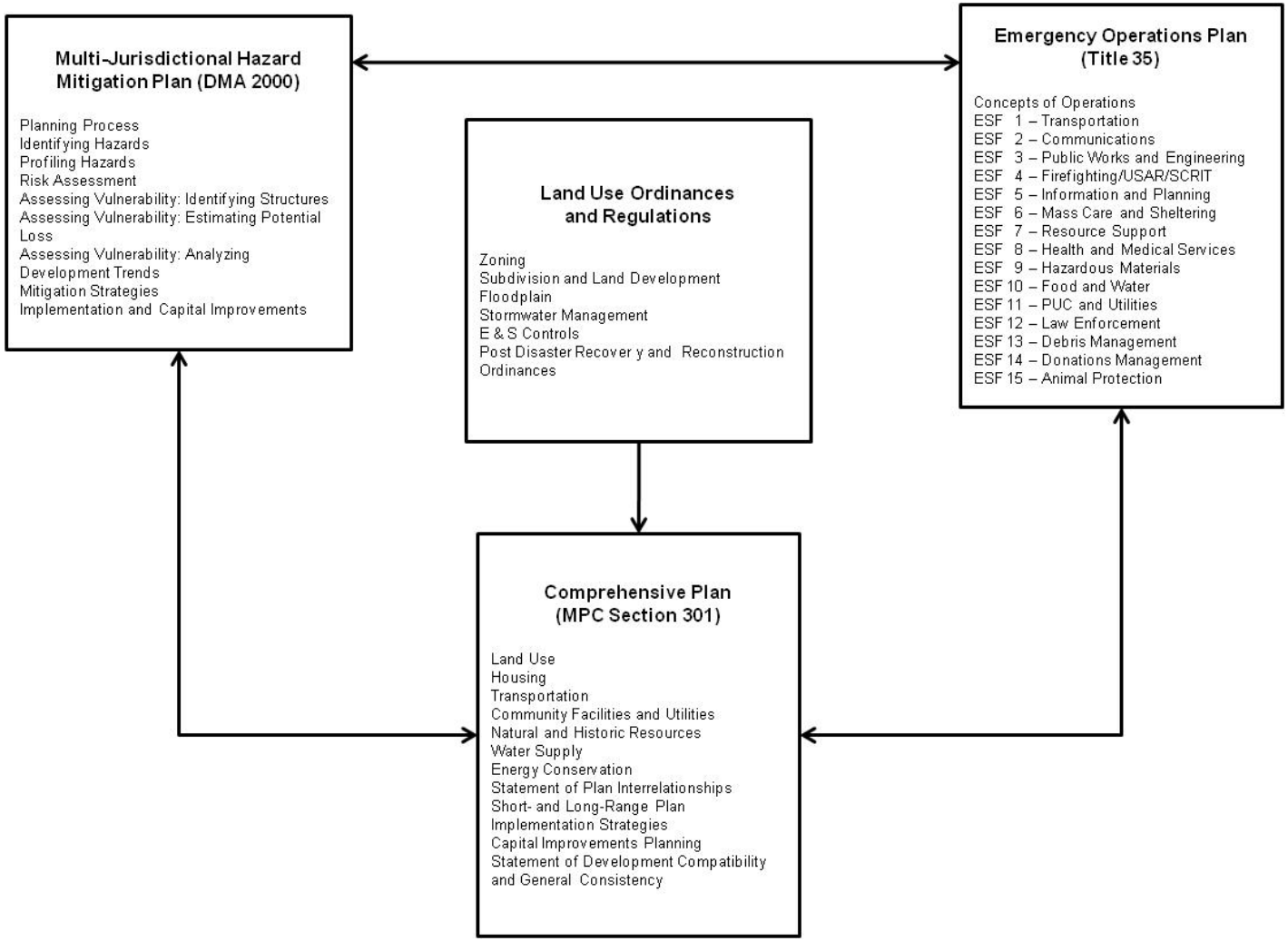
When developing the HMP, certain sections of the County Comprehensive Plan, EOP, and various land use ordinances and regulations provided key information. Moving forward, each of these documents should not be treated as unrelated and updated separately. The County and each participating municipality are responsible for incorporating the specific mitigation actions recommended in this Plan into the necessary planning documents, including the appropriate comprehensive plan, the County EOP, and any land use ordinances and regulations.

For example, zoning and other land use regulations will be amended to reflect the newly identified hazard areas, to ensure that development in those areas is minimized or at least conducted in a way that otherwise mitigates against the effects of hazards (e.g., requiring structures built in the floodplain to be elevated). As proposed changes to building codes are presented, their potential for mitigating damage due to hazards will be examined, and the changes will only be adopted if they are shown to lower risk. Changes to stormwater

management plans will incorporate identified mitigation actions and will encourage increased participation in the NFIP.

To that end, Fulton County and its municipalities must ensure that the components of the HMP are integrated into existing community planning mechanisms and are generally consistent with goals, policies, or recommended actions. Fulton County and the Hazard Mitigation Steering Committee will utilize the existing maintenance schedule of each plan to incorporate the goals, policies, or recommended actions as each plan is updated.

Figure 18: Plan Interrelationships



7.4. Continued Public Involvement

The Fulton County Planning Commission will ensure that the HMP is posted and maintained on the County Web site, and will continue to encourage public review and comment on the Plan.

The citizens of Fulton County are encouraged to submit their comments to elected officials and/or members of the Hazard Mitigation Steering Committee. To promote public participation, Fulton County welcomed comments on the HMP for a 45-day period. This offered the public the opportunity to share their comments and observations. All comments received will be maintained and considered by the Hazard Mitigation Steering Committee when updating the HMP.

Fulton County will continue to reach out to municipalities regarding mitigation projects, especially those municipalities that did not submit projects for inclusion in this HMP. Any additional Hazard Mitigation Project Opportunity Forms received during the life of this five-year HMP will be incorporated into the Plan as an interim, updated and included in the next five-year Plan update.

The HMP is available online for review at http://www.co.fulton.pa.us/planning-commission.php.

8. Plan Adoption

Resolutions reflecting formal adoption of this HMP by the County and participating municipalities can be found in Appendix A. The template resolutions used by the County and municipalities are shown on the following pages.

Fulton County Hazard Mitigation Plan

County Adoption Resolution

Resolution No. _____

Fulton County, Pennsylvania

WHEREAS, the municipalities of Fulton County, Pennsylvania, are most vulnerable to natural and human-made hazards which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, Fulton County acknowledges the requirement of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving post-disaster Hazard Mitigation Grant Program funds, and

WHEREAS, the Fulton County Hazard Mitigation Plan has been developed by the Fulton County Planning Commission and the Fulton County Emergency Management Agency in cooperation with other County departments, local municipal officials, and the citizens of Fulton County, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Fulton County Hazard Mitigation Plan, and

WHEREAS, the Fulton County Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the County and its municipal governments,

NOW THEREFORE BE IT RESOLVED by the governing body for the County of Fulton that:

- The Fulton County Hazard Mitigation Plan is hereby adopted as the official Hazard Mitigation Plan of the County, and
- The respective officials and agencies identified in the implementation strategy of the Fulton County Hazard Mitigation Plan are hereby directed to implement the recommended activities assigned to them.

ADOPTED, this _____ day of _____, 2010

ATTEST:

_____

FULTON COUNTY COMMISSIONERS

By _____

By _____

By _____

Fulton County Hazard Mitigation Plan

Municipal Adoption Resolution

Resolution No. _____

<Borough/Township of Municipality Name>, Fulton County, Pennsylvania

WHEREAS, the <*Borough/Township of Municipality Name*>, Fulton County, Pennsylvania, is most vulnerable to natural and human-made hazards which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, the <*Borough/Township of Municipality Name*> acknowledges the requirement of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving post-disaster Hazard Mitigation Grant Program funds, and

WHEREAS, the Fulton County Hazard Mitigation Plan has been developed by the Fulton County Planning Commission and the Fulton County Emergency Management Agency in cooperation with other County departments, and officials and citizens of <*Borough/Township of Municipality Name*>, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Fulton County Hazard Mitigation Plan, and

WHEREAS, the Fulton County Hazard Mitigation Plan recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the County and its municipal governments,

NOW THEREFORE BE IT RESOLVED by the governing body for the <*Borough/Township of Municipality Name*>:

- The Fulton County Hazard Mitigation Plan is hereby adopted as the official Hazard Mitigation Plan of the <*Borough/Township*>, and
- The respective officials and agencies identified in the implementation strategy of the Fulton County Hazard Mitigation Plan are hereby directed to implement the recommended activities assigned to them.

ADOPTED, this _____ day of _____, 2010

ATTEST: ***<BOROUGH/TOWNSHIP OF MUNICIPALITY NAME>***

_____ By _____

By _____

By _____