

Montgomery County

2022
Hazard
Mitigation
Plan





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LOCAL MITIGATION PLAN REVIEW TOOL HHPD FY2020

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

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

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

Jurisdiction: Montgomery County, Pennsylvania	Title of Plan: Montgomery County 2022 Hazard Mitigation Plan Update	Date of Plan: 4-6-2023
Local Point of Contact: Drew Shaw	Address: Montgomery County Planning Commission One Montgomery Plaza Suite 201 425 Swede Street Norristown, PA 19401	
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State Reviewer: Ernest Szabo Telephone: (717) 651-2159 Email: erszabo@pa.gov	Title: PEMA State Hazard Mitigation Planner	Date:
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FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region (insert #)		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

**SECTION 1:
REGULATION CHECKLIST**

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

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))		Section 3, <i>Planning Process</i> , pgs. 29-35		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))		Section 3.2, <i>The Planning Team</i> , pgs. 29-30 Section 3.3, <i>Meetings and Documentation</i> , pgs. 31-32 Appendix C		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))		Section 3.4, <i>Public & Stakeholder Participation</i> , pg. 32 Section 3.5, <i>Multi-Jurisdictional Planning</i> , pgs. 32-35		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		<p>Section 1.4, <i>Authority and Reference</i>, pgs. 2-3</p> <p>Section 2.5, <i>Land Use and Development</i>, pgs. 24-37</p> <p>Section 5.3, <i>Planning and Regulatory Capability</i>, pgs. 136-148</p> <p>Section 5.3.8, <i>Plan Integration</i>, pg. 155</p>		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))		Section 7, <i>Plan Maintenance</i> , pgs. 181-182		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))		Section 7.2, <i>Monitoring, Evaluating, and Updating the Plan</i> , pgs. 181-182		
ELEMENT A: REQUIRED REVISIONS				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
<p>B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))</p> <p>The definition of terms (Likely, Unlikely, etc.) from the SOG has been added to the Appendices, and referenced at the beginning of Section 4. Throughout the section, further clarification has been added where appropriate.</p>		<p>Section 4.2, <i>Hazard Identification</i>, pgs. 34-40.</p> <p>Section 4.3, <i>Hazard Assessment</i> pgs. 40-131</p>		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))		Section 4.3, <i>Hazard Assessment</i> , pgs. 40-131.		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))		Section 4.3, <i>Hazard Assessment</i> , pgs. 40-131.		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		Section 4.3.9, <i>Flooding</i> , pgs. 71-77, Section 5.3.3, pg. 152, Chapter 6, <i>Mitigation Strategy</i> pgs. 174-175 Appendix L		
ELEMENT B: REQUIRED REVISIONS				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))		Section 5.3 <i>Capability Assessment</i> , pgs. 136-148 Section 5.3.4. <i>Planning and Regulatory Capability</i>		
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))		Section 3.4 , Section 4.3.9, <i>Flooding</i> , pgs. 71-77 Section 5.3.3, <i>Participation in the NFIP</i> , pg. 152, and Tables 5.3.1-3, pgs. 147-148 <i>NFIP Compliance</i> Ch 6 'Floodplains' and Goal #4 Chart on Pg 270-271		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))		Section 6.2, <i>Mitigation Goals and Objectives</i> , pgs. 158-167		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))		Section 6.4, Mitigation Action Plan, pgs. 169-180 NFIP compliance themes incorporated.		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))		Section 6.4, Mitigation Action Plan, pg. 169 Recommendation noted for next update		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))		Section 5.3, Charts 5.3.1 and 5.3.2, pgs. 136-146		
<u>ELEMENT C: REQUIRED REVISIONS</u>				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))		Section 2.2, Community Infrastructure pgs. 16-19 Section 2.4 Populations and Demographics pgs. 19-22 Section 4.2 Hazard Identification, pgs. 46, 50, 56, 60, 63, 71, 77, 83, 85, 87, 90, 95, 98, 101, 103, 11, 115, 119, 123, 130		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))		Pgs xxvii and xxviii of Exec Summary Section 5.3.2, Emergency Management, pgs. 148-152 Section 6.1, Update Process Summary, pg.157		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 4.2, Hazard Identification pgs. 38-40 Section 6.4 Mitigation Action Plan, pgs. 164-177			
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Once approved by PEMA/ FEMA, Montgomery County will adopt the Plan by resolution, Section 8.1, County Plan Adoption, pg. 183			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Municipalities will adopt the plan by resolution, Section 8.2, Plan Adoption, pgs. 183			
ELEMENT E: REQUIRED REVISIONS				
OPTIONAL: HIGH HAZARD POTENTIAL DAM RISKS				
HHPD1. Did Element A4 (planning process) describe the incorporation of existing plans, studies, reports, and technical information for eligible high hazard potential dams?	Section 2.2, Community Infra- structure, pg. 17 Sect. 4.3.4-5, Table 4.3.1			
HHPD2. Did Element B3 (risk assessment) address eligible high hazard potential dams in the risk assessment?	Section v 4.3.1 , 4.3.4-1, 4.3.4-5, Table 4.3.4-2			
HHPD3. Did Element C3 (mitigation goals) include mitigation goals to reduce long-term vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?	Section 6, Mitigation Goals and Objective, Goal #3, Obj. 3c pg. 172			

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
HHPD4. Did Elements C4-C5 (mitigation actions) address HHPDs prioritize mitigation actions to reduce vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?				
<u>REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

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

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

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

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

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

A. Plan Strengths and Opportunities for Improvement

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

Element A: Planning Process

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

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

Element B: Hazard Identification and Risk Assessment

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

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

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

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

Element C: Mitigation Strategy

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

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

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

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

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

B. Resources for Implementing Your Approved Plan

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

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

Executive Summary

Purpose of the Plan

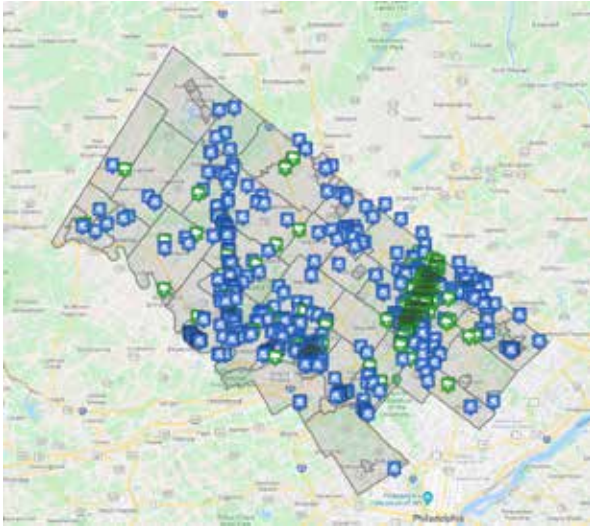
This plan is intended to provide the county and each of the municipalities with a strategy for mitigation of natural, human, and technological disasters that could occur in Montgomery County at any time. The plan addresses local government planning responsibilities established by the Stafford Act, (P.L. 106-390, the Disaster Mitigation Act of 2000) which requires state and local governments to develop and adopt an approved mitigation plan as a condition for receiving certain federal disaster grants and loans. This plan revises and updates the Hazard Mitigation Plan prepared in 2017 and adopted by the 62 municipalities in the county. The first Montgomery County Hazard Mitigation plan approved in 2007 was also adopted by all 62 municipalities.

The plan follows the same structure as the 2017 plan. Revisions in the plan reflect the changes and events that have taken place in Montgomery County over the last 5 years that could affect future hazard vulnerability in the county. Recent hazard events provide information about potential vulnerability in our community and likely changes in hazard occurrences. In addition to hazard events over the past 5 years, revisions in the plan address other key changes or trends that could affect future hazards. For example, the section characterizing pandemics has been expanded, and gun violence, opioids, and invasive species have been included and evaluated as new hazards. Other revisions in the plan account for a variety of activities undertaken in the county to implement recommendations made in the 2017 Hazard Mitigation Plan.

Recent Hazard Events

Hurricane Ida/storm remnants – Days after Hurricane Ida hit Louisiana as a Category 4 hurricane with 145 mph winds on September 1, 2021, the remnants traveled to Pennsylvania bringing record flooding and extensive tornado damage. The National Weather service predicted that 9/1 could be one of the top five wettest days on record in central PA behind Hurricane Agnes (1972) and Tropical Storm Lee (2011). The storm brought at least 5 inches of rain at Harrisburg International airport and 7 inches of rain in Lancaster. The Schuylkill river crested at 26.85 feet in Norristown.

The Montgomery County Department of Public Safety prepared for and responded to significant flooding on September 1 and 2, as the remnants of Hurricane Ida (then a tropical depression) moved slowly across the Mid-Atlantic States. The county Division of Emergency Management coordinated emergency response and recovery efforts among county agencies and municipal response departments. The National Weather Service determined that an EF-2 tornado with winds of up to 130 miles per hour touched down in Upper Dublin Township and Horsham Township. The Upper Dublin Township municipal complex on Loch Alsh Avenue, which includes the administrative offices and the police department, sustained extensive damage, including loss of the roof.



Damage Report Locations from Tropical Storm Ida
Green icons: Wind/severe weather/tornado damage
Blue icons: Flood damage

Four Montgomery County residents died as a result of the storm. The county established a Multi-Agency Response Center (MARC), and created the Hurricane Ida Response website, where residents could find recovery resources and post damage reports. The County received 3,728 damage reports through the site. Periodic updates continued to be posted, and the county. The Federal Emergency Management Agency (FEMA) designated Hurricane Ida in PA as "Pennsylvania Remnants of Hurricane Ida: 4618-DR-PA." As of Sept. 24, 2021, eight Pennsylvania counties were included in the federal disaster declaration: Bedford, Bucks, Chester, Delaware, Montgomery, Northampton, Philadelphia, and York counties.

The Department of Public Safety's Emergency Communications Center answered 6,538 calls for assistance between 11 a.m. on Wednesday and 10 a.m. on Thursday. More than 452 water rescues were dispatched during the storm, many of which involved the rescue of multiple individuals. The

Schuylkill River at Norristown and the Perkiomen Creek at Graterford crested at record levels overnight and early Thursday morning. The Schuylkill River remained in major flood stage through Friday morning.

Tropical Storm Isaias – Tropical Storm Isaias affected the mid-Atlantic region on 4 August 2020. Widespread rainfall of 4 to 7 inches was reported with a few amounts in excess of 7 to 8 inches, leading to area flooding. A person was reported to have been swept into the Schuylkill River in Whitemarsh Township. There were 94 water rescues executed throughout the county from 7:30 a.m. to 1:15 p.m., and 10,200 PECO customers were without power across Montgomery County.

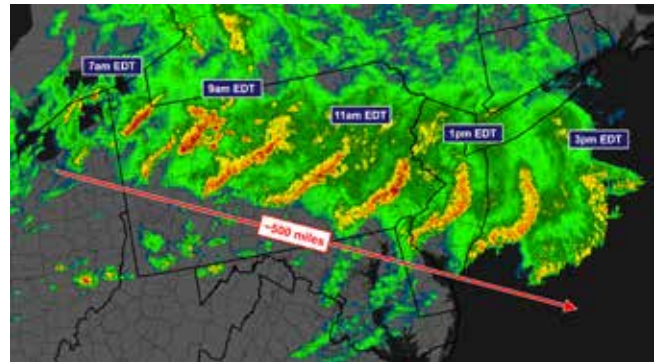
Tropical Storm Fay developed on the afternoon of 9 July 2020 off the Carolina coast. Moving northward, Fay made landfall on 10 July just to the northeast of Atlantic City. Minor flooding was reported in eastern Montgomery County.

Other storm events –

June 3, 2020 Derecho – The region experienced a derecho on June 3, 2020. Widespread and significant wind damage occurred in a swath from Berks County through the Philadelphia metropolitan area to the Ocean County coast. Several observations of 60-80 mph wind gusts were observed with the storms, with a couple reports exceeding 90 mph on the coast.

June 19, 2019 Sudden Downpour – Western Montgomery County experienced a sudden and severe rainstorm. Areas most affected were Green Lane, Marlborough, Lower Frederick, and Upper Frederick. The Montgomery County Office of Emergency Management reported that more than 4,300 PECO customers were without power as of 8 p.m. that night. Flooding destroyed homes in Green lane Borough, and the Green Lane -Marlborough Joint Authority reported significant damage to a sewage pumping station.

Winter Storm Events – In 2018, Southeastern PA experienced two winter storms on March 7th and 8th, and March 21st and 22nd. During the first storm, parts of eastern Montgomery County received significant snowfall: Rosemont reported 14.3 inches, and Montgomeryville reported 13.5 inches of snow. Snowfall during the second storm was greater, and more widespread. Snowfall amounts ranged from 6 to 8 inches in the eastern municipalities, to 15 to 16 inches in the north and northcentral parts of the county.



Chemical Road Sinkholes – A sinkhole developed along Chemical Road in Plymouth Meeting on March 26, 2021. The road reopened in December after the area was stabilized. The sinkhole had forced authorities to close off Butler Pike between Flourtown Rd. and Germantown Pike. It also affected the Norfolk Southern Railway Bridge that passes over the road, as well as natural gas, electric and telecommunication utilities that run underground through the area. Other sinkholes developed about the time Chemical Road reopened; in total, there were five sinkholes:

- » *Sinkhole #1, Discovered on 8/9/2018:* A 2' diameter sinkhole in the road shoulder below a culvert and adjacent to the Verizon communications vault, approximately 17' x 8' x 5'.
- » *Sinkhole #2, Discovered on 9/10/2018:* A 1.5' diameter sinkhole behind curb extending towards Aqua valve boxes, approximately 3' deep.
- » *Sinkhole #3, Discovered on 1/22/19:* Two sinkholes (14' x 10' x 4' depth and 12' x 10' x 4' depth) adjacent to the Norfolk Southern bridge wing wall and beneath a tree adjacent to the culvert channel.
- » *Sinkhole #4, Discovered on 4/8/19:* A 2 to 4 foot wide, 5' deep hole opened adjacent to the bridge wing wall.
- » *Sinkhole #5, Discovered on 4/8/19:* A 30' x 9' section of soft soils with a 6' diameter by 2.5' deep sinkhole occurred immediately beneath the asphalt. The section opened to a void measuring 2' x 7', 2' deep, located alongside and beneath the 8" Texas Eastern pipeline. Additional void space was identified adjacent to the Norfolk Southern wing wall and Verizon utility pole within a 30' x 9' area.

New or Potential Hazard Conditions or Events

GUN VIOLENCE

Gun violence is violence committed with the use of firearms, including homicide, assault with a deadly weapon, suicide or attempted suicide, and accidental or unintentional injury and death. Montgomery County considers gun violence a public health problem, and supports the American Public Health Association's assessment that the issue of gun violence is complex and deeply rooted in culture and that a comprehensive public health approach to addressing this crisis is necessary.

Gun violence affects people of all ages and races in the U.S. but has a disproportionate impact on young adults, males, and racial/ethnic minorities. The issue is complex, and includes different types of gun violence—domestic violence, community violence, mass shootings, and police-involved shootings. According to the Montgomery County Department of Health and Human Services, 1 in 3 homes with children have guns, and 80% of unintentional firearm deaths of children under 15 occur at home. Between 2017 and 2018, white males accounted for over 75% of all gun related deaths. Over 75% of gun related deaths were classified as suicide with an average age of 48.2 years and 54.6 years respectively (data provided by Montgomery County Coroner's office).

The Montgomery County Detective Bureau holds gun turn-in events during the year, and the Health and Human Services website lists resources for gun violence prevention, including a link to Project Child Safe, a national comprehensive firearms safety education program. These and other efforts are critical in reducing gun violence in the county.

OPIOID ADDICTION

Nationally, Pennsylvania is among four of the hardest hit states from opioid-related deaths. Overdoses caused by opioids have become the leading cause of accidental death in Pennsylvania, surpassing automobile accidents (CDC, 2017). Opioids are highly addictive. They block the body's ability to feel pain and can create a sense of euphoria. Additionally, individuals often build a tolerance to opioids, which can lead to misuse and overdose. The Centers for Disease Control and Prevention (CDC) defines the following as the three most common types of opioids:

- » **Prescription opioids:** can be synthetic-oxycodone (OxyContin) or hydrocodone (Vicodin), or natural, like morphine.
- » **Fentanyl:** A powerful synthetic opioid that is 50 to 100 times more powerful than morphine and used for treating severe pain. Illegally made and distributed fentanyl is becoming more prevalent.

- » **Heroin:** An illegal natural opioid processed from morphine that is becoming more commonly used in the United States.

In Pennsylvania, of the 5,170 overdose deaths identified in 2020, 85 percent (4,398) were confirmed to be opioid-related, an 18 percent increase in opioid-related deaths compared to 2019 (3,741). In the past 5 years, Montgomery County's Overdose Death Rate per 10,000 People has averaged around 200 persons per year. It is important to note that first responders—paramedics, police officers, and fire fighters, are also affected by Pennsylvania's opioid addiction crisis. In addition to the crisis consuming time and resources, first responders also face exposure risk, particularly to synthetic fentanyl.

INVASIVE SPECIES

Invasive species are defined by Federal Executive Order 13112 as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health". These species can be any type of organism: plant, fish, invertebrate, mammal, bird, disease, or pathogen. The damage rendered by invasive species can be significant because they have biological traits that provide them with competitive advantages over native species, particularly because in a new habitat they are not restricted by the biological controls of their native habitat.

Invasive species that recently have had an impact on Montgomery County include the Emerald Ash Borer, and the Spotted Lanternfly. Currently, there are three control options for the Emerald Ash Borer: tree removal, chemical control, and biological control. While these options may represent an expense to a homeowner with one or more affected trees, the expense is significantly multiplied for municipalities and the county, when multiple trees need to be treated or removed along trails and in parks for public safety reasons.

The Pennsylvania Department of Agriculture website recommends that a control program for the Spotted Lanternfly be a combination of:

- » Physical removal at any life stage.
- » Removal of Tree-of-Heaven host trees.
- » Pesticide applications

The Department of Agriculture also developed a Quarantine protocol, which was published as an Order of Quarantine and Treatment: Spotted Lanternfly, at 51 PA.B. 1346, issued Saturday, March 13, 2021.

According to the Pennsylvania Invasive Species Council (PISC), the probability of future occurrence for invasive species threats is on the rise. A large reason is due to expanded global trade that creates opportunities for many organisms to be transported to and established in new countries and regions. In addition, the impacts from invasive species may be compounded by climate change. It is estimated that Montgomery County and the rest of the region will continue to experience invasive species as well as their induced secondary hazards and health threats in the future.

EXPANDED HAZARD EVALUATION

Information on potential hazards in Montgomery County is provided in the following chapters, based upon various sources including several local, state, and federal level agencies, university scientific research, citizen groups, and county records. Our ability to predict when any hazard will occur and the impact of it at any time is limited. Predictions result from past information, reasonable analysis and limited modeling available to us. Making this effort more difficult are the changing conditions in which hazard mitigation planning takes place. Information on the potential effect of climate change on certain hazards has been included in some cases. In recognition that hazards do not affect the various constituents of the county's population in the same way, limited discussion of equity issues is also included.

Implementation Activities

Goal #1: Develop a better understanding of the potential disasters that could occur in Montgomery County.

Montgomery County continues to develop its Geographic Information Systems (GIS) Strategic Management Plan for the entire county. This will enable integration of data used by county

departments into the decision-making process. Data from the Penn State Data Center and the Delaware Valley Regional Planning Commission, as well as other sources, are being incorporated into the county GIS system.

Montgomery County has acquired impervious coverage data from the Delaware Valley Regional Planning Commission (DVRPC) based on recent aerial imagery. These files include building footprint information that can be maintained and updated as newer imagery is acquired.

Goal #2. Ensure that the public understands potential hazards and is aware of which actions to be taken to minimize their risks.

MC DPS maintains the Emergency Management Guide.

MC DPS and MCHD provided various types of topically important outreach activities and literature to help residents and visitors better understand various risks.

Goal #3. Significantly reduce the risk of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from all hazards.

Infrastructure Upgrades

Numerous roads and bridges, including associated culverts that convey floodwaters, have been repaired and upgraded in the county. In some cases, the affected roadways represent the main access to hospitals and other critical response facilities.

The county maintains, and has expanded its Eventbrite emergency notification system.

Training

The Montgomery County Public Safety Campus in Plymouth Township provides classrooms, training, and other support facilities for the Fire Academy, Emergency Medical Services Training Institute, Law Enforcement Division, Hazardous Materials Response Team, and the Sheriff Department's Bomb Disposal Unit.

The Emergency Management section of the Department of Public Safety attained Pennsylvania Fish and Boat Type 1a Water Rescue Certification. It also placed in service a new high water rescue vehicle and a 12' "Boat in a Bag" for smaller water rescue/flood management incidents.

The Montgomery County Community College also uses the training campus for its Municipal Police Academy, Police In-Service training program, and Fire Science classes.

Public Outreach

In the past 5 years, Montgomery County has sponsored 30 household hazardous waste collection events. Each event is typically well attended, with usually over 1,000 carloads of material safely managed. An online reservation system was initiated in 2019-2020 that has all but eliminated long lines of cars at the events, adding to their safety. Montgomery County works with the City of Philadelphia and the surrounding suburban counties to coordinate regional collection efforts, which results in approximately 30 events held annually in the Philadelphia Area.

Over the last several years, Montgomery County issued warnings to alert the public about heat and cold weather emergencies that included information about personal safety protection during extreme cold conditions.

Planning and Policy

Natural Resource Protection Ordinances: Through community planning assistance work, MCPC's professional staff has established ordinances that lessen the impact of development on environmentally sensitive resources, such as floodplains, riparian corridors, and steep slopes. These ordinances mitigate future disasters that could result from an event associated with those resources.

Montgomery County Comprehensive Plan: Montco 2040: A Shared Vision was adopted by the Montgomery County Commissioners in January 2015. The comprehensive plan provides an overall framework for local municipal plans and provides guidance on issues that transcend local boundaries, such as highways, public transportation, flooding, trails, growth trends, redevelopment trends, shopping needs, public safety, impact of large developments, overall housing needs, natural systems, and economic growth.

Several goals in the plan further the county's resilience to future hazards including:

- » Encourage collaboration and partnerships among governments, businesses, institutions,

schools, higher education, and other stakeholders.

- » Support a modern, resilient, green, and energy efficient infrastructure network.
- » Improve stormwater management and reduce the impact of flooding.
- » Conserve natural resources, environmentally sensitive areas, and farmland.
- » Enhance community character and protect neighborhoods.

Toward the end of the Hazard Mitigation Plan update process, a comprehensive plan update was initiated. The comprehensive plan update process will take several years, during which there will be a substantial effort made to incorporate the recommendations of the Hazard Mitigation Plan.

Montgomery County Debris Management Plan: The debris management plan prepared in 2014 to further debris management planning efforts in Montgomery County is still a relevant resource. Identification, assessment, and coordination of necessary debris management resources in the event of a major disaster resulting in property damage and destruction of vegetation are aspects of disaster response covered in the plan. The effort to manage and process debris resulting from storms, most notably the remnants of hurricane Ida, has been assisted by the development of this plan.

Goal #4. Encourage and promote actions to minimize the impact of floods within the county.

Planning and Training

Floodplain Map and Municipal Ordinance Updates: The FEMA Flood Insurance Rate Maps for Montgomery County were updated by the US Department of Homeland Security's Federal Emergency Management Agency (FEMA) and became effective on March 2, 2016. All Montgomery County municipalities that participate in the National Flood Insurance Program were required to update their floodplain regulations in their zoning code in accordance with federal requirements. MCPC continues to assist all 62 municipalities in maintaining and implementing their floodplain zoning. The model floodplain ordinance prepared by MCPC is used for this task.

Acquisition and Removal of Flood Prone Properties

Demolition of repetitive loss flood properties:

- » In August 2022, the county acquired 3 properties located in Perkiomen Township (1) and Upper Frederick Township (2) that were extensively damaged by flooding on September 1, 2021. The county is managing the demolition of all structures on these sites and the sites will be maintained as open space.
- » In 2019, the county acquired a property located at 51 East Park Avenue in Schwenksville Borough. A house and multiple sheds and fencing were removed from the site, which is entirely within the mapped floodplain. The site is being preserved as open space.
- » In 2022, the county completed a project to construct a floodwall around a residential dwelling located at 6007 West Valley Green Road in Whitemarsh Township. The county will apply for a Letter of Map Revision from FEMA in 2023.

Plan Contents

The introduction in Chapter 1 provides the basis for this plan and the scope of the plan. Chapter 2 includes an update of the Community Profile of the county and the 62 municipalities that comprise it. The planning process used for the plan is described in Chapter 3. Chapter 4 provides a Risk Assessment based on information from all municipalities and various other sources and addresses 27 potential natural and human-caused threats to the county. The revised Capability Assessment in Chapter 5 examines the current capacity of county and municipal government to address the potential needs associated with potential threats identified in the Risk Assessment. Mitigation Strategy, described in Chapter 6, includes specific recommendations based on plan goals pertaining to all potential risks. Plan maintenance requirements and the process for plan adoption are described in Chapters 7 and 8.

Table of Contents

<i>Executive Summary</i>	<i>xvii</i>
<i>Purpose of the Plan</i>	<i>xvii</i>
<i>Recent Hazard Events</i>	<i>xvii</i>
<i>New or Potential Hazard Conditions or Events</i>	<i>xix</i>
<i>Implementation Activities</i>	<i>xx</i>
<i>Plan Contents</i>	<i>xxii</i>
<i>1 Introduction</i>	<i>1</i>
1.1 <i>Background</i>	<i>1</i>
1.2 <i>Purpose</i>	<i>1</i>
1.3 <i>Scope</i>	<i>2</i>
1.4 <i>Authority and Reference</i>	<i>2</i>
<i>2 Community Profile</i>	<i>5</i>
2.1 <i>Environment and Natural Resources</i>	<i>6</i>
2.3 <i>Communication Infrastructure</i>	<i>18</i>
2.4 <i>Population and Demographics</i>	<i>19</i>
2.5 <i>Land Use and Development</i>	<i>24</i>
2.6 <i>Data Sources and Limitations</i>	<i>28</i>
<i>3 Planning Process</i>	<i>29</i>
3.1 <i>Update Process & Participation Summary</i>	<i>29</i>
3.2 <i>The Planning Team</i>	<i>29</i>
3.3 <i>Meetings & Documentation</i>	<i>31</i>
3.4 <i>Public & Stakeholder Participation</i>	<i>32</i>
3.5 <i>Multi-Jurisdictional Planning</i>	<i>32</i>
<i>4 Risk Assessment</i>	<i>37</i>
4.1 <i>Update Process Summary</i>	<i>37</i>
4.2 <i>Hazard Identification</i>	<i>38</i>

4.2.1. Summary of Hazards	38
4.3 Hazard Assessment	40
4.3.1. Building Or Structure Collapse	40
4.3.1-1 Location and Extent	40
4.3.1-2 Range of Magnitude	42
4.3.1-3 Past Occurrence	44
4.3.1-4 Future Occurrence	44
4.3.1-5 Vulnerability Assessment	44
4.3.2. Civil Disturbance	47
4.3.2-1 Location and Extent	47
4.3.2-2 Range of Magnitude	48
4.3.2-3 Past Occurrence	49
4.3.2-4 Future Occurrence	50
4.3.2-5 Vulnerability Assessment	50
4.3.3. Cyber Security Disruption	51
4.3.3-1 Location and Extent	51
4.3.3-2 Range of Magnitude	51
4.3.3-3 Past Occurrences	52
4.3.3-4 Future Occurrences	52
4.3.3-5 Environmental Impacts	52
4.3.3-6 Vulnerability Analysis	52
4.3.3-7 Additional Information	52
4.3.4. Dam Failure	52
4.3.4-1 Location and Extent	53
4.3.4-2 Range of Magnitude	54
4.3.4-3 Past Occurrence	55
4.3.4-4 Future Occurrence	55
4.3.4-5 Vulnerability Assessment	56
4.3.5. Drought	57
4.3.5-1 Location and Extent	57
4.3.5-2 Range of Magnitude	57
4.3.5-3 Past Occurrence	59
4.3.5-4 Future Occurrence	59
4.3.5-5 Environmental Impacts	60
4.3.5-6 Vulnerability Assessment	60
4.3.5-7 Additional Information	61
4.3.6. Earthquake	61
4.3.6-1 Location and Extent	61
4.3.6-2 Range of Magnitude	61
4.3.6-3 Past Occurrence	62
4.3.6-4 Future Occurrence	63
4.3.6-5 Vulnerability Assessment	63
4.3.7. Environmental Hazard	64
4.3.7-1 Location and Extent	64
4.3.7-2 Range of Magnitude	66
4.3.7-3 Past Occurrence	66
4.3.7-4 Future Occurrence	67

4.3.7-5 <i>Environmental Impacts</i>	67
4.3.7-6 <i>Vulnerability Assessment</i>	67
4.3.7-7 <i>Additional Information</i>	67
4.3.8. <i>Extreme Temperature</i>	68
4.3.8-1 <i>Location and Extent</i>	68
4.3.8-2 <i>Range of Magnitude</i>	68
4.3.8-3 <i>Past Occurrence</i>	69
4.3.8-4 <i>Future Occurrence</i>	69
4.3.8-5 <i>Environmental Impacts</i>	69
4.3.8-6 <i>Vulnerability Assessment</i>	69
4.3.8-7 <i>Additional Information</i>	71
4.3.9. <i>Flooding</i>	71
4.3.9-1 <i>Location and Extent</i>	71
4.3.9-2 <i>Range of Magnitude</i>	72
4.3.9-3 <i>Past Occurrence</i>	74
4.3.9-4 <i>Future Occurrence</i>	75
4.3.9-5 <i>Environmental Impacts</i>	75
4.3.9-6 <i>Vulnerability Assessment</i>	76
4.3.10. <i>War & Criminal Activity: Gun Violence</i>	77
4.3.10-1 <i>Location and Extent</i>	77
4.3.10-2 <i>Range of Magnitude</i>	77
4.3.10-3 <i>Past Occurrence</i>	77
4.3.10-4 <i>Future Occurrence</i>	78
4.3.10-5 <i>Vulnerability Assessment</i>	78
4.3.11. <i>Hailstorms</i>	79
4.3.11-1 <i>Location and Extent</i>	79
4.3.11-2 <i>Range of Magnitude</i>	79
4.3.11-3 <i>Past Occurrence</i>	79
4.3.11-4 <i>Future Occurrence</i>	82
4.3.11-5 <i>Vulnerability Assessment</i>	83
4.3.12. <i>Invasive Species</i>	83
4.3.12-1 <i>Location and Extent</i>	83
4.3.12-2 <i>Range of Magnitude</i>	83
4.3.12-3 <i>Past Occurrence</i>	84
4.3.12-4 <i>Future Occurrence</i>	84
4.3.12-5 <i>Vulnerability Assessment</i>	85
4.3.13. <i>Landslide</i>	85
4.3.13-1 <i>Location and Extent</i>	85
4.3.13-2 <i>Range of Magnitude</i>	87
4.3.13-3 <i>Past Occurrence</i>	87
4.3.13-4 <i>Future Occurrence</i>	87
4.3.13-5 <i>Vulnerability Assessment</i>	87
4.3.14. <i>Hurricane, Tropical Storm, Nor'easter</i>	88
4.3.14-1 <i>Location and Extent</i>	88
4.3.14-2 <i>Range of Magnitude</i>	88
4.3.14-3 <i>Past Occurrence</i>	89
4.3.14-4 <i>Future Occurrence</i>	90

4.3.14-5 <i>Environmental Impacts</i>	90
4.3.14-6 <i>Vulnerability Assessment</i>	90
4.3.14-7 <i>Additional Information</i>	90
4.3.15. <i>Levee Failure</i>	91
4.3.15-1 <i>Location and Extent</i>	91
4.3.15-2 <i>Range of Magnitude</i>	92
4.3.15-3 <i>Past Occurrence</i>	92
4.3.15-4 <i>Future Occurrence</i>	92
4.3.15-5 <i>Vulnerability Assessment</i>	92
4.3.16. <i>Lightning Strike</i>	93
4.3.16-1 <i>Location and Extent</i>	93
4.3.16-2 <i>Range of Magnitude</i>	93
4.3.16-3 <i>Past Occurrence</i>	93
4.3.16-4 <i>Future Occurrence</i>	95
4.3.16-5 <i>Vulnerability Assessment</i>	95
4.3.17. <i>Nuclear Incidents</i>	95
4.3.17-1 <i>Location and Extent</i>	96
4.3.17-2 <i>Range of Magnitude</i>	97
4.3.17-3 <i>Past Occurrence</i>	97
4.3.17-4 <i>Future Occurrence</i>	97
4.3.17-5 <i>Vulnerability Assessment</i>	98
4.3.18. <i>Opioid Addiction</i>	99
4.3.18-1 <i>Location and Extent</i>	99
4.3.18-2 <i>Range of Magnitude</i>	99
4.3.18-3 <i>Past Occurrence</i>	100
4.3.18-4 <i>Future Occurrence</i>	100
4.3.18-5 <i>Vulnerability Assessment</i>	100
4.3.19. <i>Pandemic and Infectious Disease</i>	101
4.3.19-1 <i>Location and Extent</i>	102
4.3.19-2 <i>Past Occurrence</i>	103
4.3.19-3 <i>Future Occurrence</i>	103
4.3.19-4 <i>Vulnerability Assessment</i>	103
4.3.20. <i>Radon Exposure</i>	104
4.3.20-1 <i>Location and Extent</i>	104
4.3.20-2 <i>Range of Magnitude</i>	104
4.3.20-3 <i>Past Occurrence</i>	105
4.3.20-4 <i>Future Occurrence</i>	108
4.3.20-5 <i>Vulnerability Assessment</i>	108
4.3.21. <i>Subsidence, Sinkholes</i>	109
4.3.21-1 <i>Location and Extent</i>	109
4.3.21-2 <i>Range of Magnitude</i>	110
4.3.21-3 <i>Past Occurrence</i>	110
4.3.21-4 <i>Future Occurrence</i>	111
4.3.21-5 <i>Vulnerability Assessment</i>	111
4.3.22 <i>Terrorism</i>	112
4.3.22-1 <i>Location and Extent</i>	112
4.3.22-2 <i>Range of Magnitude</i>	112

4.3.22-3	Past Occurrence	114
4.3.22-4	Future Occurrence	114
4.3.22-5	Vulnerability Assessment	114
4.3.23.	Transportation Crashes	116
4.3.23-1	Location and Extent	116
4.3.23-2	Range of Magnitude	116
4.3.23-3	Past Occurrence	117
4.3.23-4	Future Occurrence	118
4.3.23-5	Environmental Impacts	118
4.3.23-6	Vulnerability Assessment	118
4.3.23-7	Additional Information	119
4.3.24.	Urban Fire and Explosion	119
4.2.24-1	Location and Extent	119
4.3.24-2	Range of Magnitude	120
4.3.24-3	Past Occurrence	122
4.3.24-4	Future Occurrence	122
4.3.24-5	Environmental Impacts	122
4.3.24-6	Vulnerability Assessment	122
4.3.24-7	Additional Information	123
4.3.25.	Utility Interruption	123
4.3.25-1	Location and Extent	123
4.3.25-2	Range of Magnitude	124
4.3.25-3	Past Occurrence	125
4.3.25-4	Future Occurrence	125
4.3.25-5	Vulnerability Assessment	126
4.3.26.	Wildfire	127
4.3.26-1	Location and Extent	127
4.3.26-2	Range of Magnitude	127
4.3.26-3	Past Occurrence	127
4.3.26-4	Future Occurrence	127
4.3.26-5	Environmental Impacts	127
4.3.26-6	Vulnerability Assessment	128
4.3.26-7	Additional Information	128
4.3.27.	Winter Storms	128
4.3.27-1	Location and Extent	128
4.3.27-2	Range of Magnitude	129
4.3.27-3	Past Occurrence	129
4.3.27-4	Future Occurrence	130
4.3.27-5	Vulnerability Assessment	130

5 Capability Assessment

133

5.1	Update Process Summary	133
5.2	Legal Context	134
5.2.1.	Federal Laws	134
5.2.2.	State Laws	135
5.2.3.	Local Ordinances	135
5.3	Capability Assessment Findings	136
5.3.1.	Planning and Regulatory Capability	136

5.3.2. Emergency Management	148
5.3.3. Participation in the National Flood Insurance Program (NFIP)	152
5.3.4. Planning and Regulatory Capability	153
5.3.5. Fiscal Capability	154
5.3.6. Political Capability	155
5.3.7. Education and Outreach	155
5.3.8. Plan Integration	155
6 Mitigation Strategy	157
6.1 Update Process Summary	157
6.2 Mitigation Goals and Objectives	158
6.3 Identification and Analysis of Mitigation Techniques	167
6.4 Mitigation Action Plan	169
7 Plan Maintenance	181
7.1 Update Process Summary	181
7.2 Monitoring, Evaluating, and Updating the Plan	181
7.3 Incorporation into Other Planning Mechanisms	182
7.4 Continued Public Involvement	182
8 Plan Adoption	183
8.1 County Plan Adoption	183
8.2 Municipal Plan Adoption	183
9 Appendices	185
A Bibliography	187
B Local Mitigation Plan Review Crosswalk	191
C Public Involvement	209
D Emergency Declarations	273
E Critical Facilities	275
F Mitigation Action Progress Report Form	295
G STAPLEE Forms	297
H County Resolution	301
I Municipal Resolution	303
J Municipal Contracts	305

Introduction

1.1 Background

Hazard mitigation describes actions that are taken to eliminate or reduce risks to life and property from various forms of hazards in our world. By anticipating hazards and taking mitigation steps in advance of the onset of threatening events, communities can break the disaster cycle of damage, emergency response, reconstruction, and repeated damage. Though it is impossible to predict the future with certainty or to be prepared for every situation, effective mitigation measures can make a community more resilient and reduce exposure to the impact of the hazards that the county will face. To be effective, emergency management strategy must involve a full cycle of planning including mitigation, preparedness, response, and recovery.

Planning to avoid the consequences of disasters is a shared responsibility at all levels of local government, businesses, and residents. Everyone must be involved in mitigation. Responsibility for land use planning and preserving public health and safety can be exercised through the authority granted to municipal officials under the Municipal Planning Code (MPC) and various federally and state funded initiatives. Plans for community development, infrastructure, and emergency management are developed at the local level. Powers to enact or enforce construction, property maintenance, and fire prevention standards are derived from the individual codes that convey powers to all forms of local government, including townships of the first class, townships of the second class, boroughs, and home rule charter communities. The Pennsylvania Uniform Construction Code (UCC) is a fundamental law that guides all forms of construction. County government coordinates many initiatives that span municipal boundaries. Municipal and county government relies upon state and federal resources to implement various initiatives undertaken to mitigate local hazards. The cooperation of the private sector and each resident of the county will also be essential to ensure that mitigation actions presented in this plan are effective.

In the past several decades, the impact of various hazards on the nation has resulted in deaths, injuries, property damage and the interruption of business and government services. The resources required to recover from disasters caused by human, technological, and natural hazards have increased to the point where it is placing a strain on other government services. Since 1953, there have been 63 emergency declarations have been proclaimed that have impacted Montgomery County. A full list of all of the declarations can be found in Appendix J.

1.2 Purpose

This plan is intended to provide the county and the municipalities with a strategy for mitigation of natural, human and technological disasters that could occur in Montgomery County. It addresses the local government planning responsibilities established by the Stafford Act, as amended, which

requires state and local governments to develop and adopt an approved mitigation plan as a condition for receiving federal disaster grants and loans. This plan revises and updates the Montgomery County Hazard Mitigation Plan prepared in 2017 and adopted by nearly all 62 municipalities in the county.

The hazard mitigation plan provides a single source of information about the threat from various natural and human-caused hazards to Montgomery County and various strategies to reduce the threat. It also complements other emergency management planning documents used regularly by county and state officials. Prior to the development of the original plan in 2007, no single source of information about floods and other natural and human-caused hazards was available for reference. Instead, information was scattered in municipal and county departments. With subsequent revisions, this plan has become the source of comprehensive information about hazards in the county. With clear goals about future mitigation approaches and defined mitigation projects, this plan provides a framework for future action at all levels of government and private business to reduce the impact of future disaster conditions.

1.3 Scope

The plan follows a structure used in the 2017 Montgomery County Plan and most recent state plan based on the Standard Operating Guide (SOG) developed by PEMA for county plan updates in Pennsylvania. By using this structure, the information in the plan will be found in similar sections as the state plan and plans prepared for other counties in the Commonwealth, thereby enabling the sharing of information and cross-referencing other plans as appropriate. The plan contains several chapters which describe relevant information about hazards in the county, the planning process, recommendations for mitigating hazards and future plan maintenance responsibilities. The Community Profile Chapter of the plan provides an overview of the county and its 62 municipalities. The planning process used for this plan is documented in Chapter 3. Risk Assessment is a significant part of the plan outlined in Chapter 4. This chapter contains updated information from the 2012 Plan describing and evaluating each potential hazard. The county and study advisory committee relied upon historic information, best available research information, and predictive models to undertake this risk assessment for the county. As part of the process to evaluate hazard threats, attempts are made at estimating future losses and evaluating future trends that could change the vulnerability of the county to any of the threats. Chapter 5 describes the current capability of the county and municipal organizations to address all hazards. Chapter 6 itemizes the mitigation strategies needed to address potential threats based on community goals. Attempts are made to determine the economic, social, and environmental costs and benefits associated with each potential action given the limitations of available data. Also, the county and local governmental capacities are taken into account in the development of appropriate strategies. The remainder of this chapter identifies action strategies with cost-effective and technically feasible disaster loss reduction measures. Chapter 7 of the plan discusses the future plan maintenance procedures that the county will undertake with the help of each of the 62 municipalities and other key partners. Chapter 8 discusses plan adoption process. Appendices containing important data and summaries of the planning process steps are also included.

1.4 Authority and Reference

Authority for this plan originates from the following federal sources:

[Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., as amended](#)

[National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 et seq.](#)

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

[Pennsylvania Emergency Management Services Code, Title 35, Pa C.S. Section 101](#)

[Pennsylvania Municipalities Planning Code of 1968, P.L. 805, No. 247, as amended December 21, 1988, P.L. 1329, No. 170](#)

[Pennsylvania Stormwater Management Act of October 4, 1978, P.L. 864, No. 167](#)

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

[FEMA, Integrating Hazard Mitigation Into the Local Comprehensive Plan.](#)

[FEMA, The Role of Local Leadership.](#)

[FEMA, Social and Economic Benefits.](#)

[FEMA, Planning for Post-Disaster Redevelopment.](#)

[FEMA, Protecting Community Infrastructure.](#)

[FEMA, Mitigation Ideas – January 2013](#)

[FEMA, Natural Hazard Retrofit Program Toolkit](#)

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

[PEMA, Standard Operating Guide. October 9, 2013](#)

The following American Planning Association (APA) guides and reference documents were used to prepare this document:

[APA, PAS Report Hazard Mitigation: Integrating Best Practices Into Planning – May, 2010](#)

[APA, PAS Report 576 Planning For Post-Disaster Recovery: Next Generation – March, 2015](#)

[APA, PAS Report 584 Subdivision Design And Flood Hazard Areas - October, 2016](#)



Figure 2.1 | **Regional Setting**

Community Profile

- Montgomery County, PA is located directly northwest of Philadelphia, PA
- Created on September 10, 1784 from part of Philadelphia County
- 483 square miles of land
- 4.2 square miles of water
- Home to more than 856,500 residents and third most-populated county in PA
- Sixty-two municipalities, five types of local governments: cities, boroughs, townships, home-rule municipalities, and towns

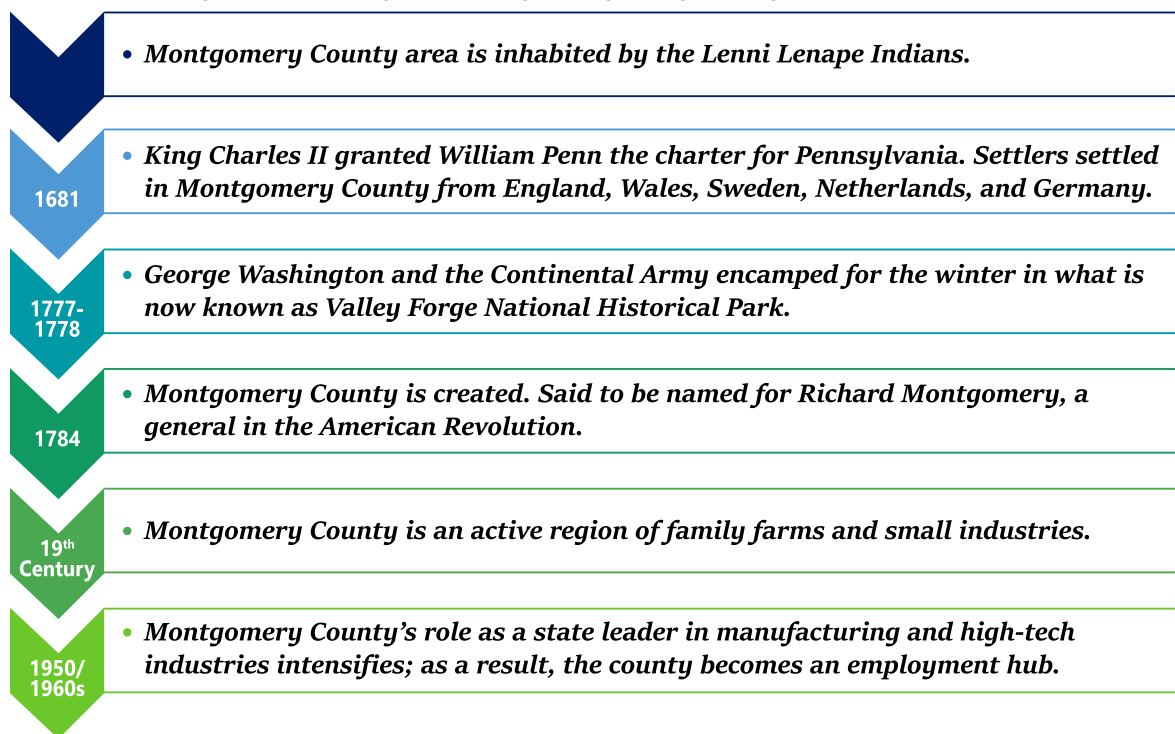
The county is one of five southeastern Pennsylvania and four New Jersey counties comprising the Philadelphia region, which is the seventh largest in the nation. This region, with more than six million people, functions as an interdependent metropolis that competes with other cities around the globe. Other Pennsylvania counties in the region include Bucks, Chester, Delaware, and Philadelphia Counties.

The Philadelphia region, located in the Northeast Corridor between New York and Washington, D.C., is relatively dense, with 1,311 people per square mile. The region's landscape is defined by its two rivers—the Delaware and Schuylkill Rivers.

Like many suburban communities across the nation, Montgomery County has changed significantly over the past century, evolving from a primarily agricultural place with a number of large industrial towns to a dynamic employment hub with a wide range of high-tech and service jobs.

Montgomery has always been a center of commerce and transportation in southeastern Pennsylvania, and this role has intensified during the past 60 years. With over a half million jobs, Montgomery County leads the state in manufacturing and high-tech jobs, importing tens of thousands of workers from neighboring counties. With its many malls, the county attracts shoppers from all over the region. And, with its extensive expressway system, the county is a transportation hub, providing a gateway to the rest of the state.

Montgomery County has a long history and was significantly involved in the American Revolution—it's a beautiful place, with rolling farmland, winding streams, and wooded hills—and it's a neighborly place, home to many traditional towns and residential communities.

Figure 2.2 | *A Brief Timeline of Montgomery County*

2.1 Environment and Natural Resources

CLIMATE

Daily temperatures in Montgomery County typically range between 22.8° (Avg. Jan Low) and 86.0° (Avg. July High). In Montgomery County, there are 20.0 days annually when the high temperature is over 90°, which is one of the hottest places in Pennsylvania. Montgomery County receives approximately 48 inches of rain on average per year, in contrast the US average is 38 inches per year. Over the winter Montgomery County averages 18 inches of snow per year. That said, Montgomery County is wetter than most places in Pennsylvania with the winter season being the driest time of the year. Heavy rain that may result in flash, urban, and small stream flooding are frequent across the county.

GEOLOGY, SLOPES & SOILS

The county contains geological formations associated with the Triassic Lowlands found to the west of the Pennsylvania Turnpike and the Piedmont Uplands south and east of the Turnpike. The Piedmont Uplands comprise metamorphic and igneous rock (granite and schist) as well as a band of carbonate rock that stretches from Willow Grove to King of Prussia. Wissahickon Schist/Granite Gneiss/Hornblende Gneiss/Chickies Quartzite, and Ledger Dolomite/Elbrook/Conestoga Limestone are formations found in the Piedmont Uplands. The Triassic Lowlands are primarily red shales and sandstones with intrusions of diabase. Four formations: the Stockton Sandstone/Conglomerate/Shale, Lockatong Argillite/Shale, Brunswick Shale/Sandstone, and diabase, make up the Triassic Lowlands.

Concentrations of steep slopes are most often associated with particular geologic formations such as the diabase intrusions in the western portion of the county; the Lockatong argillite, especially in Upper and Lower Providence Townships; and the Wissahickon Schist in Lower Merion Township. Major slopes are most prominent along the Schuylkill River valley and major streams such as the Perkiomen and Pennypack Creeks. The most significant steep slopes in the county can be found along the Schuylkill Expressway and along Mill Creek in Lower Merion; in portions of Barren Hill and Miquon in Whitemarsh; along the Perkiomen Creek in Upper Salford, Upper Providence, and Lower Providence Townships; and along the Pennypack Creek in Abington Township. Very steep ravines can be found along the Schuylkill River near Mont Clare and in the Ridge Valley Creek in Salford and Marlborough Townships.

Figure 2.3 | **Geology**

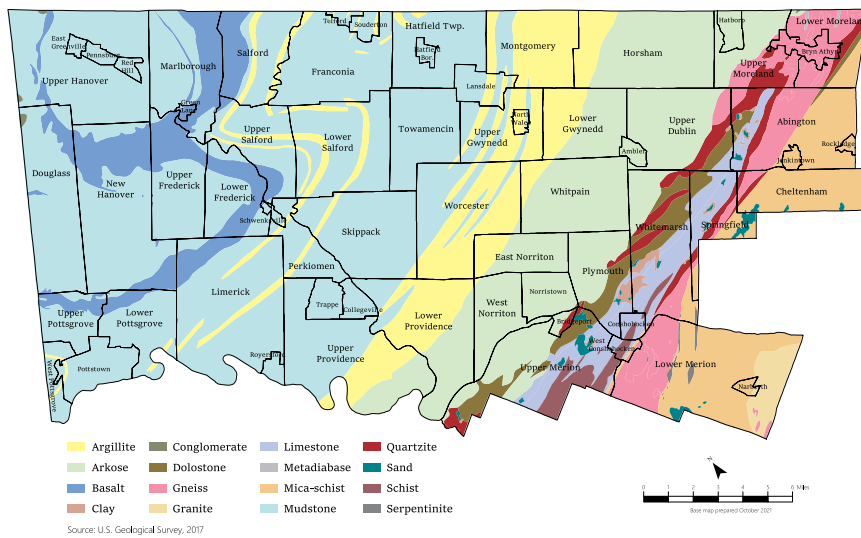


Figure 2.4 | **Steep Slopes**

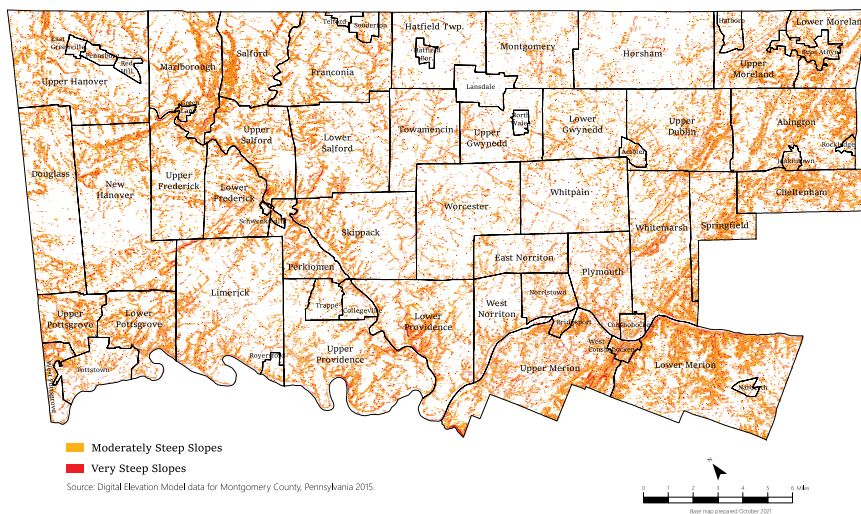
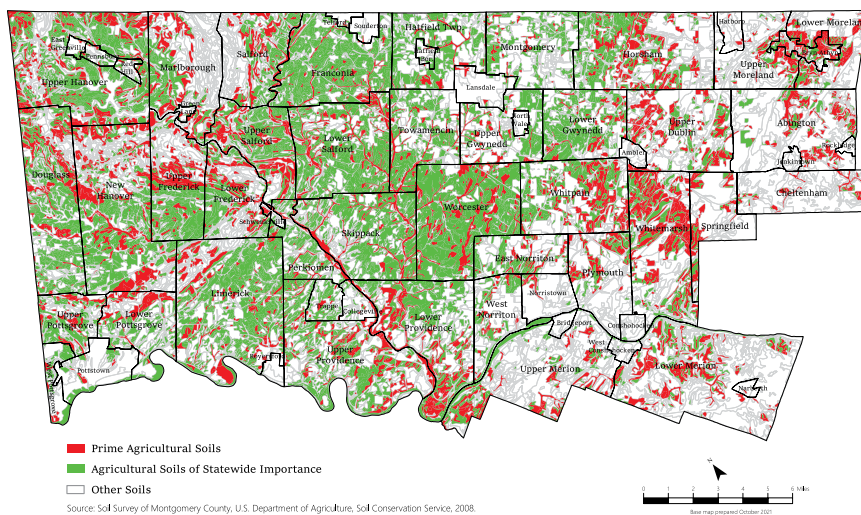


Figure 2.5 | **Soils**



Prime farmland soils, which comprise 50,983 acres, are deep, well-drained, and moderately sloped soils that can support high yields of crops with little management. Farmland of statewide importance includes soils that support cultivation but require careful crop management and includes about 87,089 acres in the county. The major areas of prime agricultural soils are in the Skippack Creek Watershed, especially Worcester Township. Ironically, some of the best agricultural soils in the county are within the heavily developed areas along the Pennsylvania Turnpike. Conversely, the western part of the county where most of the farms are located has a limited amount of prime agricultural soils. The remaining soils are generally hydric, supporting the growth of wetland vegetation, or alluvial soils, typically associated with floodplains.

WATER RESOURCES

Montgomery County contains approximately 1,135 miles of streams and rivers connecting over 4,413 acres of lakes and ponds and 2,633 acres of wetland areas, all within the Delaware River Basin. At a smaller level, 83% of the county's land area contributes to the Schuylkill River watershed, which includes the Wissahickon Creek watershed and the Perkiomen Creek watershed. All of the county's notable lakes and ponds are located in the northwest corner including Green Lane Reservoir (814 acres), Deep Creek Lake (38 acres), and Knight Lake (25 acres).

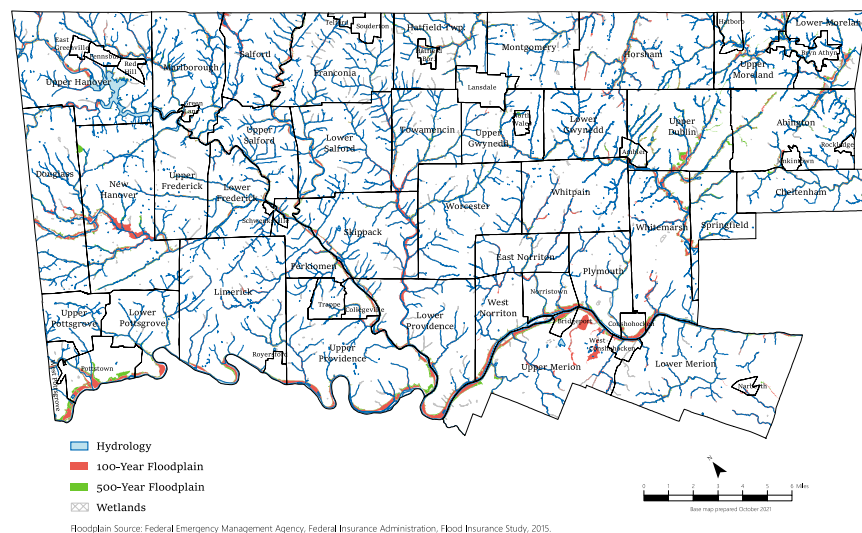
Additionally, 21,311 acres or approximately 7% of the county lie within the 100-YR floodplain.

Figure 2.6 | Delaware River Basin Region



Credit: Delaware River Basin Commission

Figure 2.7 | **Hydrology, Wetlands & Floodplains**

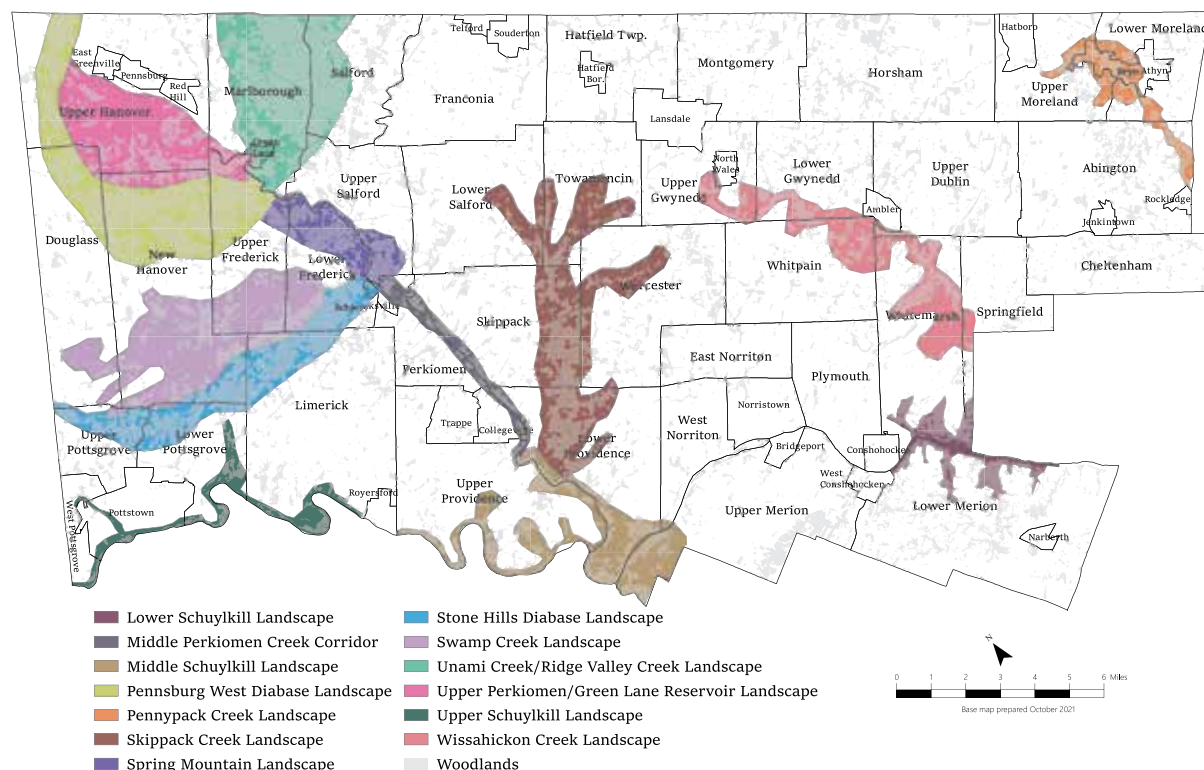


NATURAL LANDSCAPES

Woodlands across Montgomery County have become more fragmented as roads, land developments, utilities and other forms of development have cut into them. Small and isolated woodlands often have limited ecological value have been witnessing hardships due to invasive plants and deer populations. As of 2020, 54,464 acres or approximately 18.97% of the county remains woodlands. Overall, this is a decrease of 3%. Generally, Montgomery County can identify woodlands as A) Red Oak Forests, B) Mixed Hardwoods, and C) Emerging Woodlands. However, there are small areas of the county with coniferous tree stands including hemlocks, on northern facing slopes near Sunrise Mill and Green Lane Reservoir.

In 2008, Montgomery County completed a Natural Areas Inventory identify thirteen conservation landscapes across 74,711 acres or 24% of the county. These landscapes host large, forested tracts, stream corridors, wetlands and a high natural diversity of plant and animal species.

Figure 2.8 | **Woodlands & Conservation Landscapes**



Conservation Landscapes Source: Pennsylvania Department of Conservation and Natural Resources, 2008.
Woodlands Source: U.S. Department of Agriculture and University of Vermont, 2010.

Within these Natural Areas, Montgomery County is home to a diverse population of wildlife. See Table 2.2 for a list of species, which include several species classified as sensitive, threatened, or endangered by state and federal regulations.

Table 2.2 | **Common Wildlife In Montgomery County, PA**

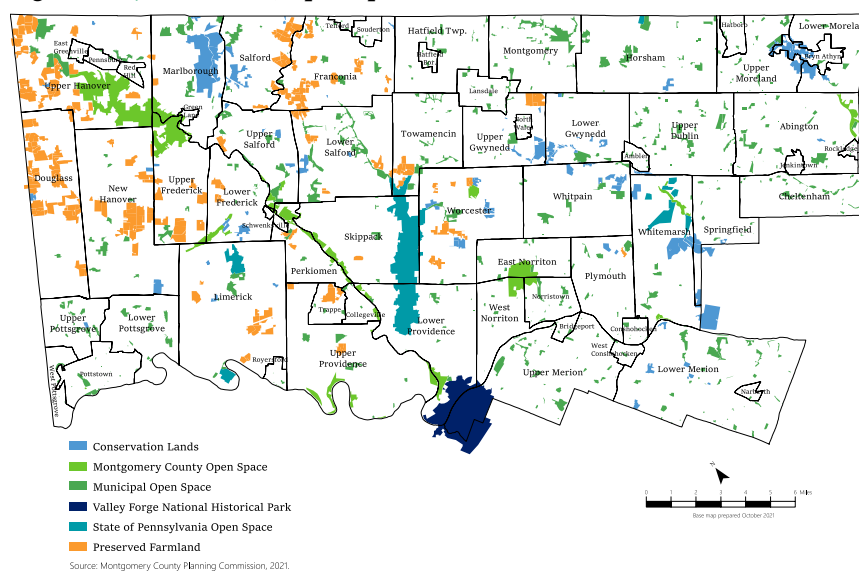
MAMMALS	REPTILES	AMPHIBIANS	WATERFOWL
Raccoons; Red Squirrels; White-tail Deer; Grey Squirrels; Flying Squirrels; Chipmunks; Woodchucks; Muskrats; Opossums; Mice; Voles; Shrews; Bats	Snapping Turtle; Musk Turtle; Painted Turtle; Red-Bellied Turtle; Bog Turtle; Eastern Garter Snake; Black Rat Snake; Northern Ring-necked Snake; Northern Brown Snake; Northern Water Snake	American Toad; Pickerel Frog; Green Frog; Bullfrog; Spring Peeper Frog; Northern Red-Backed Salamanders; Northern Two-Lined Salamander	Canada Geese; Mallards; Common Mergansers; Wood Ducks; Black Vultures; Hawks; Golden Eagles; Bald Eagles; Atlantic Flyway; Great Blue Heron

All in all, Montgomery County contains approximately 41,514 acres of permanently preserved land, or 13.4% of the total land in the county. These permanently protected lands are comprised primarily of publicly accessible park and historic sites, held under federal, state, county, and municipal ownership. Additional protected land, which may provide limited or no public access, includes preserved farmland, natural areas, and properties under conservation easements.

More than 13,500 acres of open space and park lands are currently under municipal ownership, making municipal open space the largest segment of preserved land in the county. Most of this land is owned in fee; very few municipalities have purchased conservation easements to protect properties. Municipal open space is used for a variety of activities including activity and passive recreation.

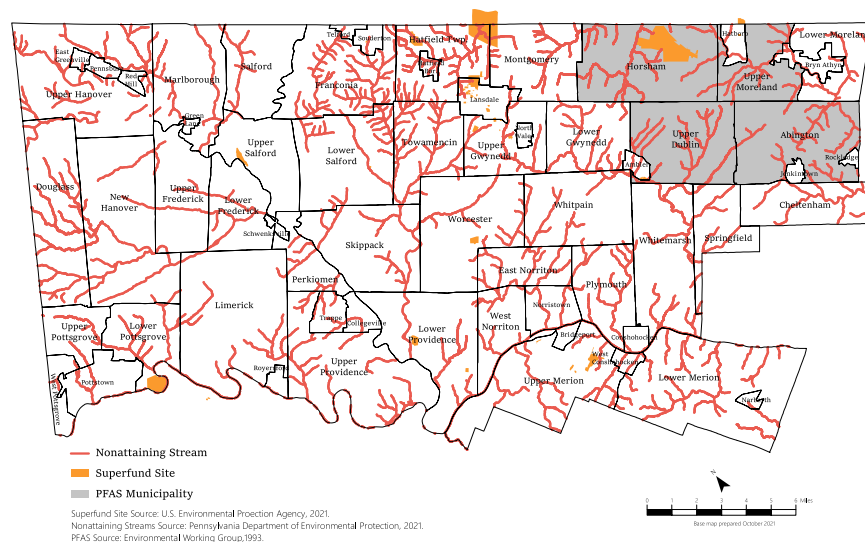
Private non-profit conservation organizations own 6,825 acres of open space as part of their primary mission to protect and conserve open land and natural resources. Additionally, as of May 2021, there are 177 farms preserved in Montgomery County under the Montgomery County Agricultural Land Preservation Program. These farms total 10,295 acres. In Pennsylvania, there are 5,813 preserved farms in 59 participating counties: 591,819 acres total.

Figure 2.9 | **Recreation, Open Space & Preserved Farmlands**



CONTAMINATION

Figure 2.10 | **Environmental Contamination 2021**



Water Quality: DEP has an ongoing program to assess the quality of surface waters in Pennsylvania and identify streams and bodies of water that are not attaining protected uses as “impaired.” As of 2021, approximately 1,032 miles of stream or 74% of Montgomery County’s streams do not attain current water quality standards set by the Pennsylvania Department of Environmental Protection. Generally, Montgomery County streams are impaired due to urban runoff/storm sewers/siltation, habitat modification/alterations/flow modification, municipal point source discharges/nutrients, unknown pathogens or PCBs, among other factors. However, large areas of attaining streams do exist in the Perkiomen Creek watershed.

Chemical Contamination: Measurements of Per- and Polyfluoroalkyl Substances (PFAS) have spiked in Eastern Montgomery County where contamination of public and private wells has occurred. PFAS are a diverse group of human-made chemicals that have been used since the 1940s in a range of consumer products, including non-stick cookware, flame-retardant fabrics, and some food packaging. These chemicals have also been used for years by the military in fire-fighting foam. Some of the state’s highest PFAS levels have been found in the Horsham/Warminster area of Bucks and Montgomery counties where two shuttered military bases have been identified as contamination sources. Most recently, the Pennsylvania Department of Agriculture (PDA), Department of Environmental Protection (DEP), and Department of Health (DOH), along with the Pennsylvania Fish and Boat Commission (Commission), announced a “DO NOT EAT” advisory for all fish species caught in the Neshaminy Creek basin in Bucks and Montgomery counties in October, 2021, due to extremely high levels of Perfluorooctane Sulfonate (PFOS). The advisory extends to all fish throughout the Neshaminy Creek basin, including Neshaminy Creek State Park and Tyler State Park.

Superfund and Brownfield Sites: Montgomery County has a handful of remediated and active Superfund sites; a Superfund site is a toxic site contaminated by various hazardous wastes that requires clean-up because it poses a risk to the environment as well as human beings. Likewise, due to the county’s history of a plethora of small industrial businesses, brownfield or old-industrial tracts exist and contamination is present. However, many brownfields have been redeveloped, such as the reuse of the Anchor Glass property in Royersford for townhouses and apartments, more office and residential development in Conshohocken, the conversion of the Turbo Lofts in Lansdale to condos, and the conversion of the Stoveworks in Hatboro to apartments.

Table 2.3 | **Montgomery County's National Priority Superfund Sites List, Final**

SITE NAME	CITY/TOWNSHIP	CONSTRUCTION COMPLETE	READY FOR ANTICIPATED FUTURE USE
Baghurst Drive	Harleysville	Nearly	No
Borit Asbestos	Ambler	Yes	Yes
Commodore Semiconductors Group	Lower Providence	Yes	Yes
Crater Resources Inc., Keystone Coke Co., Alan Wood Steel Co.	Upper Merion	No	No
Henderson Road	Upper Merion	Yes	Yes
North Penn – Area 1	Souderton	Yes	Yes
North Penn – Area 12	Worcester	Yes	Yes
North Penn – Area 2	Hatfield	Yes	Yes
North Penn – Area 5	Montgomery	No	No
North Penn – Area 6	Lansdale	No	No
North Penn – Area 7	North Wales	No	No
Occidental Chemical Corp., Firestone Tire & Rubber Co.	Lower Pottsgrove	Yes	Yes
Raymark	Hatboro	Yes	Yes
Salford Quarry	Lower Salford	No	No
Stanley Kessler	King of Prussia	Yes	Yes
Tyson's Dump	Upper Merion	Yes	Yes
Willow Grove Naval Air and Air Reserve Station	Horsham	No	No

Air Quality: There are six [principal pollutants](#) that act as indicators of air quality in the United States. The Clean Air Act calls them “criteria pollutants”. The National Ambient Air Quality Standards ([NAAQS](#)) identify the concentrations of these principal pollutants, above which, adverse effects on human health may occur. Montgomery County is designated as a “nonattainment” area for Ozone and Particulate Matter (PM) which means the county consistently exceeds safe standards.

As levels of any, or all, of these air pollutants rise beyond health standards, precautionary health warnings are triggered. Exposure warnings are divided into six categories: Good, Moderate, Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, and Hazardous. Since 2010, Montgomery County has only issued the “Unhealthy for All” warning for two days, whereas the “Unhealthy for Sensitive Groups” warning was issued for 82 days over 10 years.

Table 2.4 | **Montgomery County Air Quality, 2010 - 2020**

OVERALL AIR QUALITY, NUMBER OF DAYS ON WHICH MEASUREMENTS FROM MONITORING SITES IN THE COUNTY WERE REPORTED BASED ON AIR QUALITY INDEX (AQI) VALES					
Year	# Days Good	# Days Moderate	# Days Unhealthy for Sensitive Groups	# Days Unhealthy for All	# Very Unhealthy Days
2020	313	53	0	0	0
2019	302	59	1	0	0
2018	284	61	7	0	0
2017	268	89	7	0	0
2016	280	46	5	0	0
2015	247	112	6	0	0
2014	259	100	6	0	0
2013	168	187	10	0	0
2012	237	121	8	0	0
2011	205	144	15	1	0
2010	229	118	17	1	0
DAYS ON WHICH NATIONAL STANDARDS FOR AIR QUALITY WERE EXCEED FOR CRITERIA POLLUTANTS					
Year	Nitrogen Dioxide	Ozone	Sulfur Dioxide	Particulate Matter	
	# Days N02	# Days O3	# Days S02	# Days PM 2.5	# Days PM 10
2020	0	219	0	147	0
2019	0	231	0	131	0
2018	0	212	0	140	0
2017	0	22	0	142	0
2016	0	317	0	14	0
2015	0	230	0	135	0
2014	0	210	0	155	0
2013	11	116	0	236	2
2012	0	184	0	182	0
2011	0	131	0	234	0
2010	0	162	21	182	0

CLIMATE CHANGE

Impacts of climate change are currently visible throughout the United States and scientists have high confidence that change will continue into the future. The [Delaware Valley Regional Planning Commission \(DVRPC\)](#) has analyzed climate data at the local level and has generated the following expected outcomes:

1. **TEMPERATURES WILL CONTINUE TO RISE.** Projections of future temperature and humidity in Montgomery County suggest that recent trends towards temperature increases will continue. In the future, higher cooling costs and higher heat related illnesses are expected.
2. **MORE EXTREME AND EXTENDED HEAT WAVES.** Periods of abnormally hot weather lasting days to weeks are project to appear more frequently. This trend suggests magnified usage of cooling equipment and as a result energy expenditures. In contrast, in the future, milder winters are expected leading to reduced heating requirements in Montgomery County.
3. **CHANGES IN PRECIPITATION PATTERNS.** Average Montgomery County precipitation is projected to increase by five (5) to seven (7) inches annually by the end of century. These increases in precipitation will vary seasonally. The largest increases in precipitation are projected over the winter months (approximately 50% intensification). On days below freezing, record snowstorms are predicted.
4. **STORM EVENT WILL INCREASE IN FREQUENCY AND DURATION.** The intensity, frequency and duration of rainfall events are expected to become extreme. In the next several decades, increases in flooding and associated loss of life and property, erosion and pollution of water bodies, and infrastructure strain is projected.

Some neighborhoods are more vulnerable than others to the heat waves, heavy downpours and other physical challenges posed by climate change. In 2021, the Montgomery County Planning Commission (MCPC) aimed to categorize neighborhoods at most risk to the impacts of climate change and least able to adapt to climate change. In doing so, MCPC combined readily accessible information on sociodemographic, health factors and critical infrastructure locales with historical temperature and flooding data from the Federal Emergency Management Agency, the Montgomery County Division of Emergency Management and DVRPC to create three impacts indexes: Heat Risk Index, Flood Risk Index, DVRPC's Indicators of Potential Disadvantage.

Neighborhoods that are most vulnerable to the potential impact of climate change include:

Table 2.5 | **Vulnerable Communities: Flood, Heat & Cumulative Climate Change Risk**

MOST VULNERABLE TO FLOOD & PRECIPITATION	MOST VULNERABLE TO HEAT	HIGHEST CUMULATIVE CLIMATE CHANGE RISK
Census Block 2020 (West Norriton Twp., West Indian Lane)	Census Block 3022 (Upper Gwynedd Twp., Neighboring Pennbrook Parkway)	By Far The Most Vulnerable Census Blocks Exist In Downtown Norristown Borough
Census Block 2016 (Upper Providence Twp., Neighborhood on Amanda Lane and Scarlet Oak Drive)	Census Block 3060, 3061, 3072 (Plymouth Twp., Metroplex Mall)	Other Vulnerable Census Blocks Include:
Census Block 2017 (Upper Providence Twp., Port Providence Neighborhood)	Census Block 3016 (Upper Dublin Twp., Corporate Center between Camp Hill Road and Virginia Drive)	Downtown Pottstown Borough
Census Block 1035 (Pottstown Boro., Between Buttonwood Alley, King Street, N Washington Street, and N. Franklin Street)	Census Block 1004 (Montgomery Twp., Montgomery Mall)	Downtown Ambler Borough
Census Block 1012 (Lower Moreland Twp., Elkins Park near Bethayres Station)		Fort Washington Business Park
		Elkins Park Neighborhood

Figure 2.11 | **Heat Risk Index, 2021**

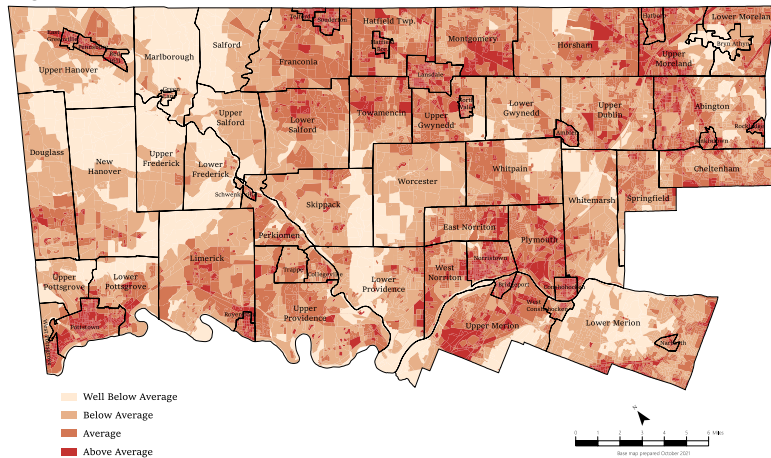


Figure 2.12 | **Flood Risk Index, 2021**

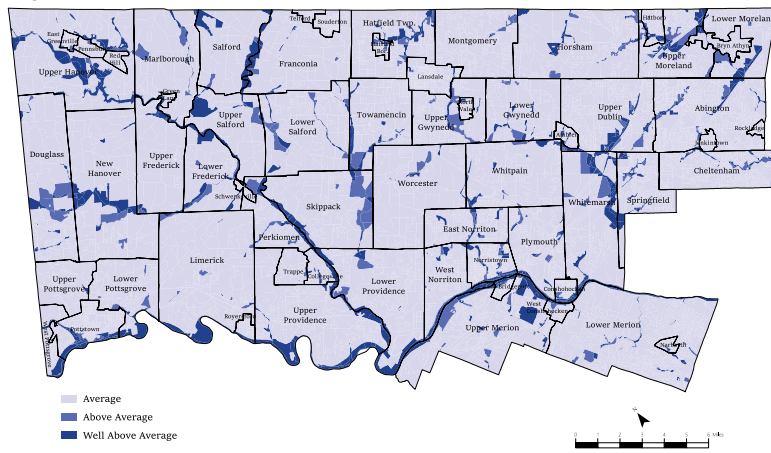
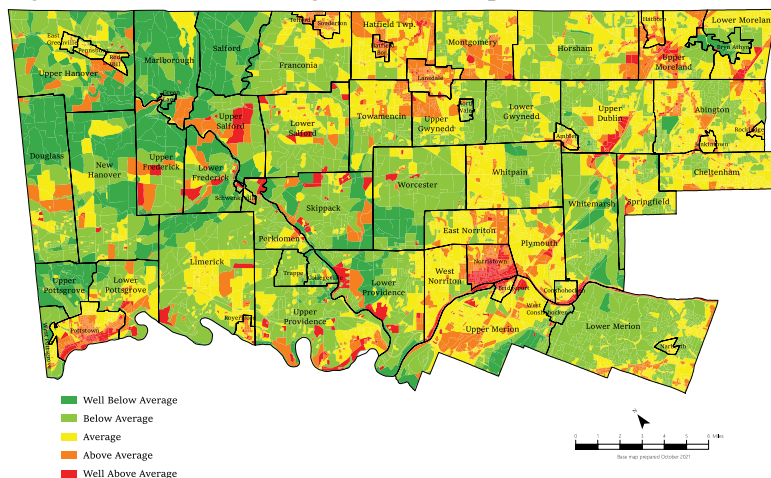


Figure 2.13 | **Climate Change Potential Impact Assessment, 2021**



2.2 Community Infrastructure

TRANSPORTATION

Montgomery County contains more than 3,300 miles of roads and 1,009 bridges and is located at the core of the northeast corridor. Major roadways intersecting Montgomery County that act as a dominant mode of transportation for workers and residents include the Schuylkill Expressway (1-76), Blue Route (1-476), Route 422, Route 100, Northeast Extension/PA Turnpike (1-476), Route 309 Expressway and PA Turnpike (1-276).

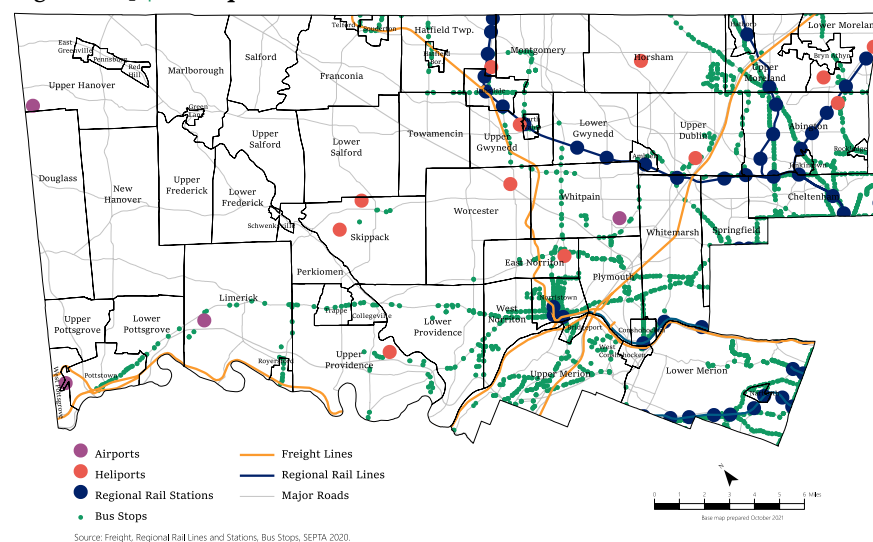
For more than 60 years, the personal automobile has been the dominant mode of transportation for suburban workers and residents. Despite having access to commuter rail, high-speed rail, and bus service provided by public agencies, 80% of Montgomery County workers got to work by driving alone (American Community Survey, 2011). The county's suburban location, the distribution of jobs from Philadelphia's core to various economic centers across the region, and people's general preference to drive alone all add to this trend of longer commutes.

Public transportation agencies operating in Montgomery County include the Southeastern Pennsylvania Transportation Authority (SEPTA) and Pottstown Area Rapid Transit (PART). Additional shuttle bus service is provided by employers, apartment buildings, universities, and transportation management associations (TMAs). SEPTA, the nation's sixth largest transit provider, operates a regional rail network of 13 rail lines, six of which serve the county; 119 bus routes, 43 of which serve the county; and the Norristown High Speed Line, a stand-alone interurban rail line between the 69th Street Transportation Center and the Norristown Transportation Center with 22 stations, six of which are in the county. Ardmore station hosts AMTRAK services directly to the Keystone Route (to Harrisburg) or connections to Center City Philadelphia which allows passengers to connect to almost all east coast routes. To boot, Montgomery County offers its residents and visitors nearly 100 miles of multi-use trails that connect open spaces, business centers and other points of interest.

Additionally, 136 miles of freight rail exist in Montgomery County, which is more than any other county in the southeast Pennsylvania region. On top of rails owned by SEPTA, the major Class I carrier operating in the county is Norfolk Southern, which owns the double-track line parallel to US 422, which is called the Harrisburg Line. Further, local "short line" railroad service is provided along several other tracks by Pennsylvania Northeastern, Colebrookdale, and Upper Merion & Plymouth (UM&P) railroads.

For service to national and international destinations, Montgomery County residents are served by Philadelphia International Airport, Lehigh Valley International Airport in Allentown, PA, and Trenton-Mercer Airport and Atlantic City International Airport, both in New Jersey. Montgomery has five smaller-scale airports to relieve congestion at commercial service airports or provide limited corporate and charter service or recreational aviation services.

Figure 2.14 | **Transportation Network**



WATER-RELATED INFRASTRUCTURE

Drinking Water Supply: Altogether, Montgomery County has approximately 1,031 miles of streams and rivers that supply drinking water to treatment plants and receive treated wastewater. Potable water supply is provided by twenty-four registered public water supply agencies, including four municipal departments, three private companies, eight authorities, two associations, four institutional suppliers and three mobile home parks. The lion's share of the supply of potable water, over 60%, is provided by Aqua America Pennsylvania, which is comprised of seven water supply systems in Montgomery County.

Wastewater and Stormwater: Forty-three sewage treatment plants serve Montgomery County and are owned and/or operated by municipalities, the City of Philadelphia and private companies such as Pennsylvania American Water Company and Aqua Pennsylvania Wastewater, Inc. Across the county a handful of sewer lines are challenged by inflow and infiltration that robs the system of its valuable capacity and puts a burden on operation and maintenance which in the long-term can reduce the life expectancy of the treatment facility. Additionally, a small number of combined-sewer systems remain. During large rain events, these systems are inundated by storm runoff and discharge untreated wastewater into the Schuylkill River and Perkiomen Creek. However, all municipalities in Montgomery County operate a Municipal Separate Storm Sewer System (MS4) Program and are responsible for development and implementation of stormwater management regulations to reduce the discharge of pollutants and contamination of stormwater runoff.

Dams: The National Inventory of Dams has identified twenty-nine (29) dams in Montgomery County that meet at least one of the following criteria:

- classification as a high hazard (dam failure could lead to loss of at least one life)
- significant hazard potential
- equal to or exceeds 25 feet in height and 15-acres in storage
- equal to or exceeds 6 feet in height and 50-acres in storage.

Several of these dams are present on the Schuylkill River, the Pennypack Creek, Perkiomen Creek, and Pine Run for flood control, water supply storage and recreation. Montgomery County's rivers and creeks are also punctuated by a number of smaller dams originally utilized by the ice harvesting industry.

WASTE MANAGEMENT

Waste generation rates have continued to rise in Montgomery County. Approximately thirty facilities within and outside of Montgomery County accept solid waste. However, the majority of solid waste disposal is completed by Covanta Plymouth Waste-to-Energy Plant. A portion of waste is taken to landfills located outside the county; there are no operating landfills within Montgomery County. As of 2020, the average generation rate of municipal solid waste (including trash, recycling and compost) was 6 pounds per capita per day or about a pound higher than the national 2018 rate of 4.9. Additionally, in 2020 the county's recycling rate was 32% which is the same as the national 2018 recycling rate.

Table 2.6 | **Montgomery County Municipal Solid Waste, 2013 – 2020**

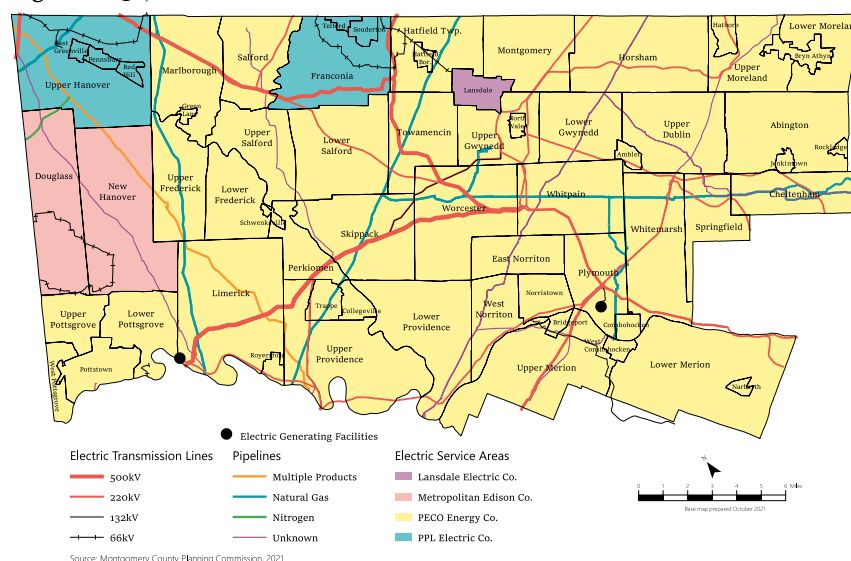
Solid Waste (Tons)	2013	2014	2015	2016	2017	2018	2019	2020
Recycling (including compost)	297,804	319,220	308,840	348,525	314,536	340,784	333,365	295,230
Trash (countywide from DEP)	623,599	626,421	612,928	530,043	544,364	572,350	645,590	630,234
Trash and Recycling	921,402	945,641	921,768	878,568	858,900	913,134	978,955	925,464
Recycling Rate	32%	34%	34%	40%	37%	37%	34%	32%
Population	813,832	816,857	819,264	821,725	823,000	828,604	830,915	834,906
Per capita generation rate (trash & recycling) (tons/year)	1.13	1.16	1.13	1.07	1.04	1.10	1.18	1.11
Per capita generation rate (trash & recycling) (pounds/year)	2,264.36	2,315.32	2,250.23	2,138.35	2,087.24	2,204.03	2,356.33	2,216.93
Per capita generation rate (trash & recycling) (pounds/day)	6.20	6.34	6.17	5.86	5.72	6.04	6.46	6.07

POWER SUPPLY

Montgomery County relies on PECO, PPL, Metropolitan Edison, and the Boroughs of Lansdale and Hatfield to distribute electricity to residents and industries under Pennsylvania's utility deregulation program. Exelon's Nuclear Power Station in Limerick Township, followed by Covanta Plymouth Waste-to-Energy Plant, are the primary sources of public electricity. Additionally, many large private facilities, including Merck & Co. and Einstein Medical Center fulfill their own needs by self-generation on-site. In most areas of the county, above-ground electrical power lines persist and are challenged by tree damage, high winds, ice accumulation, and other weather events that aid in the physical deterioration of power lines.

Gas service is supplied by more than 180 miles of pipeline which transverse the county to transmit gasoline, oil, and natural gas by PECO and UGI Corporation. All power infrastructure has been and will continue to be confronted by extreme weather conditions and continued maintenance requirements.

Figure 2.15 | Power Network



2.3 Communication Infrastructure

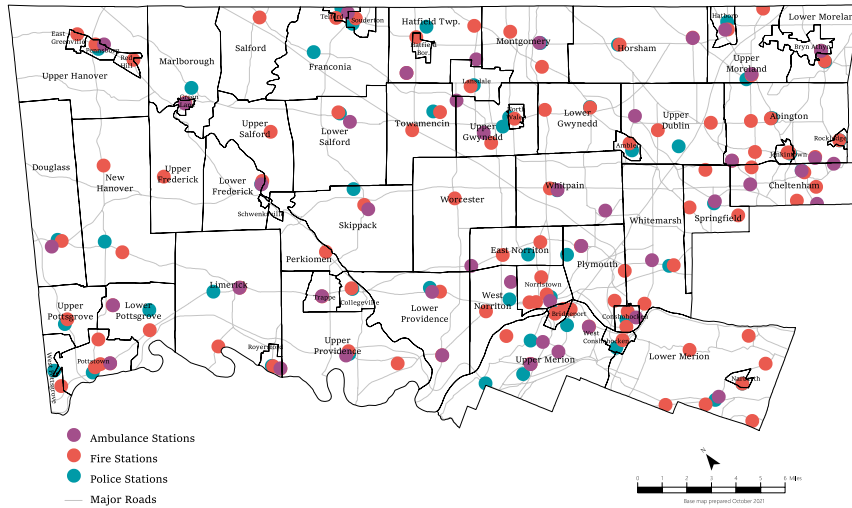
Verizon Wireless manages most of the wired communication system in the county. Windstream Communications manages the wired communication system for a small area around Gilbertsville in the western part of the county. Numerous companies provide communication services through these systems. Additionally, wired cable systems operate throughout the county within established franchise areas. Several companies provide wireless communications service throughout the county with ever-expanding wireless communication infrastructure. Many households in Montgomery County no longer have landline-based phone service; rather, residents rely upon wireless phone service.

EMERGENCY SERVICES

The Montgomery County Department of Public Safety's Division of Emergency Management works to mitigate, plan, and prepare for emergencies; educate the public about preparedness; coordinate emergency response and recovery efforts; and develop tools and identify resources to support the overall preparedness of Montgomery County. The Division of Emergency Management serves as the lead for the development and maintenance of the Montgomery County Emergency Operations Plan and other supporting emergency plans, including the Limerick Generating Station Radiological Emergency Response Plan. In addition, the Division provides assistance to municipalities, critical infrastructure organizations, and partner agencies in designing and updating preparedness, mitigation, response, and recovery plans. The division also maintains and promotes ReadyMontco, Montgomery County's public emergency notification system.

Police and fire services are provided at the municipal or regional level from 103 fire stations and 53 police stations. Fire departments are staffed by a mixture of paid and volunteer firefighters that are typically trained and certificated from the Montgomery County Fire Academy, operated by the county's Department of Public Safety. Additionally, the county coordinates 41 EMS stations which provide ambulance services, including paramedics, emergency medical technicians and other first responders.

Figure 2.16 | Emergency Infrastructure



2.4 Population and Demographics

RESIDENT POPULATION

Montgomery County is the third most populated county in Pennsylvania. In fact, the county, having more than 856,500 residents, has a greater population than four entire states. The county has evolved over the last hundred years from a collection of industrialized towns and villages spread amongst rural farmland and open space to a mix of old and new suburbs with regional economic centers that both support and compete with Philadelphia. The county's fastest growth periods took place in the decades prior to 1970 as the rapid expansion of roads, sewers, and other infrastructure opened new and less expensive areas of the county for development. Since 1970, population growth has slowed, but it has still grown by about six percent on average each decade.

The areas of the county with the greatest population densities are found in the boroughs and in some of the mature suburbs in the eastern part of the county that border Philadelphia. However, the greatest growth over the last twenty years has taken place in some of the townships in the western half of the county, especially along the Route 422 corridor.

NONRESIDENT POPULATION

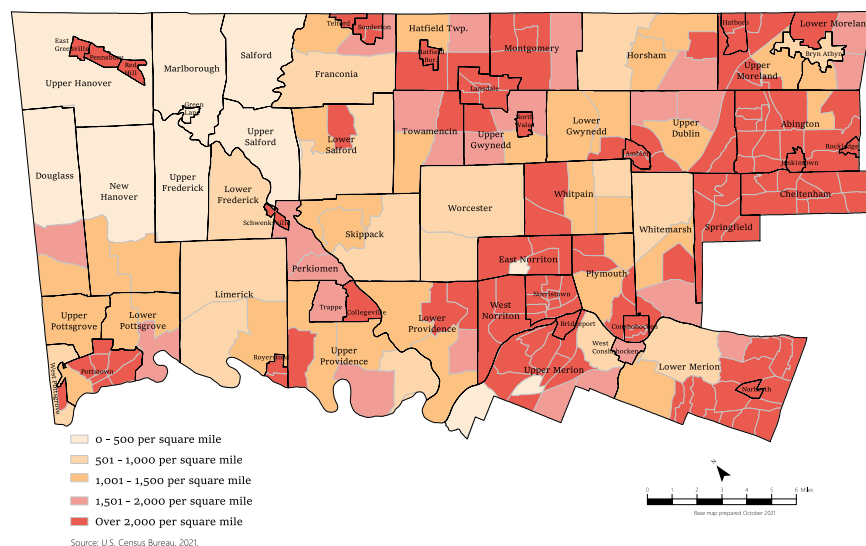
Montgomery County has grown not only in terms of population, but also in jobs and recreational visitors. In fact, there are more jobs than resident workers, making the county a "net importer" of workers, which is rare among counties that don't feature a dominant central city. Additionally, approximately 100 miles of county-built trails connect greenways, heritage corridors, and points of interest within Montgomery County. Annually, more than 800,000 people use Montgomery County trails, including a number of non-residents.

DEMOGRAPHIC & SOCIOECONOMIC CHARACTERISTICS

Of the total population, Lower Merion Township accounts for approximately 60,000 or 7.2% of the county's population, while Abington Township is the second largest community with approximately 55,000 or 6.6% of the population.

In 2020, the median age of the population in the county was 41.4 years of age. The largest demographic age groups in the county are school-aged children (ages 5 to 17), having a population of over 183,000. The approximate median household income reported between 2016 - 2020 was \$93,518 while the poverty rate over the same period was 5.6% county-wide. Nearly 95% of adults older than age 25 within Montgomery County have reportedly completed a high school education. Further, 49.3% adults have completed a bachelor's degree or higher. Additional demographic variables are provided in Table 2.5.

Figure 2.17 | Population Distribution



EQUITY ANALYSIS/INDICATORS OF POTENTIAL DISADVANTAGE

Disadvantage refers to the potential negative impact of an individual's identity as a member of a group without regard to their individual qualities. Disadvantage is not simple – complex factors make it difficult for people living in certain areas or those who identify as member of a group to achieve certain outcomes. Starting in 2001 DVRPC began an effort to consider equity issues in planning, as well as demonstrate compliance with federal nondiscrimination mandates.

In 2001, DVRPC developed the [Indicators of Potential Disadvantage \(IPD\) - an Environmental Justice \(EJ\)](#) technical assessment to identify direct and disparate impacts of its plans, programs, and planning process on defined population groups in the Delaware Valley region. DVRPC is committed to making federal Title VI and environmental justice a part of their planning process, integrated in all programs and plans, and a guide for public participation efforts. Each indicator, representing an at-risk population group, was quantified using data tables from the [American Community Survey's 2015-2019 Five Year Estimates](#) at the Census Tract special scale. Indicators include the following populations: racial and ethnic minorities, English as a second language, senior citizens, youth, women, people with disabilities, and low-income households.

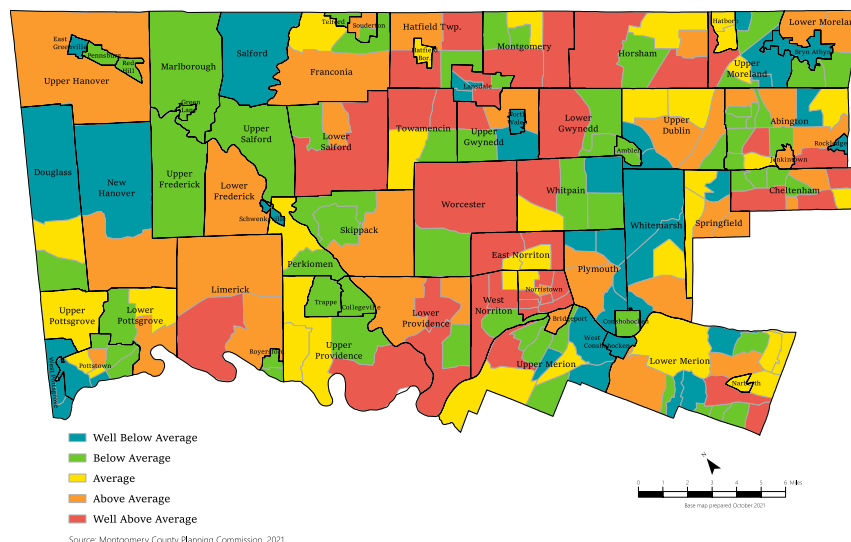
Municipalities identified as having areas of potential disadvantaged populations include:

Municipality of Norristown	Cheltenham Township
East and West Norriton Townships	Pottstown Borough
Abington Township	Lansdale Borough
Lower Moreland Township	Upper Gwynedd Township/Towamencin Township
Upper Moreland Township	Lower Merion Township

Table 2.7 | **Montgomery County's Quick Facts**

DEMOGRAPHICS			
Race & Ethnicity	Montgomery County	Pennsylvania	United States
White (Alone)	75.5%	81.0%	76.3%
Black Or African American (Alone)	10.3%	12.2%	13.4%
American Indian and Alaska Native (Alone)	0.3%	0.4%	1.3%
Asian (Alone)	8.4%	3.9%	5.9%
Native Hawaiian and Pacific Islander (Alone)	0.1%	0.1%	0.2%
Two or More Races	2.4%	2.3%	2.8%
Hispanic Or Latino	5.8%	8.4%	18.5%
White (Alone), Not Hispanic or Latino	74.0%	74.8%	60.1%
MONTGOMERY COUNTY		PENNSYLVANIA	
Age			
21.4% Under Age 18	18.3% Over Age 65	21.4% Under Age 18	18.7% Over Age 65
Economy			
68.0% In workforce		62.7% In workforce	
Education			
49.63% With bachelor's degree or higher		32.3% With bachelor's degree or higher	
English Speaking			
4.4% Have limited English-speaking skills		3.8% Have limited English-speaking skills	
Income			
\$93,518 Median household income	5.6% Poverty rate	\$63,627 Median household income	10.9% Poverty rate
Health			
6.3% With a disability	4.9% Without health insurance	9.8% With a disability	7.0% Without health insurance
Housing			
48,943 Housing units	71.9% Owner-occupancy rate	5,770,601 Housing units	69.0% Owner-occupancy rate
\$1,323 Median rent	\$2,122 Monthly owner costs with a mortgage	\$958 Median rent	\$1,505 Monthly owner costs with a mortgage
Technology			
94.5% Households with a computer	91.0% Households with an internet subscription	89.6% Households with a computer	84.0% Households with an internet subscription

Figure 2.18 | **Equity Analysis, an Adaptation of DVRPC's Indicators of Potential Disadvantage (Version 2.0, 2019)**



ECONOMY

The prosperity of Montgomery County, its businesses, its communities, and its residents is driven by remaining resilient in key sectors including modern manufacturing, healthcare, life sciences, hospitality, destination retail, and professional and financial services. Communities, entrepreneurs, and businesses are making investments and being proactive in understanding emerging sectors, supporting a flourishing entrepreneurial and leadership network, and developing a talented and multifaceted workforce.

The third largest county in Pennsylvania, Montgomery County is home to 75 hotels, over 30 craft breweries, wineries, and distilleries, 53 golf courses, close to 100 miles of trails, over 200 arts attractions, more than 1,600 restaurants, and premier meeting and convention facilities. Twenty-two colleges and universities play a role through their employment, research-and-development activities, real estate developments and purchase of goods and services that have spillover effects into the local economy. However, the largest percentage of jobs, approximately 17% of all jobs in the county, comes from the health care and social assistance sector.

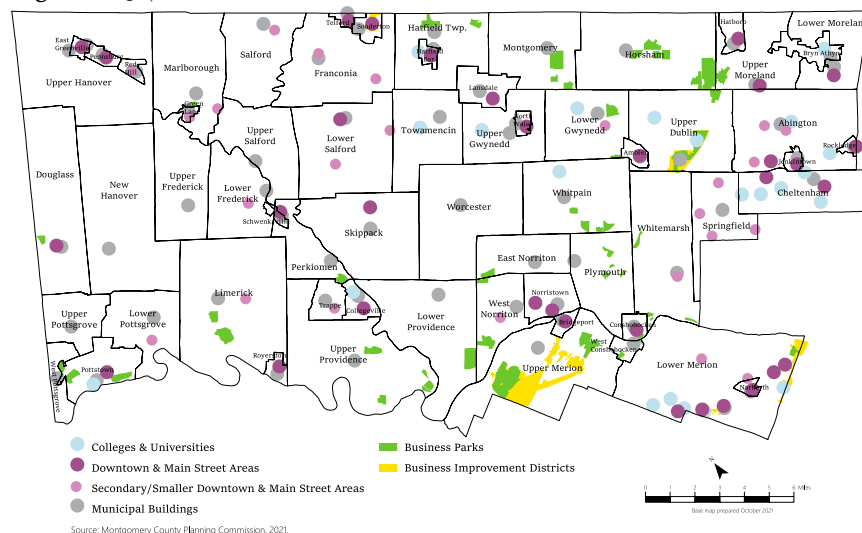
Health-care companies, such as hospitals and pharmaceutical firms, are trying to keep up with the industry's evolving demands, and often have a demand for new employees which includes nurses, pharmacists, lab technicians, and paramedics. Montgomery County, as in most places, has a large Baby Boomer population that is contributing to the demand for the health care profession. Additionally, it is expected that Baby Boomers may continue to work past traditional retirement age. This may result in a higher unemployment rate among younger residents in the future due to delayed opportunities for them to enter the workforce.

County-Owned Property: The overall assessment value of all real estate, as compiled by the Montgomery County Board of Assessments at the end of 2016, is \$67,126,862,102. Based on recent real estate market sales, the current market value of all county property would be \$124,184,695,055, nearly \$12 billion more than the property value five years ago. Personal property and other non-real estate improvements including equipment and machinery are not part of this overall property estimate.

Table 2.8 | **Montgomery County's Economic Highlights**

ECONOMIC HIGHLIGHTS			
411,300 out of 440,900 Residents Employed	Montgomery County is 10.3 of the State's economy	Montgomery County is 3rd of the Philadelphia area's economy	Montgomery County's economic growth is 1.44
\$91,546 Median household income	Males in PA have an average income 1.01 times higher that average income of females	Highest household income areas are: South Penn Valley Gladwyne Rosemont	\$313,400 Median property value
Most common jobs: Management Occupations, Office & Administrative Support Occupations; and Sales & Related Occupations		Top employment industries: Health Care and Social Assistance (17.0%), Professional and Technical Services (11.5%), Retail Trade (10.3%), Manufacturing (9.5%)	
Health Care & Social Assistance Industry			
17.0 % Of total workforce	\$56,562 Median wages	Major Employers Merck Sharp & Dohme Corporation Abington Memorial Hospital Main Line Hospital Albert Einstein Medical Center	
Other Major Employers	GSK Giant Food Stores LLC United Postal Services	SEI Investments Company Lockheed Martin Corp Hatfield Quality Meats	State Government Federal Government County Government School Districts
Primary Economic/Employment Centers			
30,000 – 50,000 Employees	20,000 – 30,000 Employees	10,000 – 20,000 Employees	
King of Prussia	Conshohocken Lansdale Area Horsham	Abington Montgomeryville Norristown Pottstown Huntingdon Valley Ambler Area Bala Cynwyd	Jenkintown Fort Washington Valley Forge Willow Grove Blue Bell Plymouth Meeting Upper Providence

Figure 2.19 | **Economic Centers**



2.5 Land Use and Development

EXISTING LAND USE

Montgomery County features a rich diversity of places and uses. Older towns and main streets formed before the advent of the automobile are entrenched alongside farmland and wooded areas holding on to their rural character. These places exist while even more acreage is devoted to the suburbanization patterns that fueled the county's rise to become Pennsylvania's third most populated county. Two-thirds of the county's developed land is used for residential purposes, and the county also features significant amounts of commercial, office, industrial, and institutional acreage that allowed it to become the economic driver it is today within the Philadelphia region.

The county is represented by its range of uses and the relatively small space in which these uses change. Major office or retail segues into single-family detached homes, then to open land or low-density development, and then back to a retail hub or manufacturing area. This variety reflects historic development patterns, based on both railroads and highways, and has been impacted by the

Figure 2.20 | **Land Use, 2015**

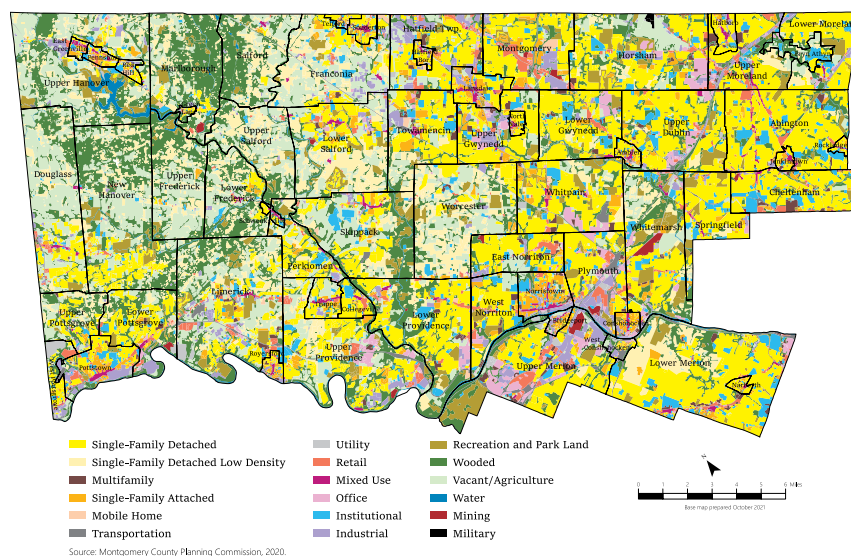
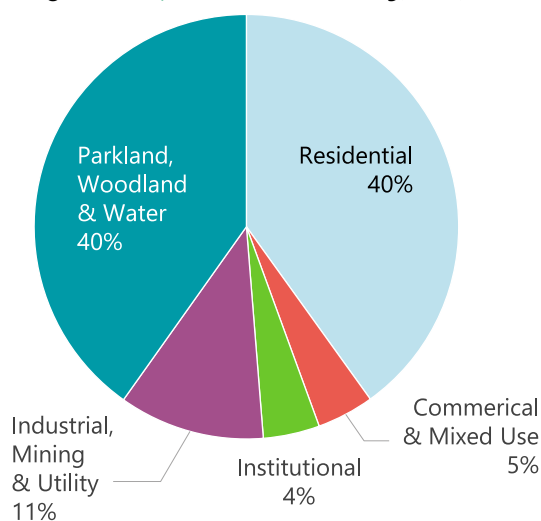


Figure 2.21 | **Land Use Summary, 2015**



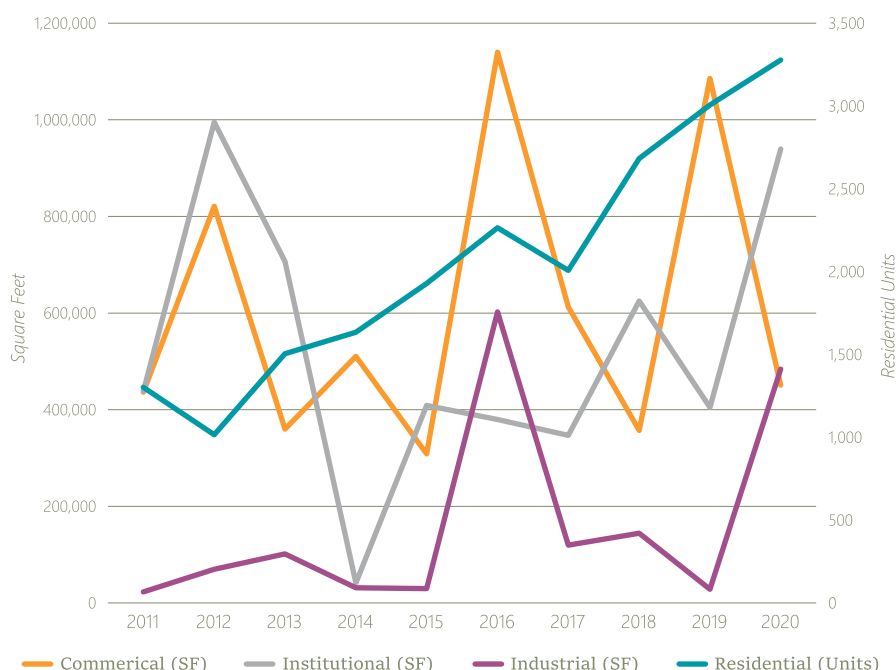
county's 62 municipalities making their own planning and zoning decisions.

In 1970, Montgomery County had three different types of areas—residential suburban neighborhoods oriented to Philadelphia, industrial concentrations with associated towns, and rural farmland. At this time, a fourth type was emerging—significant suburban industrial, office, and retail development, along with associated residences, that was not directed towards Philadelphia. From 1970 to 2010, this fourth type of development—independent suburban development—has dominated new development in Montgomery County.

Of course, not all new development takes place on undeveloped land. Underutilized sites in urbanized areas are increasingly targeted for redevelopment and adaptive reuse, especially as the creation of new infrastructure slows. In recent years, Upper Merion Township has experienced significant infill redevelopment of residential units, leading to higher density.

In the past five years, residential and nonresidential development have been on the rebound since hitting a low in 2010 due to the impact of the housing bubble crisis that led to the Great Recession in 2008.

Figure 2.22 | Completed Developments By Type, 2011 - 2020

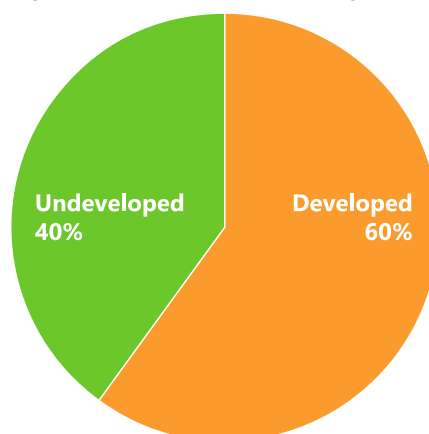


LAND USE TRENDS

In order to understand the magnitude, direction, and geographic distribution of land-use changes, the Planning Commission has identified land-use trends during the beginning of the 21 century. The most significant developments, issues and opportunities include:

- The retail industry will remain continuously evolving.
- The rising demand for apartment-style living.
- The rising popularity of mixed-used developments.
- Investing in infill and redevelopment will persist.
- The inclusion of green and low-impact development techniques will be expected.

Figure 2.23 | Land Use Coverage, 2015



LAND USE VISION

Over the next 25 years, the county will see a variety of improvements that will connect communities, sustain places, support a vibrant economy, and implement land use and transportation visions. County priorities are listed below.

Connected Communities:

By 2040, the county will take a number of steps to connect communities:

- Encouraging more collaboration and partnerships – the county will participate actively in local and regional organizations while encouraging municipalities to work together and expand multi-municipal planning.
- Improving transportation quality and options – priorities include improving the current road system, adding new Turnpike interchanges; improving the frequency of service on the Norristown, Warminster, and West Trenton lines; extending the Norristown High Speed Line to King of Prussia; and making communities more walkable.
- Expanding county trails and greenways – expanding the county trail system is a priority, beginning with completion of the Schuylkill Valley, Chester Valley, Pennypack, Wissahickon, and Cross County trails.
- Supporting strong downtowns and community destinations – making the county's downtown areas appealing destinations for local residents, visitors, and skilled high tech and creative workers is very important.

Sustainable Places:

By 2040, the county will take a number of steps to sustain places:

- Supporting a modernized infrastructure network – improving county roads and bridges and advocating for other infrastructure providers to modernize their systems are priorities.
- Improving stormwater management – implementing the county's MS4 permit requirements and completing the required ACT 167 stormwater management plans are priorities.
- Conserving natural resources – improving county parks, protecting conservation areas, and

continuing the farmland preservation program are extremely important.

- Providing opportunities for healthy lifestyles – adding loop trails and fitness stations to county parks and advocating for county residents to exercise and have fun are priorities.
- Supporting diverse housing choices – supporting new affordable housing developments, providing housing for the disabled, and helping homeless residents are critically important priorities.
- Enhancing community character – supporting neighborhood improvements and updating the county's emergency dispatch system are county priorities.

Vibrant Economy:

By 2040, the county will take a number of steps to support a vibrant economy:

- Improving transportation access to businesses – reducing congestion while adding new interchanges and other road access to businesses, as well as public transit access, are priorities.
- Encouraging focused development – encouraging new development in the county's many business parks, office campuses, and industrial areas is a county priority.
- Attracting and retaining businesses – partnering with regional and state economic development agencies to expand the county's economy while training the workforce to meet current industry needs are priorities.
- Flexibly adapting to market conditions – attracting millennials and high tech, creative workers is a priority.
- Facilitate marketing of the county – making regional and national visitors and businesses aware of the county's many assets is important.

Transportation Network:

By 2040, the county will take a number of steps to support the land use and transportation visions:

- Advocating for land use – although much of the county will remain relatively unchanged by 2040, other areas may see significant changes. Important land use considerations include:
 - » Creating more walkable development around train stations
 - » Encouraging mixed use development in regional mixed use business centers
 - » Reinventing business and office parks
 - » Increasing the vibrancy of downtowns
 - » Limiting development in rural areas
 - » Diversifying retail commercial areas
 - » Providing a range of housing options
 - » Protecting existing neighborhoods, important historic properties, and vulnerable natural resources
- Improving transportation – completing existing road and transit projects while finding ways to fund additional projects are priorities for the county. Creating a more walkable landscape is also critically important.

2.6 Data Sources and Limitations

The following are selected resources from published by MCPC or by governments and organizations that contribute to Montgomery County Planning Commission's understanding of its physical area and community. Refer to Appendix A – Bibliography for a complete list of data sources consulted during the planning process.

MONTGOMERY COUNTY

[Comprehensive Plan](#) This nationally awarded plan focuses on the future of Montgomery County until the year 2040. The plan, which contains goals and a future land use plan, guides overall growth and development in the county.

[Board of Assessments Records](#) The BOA maintains the assessment rolls, tax maps, and real estate registry of the ownership for all real estate in Montgomery County.

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

[Delaware Valley Regional Planning Commission](#) DVRPC provides access to a wealth of data, some original to the Commission and some provided by partners. DVRPC's various products include publications, web applications, interactive mapping applications and a gallery of maps available for download.

PENNSYLVANIA

[PA Geological Survey](#) DCNR Bureau of Geological Survey: researches the state's geologic resources and topography, maps the surface and underground rocks and geologic structures across the state and makes their findings available through publications and outreach.

FEDERAL

[US Bureau of Census](#)

[US National Oceanic and Atmospheric Administration \(NOAA\)](#)

Planning Process

This chapter reviews the Montgomery County Hazard Mitigation Plan preparation process including how the plan was prepared, the people involved in drafting the plan, and the public process which guided the development of the plan. A discussion of how the plan will be maintained is included in Chapter 8 at the end of this plan.

3.1 Update Process & Participation Summary

In accordance with the Disaster Mitigation Act (Stafford Act) and the guidelines established by FEMA and PEMA, this plan documents the following topics: (a) hazard identification, (b) risk assessment, and (c) mitigation strategies. Intensive efforts were made to solicit input from all 62 municipalities, the public and the Planning Team throughout the planning process to generate the 2023 HMP. As a result of this update process, Montgomery County has engaged with neighboring counties on an ongoing periodic basis to explore options to collaborate and create a cohesive regional approach toward hazard mitigation.

The Montgomery County HMP was based on the best available information obtained from a wide variety of sources. A dedicated effort will be made to reduce any deficiencies related to distinct hazards or mitigation projects. And in the future, as more accurate information becomes available, Montgomery County will supplement and revise the plan to address these knowledge gaps.

3.2 The Planning Team

Montgomery County convened a Steering Committee for the development of the HMP 2023 Update. The Steering Committee met monthly to set goals for the planning process, provide input into hazard events/vulnerability and mitigation strategies, develop Planning Team workshops, and draft the update. The Steering Committee was composed of the following full-time staff members of Montgomery County:

- Joe Anna Haelig, Community Resilience Planner, Montgomery County Public Safety
- Drew Shaw, Environmental Planning Manager, Montgomery County Planning Commission
- Jon Leshner, Environmental Planning Assistant Manager, Montgomery County Planning Commission
- Ellis Foley, Senior Environmental Planner, Montgomery County Planning Commission (Ellis changed employment during this plan update)
- Donna Fabry, Senior Trails & Open Space Planner, Montgomery County Planning Commission

The Steering Committee developed a list of potential Planning Team members which included municipal officials, state and Montgomery County government representatives, other stakeholders,

and non-profit organizations. Members were invited due to their subject matter expertise and local knowledge and experience. The Planning Team was invited to a series of five online workshops organized around topic areas.

More information about materials presented at virtual workshops is available in Appendix C.

To maximize participation and engagement, Planning Team members coordinated plan review and analysis activities between meetings through emails or phone calls. Key areas of the plan that the planning team focused on and revised include: the hazards to be profiled, hazard vulnerability ranking, past occurrences of various hazards, the capability assessment of local and county agencies, plan goals, and mitigation action items. The following participants were members of the Planning Team:

Table 3.1 | Planning Committee Members

Agency	Name	Title	Area of Expertise
Montgomery County	Barbara O'Malley	Deputy Chief Operating Officer	Development
Montgomery County, Department of Public Safety	Jason Wilson	Deputy Director – Emergency Management	Response
Montgomery County, Department of Public Safety	Matt Maillie	Emergency Management Specialist	Response
Montgomery County, Department of Assets & Infrastructure	Dave Clifford	Parks Administrator	Infrastructure, Environment
Montgomery County, Department of Commerce	Dave Zellers	Department Head – Commerce	Development
Montgomery County, Office of Public Health	Megan Young	Public Health Emergency Preparedness Coordinator	Public Health, Response
Montgomery County, Office of Public Health	Sam Korman	Public Health Emergency Preparedness Coordinator	Public Health, Response
Montgomery County, Office of Public Health	Erin McDermott	Public Health Planner	Public Health, Response
Montgomery County, Office of Public Health	Kyle Schmeck	Division Director – Water Quality Management	Public Health, Environment
Montgomery County, Office of Public Health	John Pepper	Field Supervisor	Public Health, Environment
Montgomery County, Information Technology Solutions	Anthony Olivieri	Chief Information Officer	Response, Infrastructure
Montgomery County, Sheriff's Office	Tom McDonald	Lieutenant	Response
Montgomery County, Conservation District	Jessica Buck	District Manager	Environment, Infrastructure
Abington Township, Police Department	Tom McAneney	Emergency Management & Planning Unit Coordinator	Response
Collegeville Volunteer Fire Company	Jeffrey Wentworth	Fire Police Captain	Response
Lower Providence Township	Michael Rohlfing	Fire Marshal	Response
Municipality of Norristown, Fire Department	Tom O'Donnell	Fire Chief & Emergency Management Coordinator	Response
Upper Merion Township, Police Township	Brendan Brazunas	Lieutenant	Response

Upper Gwynedd, Public Works Department	Willard Troxel	Public Works Superintendent	Infrastructure, Development
Schwenksville Borough	Chris Melville	Emergency Management Coordinator	Response
Limerick Township, Public Works Department	William Bradford	Public Works Superintendent	Infrastructure, Development
Penn State Extension	Ross Snook	Master Watershed Steward	Environment
Audubon Lands	Tom Shires		Environment, Development
Limerick Generating Station	Sara Schmidt	Emergency Preparedness Specialist	Utilities, Infrastructure
PECO – An Exelon Company	Suzanne Ryan	Regional External Affairs Manager	Utilities, Infrastructure
Main Line Health	Armand Alessi	Division Director – Public Safety	Public Health, Response
Holy Redeemer Hospital	Mike Green	Division Director – Referral Management	Public Health, Response
American Red Cross – Delaware Valley Chapter	Mary Newsom		Response
Salvation Army – Greater Philadelphia	Luke Rodgers	Division Director – Emergency Disaster Services	Response
Temple University	Nicola Mammes	Director of Emergency Management	Public Safety/Response

3.3 Meetings & Documentation

The Steering Committee coordinated the following meetings during the planning process. All meetings were hosted in virtual form which the Steering Committee found increased attendance and accessibility for the Planning Team and the general public. Documentation from all meetings is in Appendix G.

PLANNING TEAM MEETINGS - DISCUSSION TOPICS (DATE/TIME)

- Hazard Mitigation Planning; Process Requirements (August 2021)
- Public Outreach & Participation; Community Profile; Hazard & Vulnerability Profile (January 2022)
- Risk Assessment; Capability Assessment (May 2022)
- Mitigation Action Plan; General Plan Maintenance (August 2022)
- Draft Plan; Submission Schedule (November 2022)

PUBLIC MEETINGS - DISCUSSION TOPICS (DATE/TIME)

- Kick-Off (December 2021)
- Risk Assessment (March 2022)
- Draft Plan Review (November 2022)

Additionally, in Fall 2021 the Steering Committee hosted a meeting with neighboring counties to share and strategize regarding the HMP 2023 Update. The following counties participated in the event:

- Delaware County
- Philadelphia County
- Chester County
- Lehigh County
- Berks County
- Northampton County
- Bucks County

3.4 Public & Stakeholder Participation

Community participation and comments were encouraged throughout the planning process. Chiefly, the update process began with two extensive surveys of municipal managers and the general public, the report presents these materials and results in Appendix C. The individual municipal survey responses have been included in Appendix C. The data and inputs from these surveys informed the structure of Planning Team meetings and advised the project team on priority vulnerabilities and activities to pursue over the course of the update. To help reach as many residents as possible, the online survey was translated into Spanish and additional paper copies were distributed at six libraries across Montgomery County. Montgomery County has

strong relationship with its 62 municipalities through the Community Planning Assistance program and the Act 247 Development Review Process. In order to reduce the time required for the municipal data surveys to be completed, the staff working with each municipality contacted them directly to gather the information. While this did save time, it makes it difficult to document municipal participation in the plan. The next plan update will rely on the survey process and forms provided in the PEMA SOG. Examples of the email communications with municipalities are provided in Appendix C. Despite multiple prompts less than 50% of municipal managers responded to the survey.

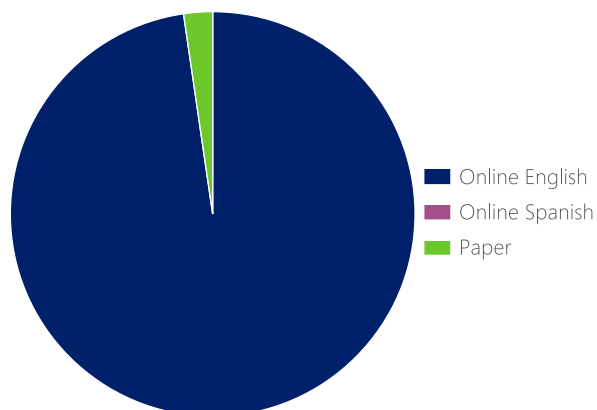
Public response was more enthusiastic, with over 250 respondents. Distribution of public responses by format is as follows: The public was made aware of the plan and participation activities through various types of media,

including social media and print media (see Appendix G for examples of outreach materials). Flyers promoting the survey were distributed to all municipalities and featured at the county 4-H Fair, National Night Out, and the MCATO Convention. Key social media used included: [Facebook](#), [Twitter](#), and the [county's website](#). Additionally, a mass email notification about the plan was also sent out through the Mass Notification system on the Everbridge platform to 15,159 county-based subscribers in advance of the public meetings.

Outreach efforts also targeted the business community and the cultural and historic resources communities through professional organizations. The Suburban Philadelphia Alliance for Response aims to link the cultural heritage institutions of the Southeastern Pennsylvania region, including Montgomery County, with emergency response organizations as well as fostering communication and education while preventing and mitigating the loss of cultural and historical collections in the event of a disaster. Members of this network operating in Montgomery County include educational institutions including Bryn Mawr College and Haverford College. The draft plan was distributed to the At-Large Committee, which includes representatives from Bucks, Chester, Delaware, and Montgomery counties.

The comment period on the plan was held between November 1 and December 1, 2023. During that time the plan was available for review on the county's website and promoted through social media. All comments received during this process were considered in the revisions to this plan.

Figure 3.1 | **Public Survey Responses**



3.5 Multi-Jurisdictional Planning

The county adopted its comprehensive plan, *Montco 2040: A Shared Vision*, on January 15, 2015. Additionally, the county public safety department and planning commission have prepared various plans and special studies in the past that addressed hazard issues such as flooding. Each municipality in the county has also prepared and updated comprehensive plans and special studies

Table 3.2 | **Existing Planning Mechanisms**

Planning Mechanism	Managing Agency	Approval Date	Summary of Action
Montgomery County Comprehensive Plan	MCPC	2015	Adopted by Commissioners 1/2015.
Model Land Use Ordinances	MCPC		Model Floodplain ordinance developed 2011.
Stormwater Management Plans (Act 167)	MCPC	Various dates	Plans are developed by watershed.
Floodplain Ordinance Review and Approval	MCPC and Montgomery County Conservation District	Various dates (effective FIRM date is 3/2/2016)	Review all 62 ordinance updates under FIRM update process.
Nuclear Radiological	PADEP and MCPDS	Various dates	
PA Dam Safety Program	PADEP and MCPDS		Review plans for all priority dams.
PA Greenways Initiative	PA DCNR, MCPC, MC Parks and Heritage Services Division		Acquire and protect lands along the major waterways in the county.
Comprehensive Emergency Management Plan	MCPDS	Continuously updated	Addresses all phases of emergency management.
Montco 2040 Implementation Grant Program	Montgomery County	2016	Montgomery County provides \$2.5 million in grant funding to municipalities to address specific plan implementation needs.
Impaired Waters and TMDLs	PADEP		Water quality program to implement clean streams standards.
Uniform Construction Code	PA Labor and Industry and local municipalities	Various dates	All municipalities have adopted.

addressing local concerns, including flooding. Every attempt was made in preparing this document to incorporate key recommendations within these plans and studies. This plan builds upon those efforts to make the county more resistant to the negative impacts associated with likely hazards.

EXISTING PLANNING MECHANISMS

There are several federal, state, regional, county, and municipal planning mechanisms that are consistent with and support the fulfillment of county hazard mitigation goals. A summary of these mechanisms that were consulted in the development of this plan are listed on the next page.

MONTGOMERY COUNTY COMPREHENSIVE PLAN

Montgomery County adopted amendments to its new comprehensive plan, *Montco 2040: A Shared Vision*, on July 15, 2021. The plan focuses on the future of Montgomery County until the year 2040. The plan, which contains goals and a future land use plan, guides overall growth and development in the county. *Montco 2040: A Shared Vision* provides an overall framework for local municipal plans and provides guidance on issues that transcend local boundaries, such as highways, public transportation, flooding, trails, growth trends, redevelopment trends, shopping needs, impact of large developments, overall housing needs, natural systems, and economic growth.

The most crucial element in creating the plan was public input. *Montco 2040: A Shared Vision*, which took approximately two years to complete, involved extensive outreach to citizens, businesses, organizations, community leaders, and municipal officials. These efforts included eight public

meetings, presentations to interested groups, a survey completed by over 2,500 residents, a dynamic website, videos, a webinar for municipal officials, a photo contest, wide distribution of draft plan versions, and a public hearing on the final draft plan.

The implementation of the Montgomery County Hazard Mitigation Plan is recognized under two of the interrelated planning themes: Sustainable Places and Vibrant Economy.

MODEL ORDINANCES AND DESIGN GUIDEBOOKS

Several model ordinances and guidebooks have been prepared to address floodplain management, signs, townhouse development, parking lots and Model Ordinances and adaptive reuse of institutional properties. The model ordinances and design guidebooks prepared by the Planning Commission include:

[Accessory House, Adaptive Reuse and Infill](#)

[Child Day Care Model Zoning Provision](#)

[Village Mixed Use District: Creating Small-Town Character](#)

[Village Residential District: Creating a Village Community](#)

[General Commercial District: Creating Commercial Areas With Character](#)

[Town Center District: Creating New Opportunities](#)

[Land Preservation District: Preserving Open Space in Rural Areas](#)

[Neighborhood Residential District: Recreating The Neighborhood](#)

[New Town Mixed Use District: Creating Walkable, Transit-Friendly Places](#)

[TDR Guidebook: Creating a Municipal TDR Program](#)

[Model Landscape Regulations](#)

[Model Sign Ordinance: A Comprehensive, Content-Neutral Approach To Local Sign Control](#)

[Affordable Housing Series: Promoting Workforce Housing](#)

[Rural Residential District: Protecting Natural, Scenic, and Historic Resources](#)

[Residential Office District: Creating a Transition to Residential Neighborhoods](#)

[Guidebook for Riparian Corridor Conservation](#)

[Subdivision And Land Development Ordinances: Building Sustainable Communities](#)

[Sustainable Green Parking Lots Guidebook](#)

[Model Floodplain Ordinance](#)

The model ordinances on riparian corridors and floodplain management specifically address flooding, the county's most significant natural threat. Other model ordinances contain design guidelines which further promote reduction in flooding. The concentration of development and the promotion of infill development advocated in many of these model ordinances also can reduce vulnerability of the county to various threats.

PLANNING BY DESIGN

The Planning Commission also has promoted a Planning by Design Series of educational publications that feature short, informative summaries of the following topics: [Green Streets](#), [Green Parking Lots](#), [Sustainable Paving](#), [Green Roofs](#), [Shading Parking Lots](#), [Stormwater Bioswales](#), [Drainage Swales](#), [Stormwater Basins](#), [Traffic Calming Devices](#), [Pedestrian Amenities](#), [Cul-De-Sac Islands](#), [Woodland Edge Treatments](#), and [Street Trees](#). These publications address flood reduction, landscaping to avoid power system disruption, and safe transportation.

MUNICIPAL COMPREHENSIVE PLANS

All municipalities except for Narberth Borough have adopted comprehensive plans. During the past five years comprehensive plans were revised and updated in the following municipalities: Ambler

Borough, the Municipality of Norristown, West Conshohocken Borough, Whitpain Township, Lower Merion Township, Pottstown Borough, Cheltenham Township, Royersford Borough, and Springfield Township. Regional plans were prepared for the Indian Valley Region (6 municipalities adopted) and Central Perkiomen Region (7 municipalities adopted). Sustainability plans addressing flooding and stormwater management among other sustainability-focused issues were prepared for Pottstown and Collegeville over the past five years. Over the past five years, open space plan amendments which seek to preserve key natural areas such as stream corridors and greenways were prepared for Whitmarsh Township, Upper Frederick Township and Upper Providence Township. A plan for the Whitmarsh and Conshohocken riverfront was prepared to demonstrate various compatible recreation uses for the Schuylkill River floodplain through both municipalities. Whitpain Township prepared a Revitalization Plan for the neighborhood of West Ambler, which has been impacted by flooding over the past several decades. This plan addresses both the flooding vulnerability as well as the safe adaptive reuses of a large, remediated asbestos waste site in the borough.

MUNICIPAL ORDINANCE UPDATES.

From January 2017 through the end of December 2022, Montgomery County received 120 zoning ordinance amendments, 168 zoning map amendments, and 460 zoning text amendments. During that same period, 38 subdivision and land development ordinance amendments were submitted. Significant zoning ordinance amendments included revised floodplain regulations from all 62 municipalities to be consistent with the model ordinances developed by DEP. All ordinances are prepared, revised or updated in accordance with the PA Municipalities Planning Code. That same law requires municipalities to submit the proposed ordinance amendments to county planning commissions for review. The Montgomery County Planning Commission conducted reviews and submitted review letter reports on all submitted ordinances. As part of the review, the Montgomery County Planning Commission considered relevant plans and studies such as the 2017 Hazard Mitigation Plan.

No new stormwater plans were completed during the past five years due to a lack of state funding.

Other important plans and studies undertaken in the past five years include:

1. [Bike MontCo: The Bicycle Plan for Montgomery County](#)
2. [Walk MontCo: Montgomery County Walkability Study](#)
3. [Montgomery County Trail Access, Diversity & Awareness Plan](#)

Risk Assessment

4.1 Update Process Summary

Risk assessment is fundamental to understanding the threat posed by various hazards and is the basis for the mitigation strategy. In the following sections, hazards that may affect Montgomery County are identified and defined in terms of location and geographic extent, magnitude of impact, previous events, and likelihood of future occurrence. Existing data and analysis from the previous FEMA-approved HMP, as well as more recent data and analysis on hazards occurring during the last five years has been used in this assessment. Both natural and human-made hazards with the potential to impact Montgomery County are included. The experience of a hazard in the County's past may mean that it could be experienced in the future, but it must be realized that not experiencing an event in the past is no guarantee the county will not experience it in the future. Also, it should be recognized that a few hazards by definition could not occur in the county, such as coastal flooding. These few have not been considered.

A listing of emergency declarations involving Montgomery County is provided in Appendix J. From this disaster declaration data, flooding appears to be the single greatest hazard in Montgomery County. Other weather related, geologic, human caused, technological failure, and wildfire hazards that potentially threaten the county are described in this chapter. Most natural hazards occurring in the county result from both geologic and weather-based features and processes. In addition, wildfires and floods can occur due to both factors as well as human impact. Human caused hazards are a result of various incidents, individual or group actions, and errors including technological failure.

Information on potential hazards in Montgomery County is provided below based upon various sources including several local, state, and federal level agencies, university scientific research, citizen groups, and county records. Our capabilities to accurately predict when any hazard will occur and the impact of it at any time are limited. Predictions result from past information, reasonable analysis and limited modeling available to us. The meaning of the terms used to describe the probability of occurrence is taken from the PA Hazard Mitigation Plan Standard Operating Guide Summary of Risk Factor (RF) Methodology. See Appendix K. Information on the potential effect of climate change on certain hazards has been included in some cases. In recognition that hazards do not affect the various constituents of the county's population in the same way, limited discussion of equity issues is also included.

In assembling the information contained in this section, tools such as the county GIS were employed. GIS, digital ortho-photography, and LIDAR enabled manipulation of spatially tied data to better analyze widely dispersed information at common scales. An interdepartmental and interagency team which included the public safety office has created a strategic management plan to expand the role of GIS to more fully integrate county operations and utilize various applications to improve the overall ability of the county staff to respond various needs. The county intends to utilize this tool to the extent possible in developing applications to enhance response to disaster and provide targeted warnings to potentially impacted residents. In compiling the information for this risk assessment,

specific property-based information was used, particularly related to flood impact. This information has been generally characterized in the plan, but references to specific properties are not made in the plan. The address-specific information will remain confidential and be used to evaluate future hazard mitigation projects and grant priorities.

4.2 Hazard Identification

4.2.1. SUMMARY OF HAZARDS

The vulnerability of the county to the various hazards is summarized on Figure 4.2.1-1. This table is based upon the analysis provided in this section and was reviewed during review committee meetings. Each municipality also had the opportunity to complete a survey distributed through Survey Monkey which asked, among other things, which type of disaster they were most vulnerable to. The results of this survey are contained within the summary of vulnerability for the county as a whole. Additionally, the municipal results and survey form are contained in Appendix C. The individual responses illustrate the differences in perceived vulnerability among different municipalities.

Avalanche, coastal flooding, expansive soils, tsunamis, and volcano were not considered, since they are not hazards that could occur in Montgomery County. Based on discussion with the planning committee, pandemic/infectious disease was expanded, and gun violence and—added to the plan. The 2017 committee felt that the impact of invasive species should be added in future plans, and this has been done.

Figure 4.2.1-1 | **Summary of Potential Hazards**

Natural Hazards	Frequency of Occurrence	Severity of Disaster	Extent of Disaster	Perceived Threat
Drought	Generally occurs a few times each decade.	Can be particularly damaging to agriculture and other green industries.	Would impact the entire county though it will have a more pronounced impact in rural areas.	Moderate
Earthquake	Unlikely, only one earthquake event reported with an epicenter in the county over the past 50 years.	No history of severe earthquakes causing damage in eastern Pennsylvania.	Major damage could occur near epicenter of an earthquake in the county.	Low
Extreme Temperature	Often the county will have a few days of extreme cold during the winter months and extreme warm and humid weather in the summer months.	Extreme cold can create hazardous conditions when combined with utility outages or winter storms. Extreme heat does not cause county disasters unless coupled with power outages, or in areas without modern air conditioning.	Generally extreme cold and warm conditions will affect the entire county.	Moderate
Floods, Flash Floods and Ice Jams	Floods occur in various streams throughout the county, including the Schuylkill River in Pottstown Borough (Boro), Upper Providence Township (Twp), West Norriton Twp, Norristown, Bridgeport Boro and Lower Merion Twp; Perkiomen Creek in Collegeville Boro; Little Neshaminy Creek in Horsham Twp; Wissahickon Creek including the Sandy Run in Abington Twp, Upper Dublin Twp, Ambler Boro, and Whitmarsh Twp; Pennypack Creek in Upper Moreland Twp, Hatboro Boro, Horsham Twp, and Lower Moreland Twp; Tookany Creek in Cheltenham Twp, Park Creek in Horsham Twp.	Some floods have caused major disasters in parts of the county with severe property damage and loss of life. Evacuations and displacement of families for significant periods of time has occurred during floods. Floods and flash floods are common; ice jams are rare.	Approximately 2.5% of the county is located in flood prone areas. It is estimated that 2,648 buildings are located in the 1% probability flood plain area.	High
Hail	Hail storms occur several times in a year during late spring and summer.	No major problems have occurred due to hail; some local property damage and crop damage could be significant.	Hails storms generally cover a small area and occur very briefly, yet they can occur anywhere.	Low
Hurricanes, Tropic Storms, Northeasters	The tracks of hurricanes rarely cross the county. The impact of coastal hurricanes can cause flooding and wind damage in the county.	Hurricanes can be a significant disaster, though the distance from the coast reduces the potential severity.	Impacts can occur over a wide area which could include the entire county.	Moderate

Natural Hazards	Frequency of Occurrence	Severity of Disaster	Extent of Disaster	Perceived Threat
Landslide	Landslides are unlikely in most of the county due to lack of steep slopes and extreme wet and dry weather.	Severity related to extent of slope and development downhill. Generally those conditions don't exist in the county.	Localized within limited steep slope areas found in the county.	Low
Lightning	Lightning storms occur many times each year.	Lightning by itself is not likely to create a significant disaster.	The direct impact of lightning is local; power outages caused by lightning can be extensive.	Moderate
Pandemic/ Infectious Disease	Influenza generally occurs annually to varying scales	Based on intensity and extent of illness.	Based on intensity and extent of illness. Seniors, children and people with compromised immune systems are at higher risk for infection.	Moderate
Radon	Relatively common	Long term exposure to elevated radon may cause cancer.	Long-term impact and found in specific locations.	Moderate
Land Subsidence/ Sinkholes	Possible only in areas underlain with Conestoga Limestone and Ledger Dolomite. Several sinkholes have been reported in the King of Prussia and the Plymouth Meeting area over the past 40-years.	Generally not catastrophic, but can result in property damage/ loss of road use, and a need to refill sinkhole cavity.	Localized in areas with limestone/ dolomite geology.	Low countywide, moderate in Upper Merion, Whitemarsh, and Plymouth Townships
Tornado, Severe Wind	Fifteen tornadoes have been reported in last 50 years. Possible a few times a year in various locations. Generally associated with various types of storms.	Potential exists for severe damage similar to the tornado in Limerick Twp that struck in 1994. For most severe wind events moderate property damage may result. Utility disruption and traffic accidents may be caused by wind storms.	Tornadoes generally damage a defined corridor. Wind storms are generally short-term and localized.	Moderate
Wildfire	Approximately 47 wildfires have been reported in the county consuming less than 30 acres and causing no significant property damage.	Not likely to be a disaster due to extent of undeveloped lands.	Any wildfires would be very localized due to lack of large forests or range lands.	Low
Winter Storms	A variety of winter storms have struck the county over the last 50 years.	The severity of the disaster associated with winter storms is due to the disruption of utilities and basic services, including transportation systems.	Generally storms will affect the entire county.	High

Human-Made Hazard	Frequency of Occurrence	Severity of Disaster	Extent of Disaster	Perceived Threat
Building or Structure Collapse	A few small structures have collapsed in the past for a variety of reasons.	The impact of structure collapse is limited to a small area.	Generally buildings are in excellent condition and comply with local codes.	Low
Civil Disturbance	A few civil disturbance events have occurred in the county.	There have been no group behavior patterns occurring in the recent past that would suggest the likelihood for civil disturbance.	A civil disturbance in the county would only impact a small area.	Low
Cyber Security Breach	Various types of cyber-attacks occur with increased frequency over the past few years.	As more common infrastructure and various services and communications depend upon internet and digital technology, cyber-attack could result in severe impacts.	Impact from a successful cyber-attack could impact the entire population directly on due to impact on the operation common infrastructure.	Moderate
Dam Failure	Dams in the county are generally maintained with no history of failure	Most dams in the county are not large with generally small populations living below them.	The potential extent of dam failure disaster varies with each dam, though for most days, the affected area would be very small.	Low
Environmental Hazard	Various chemical releases to the environment occur in the county, though most are not serious.	In most cases, environmental releases do not cause significant damage, though there is the potential for significant health/ safety impacts associated with a major toxic release.	Most chemical releases or plumes are localized or contained within a defined stream corridor.	Moderate
Levee Failure	Montgomery County has only one small levee system.	Levees play such a small role in county flood protection.	A levee system serves one neighborhood in Cheltenham Township.	Low

Human-Made Hazard	Frequency of Occurrence	Severity of Disaster	Extent of Disaster	Perceived Threat
Nuclear Incident	The Limerick Nuclear Power Plant is a significant potential source of radiation due to the large amount of radioactive material both used and stored on site.	A major radioactive release from the Limerick Power Plant, though extremely rare, could result in catastrophic impacts.	A major radioactive release at the power plant would affect the entire county.	Moderate
Terrorism	Incidents of terrorism could occur anywhere. The county, however, does not contain any significant terrorist targets that are unprotected.	A terrorist attack involving a nuclear weapon or long term destruction of water and food supplies could be catastrophic.	A catastrophic attack involving nuclear weapons could impact the entire county and region.	Low
Transportation Accident	A high volume of traffic flows through Montgomery County each day.	Most transportation accidents would not create a significant community disaster.	Most vehicle crashes would have very localized impacts. A train accident with a significant chemical release or a major aircraft accident could have wider reaching impact.	Moderate to High
Urban Fire and Explosion	Fires occur commonly in the county. Yet, the first responders located in the county are able to contain blazes so that most damage is relatively minor in extent.	Most fires are limited to a particular structure, though the potential always exists for a wider impact fire in developed areas of the county.	Large fires could occur in the county, although most properties are unlikely to experience a major fire. Response to fire calls is swift in the county.	Low to Moderate
Utility Interruption	Several major utility lines cross the county.	The interruption by itself may not be a significant disaster unless it lasts long or it occurs during periods of extreme weather.	The interruption could be extensive if major elements fail. System redundancy and quick response for repairs would limit the extent of the disruption.	Moderate to High

4.3 Hazard Assessment

4.3.1. BUILDING OR STRUCTURE COLLAPSE

Buildings and other engineered structures, including bridges, may collapse if their structural integrity is compromised, especially due to effects from other natural or human-made hazards. Older buildings or structures, structures that are not built to current code, or structures that have become weak through lack of routine inspection and maintenance activities are more susceptible to the effects of these hazards.

4.3.1-1 Location and Extent

Adherence to modern building codes can lower a building's risk of collapse. Building codes—developed by the International Code Council in partnership with FEMA and other federal, state, local, and private authorities—specify the minimum legal design and construction requirements for structural integrity, construction materials, and fire protection (FEMA, 2014). Most buildings constructed after 1961 in the Commonwealth were built under modern building codes as adopted in the Pennsylvania Uniform Construction Code. However, 40% of occupied housing units were built before 1960 in Pennsylvania.

Most of the historic resources (which are typically considered eligible for listing in the National Register of Historical Places once they past 50 years in age) were constructed prior to 1960. Historic resources are addressed in association with other hazards, but the hazard of building collapse poses a distinct, heightened risk. Based on the historic resources inventory provided by the PA SHPO, the County has at least 161 historic buildings classified as Eligible, Listed, or National Historic Landmark. Table 4.3.1-1 shows the distribution of Eligible, Listed, and NHL buildings in the Commonwealth by county. The municipalities with the largest numbers of historic buildings include those in the Lower Merion Township, Whitemarsh Township and Cheltenham Township.

Table 4.3.1-1 | **Historic Buildings in Montgomery County By Municipality** (PHMC, 2016)

Municipality	Eligible, Listed, and NHL Buildings	Percent of Municipal Total
Lower Merion	19	12%
Cheltenham	15	10%
Whitemarsh	11	7%
Pottstown	9	6%
Upper Merion	7	4%
Springfield	6	4%
Bryn Athyn	5	3%
Norristown	5	3%
Hatboro	4	3%
Horsham	4	3%
Lower Providence	4	3%
Marlborough T	4	3%
Plymouth	4	3%
Upper Frederick T	4	3%
Whitpain	4	3%
Abington	3	2%
Hatfield Twp.	3	2%
Jenkintown	3	2%
Lansdale	3	2%
Limerick	3	2%
Upper Gwynedd	3	2%
Collegeville	2	1%
East Norriton	2	1%
Franconia	2	1%
Lower Frederick	2	1%
Lower Gwynedd	2	1%
Lower Moreland	2	1%
Lower Pottsgrove	2	1%
Royersford	2	1%
Skippack	2	1%
Trappe	2	1%
Upper Dublin	2	1%
Worcester	2	1%
Conshohocken	1	1%
East Greenville	1	1%
Green Lane	1	1%
Hatfield Bor.	1	1%
Montgomery	1	1%
Narberth	1	1%
New Hanover	1	1%
Perkiomen	1	1%

Red Hill	1	1%
Salford	1	1%
Schwenksville	1	1%
Souderton	1	1%
Towamencin	1	1%
Upper Salford	1	1%

Bridges serve to connect both large and small roadways and communities throughout the Commonwealth. Whether they span another roadway or a body of water, bridges are a crucial part of every transportation system. However, as in most locations throughout Pennsylvania, Montgomery County's bridge structures are aging and in need of significant repair. Inspection and maintenance are necessary to observe conditions and prescribe maintenance and repair activities, especially on older structures. The impact of bridge closures can range from minor detours to loss of access to emergency and other critical facilities.

4.3.1-2 Range of Magnitude

There are different effects of a collapse, depending on the type and cause of the collapse and the type of structure that collapses. Active utility connections, such as gas, electric, water and sewer, can increase the impact of building collapse. A building collapsing on itself will likely result in debris that needs to be removed. If a building collapses in an outward direction, the debris field will be more widely scattered. Both types of collapses can cause injury to and endanger the lives of those inside or near to the structure and can result in damage to nearby property, especially if the collapse causes a large amount of debris near a populated area. Though occupied buildings are less likely to collapse since they would generally be maintained, more risk of death or injury would be likely with the sudden collapse of an occupied building. A worst-case scenario for a building collapse would be for a building with multiple people in it to collapse in a denser area causing injuries and possible death to those in the building as well as around the area.

Deterioration can critically affect the integrity of bridge structures as well. The level of deterioration depends on how much of the structure is damaged and how critical that portion of the structure is to the safety of drivers. Some structures only need deck replacement or a new superstructure, while others have substructure problems and should be entirely replaced. In PEMA's latest State Hazard Mitigation Plan (2019), Montgomery County was listed as the jurisdiction with the greatest number of closed bridges in the State. As of January 2022, 77 of the 655 bridges on state roads and 59 of the 304 bridges on locally owned roads were classified as in poor condition. 12 municipalities have five or more poor condition bridges on state—and locally owned roads combined, with Pottstown Borough and Cheltenham Township having the most at 10 each.

A worst-case scenario for a bridge structure collapse is for a high traffic bridge to collapse during rush hour causing many injuries and several deaths.

Table 4.3.1-2 | **Total, Closed, and Structurally Deficient Bridges on State, County and Locally-owned Roads by Municipality (PA DOT, 2022)**

	LOCAL			STATE		
Municipality	Total Count	Poor Condition	Percentage Poor	Total Count	Poor Condition	Percentage Poor
Abington	11	1	9%	16	1	6%
Ambler				1	1	100%
Bridgeport				7		0%
Cheltenham	16	5	31%	28	5	18%
Collegeville	2		0%	1		0%
Conshohocken				3		0%
Douglass	11	3	27%	17	6	35%
East Greenville				1		0%
East Norriton	7	1	14%	2		0%
Franconia	9	1	11%	11	1	9%
Green Lane				4	1	25%
Hatboro	2	1	50%	2		0%
Hatfield Boro	1		0%	1		0%
Hatfield Twp	8		0%	8	4	50%
Horsham	10		0%	9	2	22%
Limerick	8		0%	27	2	7%
Lower Frederick	7	2	29%	13		0%
Lower Gwynedd	5	1	20%	12	3	25%
Lower Merion	18	1	6%	31	4	13%
Lower Moreland	3	1	33%	12	4	33%
Lower Pottsgrove	6	4	67%	21	5	24%
Lower Providence	6		0%	13	1	8%
Lower Salford	8	4	50%	17	1	6%
Marlboro	3	2	67%	6	1	17%
Montgomery	1	1	100%	14		0%
Narberth	1	1	100%	1		0%
New Hanover	13	3	23%	7	1	14%
Norristown	13	4	31%	6	2	33%
North Wales	1		0%			
Pennsburg				1		0%
Perkiomen	4		0%	11	2	18%
Plymouth	9	3	33%	29		0%
Pottstown	8	5	63%	17	5	29%
Salford	3	2	67%	5	1	20%
Schwenksville				2		0%
Skippack	6		0%	20	1	5%
Souderton	1		0%			
Springfield	5		0%	15		0%
Towamencin	8		0%	14		0%
Trappe	1		0%			
Upper Dublin	13	4	31%	31	3	10%

Upper Frederick	5		0%	5	2	40%
Upper Gwynedd	6	1	17%	6	1	17%
Upper Hanover	21	2	10%	15	1	7%
Upper Merion	17	2	12%	55	5	9%
Upper Moreland	2	1	50%	17	1	6%
Upper Pottsgrove				4		0%
Upper Providence	6		0%	32	4	13%
Upper Salford	2		0%	7	1	14%
West Conshocken	1		0%	27		0%
West Norriton	1		0%	8		0%
West Pottsgrove	2		0%	5		0%
Whitemarsh	2	1	50%	22	4	18%
Whitpain	5	2	40%	8		0%
Worcester	6		0%	8	1	13%

4.3.1-3 Past Occurrence

There is no comprehensive list of buildings or structure collapses in Montgomery County. Minor structure failure has occurred in the county generally involving small non-residential, agricultural buildings (such as barns) or unoccupied housing structures. Generally, in cases where structural hazards occur, municipal action is initiated to require the property owner to either repair or raze the structure. Most recently a handful of collapses have occurred, resulting in no fatalities or serious injuries. Recent events include:

1. A partial 10-FT trench collapse at a home construction project. Two men performing utility work were rescued. (Lower Pottsgrove, 2022)
2. A collapsed wall in the rear of a DeKalb Street building brought electrical wires down onto a passing vehicle and made it unsafe for pedestrians and motorists. (Norristown, 2019)
3. A row of homes that were severely damaged by a fire in 2013 collapsed. (Norristown, 2019)
4. A partial roof collapses in the rear of the Old County Jail. (Norristown, 2018).
5. Numerous stormwater arch collapses from stormwater surges. (Pottstown, Numerous).

4.3.1-4 Future Occurrence

The risk of issues with bridges and building structural integrity in the County will increase unless proper maintenance and code enforcement is provided. As discussed, Montgomery County has the highest number of closed bridges in the state and 136 bridges rated as in poor condition. Forty percent of occupied housing in Pennsylvania was constructed prior to 1960 and an unknown number of vacant buildings are not for sale, for rent, or seasonally occupied, an indication that these units are not receiving routine maintenance and inspection. Older and uninhabited structures may be at greater risk of building collapse. Additionally, other hazard events such as fires, winter storms, and tropical storms could create conditions that would cause buildings or structures to collapse. Information on the future occurrences of such events can be found in their respective hazard profiles.

4.3.1-5 Vulnerability Assessment

Many factors influence the vulnerability of a structure or building to collapse. Age of structure, building materials, density of the area of the building location, maintenance, and enforceable measures. Older structures may not have been built with the same level of structural stability required by modern building codes and therefore may be more susceptible to collapse than a modern structure. Typically, more densely populated areas of Montgomery County face a higher vulnerability because of the proximity of residences to each other, commercial structures, and potentially vacant/damaged structures.

Structures can house transmission lines for gases, liquids, and other products, such as sheetrock dust, asbestos, etc., which could be released into the environment during a failure. Environmental impacts from a structural fire could occur if hazardous materials are released. Debris from fire can also contain chemicals or substances stored in the building or used as part of its construction, which may also impact the environment.

In addition, the public, residents, or individuals trapped by or in the vicinity of the collapse may react unpredictably, creating the possibility of civil unrest. Following the initial events of a structural collapse, residents and/or businesses may be displaced. Depending on the type of structural collapse, it could cause disruption to the local economy, housing, and healthcare access. Dust from the collapse may contain hazardous materials leading to long term health issues with local residents and first responders.

US Census Bureau records show that approximately 320,745 people live in 250,788 residential buildings built prior to 1960. The largest concentrations of vulnerable people, based on residential building age, are in Abington Township, Lower Merion Township, Cheltenham Township, Norristown Borough and the Borough of Pottstown. If all residential units built before 1960 are considered vulnerable the total value at risk equates to over \$40 billion.

Table 4.3.1-3 | Vulnerability of People and Buildings to Structure Collapse
(US Census Bureau, 2019)

Municipality	Vulnerable Population	Vulnerable Residential Buildings	Value of Exposed Residential Buildings	Percentage of Residents Exposed
Abington	37,786	28,460	\$4,293,810,100.00	68%
Ambler	4,354	3,604	\$503,572,100.00	68%
Bridgeport	2,743	2,504	\$250,149,600.00	59%
Bryn Athyn	607	426	\$96,744,600.00	51%
Cheltenham	23,667	18,910	\$2,712,758,216.75	64%
Collegeville	763	616	\$103,303,200.00	23%
Conshohocken	4,811	46,50	\$712,615,500.00	59%
Douglass	2,526	1,864	\$263,973,800.00	25%
East Greenville	1,332	998	\$79,790,100.00	45%
East Norriton	4,528	3,928	\$510,479,100.00	32%
Franconia	2,230	1,692	\$281,693,000.00	17%
Harboro	4,551	3,430	\$443,246,500.00	58%
Hatfield Boro	1,555	1,196	\$150,217,600.00	47%
Hatfield Twp	2,985	2,298	\$342,629,600.00	17%
Horsham	5,615	4,364	\$796,043,300.00	22%
Jenkintown	3,295	2,624	\$404,620,800.00	73%
Lansdale	9391	7,404	\$824,926,900.00	57%
Limerick	3,234	2,400	\$381,967,000.00	17%
Lower Frederick	1,472	1,126	\$131,573,100.00	30%
Lower Gwynedd	2,718	2,108	\$479,991,500.00	23%
Lower Merion	36,705	29,962	\$8,952,258,600.00	65%
Lower Moreland	4,411	2,934	\$602,881,100.00	33%
Lower Pottsgrove	2,424	1,882	\$200,987,700.00	20%
Lower Providence	5,985	4,390	\$727,628,300.00	24%
Lower Salford	2,387	1,778	\$332,920,300.00	15%

Marlborough/Green Lane	1,581	1,208	\$162,657,200.00	42%
Montgomery	1,838	1,358	\$229,581,300.00	7%
Narberth	3,532	2,994	\$757,482,000.00	80%
New Hanover	2,496	1,682	\$262,473,000.00	19%
Norristown	20,003	15,020	\$1,022,110,600.00	60%
North Wales	2,439	1,944	\$246,790,800.00	75%
Pennsburg	1391	1,040	\$106,912,000.00	39%
Perkiomen	1,384	994	\$130,715,900.00	16%
Plymouth	5,925	4,564	\$765,562,500.00	32%
Pottstown	15,928	12,892	\$795,046,100.00	71%
Red Hill	733	624	\$53,601,600.00	29%
Rockledge	1,973	1,668	\$197,491,200.00	77%
Royersford	2,615	2,386	\$239,348,800.00	54%
Salford	758	592	\$101,587,200.00	27%
Schwenksville	456	424	\$40,640,400.00	34%
Skippack	1,332	994	\$191,255,100.00	12%
Souderton	4,122	3,126	\$356,078,000.00	58%
Springfield	12,815	9,730	\$1,665,825,700.00	66%
Telford	1,773	1,246	\$145,034,400.00	67%
Towamencin	2,483	1,938	\$324,687,000.00	13%
Trappe	707	546	\$70,570,500.00	20%
Upper Dublin	7,621	5,404	\$1,009,309,700.00	28%
Upper Frederick	913	754	\$96,549,700.00	26%
Upper Gwynedd	2,717	2,096	\$364,116,400.00	16%
Upper Hanover	1,592	1,178	\$166,863,700.00	21%
Upper Merion	9,879	8,006	\$1,309,721,700.00	31%
Upper Moreland	12,982	9,936	\$1,389,108,400.00	52%
Upper Pottsgrove	1,670	1,130	\$127,746,500.00	30%
Upper Providence	3,601	2,598	\$468,325,700.00	16%
Upper Salford	1,240	778	\$137,005,800.00	35%
West Conshocken.	859	796	\$141,528,800.00	62%
West Norriton	4,507	4,188	\$434,827,700.00	28%
West Pottsgrove	2,113	1,744	\$124,720,000.00	55%
Whitemarsh	6,684	5,114	\$1,085,826,100.00	37%
Whitpain	4,369	3,274	\$726,913,500.00	22%
Worcester	1,641	1,274	\$285,016,900.00	17%

Development Pressures

Population growth and associated building densification have the potential to impact building or structural collapse. New construction should adhere to modern building codes that can lower a building's risk of collapse.

However, the structures, utilities and people in debris field are at highest risk during a collapse; meaning collapses in high density areas typically have higher impacts.

Unsecured vacant or abandoned buildings are intrinsically more dangerous than occupied buildings. It can be assumed that any new structure would be an improvement to structures that do not meet current building codes such as dilapidated structures or structures. New construction that follows modern building codes will preserve human life as well as stop any damage to the neighboring community.

Inequity

Buildings and structures don't fail frequently and are designed to withstand forces and hazards such as weather. Disrepair from lack of inspection or maintenance or construction errors, which are rare but possible, may lead to collapse. Generally, renters have limited sway regarding building upkeep and homeowners without the economic means to address structural inadequacies may be more exposed to risk to collapse.

Some municipalities may be able to dispose of nuisance or abandoned buildings. But the cost of maintaining vacant and abandoned buildings is high; coupled with the loss of revenues associated with these properties, it can lead to severe fiscal drains on local government. According to the Brookings Institute vacant properties not only undermine the vitality and quality of life of neighborhoods, but they act as a barrier to the revitalization of areas where market demand might exist were it not for the presence of those properties, and as a disincentive for the regeneration of the community ([The Brookings Institution, 2012](#))

Climate Change

The effects of climate change are already being felt across Pennsylvania in the form of more severe weather, flooding, changes in our forests and other ecosystems, and human health impacts. Anticipating future climatic challenges and constructing/reinforcing buildings and infrastructure to withstand them should be an important consideration. Heavy rain and surface flooding can have a direct impact on the structural integrity of buildings and structures as well as sustained dampness in different parts of the building including flooring, wall, roofing, etc. might render them uninhabitable and eventually lead to collapse. Likewise, snowfall can result in catastrophic structural damage due to heavy snow loads. Further, it is expected that sinkhole formation and destabilization will intensify; leading to more sudden collapses which impact range from nuisance to delay new construction projects to complete destruction of complete destroy buildings/structures and groundwater contamination.

4.3.2. CIVIL DISTURBANCE

4.3.2-1 Location and Extent

Civil disturbance is a broad term that is typically used by law enforcement to describe one or more forms of disturbance caused by a group of people. Civil disturbances are typically a symptom of and a form of protest pertaining to major socio-political problems. Civil disturbance hazards include the following:

- **Famine:** Involves a widespread scarcity of food leading to malnutrition, increased mortality, and a period of psychosocial instability associated with the scarcity of food, such as riots, theft of food, and the fall of governments caused by political instability borne of an inability to deal with the crisis caused by famine.
- **Economic Collapse or Recession:** Very slow or negative growth.
- **Misinformation:** Erroneous information spread unintentionally.
- Civil Disturbance, Public Unrest, Mass Hysteria, and Riot: Group acts of violence against property and individuals, for example.
- **Strike or Labor Dispute:** Controversies related to the terms and conditions of employment, for example.

Typically, the severity of the action coincides with the level of public concern. In addition to socio-political problems, civil disturbances can also arise out of union protest, institutional population uprising, or from large celebrations that become disorderly.

The scale and scope of civil disturbance events varies widely. However, government facilities, landmarks, prisons, and universities are common sites where crowds and mobs may gather. The County hosts two prisons that may be targets for civil unrest. Areas across the County that attract crowds such as large parks, main street areas with bars, college campuses, and event facilities may also serve as potential locations for civil disturbance.

4.3.2-2 Range of Magnitude

Civil disturbances can take the form of small gatherings or large groups blocking or impeding access to a building or disrupting normal activities by generating noise and intimidating people. They can range from a peaceful sit-in to a full-scale riot, in which a mob destroys property and terrorizes individuals. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order. Often that which was intended to be a peaceful demonstration can escalate into general chaos. There are two types of large gatherings typically associated with civil disturbances: a crowd and a mob. A crowd may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified into four categories:

Casual Crowd: A casual crowd is merely a group of people who happen to be in the same place at the same time. Violent conduct does not occur.

- **Cohesive Crowd:** A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshiping, dancing, or watching a sporting event. Although they may have intense internal discipline, they require substantial provocation to arouse.
- **Expressive Crowd:** An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest.
- **Aggressive Crowd:** An aggressive crowd is comprised of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They may be more impulsive and emotional and require only minimal stimulation to arouse violence. Examples of this type of crowd could include demonstrators and strikers, though not all demonstrators and strikers are aggressive.

A mob can be defined as a large disorderly crowd or throng. Mobs are usually emotional, loud, tumultuous, violent and lawless. Like crowds, mobs have different levels of commitment and can be classified into four categories (Alvarez and Bachman, 2008)

- **Aggressive Mob:** An aggressive mob is one that attacks, riots and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.
- **Escape Mob:** An escape mob is attempting to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs are generally difficult to control and can be characterized by unreasonable terror.
- **Acquisitive Mob:** An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting spree. This mob exploits a lack of control by authorities in safeguarding property.
- **Expressive Mob:** An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent-up emotions in highly charged situations.

The worst-case scenario for a civil disturbance event would be riots akin to the 1967 Newark Riots, an event fueled by police brutality, political exclusion of African Americans, urban renewal, inadequate housing, unemployment, and poverty. In this event, the arrest and subsequent treatment

of a cab driver sparked violence and looting in downtown Newark, NJ. The National Guard was called in, but their presence only served to intensify the violence. The riots lasted six days, after which 23 people were dead, 725 were injured, and nearly 1,500 were arrested.

4.3.2-3 Past Occurrence

While some civil disturbance has occurred in the county, they have largely not been catastrophic or widespread. Civil disturbance events of some kind occur every day with minimal impact on the County, often in relation to politics, elections, economic stagnation, inflation, unemployment, oppression, disruption of services, or political scandal.

The COVID-19 pandemic (2020 to present) has had a profound effect on Pennsylvania's economy, in a way that has no historical comparison ([Penn State, 2020](#)). Residents of Montgomery County were struck with job losses and subsequent losses of income as a result of the outbreak of the pandemic. There was a double negative impact on businesses — imposed lockdowns and several regulations on businesses, but also the general public aimed to avoid public areas due to the health risks which resulted in little business for companies. At the same time, spread of misinformation on social media and through other channels occurred over the course of the pandemic and targeted resident's opinions on COVID-19 avoidance, treatment and vaccine.

Another core event over the past five years, include the dozen or so peaceful protest in the County addressing racial inequalities following the death of George Floyd in Minnesota. Subsequent, two political demonstrations were held in response to comments made regarding the Black Lives Matter movement. Other key events which can be classified as civil disturbance and lead to the activation of Major Incident Response Team (MIRT)/Behavior Response Team (BRT) include:

- Villanova's NCAA Championship (Lower Merion Township, April 2018)
- Joe Biden's Inauguration (Entire County, January 2021)

All in all, between 2015 and present Montgomery County was home to several annual events classified as mass gatherings by the Pennsylvania Department of Health. The list in Table 4.3.2-1 is a partial compilation of annual events that draw large groups together with peaceful intent. Due to the number of events being hosted by each municipality in the county, a full listing of events is unable to be maintained. The information identified below was provided by the County Emergency Management Agencies and was noted to be events that require assistance from county and municipal agencies due to location and number of attendees. Most past occurrences of non-planned gatherings within the County have been peaceful, *with only XXX incident identified....*

Table 4.3.2 - 1 | **Mass Gathering, 2015 - Present**

PRE-PLANNED MASS GATHERINGS, 2015 - PRESENT			
Municipality	Event/ Date	Estimated Attendance	Mass Hysteria/ Riot Emergence
Emergence			
Norristown	6-30-2018	>100	No
Norristown	5-21-2020	>100	No
Norristown	6-4-2020	'Hundreds' reported	No
Pennsburg	6-4-2020	'Roughly 600'	No
Norristown	6-16-2020	<100	No
Totals			
NON-PLANNED MASS GATHERINGS, 2015 - PRESENT			
Municipality	Event/ Date	Estimated Attendance	Mass Hysteria/ Riot Emergence
Several within the county	2020 – 2022, related to covid and school closings	Small, <100	No
Totals			

Additionally, another form of misinformation/cyber-crime that has arisen over the past half-decade is phone scams. Often targeting the elderly, scammers claiming to be a family member in

trouble and in need of money, a Sheriff's Office claiming an outstanding warrant for their arrest can be avoided by paying a fine or soliciting money for a fake charity. Scammers were active across the County and in some cases were successful at getting seniors to wire or send them money.

4.3.2-4 Future Occurrence

Minor civil disturbances will continue to occur throughout the County, but it is not possible to accurately predict the probability and triggers for a large-scale civil disturbance event over the long-term. Civil disturbance is always a possibility while there is discrimination or other perceived social or economic injustice.

The location of civil disturbance events is unpredictable, yet spatial distribution patterns of riots in the past suggest that cities, universities, sporting events, and where large crowds gather are probable areas for a civil disturbance event to ensue. Local and County offices/buildings are also possible locations. Local law enforcement should continue to anticipate these types of events and be prepared to handle a crowd so that peaceful gatherings are prevented from turning into unruly public disturbances.

4.3.2-5 Vulnerability Assessment

The impacts of civil disturbance events are contingent upon a variety of factors including social, economic, or political issues and/or response. Generally, the impact of civil disturbance events is nominal and short-lived unless acts of sabotage are performed. There may be minor injuries to first responders or participants from physical confrontations, and vandalism may cause minimal damage to property, facilities, and infrastructure.

Mass gatherings may stretch health systems beyond their capacity. However, these events also present opportunities for long-lasting positive effects such as a stronger public health system after the event, or residents and visitors that are better informed about how they can protect themselves from certain diseases ([WHO, 2018](#)). Additionally, the health consequences of mass gathering-related events may include injuries resulting from crowd density and inadequate infrastructure, such as a bridge collapse, exposure to extreme weather events, and escalation of violence as a result of crowd behavior (Aitsi-Selmi, Murray, et al. 2016).

The vulnerability of facilities to civil disturbances depends on the type and function of a facility, as well as whether it is centrally located or not. As visible symbols of government, government facilities and national monuments are more vulnerable to civil disturbance events.

The maximum threat of civil disturbance is difficult to project. It has the potential (in terms of injuries, loss of life, and economic, property, and infrastructure damage) to inflict tremendous losses. Additionally, National Historical Parks or other historical places do not have a replacement value, meaning that potential losses should be considered an underestimation. For large civil disturbance events, there may be losses related to work stoppages.

Development Pressures

Most directly, new developments (of all types) may lead to protests of a wide range of sizes, influence and goals. A coalition of residents may oppose new construction of a sport stadium or commercial structure due to its perceived enhancement of traffic, while others may protest a new subdivision or apartment complex that doesn't match the architecture style of the surrounding properties. Past efforts to expand commuter rail and trail systems have been opposed by small but vocal groups, often motivated by a perceived 'undesirable connection' to another neighborhood or city.

Inequity

In the recent history protests/demonstration have been on-going and targeting inequity, racism or other social or economic injustices. Frequently, attendees at these events identify with the community demanding justice and equity under the law. Meaning, more residents within these racially oppressed groups are exposed to the potential risk of civil disturbance, public unrest, mass hysteria and riot. However, the impacts of civil disturbance/mass gathering events are also contingent upon numerous factors, including issues, politics and method of response. Unfortunately, it has been

observed that some instances of police response to minority protests have been more brutal than necessary, which can escalate conflict and mass hysteria.

Climate Change

Climate change may indirectly increase the risk of conflict by exacerbating existing social, economic and environmental factors. However, because communities will be forced to grapple with unprecedented conditions that go beyond known experience and what they may be capable of adapting to, new disturbances may arise. Additionally, as climate change accelerates public opinions climate action demonstrations may intensify.

4.3.3. CYBER SECURITY DISRUPTION

Significant damage to any computer systems with access to the internet can be initiated by remote sources that intrude operating systems to erase data, extract data, manipulate data, implant malicious software codes that further control operating system functions, or destroy the operating system and associated software. Attacks come in various forms and can originate from anywhere in the world. Even attacks that do not penetrate a computer operating system can cause disruptions if multiple service requests sent to a victim's computer overwhelms the system causing it to freeze, reboot, and ultimately not be able to carry out regular tasks. Other forms of attacks involve various deceptive schemes (referred to as social engineering) which induce people to do things they would not (and should not) ordinarily do for someone they do not know (such as giving someone their password). These deceptions include posing as a new employee seeking help, a friend, or as a vendor or employee of a partner company. Common targets of social engineers are receptionists and administrative assistants because they are predisposed to being helpful. In other schemes, messages use the guise of a friend or victim asking for assistance or some foreigner with money to invest. Recent attacks have focused on capturing the critical data in a target system and demanding a ransom for its release.



4.3.3-1 Location and Extent

Cyber security attacks respect no boundaries. Victims and perpetrators can be anywhere on the globe so long as they are both connected to the internet. Though many of the cyber- attacks are initiated by criminals seeking to make money through some scheme, hackers with no criminal intent may create attacks for the intellectual thrill or notoriety of it. Also, attacks to cyber security may be initiated as part of a terrorist action or other form of protest. In all cases they are criminal acts that can result in significant damage or theft of money or identity.

4.3.3-2 Range of Magnitude

As more business is transacted through the internet and more people rely on internet access, the potential for cyber disruption becomes more of a concern for society. The county has a higher percentage in broadband internet subscribers than Pennsylvania or the United States. Businesses, government, and various non-profit organizations rely on the internet.

Cyber security incidents may include, but are not limited to, the following events (regardless of platform or computing environment):

- Unauthorized access to a network, system, and/or data
- Repeated attempts at unauthorized access (from either internal or external sources)
- System changes not authorized by nor known to the system owner
- Denial of Service (DoS) attack or other disruptions to service
- Evidence of tampering with, removal of, or loss of data
- Web site defacement
- Social engineering incidents
- Theft of, or non-accidental physical damage to, information systems
- Malware attacks adversely affecting servers or workstations

The National Institute of Standards and Technology (NIST) Special Publication 800-61: Computer Security Incident Handling Guide, list several common malicious actions that would be considered cyber security incidents and the possible indicators of such actions. Users need to be familiar with these indicators. Successful cyber hacking of either the power grid system or communications system (in particular, wireless communication) could have significant impact on society and business. Loss of either vital power or communication system would prevent public safety response as well.

4.3.3-3 Past Occurrences

Since the development of the internet, various forms of disruptive attacks have been made for a variety of reasons. Initially, many of the attacks appear to result from an odd sense of intellectual curiosity in which hackers were trying to outwit new forms of technology for the sheer thrill of it. Later, as the economic power of the internet became evident, more attacks were initiated to steal money and information. Today, internet crime is a billion dollar enterprise operating at all points of the globe.

4.3.3-4 Future Occurrences

With the high value of the internet as a communication and commerce tool, it would be hard to imagine any abatement in future cyber-attacks. Even with better efforts to thwart attacks and arrest attackers, new and different sources of attack will continually arise. In some cases cyber attacks will be part of a larger terrorist action or be part of geo-global warfare.

4.3.3-5 Environmental Impacts

Large-scale cyber incidents may overwhelm government and private-sector resources by disrupting the Internet and/or taxing critical infrastructure information systems. In most cases, temporary disruption and inconvenience may be the result.

Yet significant attacks may threaten lives, property, the economy, and national security. For example the loss of computer control on various mechanical and environmental systems could lead to system failures and potential pollution threat. More critically, the loss of computer support for critical security, defense, or medical systems could result in injury or death.

4.3.3-6 Vulnerability Analysis

All systems with internet access used in the county are exposed to potential attack. Many system users and internet service providers utilize various protection strategies to shield local systems from various forms of attack. These strategies involve different forms of hardware, software, and user protocols. Even still, some attacks will penetrate even the best shields and cause disruption from time to time. Disruptions should not cause serious damage to large system users who have backup systems, emergency operating plans, and the ability to restart swiftly after a successful attack without loss of data.

4.3.3-7 Additional Information

[Standards and Technology \(NIST\) Special Publication 800-61: Computer Security Incident Handling Guide](#)

[United State Computer Emergency Readiness Team](#)

4.3.4. DAM FAILURE

The purpose of a dam is to store water, or other liquid materials for different reasons, such as human water supply, irrigation, livestock water supply, energy generation, containment of mine tailings, recreation, pollution, or flood control. Many dams fulfill a combination of the above functions.

Dam failure is defined as a collapse of an impounding structure resulting in an uncontrolled release of impounded water from a dam (DCR, 2017a). Dams typically fail when spillway capacity is inadequate and excess flow over tops the dam, or when internal erosion (piping) through the dam or foundation occurs. Complete failure occurs if internal erosion or over topping results in a complete structural breach, releasing a high-velocity wall of debris-filled water that rushes downstream, damaging or destroying anything in its path (Federal Emergency Management Agency [FEMA] 2015b).

4.3.4-1 Location and Extent

The U.S. Army Corps of Engineers (USACE) is responsible for safety inspections of some federal and non-federal dams in the United States that meet the size and storage limitations specified in the National Dam Safety Act. The database contains information on dams that meet the following criteria:

- Dams where downstream flooding would likely result in loss of human life (high hazard potential).
- Dams where downstream flooding would likely result in disruption of access to critical facilities, damage to public and private facilities, and require difficult mitigation efforts (significant hazard potential).
- Dams that meet minimum height and reservoir size requirements, even though they do not pose the same level of life or economic risk as those above – these dams are typically equal to or exceed 25 feet in height and exceed 15 acre-feet in storage, or equal to or exceeding 50 acre-feet storage and exceeding 6 feet in height.

The National Inventory of Dams (NID) has identified twenty-eight dams within the limits of Montgomery County, as documented in Table 4.3.1. All twenty-eight dams are state regulated with an average age of 56 years. Additionally, all high-hazard dams have a current Emergency Action Plan; a formal document that identifies potential emergency conditions at the dam and specifies actions to be followed to minimize loss of life and property damage.

Table 4.3.1 | [Dam Inventory](#)

Dam Name (Primary Owner)	Hazard Class	Emergency Action Plan	Impounded Water
Green Lane Reservoir (Aqua PA, Inc.)	High	Yes	Perkiomen Creek
Saw Mill (Borough of Norristown)	High	Yes	Saw Mill Run
Martins (Martins Dam Swim Club)	High	Yes	Crow Creek
Knight (Montgomery County)	High	Yes	Perkiomen Creek
Pine Run Flood Retarding (Upper Dublin Twp.)	High	Yes	Pine Run
Deep Creek (Montgomery County)	High	Yes	Deep Creek
Rapp Run Flood Retarding (Upper Dublin Twp.)	High	Yes	Rapp Run
Andorra Springs Basin B (The Reserve at Lafayette Hill HOA)	High	Yes	Tributary to Schuylkill River
Loch Alsh Reservoir (Borough of Ambler)	High	Yes	Tributary to Wissahickon Creek
Remington Road Detention (Lower Merion Twp.)	High	Yes	West Branch Indian Creek
Susquehanna Woods Lower (Abington Twp.)	High	Yes	Tributary to Sandy Run
Golf Ridge Lower (Golf Ridge HOA)	High	Yes	Tributary to Landis Creek
Mill Creek Detention Basin (Upper Moreland Twp.)	High	Yes	Tributary to Pennypack Creek
Graterford Sewage Lagoons (PA Dept. Of Corrections)	Significant	Yes	Perkiomen Creek
Estates of Audubon (Lower Providence Twp.)	Significant	No	Tributary to Mine Run
Horsham Towne Upper Pond (RV OP 1LP C/O Workspace Property Trust)	Significant	Yes	Tributary to Pennypack Creek
Horsham Towne Lower Pond (RV OP 1LP C/O Workspace Property Trust)	Significant	Yes	Tributary to Pennypack Creek
Renaissance Regional Basin (Renaissance at Gulph Mills Holding Co.)	Significant	Yes	Tributary to Schuylkill River
Sunny Brook Estates #1 (Sunnybrook Estates Community Assoc.)	Significant	No	Tributary to Stony Creek
Rinehart (SCA Services of PA, Inc.)	Significant	Yes	Tributary to Manatawny Creek
Penallen (United Parcel Service)	Significant	Yes	Tributary to Pennypack Creek
Timber Creek Condo (Timber Creek Condo Assoc.)	Significant	No	Tributary to Towamencin Creek
Knox Road Detention (Lower Merion Twp.)	Significant	Yes	West Branch Indian Creek
Camp Delmont (Boy Scouts of America)	Low	No	Unami Creek
Sterling Drug (GlaxoSmithKline)	Low	No	Doe Run
Metroplex (Goldenberg Management, Inc.)	Low	No	Plymouth Creek
Norristown, Swede Street (Montgomery County)	Low	No	Schuylkill River
Black Rock (Exelon Generation Company)	Low	No	Schuylkill River

The NID does not yet contain all dams in the United States and as a result it is expected that Montgomery County has other low-impact dams that may not be identified and monitored by the State. Historically, small dams were prevalent along Montgomery County water bodies to aid in ice harvesting. Although no-dam is risk free, dams that don't meet or exceed federal or state requirements for dam safety regulations are not expected to create loss of life or property damage during failures.

4.3.4-2 Range of Magnitude

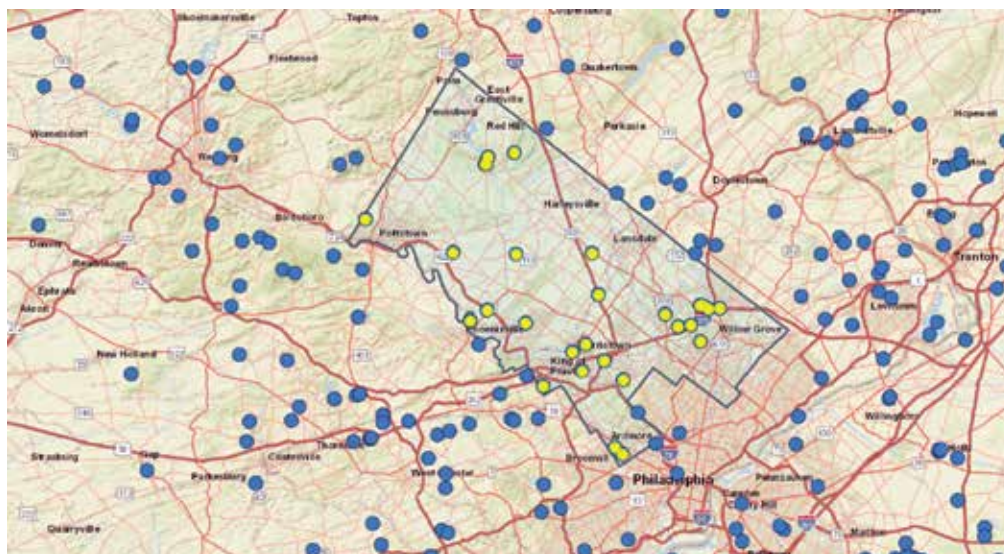
The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA), has developed a classification system for the nation's more than 90,000 dams. The current classification system used to evaluate the hydrologic hazard potential of dams was established in response to several dam failures in the early 1970's which resulted in significant loss of life and property damage. This classification system, while useful for the evaluation of hazard to life and property, is deficient in that it does not consider the indirect losses of critical lifelines due to a dam failure.

Approximately 82% or 23 dams in Montgomery County have been classified as either significant or high hazards. A heavy concentration of these dams exists in the north-east portion of the County within or near Horsham Township, Upper Moreland Township, Upper Dublin Township and Abington Township.

Table 4.3.4-2 | [Hazard Potential Classification](#)

Category	Direct Loss of Life	Lifeline Losses	Property Losses	Environmental Losses
Low	None expected	No disruption of services - repairs are cosmetic or rapidly repairable damage	Private agricultural lands, equipment and isolated buildings	Minimal incremental damage
Significant	None expected	Disruption of essential or critical facilities and access	Major or extensive public and private facilities	Major or extensive mitigation required or impossible to mitigate
High	Certain (one or more)	Disruption of essential facilities and access	Extensive public and private facilities	Extensive mitigation cost or impossible to mitigate

Figure 4.3.4-1 | [Dams in Montgomery County](#)



US Army Corps of Engineers National Inventory of Dams

Dam failures can pose a serious threat to communities located downstream from major dams. The impact of a dam failure is dependent on the volume of water impounded by the dam and the development located downstream. Catastrophic failures are characterized by the sudden, rapid, and uncontrolled release of impounded water from a water body.

Dam failures may not leave enough time for evacuation of people and property if dams deteriorate abruptly. Seepages in earth dams may develop gradually, and, if the embankment damage is detected early, downhill residents have at least a few hours or days to evacuate. Failures of concrete or masonry dams, though very rare, would occur suddenly, sending a wall of water and debris down a stream valley at great speeds. Survival would be a matter of having the good fortune not to be in the flood path at the time of the break. Dam failures due to over topping of a dam may give sufficient lead time for evacuation if the rising waters and deteriorating conditions are monitored.

4.3.4-3 Past Occurrence

Fortunately, no dam failure disasters have occurred in Montgomery County in the past 100 years. In the early part of the 20th Century, several minor dam failures occurred in Montgomery County along the Perkiomen Creek which was a significant source of ice used for refrigeration up until the late 1930s. At that time, the entire upper end of the creek contained ice dams and ice storage barns. The most significant ice dam failure involved the Palm Dam located along the Perkiomen Creek above Route 29. The rupture of the dam during floods in 1902 caused damage to a downstream rail line trestle, highway toll house, and several county bridges. Most of the other ice dams were washed out during the 1935 and 1936 floods. In addition to the ice dams, old Schuylkill Navigation system dams on the Schuylkill River at Plymouth Township above Conshohocken and the Linfield Dam at Limerick Township were breached during flood conditions. Since both dams were run of the river type of dams, the breaching had no impact on the downstream flood elevation levels at the time that they were breached. Since being initially breached, both dams have been completely removed by the Commonwealth of Pennsylvania.

During Hurricane Ida the Schuylkill River crested at 17.2 feet, over topping all the dams along its mainstem in Montgomery County. Fortunately, none of these failed or sustained significant damage.

Table 4.3.4-3 | [Past Ten Dam Failures In Pennsylvania](#)

Dam Name	Date	Incident Mechanism	Fatalities	People Evacuated	Infrastructure Damaged	Economic Damage (\$)
Augustine	3/5/18	Over topping	0	0	Unknown	Unknown
Lake Quinn	1/24/18	Reservoir Overfilling	0	0	Unknown	\$1 - \$100,000
Derry Run Basin C	7/22/13	Spillway Pipe Failure	0	0	Unknown	Unknown
Brookville Waterworks	7/17/12	Over topping	0	0	Unknown	Unknown
Sullivan	9/8/11	Over topping	0	0	Roadways	Unknown
Sunfish Pond	4/17/11	Over topping	0	0	Unknown	Unknown
Mariano Boro. Intake Dam	12/1/10	Over topping	0	0	Unknown	Unknown
Huntersville Intake & Filter	6/28/06	Over topping	0	0	Unknown	Unknown
Brushville Lake	6/26/06	Over topping	0	0	Unknown	Unknown
Elbow Lake	6/26/06	Over topping	0	0	Unknown	Unknown

4.3.4-4 Future Occurrence

Provided that adequate engineering and maintenance measures are in place, dam failures are unlikely in Montgomery County due to the overall conditions of the dams and the inspection efforts undertaken by the state. However, the risk increases for each dam as the dam's age increases or frequency of maintenance decreases. Many dams built during the 1930-70s, an era of intensive dam construction, have an expected life of 50-100 years. With the average age of Montgomery County's dams at 56 years old, most of the County's dams will be removed or rehabilitated in the next 25-50 years.

Minor dam failures are more common since low hazard structures are minimally regulated, but the impact of these events should pose no threat to lives or property. Even though these low head dams are not a threat due to dam break, they can present hazards to boaters and fisherman. Areas below even very small dams could present unique currents that can cause drowning. As such, dam owners are required to post warning signs above and below these dam structures in accordance with the state law described earlier.

Dam failure events usually coincide with events that cause them, such as earthquakes, landslides, excessive rainfall, and snowmelt. Hence, climate-induced changes are likely to increase the risks associated with structural integrity, operational management, and potential failure. Additionally, new developments that cause direct or indirect changes in the hydrological and hydrogeological conditions can influence dam failure events.

4.3.4-5 Vulnerability Assessment

A dam failure could result in catastrophic impacts to both Montgomery County and the surrounding areas that rely so heavily on the County. Dam failure or levee breaches can occur with little warning, sometimes within hours of the first signs of breaching. Buildings would be destroyed, homes lost, roads washed out, and stream banks eroded. Typically, secondarily flooding events triggered by dam failures are more destructive due to the water velocity and area restriction. As a result, erosion and scouring can be significant.

Impacts of a dam failure event on infrastructure and facilities could initiate a hazardous material or radiological release, a cyber-disruption, or power outage. A dam failure event can overwhelm wastewater treatment facilities, leading to contaminated wells and other water supplies. Inundated agricultural land is out of production until the water drains away. The cost to recover from dam failure and secondary impacts vary depending on the hazard risk of each dam. The latest large-scale dam failure in Pennsylvania occurred in 1997; the Laurel Run Dam (Laurel Run, PA) failed killing over 40 people and causing over \$5.3 million in damages.

Several members of the Planning Committee are emergency response personnel with knowledge and training pertaining to dam safety, failure, and response. PADEP Division of Dam Safety and the National Inventory of Dams maintain websites with data pertaining to High Risk Dams. These sources were consulted during the planning process. However, the owners of the 13 dams whose risk classification is listed as high were not consulted during this plan update, nor were the Emergency Action Plans for these dams consulted. The next update of the Plan will include information from the EAPs for these dams pertaining to areas at risk of inundation, and numbers of structures and population at-risk, as part of the vulnerability assessment.

Development Pressures

New development can indirectly affect dam failure by affecting hydrological and hydrogeological conditions. Dams are designed based on historical/known upstream conditions; intensification of stormwater flows, and sediment deposition may degrade the integrity of dam. Increased population growth in floodplain areas downstream from dam's result in larger at-risk populations and higher associated costs of dam failures.

Inequity

All populations and all existing infrastructure, including critical facilities, in the downstream inundation area of the dam are at risk during failure events. People experiencing homelessness, the elderly, and people with disabilities are often most vulnerable during these events. More specifically, populations unable to evacuate due to physical or financial reasons or populations reliant on electricity for medical care will be hardest hit. Populations living or sheltering near facilities that may flood and discharge illicit materials (household, medical and industrial waste; coal ash waste; human and livestock waste, etc.) during a dam failure will be more at-risk to chemical hazards exposure, fires, and explosions.

Climate Change

Climate change and more extreme weather events are likely to increase the risks associated with structural integrity, operational management, and potential failure. For example, over topping is one of the most common forms of catastrophic dam failure and may result from an increase in the frequency and intensity of extreme rainfall. Aging dams must be upgraded to maintain historical levels of flood protection in the face of climate change, new dam release operations will be required.

4.3.5. DROUGHT

Drought conditions occur periodically in the county during low rainfall periods. Droughts are generally defined as a period of prolonged dryness that contributes to the depletion of groundwater and surface water yields. These dry periods can occur as a result of long-term global weather patterns potentially causing droughts that last for a period of several years.



4.3.5-1 Location and Extent

During average climatic conditions, Montgomery County and the rest of the Commonwealth of Pennsylvania are water rich, when compared to many other states across the United States. (see PA State Water Plan) Since climatic conditions vary over time producing periods of dry weather conditions, Montgomery County is subject to periodic drought conditions that limit available water supplies. Droughts are regional climatic events which can impact various sized areas ranging from several counties in Pennsylvania, the entire Delaware River Basin, to the entire state.

4.3.5-2 Range of Magnitude

Droughts can have different effects, depending upon their timing, severity, duration, and location. Some droughts may have their greatest impact on agriculture, while others may impact water supply or other water use activities such as recreation. Most droughts cause direct impacts to aquatic resources which in turn impact human activities such as water supply use and recreation.

Drought events are defined by rainfall amounts, vegetation conditions, soil moisture conditions, water levels in reservoirs, stream flow, groundwater recharge, agricultural productivity, or economic impacts. Hydrologic drought events result in a reduction of stream flows, reduction of lake/reservoir storage, and reduced groundwater levels. These events have a significant adverse impact on public and private water supplies for human consumption, rural water supplies for livestock consumption and agricultural operations, water quality, natural soil water, or irrigation water for agriculture, soil moisture, and water for navigation and recreation. Droughts can also create conditions conducive to wildfire events.

Pennsylvania uses the following five drought condition indicators: precipitation deficit, stream flow, lowered groundwater levels, soil moisture, and water supply reservoir storage.

Precipitation Deficits: The earliest indicators of a potential drought are precipitation deficits, since rainfall and snow resupplies ground and surface water resources. The National Weather Service compiles long-term monthly averages of precipitation for each county. These averages are updated at the end of each decade, based upon the most recent 30 years, and are considered “normal” monthly precipitation. When rainfall continues below these averages, precipitation deficits occur.

Stream Flows: After precipitation, stream flows provide the next earliest indication of a developing drought. Stream flows typically lag one to two months behind precipitation in signaling a drought. The U.S. Geological Survey (USGS) maintains a network of 12 stream gauges across the county. Across the state, the Department of Environmental Protection (DEP) currently uses 73 of these gauges, equipped with satellite communication transmitters, as its drought monitoring network.

Groundwater Levels: Groundwater is usually the third indicator of a developing drought. Groundwater typically lags two to three months behind precipitation, largely because of the storage effect. About 80 trillion gallons of groundwater are stored throughout Pennsylvania, enough to cover the entire state with more than eight feet of water. Therefore, precipitation deficits can accumulate for several months before the resultant lack of groundwater recharge becomes evident in groundwater levels.

The USGS also maintains a network of groundwater monitoring wells, including at least one well in each county. The Montgomery County well used by USGS is a non-producing well owned by the North Penn Water Authority in Lansdale. The USGS has continually monitored groundwater depth in this Triassic shale aquifer well since 1997. Groundwater level is used to indicate drought status in a similar manner to stream flows. The Montgomery County Health Department (MCHD) has developed a more complete groundwater monitoring network for the county. The monitoring network includes

18 wells, several of which are on public property, located in different geological settings throughout the county. Since July 2005, the MCHD has been measuring the elevation of the groundwater at each well on a monthly basis to determine changes in the water table. However, MCHD does not have data for all 18 wells back to 2005. This information is made available under the [USGS Groundwater Watch](#).

Soil Moisture – Palmer Drought Severity Index: Soil moisture information is provided by the National Oceanic and Atmospheric Administration (NOAA) in the form of the “Palmer Drought Severity Index (PDSI).” The Palmer Index is a computed value, based on several meteorological and hydrological factors; it is compiled weekly by the Climate Prediction Center of the National Weather Service. Palmer values of -2.00 to -2.99 indicate a watch status; values of -3.00 to -3.99 indicate warning; and values of -4.00 and less indicate emergency. The Palmer Indices are available for the 10 Palmer regions of the state. Montgomery County is in region 3.

Water Supply Reservoir Storage: Storage in several large public water supply reservoirs is the fifth indicator used for drought monitoring in Pennsylvania. Depending on the total quantity of storage and the length of the refill period for the various reservoirs, drought stages associated with the level of drawdown have been established for key reservoirs. The Delaware River Basin Commission (DRBC) has established drought triggers based upon the water levels in key New York City Reservoirs in the headwaters of the Delaware River.

DEP and the Pennsylvania Emergency Management Agency (PEMA) manage droughts based on a three-stage process. Drought indicators are used to identify the overall water supply conditions. These indicators are used by DEP, DRBC, and PEMA to initiate various actions. While some of the indicators could be used as well to help identify meteorological, agricultural, or other types of droughts, the primary objective is to identify and manage water supply droughts.

Generally, when three or more of the indicators are signaling a *drought watch* condition for a county or group of counties, DEP will notify PEMA of the developing conditions and will ask PEMA to convene a meeting of the Commonwealth Drought Task Force. This group includes membership from most of the state agencies, particularly those whose operations or programs may be impacted either by droughts directly or by drought management operations. Based upon recommendations from the Task Force, including direction from the Governor, the Secretary of DEP may issue a drought watch on behalf of the Governor. Press releases are issued to the media and letters are sent to all public water suppliers in the affected area, notifying them of the need to monitor their own supplies and begin following their drought contingency plans and to update their plans if necessary. Citizens are requested to voluntarily reduce water usage by about five percent. DEP increases its monitoring activities from monthly to weekly and begins to monitor the status of public water suppliers in the affected area. Regular meetings of the task force are also scheduled to review developing conditions.

When the indicators signal a warning condition, the Secretary of DEP on behalf of the Governor follows a similar process, leading to a *drought warning* announcement. Press releases are issued to the media and letters are again sent to all public water suppliers in the affected area, notifying them of the developing conditions. Citizens are asked to voluntarily reduce water use by 10-15 percent. Frequency of Task Force meetings may be increased as well.

If drought conditions persist, the Governor may issue a proclamation of *drought emergency*. Upon issuance of the emergency proclamation by the Governor, Chapters 118, 119, and 120 of the Emergency Management Regulation become effective. When sufficient data becomes available for the newly established county groundwater monitoring network, the county may issue localized drought warnings based upon the findings of MCHD working with the USGS regional office. During drought emergency conditions, the Montgomery County Drought Task Force meets regularly to coordinate various response measures and make recommendations to the state. The task force was appointed by the County Commissioners and is chaired by representatives of MC PSD and MCHD.

Local Water Rationing: Although not a drought phase, local municipalities may, with the approval of the PA 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 the Pennsylvania 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 the granting of variances to consider individual

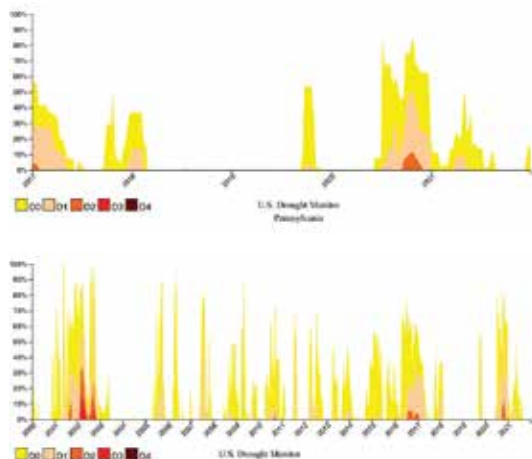
hardships and economic dislocations.

<https://www.drought.gov/states/pennsylvania/county/montgomery>

4.3.5-3 Past Occurrence

Rainfall and drought can vary significantly in a short period of time. For example, the National Integrated Drought Information System (www.drought.gov/states/pennsylvania/county/montgomery) records that January-July 2022 was the 63rd wettest year to date over the past 128 years, yet the following July is ranked the 15th driest July on record.

From 1980 through 2021, Montgomery County has had six drought emergencies of varying lengths occurring from 11/18/80-4/20/82; 4/26/85-12/19/85; 9/20/95-11/8/95; 7/20/99-9/30/99; 2/12/02-6/14/02; and 9/5/02-11/7/02. Additionally, *drought warnings* have occurred during 13 of the last 41 years, and drought watches have been called during 13 of the last 41 years. Some major droughts impacting Montgomery County before 1980 occurred between 1961-67, and 1979-81. The worst drought experienced in the county occurred in the early 1960s. For a period of nearly six years, drought conditions prevailed throughout the Mid-Atlantic Region including the entire Delaware River Basin. As a result of this drought, various water resource projects were developed to expand water supply sources. Since 2013, the county has enjoyed average and above precipitation. In November 2016 the county was placed in drought watch status due to lowered groundwater and soil moisture conditions. That watch status was lifted in May 2017.



<https://www.drought.gov/states/Pennsylvania>

4.3.5-4 Future Occurrence

It is difficult to forecast the severity and frequency of future drought events in Pennsylvania. However, work performed by Justin Sheffield and Eric Wood (2007) shows that there has been relatively little change in PDSI values over the 50-year period ending in 2004. This research is interpreted to indicate that soil moisture and drought conditions can be relatively equivalent to the average PDSI values experienced over the period 1954 to 2004. Historically, most of the Commonwealth is under a drought warning or emergency 5-10% of the time. Note that these conclusions are based on past occurrences over a relatively short record period which may not represent adequate statistical sampling.

Uncertainty regarding the future occurrence of droughts exists due to the potential impacts of climate change. The Pennsylvania Climate Impacts Assessment published in 2021 projected warmer and wetter conditions over the next 20 years. By midcentury the average annual temperature statewide is rising and is expected to increase by 5.9°. Pennsylvania could experience more total average rainfall, occurring in less frequent but heavier rain events. Extreme rainfall events are projected to increase in magnitude. Most of this increase is expected to occur during winter but coupled with warmer temperatures most of the precipitation will be rainfall. The report also concluded that it is likely that Pennsylvania's precipitation will become more extreme in the future, with longer periods of drought

interspersed by an increased frequency of extreme precipitation events.

More accurate estimates of future drought events require improvements in climate modeling and increased understanding of the processes underlying drought behavior.

4.3.5-5 Environmental Impacts

Environmental impacts of drought include:

- Hydrologic effects—lower water levels in reservoirs, lakes, and ponds and reduced stream flow
- Loss of wetlands
- Groundwater depletion and land subsidence
- Impairment of water quality such as increased water temperature and higher concentration of dissolved solids
- Impairment to the health of animal species—lack of feed and drinking water; disease; loss of biodiversity; migration or concentration; and reduction and degradation of fish and wildlife habitat
- Damage to plant communities—loss of biodiversity; loss of trees from urban landscapes and wooded conservation areas
- Increased number and severity of wildfires
- Reduced soil quality and fertility
- Air quality effects—dust and particulates
- Loss of quality in landscape

4.3.5-6 Vulnerability Assessment

As a hazard, droughts primarily impact water supply and agricultural land. All areas of the county are vulnerable to the effects of water supply reductions, but some municipalities that depend upon shallow individual groundwater wells or wells in Diabase geologic formations with generally low yields are most vulnerable to drought conditions. Other areas of the county are served by water suppliers that have multiple water sources or are interconnected with other water suppliers. Municipalities with residents or businesses most vulnerable to ground water supply loss include Marlborough Township, Salford Township, Upper Pottsgrove Township, and New Hanover Township. In these communities, several homeowners have experienced a disruption in water supply during past droughts. In many cases, they were able to obtain water by deepening their wells or hydro-fracking. The Montgomery County Department of Health reports that since 1997, the number of emergency well permits issued in these townships is: 47 in Upper Pottsgrove, 75 in New Hanover, 97 in Salford, and 48 in Marlborough. Municipalities with large concentrations of farming include New Hanover Township, Douglass Township, Franconia Township, Upper Frederick Township and Upper Hanover Township. In these communities, agricultural yields are more likely to be affected by drought hazards. Total crop, fruit, and nursery yields are about \$18 million. A drought could reduce these crop yields significantly. A prolonged and very severe drought could completely wipe out existing crops in any given year as well as do sustained damage to pasture lands, fruit trees, and nursery stock on any of the county's 30,896 acres of farmland.

Development Pressures

More development will necessitate more water consumption. The larger the demand for water, the more risk drought presents to Montgomery County. This risk applies to those consuming drinking water and the commercial and industrial sectors that rely on water for production. If prolonged drought conditions occur, it may limit the demand and capacity for new development.

Inequity

Those without the necessary financial resources may not be able to afford to deepen their on-

site wells. Water scarcity may lead to additional costs that will be an additional burden on the lower income community.

Climate Change

While climate change projections predict increased rainfall and more extreme rainfall events for Montgomery County, that does not mean there will not be periods of drought. In fact, the predicted extreme nature of the rainfall events may lead to more frequent drought periods, though they may be shorter in length.

4.3.5-7 Additional Information

[Drought in Pennsylvania Publication](#)

[USGS](#)

[Montgomery County Health Department Groundwater Monitoring Network](#)

[PA DEP Website](#)

4.3.6. EARTHQUAKE

An earthquake is an intense shaking of Earth's surface. The shaking is caused by a sudden release of stored energy along part of a fault plane within the earth. Other events can cause earth shaking, such as blasting or a mine roof collapse, but these events are not earthquakes. An earthquake has the potential to damage and destroy buildings and a city's infrastructure and take lives. Population density, building conditions, and the interdependencies of its critical infrastructure influence risks.

4.3.6-1 Location and Extent

Although Montgomery County does not sit on a major fault system, earthquakes are possible. The county has a low earthquake risk, with a total of 2 earthquakes since 1931. The USGS database shows that there is a 2.32% chance of a major earthquake within 50km of Montgomery County within the next 50 years. The largest earthquake within 30 miles of Montgomery County, PA was a 3.7 Magnitude in 1980.

Generally, earthquake events in Pennsylvania typically do not impact areas greater than 100 km (62 miles) from the epicenter. Historically, earthquakes in Pennsylvania have occurred in the northwestern and southeastern portions of the state. Most earthquakes in southeastern Pennsylvania have occurred in the Lancaster Seismic Zone (LSZ) which is located along the western edge of the Newark Basin Seismic Zone that extends through New Jersey into New York (Armbruster and Seeber, 1987). Figure 4.3.6-1 shows the relative seismic zones of Pennsylvania based on potential ground shaking intensity (or horizontal acceleration) from earthquakes.

4.3.6-2 Range of Magnitude

The intensity of ground shaking depends on several factors, including the amount of released energy, the depth of the earthquake beneath earth's surface, the distance from the fault, and the type of underlying soil or bedrock. The magnitude and intensity of an earth is measured by the Richter Magnitude Scale and the Modified Mercalli Intensity Scale (MMI). The Richter scale, an open-ended logarithmic scale that describes the energy release of an earthquake and as a result does not give any indication of the impact or damage of an earthquake. In contrast, MMI assigns intensity values based on the magnitude experience at the earthquake site.

Earthquakes that occur in Pennsylvania often register less than 3.0 on the Richter scale therefore are not felt but recorded. For comparison blasting in coal mines and quarries are recorded as between 2.00 and 2.50 whereas fracking-related events may reach up to 5.0 on the Richter scale (Pacchioli, 2017). The largest earthquake ever recorded in Pennsylvania occurred in 1998 in the region of Pymatuning Lake in the northwestern part of the state. The 5.2-magnitude earthquake caused minor structural damage but had effects on Montgomery County.

Table 4.3.6-1 | **Modified Mercalli Intensity Scale with Associated Richter Scale**

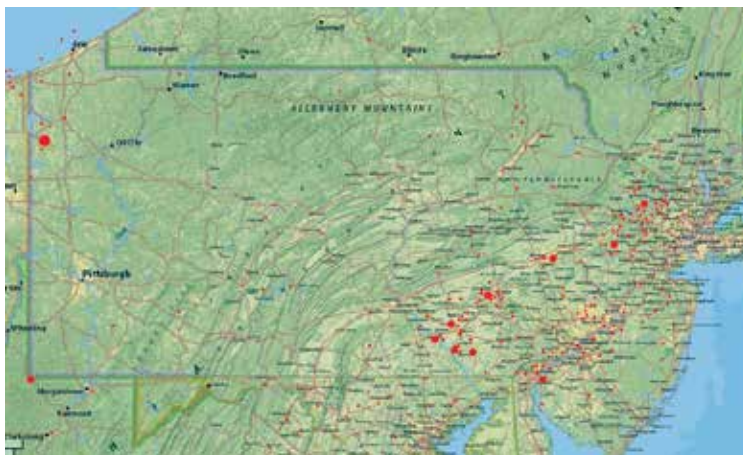
Intensity (Mercalli)	Magnitude (Richter)	Description
I	1 to 2	Not felt except by a very few under especially favorable conditions.
II	3	Felt only by a few persons at rest, especially on upper floors of buildings.
III	3.5	Felt quite noticeably by persons indoors. Many people do not recognize as earthquake. Vibrations similar to the passing of a truck.
IV	4	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building.
V	4.5	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned.
VI	5	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
VII	5.5	Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
VIII	6	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Chimneys, factory stacks, columns, monuments, walls may fall. Heavy furniture overturned.
IX	6.5	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X	7	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI	7.5	Few, if any structures remain standing. Bridges destroyed. Rails bent greatly.
XII	8	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

4.3.6-3 Past Occurrence

There have been two earthquake epicenters recorded in Montgomery County in 1980 and since no earthquakes have occurred up to the present (Table 4.3.2-1). While the two earthquakes with epicenters in Montgomery County caused no damage, about 35 earthquakes have caused light damage in Pennsylvania. Light damage includes occasional broken windows, cracked plaster, and glassware toppled from shelves. The most recent earthquake that was widely felt in Montgomery County occurred in 2011 and originated from southwestern Virginia and lasted over 10-15 seconds.

Table 4.3.6-2 | **Earthquake Epicenters Identified in Montgomery County (USGS, 2021a)**

Municipality	Date	Magnitude
Horsham	3/5/1980	3.5
Upper Moreland	3/11/1980	3.7

Figure 4.3.6-3 | [Earthquake Epicenters In/Near Pennsylvania](#)

4.3.6-4 Future Occurrence

Montgomery County does not lie on top of any fault lines and does not have a historical record of high-impact earthquake events therefore, it is reasonable to assume that the probability of an earthquake event occurring in Montgomery County in any given year is unlikely very low (less than 1% annual probability). While earthquakes cannot be predicted we can assume that any future earthquakes felt by residents will have epicenters outside of the County and will be of a lower magnitude. The future occurrence of nuisance level shaking from induced-seismic activity via coal, quarry, and fracking will be related to the management of these industries by operators and the Department of Environmental Protection as well as technological innovation. However, it is possible that seismic activity that is induced from fracking or wastewater injection could reach magnitude 4.0 or 5.0 on the Richter scale. Induced events reaching a magnitude have been recorded in Texas and Canada, if these events occurred in Pennsylvania, they would be on par with the largest natural earthquakes recorded in state history.

4.3.6-5 Vulnerability Assessment

Although the seismic hazard of Montgomery County is low, because of the potential occurrence of a unique set of factors, the risk to individual communities of the county may vary due to the high cost of dealing with the repercussions of any shaking event in a congested environment. Natural seismic effects strike without warning could pose a threat by causing treefalls, breakage/damage to utility systems, inducing landslides/rockfalls or chemical/fuel spillage. Impacts on structures vary from minor (cracked chimneys or broken windows) to major (total collapse) depending on many factors including age, construction type, and underlying soils. Shaking events both natural and induced can lead to economic losses due to business disruptions and damage to infrastructure which can trigger a cascading set of impacts. The next plan update should include an estimate of the number of at risk structures, based on age of construction and construction type.

Development Pressures

Population growth and associated building densification has the potential to impact earthquake damage. However, unsecured vacant or abandoned buildings are intrinsically more dangerous than occupied structures. It can be assumed that any new structure would be an improvement to structures that do not meet current building codes such as dilapidated structures or structures with unreinforced masonry. New construction that follows seismic standards, not generally in PA building codes, will not only preserve human life if a major earthquake hits but also cause not cascading damage to the neighboring community.

Inequity

A school of thought established by quake engineers is that is earthquakes do not kill people, poorly designed, built and maintained buildings do. While seismic building codes are rarely applied to buildings in Montgomery County, some buildings are more at risk too collapse. Renters have limited sway regarding building upkeep and homeowners without the economic means to address structural inadequacies may be more exposed to risk during earthquake events.

During natural disasters households may be isolated which would pose a challenge for populations with special needs that require assistance in daily activities or depend on power for their well-being. Additionally, any event that interrupts the flow of business, transportation, tourism, etc. to Montgomery County will disproportionately affect population reliant on in-person employment.

Climate Change

Earthquakes are not known to be affected by climate change. Because Earthquakes occur miles beneath the surfaces due to heat within earth that drives plate motion it is extremely complicated to determine what kind of tectonic process might be related to climate. However, climate change may lead to migration to more favorable environments (including Pennsylvania) which may add to existing development pressures in Montgomery County. As stated previously, new development would benefit from the inclusion of modern seismic standards as well as programs to pinpoint buildings that are most at risk of collapse to mitigate the damage from natural or induced seismic events.



4.3.7. ENVIRONMENTAL HAZARD

Environmental hazards in Montgomery County can involve the release hazardous material that is used, stored, or transported through the county, located at Superfund or uncontrolled brownfield sites, or may come from other types of products that are defective or contaminated. These hazards result from human activities and industries and may cause injury and death to humans, damage to property, and contamination of the environment. Montgomery County contains 17 sites listed on the National Priority List under Superfund. These sites involve soil and groundwater contamination in most cases. One site, the Bo-Rit property in Ambler Borough, Whitpain Township, and Upper Dublin Township, has been stabilized under an emergency stabilization action. Construction of all remediation facilities has occurred on nine of the other sites. The remaining sites are actively being remediated under Superfund Program requirements. In addition to the NPL sites, there are properties in the county that may contain hazardous waste or have some form of soil or ground water contamination. No information on deaths, serious injury, or property damage could be found for Superfund sites or product defects or contamination; therefore, these types of environmental hazards were not profiled in this plan.

4.3.7-1 Location and Extent

Hazardous Materials Release

Hazardous material releases pose threats to the natural environment, the built environment and public safety through the diffusion of harmful substances, materials, or products. Hazardous materials can include toxic chemicals, infectious substances, bio-hazardous waste, or any materials that are explosive, corrosive, flammable, or radioactive (PL 1990-165, §207(e)). Hazardous material releases can occur wherever hazardous materials are manufactured, used, stored, or transported. Such releases can occur along transportation routes or at fixed-site facilities. Hazardous material releases can result in human and wildlife injury, property damage, and contamination of air, water, and soil.

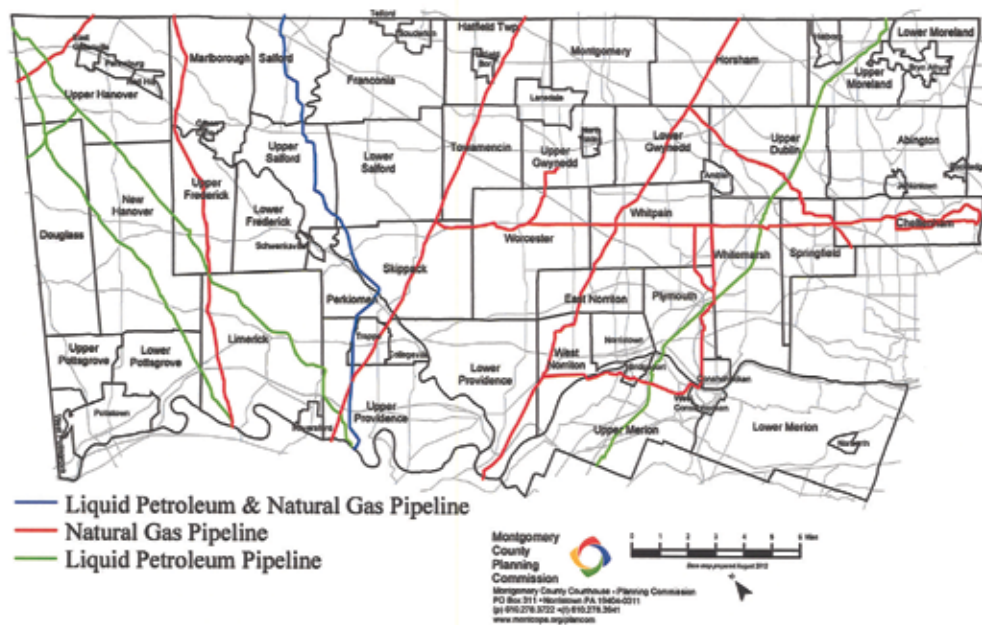
Transportation of hazardous materials on highways involves tanker trucks or trailers which are responsible for the greatest number of hazard material release incidents. There are over 3,668 miles of highway in the county and many of those are used to transport hazardous materials. In addition, sections of the Pennsylvania turnpike and other major expressways through the county support the largest volumes of traffic in the state. These roads also cross rivers and streams at many points where a hazardous material spill could have the potential to pollute watersheds that serve as domestic water

supplies. The potential also exists for hazardous material releases to occur along rail lines as collisions and derailments of train cars can result in large spills.

Pipelines can also transport hazardous liquids and flammable substances such as natural gas or liquid petroleum. Incidents can occur due to pipe corrosion, damage to pipes during excavation, incorrect operations, weld point failures or pipe damage from other forces. Montgomery County contains several miles of gas and liquid pipelines transporting large volumes of natural gas and petroleum (see Figure 4.3.7-1).

Fixed-site facilities that use, manufacture, or store hazardous materials in Pennsylvania pose risk and must comply with both Title III of the federal Superfund Amendments and Reauthorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), and the Commonwealth's reporting requirements under the Hazardous Materials Emergency Planning and Response Act (1990-165), as amended. These laws require that all owners or operators of facilities that manufacture, produce, use, import, export, store, supply, or distribute any extremely hazardous substance, as defined by the EPA, at or above the threshold planning quantity, as established by EPA, shall report to the county where the facility is located and the Commonwealth that the facility is subject to the requirement to assist the Local Emergency Planning Committee (LEPC) in the development of an Off-site Emergency Response Plan. The community right-to-know reporting requirements keep communities abreast of the presence and release of chemicals at individual facilities. Currently, there are nearly 300 SARA Title III facilities located in Montgomery County.

Figure 4.3.7-1 | Major Pipelines in Montgomery County



The EPA tracks key information about the chemicals handled by manufacturing or processing facilities through its Toxic Release Inventory (TRI) database. Facilities which employ ten or more full-time employees, and which manufacture or process 25,000 pounds or more, or otherwise use 10,000 pounds or more, of any SARA Section 313-listed toxic chemical during a calendar year are required to report TRI information to the EPA, the federal enforcement agency for SARA Title III, and PEMA. Additional hazardous materials were contained at the now closed Willow Grove Naval Air Station in Horsham Township.

Nuclear facilities are another type of fixed facility that poses risk of hazard material release. For more information about radiological release incidents, reference Section 4.3.16.1

4.3.7-2 Range of Magnitude

Hazardous Materials Release

Hazardous material releases can contaminate air, water and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas. With a hazardous material release, whether accidental or intentional, there are several potentially exacerbating or mitigating circumstances that will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. Primary and secondary containment or shielding by sheltering-in-place protects people and property from the harmful effects of a hazardous material release. Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous material release include:

- Weather conditions: affects how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain alters dispersion of hazardous materials
- Non-compliance with applicable codes (e.g., building or fire 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 is dependent not only on the circumstances described above, but also on the 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 remain present in the environment for a long period of time (e.g., centuries to millennia for radioactive materials), resulting in extensive impacts on people and the environment. A worst-case scenario event of a hazardous material release occurred in March 2009 when a tractor trailer overturned, spilling 33,000 pounds of toxic hydrofluoric acid near Wind Gap, Pennsylvania resulting in the evacuation of 5,000 people. Residents were evacuated because contact with concentrated solutions of the acid can cause severe burns and inhaling the gas can cause respiratory irritation, severe eye damage, and pulmonary edema.

4.3.7-3 Past Occurrence

Hazardous Materials Release

Since the enactment of SARA Title III requirements, facilities which produce, use, or store hazardous chemicals must notify the public through their county's emergency dispatch center and PEMA if an accidental release of a hazardous substance meets or exceeds a designated reportable quantity, and affects or has the potential to affect persons and/or the environment outside the plant. SARA Title III and Pennsylvania Hazardous Material Emergency Planning and Response Act (Act 165) also require a written follow-up report to PEMA and the county where the facility is located. These written follow-up reports include any known or anticipated health risks associated with the release and actions to be taken to mitigate potential future incidents. In addition, Section 204(a)(10) of Act 165 requires PEMA to staff and operate a 24-hour State Emergency Operations Center (EOC) to provide effective emergency response coordination. The number of hazardous material release incidents in Pennsylvania has increased from 665 incidents in 2006 to 950 incidents in 2008. Transportation-related hazardous material release incidents are also tracked by the federal government. The U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) maintain information on highway-related hazardous material release incidents. The PHMSA reports that between 2003 and 2012, there were over 8,000 highway related release incidents, resulting in 10 hospitalized injuries, and only one fatality.

Pipeline releases can also result in fatality, injury, property damage, the release of highly volatile

liquids, or liquid releases that result in unintentional fire or explosion. Unfortunately, three major pipeline incidents have already occurred in the county.

On November 24, 1950, a newly built 30-inch natural gas pipeline in Upper Merion Township ruptured for nearly 3,000 feet, causing a fire that destroyed two nearby homes that were under construction nearby.

On October 7, 1986, a 14-inch petroleum pipeline, also in Upper Merion Township, ruptured spilling thousands of barrels of gasoline. This emergency resulted in the closure of several major roadways and the evacuation of area homes and the King of Prussia Mall.

The most disastrous pipeline accident in Montgomery County occurred on the evening of January 27, 1971, in West Conshohocken Borough when a gas line exploded on Front Street destroying 15 homes and damaging 25 others. Fifty people were injured and taken to nearby hospitals. Five people were killed, including a nineteen-year-old fireman.

4.3.7-4 Future Occurrence

Hazardous Materials Release

While many hazardous material release incidents have occurred in Pennsylvania in the past, they are generally considered difficult to predict. An occurrence is largely dependent upon the accidental or intentional actions of a person or group. Intentional acts are addressed under Section 4.3.22., Terrorism. The risk associated with hazardous materials release is expected to remain moderate. Hazardous materials release incidents occur annually in Montgomery County, so a 100 percent annual probability is anticipated. Yet, most releases expected in the future will not likely cause a significant impact on the environment or result in deaths or injuries.

4.3.7-5 Environmental Impacts

Hazardous Materials Release

The environmental impacts of hazardous material releases include:

- Hydrologic effects—surface and groundwater contamination
- Other effects on water quality such as changes in water temperature
- Damage to streams, lakes, ponds, estuaries, and wetland ecosystems
- Air quality effects—pollutants, smoke, and dust
- Loss of quality in landscape
- Reduced soil quality
- Damage to plant communities—loss of biodiversity; damage to vegetation
- Damage to animal species—animal fatalities; degradation of wildlife and aquatic habitat;
- Pollution of drinking water for wildlife; loss of biodiversity; disease

4.3.7-6 Vulnerability Assessment

The vulnerability of Montgomery County to environmental hazards differs based on the type of environmental hazard being examined. For typical hazardous material releases, vulnerability is defined as jurisdictions and/or critical facilities located within 1.5 miles of gas or oil pipelines. Generally, 187,293 land parcels are within this range containing buildings with a \$25,688,850,720 assessed value. Five hospitals, 11 colleges, 147 schools and 34 nursing homes appear within this area.

4.3.7-7 Additional Information

[EPA Superfund NPL Status](#)

[Sara Title III](#)



4.3.8. EXTREME TEMPERATURE

Extremely warm conditions with temperatures above 90°F accompanied by high levels of humidity or very cold temperatures below 32°F can be hazardous to vulnerable populations and infrastructure. Extreme temperature events are occurring on a regular basis and scientists predict the frequency will increase.

4.3.8-1 Location and Extent

The average global temperatures have risen significantly over the past 137 years. Since the 1980s, each decade has been warmer than the previous one. This is expected to continue. The warmest seven years have all been since 2015, with 2016, 2019 and 2020 constituting the top three. 2021 has been declared the 6th hottest year on record for the country, and the 4th hottest for Pennsylvania. The climatic information for Montgomery County based upon readings taken at the Philadelphia International Airport is provided in Section 2.1. Though the county currently enjoys a generally moderate climate on the whole, extreme temperatures occur. For the purpose of this Plan, extreme temperatures are defined as below 0°F and above 90°F. Freezing temperatures occur on an average of 116 days per year. High temperatures of 90°F or above occur in the county about 24 days per year at any one location.

4.3.8-2 Range of Magnitude

The heat index is a measure that combines air temperature and relative humidity to determine the human-felt equivalent temperature. For example, when the temperature is 90°F (32° C) with very high humidity, the heat index can be about 105° F (41°C). The human body normally cools itself by perspiration, or sweating, which evaporates and carries heat away from the body. However, when the relative humidity is high, the evaporation rate is reduced, so heat is removed from the body at a lower rate, causing it to retain more heat than it would in dry air.

Temperature advisories, watches, and warnings are issued by the National Weather Service relating the above impacts to the range of temperatures typically experienced in Pennsylvania. Excessive Heat Watches are issued when the heat index is expected to be 105°F or higher within the next 24-72 hours. Excessive Heat Warnings are issued when the heat index is expected to be 105°F or higher within the next 12 hours. The Montgomery County Commissioners, on the advice of MC PSD, will declare a Code Red Hot Weather Health Warning for Montgomery County based on a review of forecasts from the National Weather Service.

Extremely high temperatures cause heat stress which results in cramps, fainting, heat exhaustion, and heatstroke, or can exacerbate other medical conditions. The impacts of high temperatures will vary from person to person based on individual age, health, and other factors. Elderly residents, people with certain health problems, and those who face socio-economic difficulties are the most at risk during hot weather. More drowning occurs in rivers and lakes as people seek refuge from the heat. Excessive heat can also hurt agriculture through crop damage, reduced milk production and fatalities to flocks and herds. Roads, bridges, and building HVAC systems undergo additional stresses during hot weather periods. Electric power and water utilities typically have a higher demand from their customers during heat waves.

In Montgomery County, Wind Chill Advisories are issued when the wind chill is expected to be between -10°F to -24°F. Wind Chill Warnings are issued when wind chill is expected to be below -25°F. Wind Chill Advisories are issued when wind chill values drop to -10°F to -24°F. The Montgomery County Commissioners, on the advice of the MC DPS, will declare a Code Blue Cold Weather Health Warning for Montgomery County based on a review of forecasts from the National Weather Service. A Code Blue is called when the combination of air temperature and wind chill is anticipated to be 20° F or less.

Cold temperatures can be extremely dangerous to humans and animals exposed to the elements. Without heat and shelter, cold temperatures can cause hypothermia, frost bite, and death. Wind chill temperatures are often used in place of raw temperature values because that wind can have in drawing heat from the body under cold temperatures. These values represent what temperatures feel like to humans and animals during cold, windy conditions. Similar to high temperatures, the effects of cold temperatures are dependent upon the age and health of the individual. During cold conditions the elderly, and populations with limited financial means, are threatened. Cold conditions, when combined with wind, could result in very low temperatures due to wind chill causing greater danger for people exposed to it. Stress on building heating systems and heating fuel supplies can

occur as a result of these conditions. Additional costs for heating may create significant hardships for populations with limited financial resources.

When either cold or hot weather persists for an extended period, the impact of the weather will be more dramatic. During these conditions, power or fuel needs might overwhelm supplies, causing widespread blackouts or loss of heating fuels. This kind of event could create a public health hazard for the elderly and children.

4.3.8-3 Past Occurrence

Data from the National Climatic Data Center reports that there have been 85 extreme temperature episodes in Pennsylvania between 2000 and 2021, resulting in a total of 94 deaths and 103 injuries. 50 of these events have been a result of extreme cold/wind chill, resulting in 4 deaths. The database reports one event in January 2000 and one in February 2007 which resulted in 2 deaths each. There have been 35 extreme heat episodes, resulting in 90 deaths and 103 injuries across the state. The database reports an episode on June 21st, 2011 that resulted in 25 deaths and 60 injuries across 10 counties. Past events typically affected multiple counties or the entire state (NCEI).

Local damage to infrastructure such as highways has occurred in the county during extreme temperature events due to expansion and contraction of various structural components. In the past summers, lane closures occurred on US Route 422 in Lower Providence Township due to highway concrete sections buckling.

The Montgomery County Public Safety Department has issued Code Blue warnings 3 to 4 times each year since 2018. Typically, these code blue warnings last for two to three days. During the same time frame, 1 or less Code Red events occurred per year.

4.3.8-4 Future Occurrence

It is important to note that frequency estimates based on the past may not be an accurate representation of future conditions due to the impacts of climate change. The 2021 PA Climate Action Plan predicts the average annual temperature statewide is expected to increase by about 6 degrees Fahrenheit. Extreme heat events will also increase. 90+-degree temperatures are expected to occur approximately 37 days per year, up from 5 days historically. While temperatures are expected to increase, during the winter months Montgomery County may still experience extreme cold events at the current rate of 2 to 3 cold blue issued each year lasting three to four days at a time, based on current experience.

4.3.8-5 Environmental Impacts

Temporary periods of extreme hot or cold temperatures typically do not cause a significant environmental impact. However, prolonged periods of hot temperatures may be associated with drought conditions (see section 5.3.5) and can damage or destroy vegetation, dry up rivers and streams, and reduce water quality. Prolonged exposure to extremely cold temperatures, particularly associated with winter storm conditions, can kill wildlife. Extremely hot weather may cause fish kills in streams and rivers. An increase in drowning may result during periods of high temperature since more people are likely to swim in the Schuylkill River and area streams.

4.3.8-6 Vulnerability Assessment

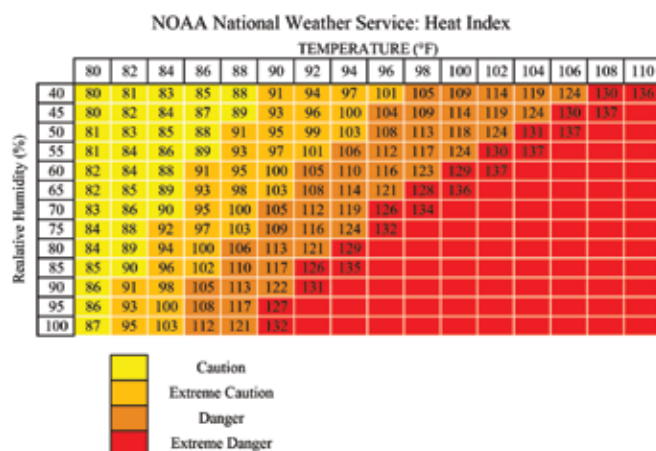
The vulnerability of the county to extreme heat and extreme cold is discussed separately below since each has a very different impact.

Extreme Heat

Vulnerability for extreme heat was classified as areas having a maximum average temperature over 85 degrees, according to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) study. Extreme heat does not generally impact buildings; instead, it primarily impacts people and, in some cases, equipment, roads and other forms of infrastructure. Nonetheless, key facilities need to be maintained to ensure that they can provide relief from extreme heat conditions for people.

Nearly all critical facilities in the county are equipped with air conditioning. Some school buildings do not have air conditioning since they are not occupied during the warmest part of the summer. In the event of a power failure or if the air conditioning systems malfunctioned, significant heat impacts at these facilities would occur. It's evident from past events that extreme heat is dangerous and can cause human related illnesses and death. As temperature goes up so does the number of people hospitalized for heat related illnesses. Therefore, it's important to understand how many people are

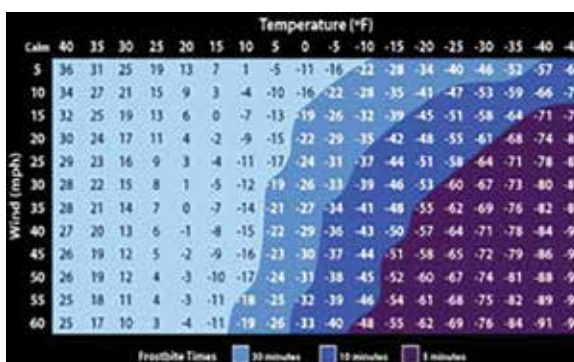
exposed to such conditions, and how many buildings exist where potential problems could arise should power be lost. The vulnerability analysis identified areas of the county that experience the top 5% exposure to extreme heat. These areas contain a population of 31,029 (2010), and 11,136 buildings. A slightly broader area experiencing the top 10% exposure to extreme heat was also identified. Within these areas there are 54,601 people, and 21,914 buildings.



Extreme Cold

People outside of heated buildings are the most vulnerable to extreme cold conditions. In January 2014, a public-private partnership was launched called Your Way Home Montgomery County to help working and low-income families end or prevent their homelessness. Since its launch, Your Way Home has had some great successes. The keys to this success include consumer-driven and coordinated entry into our housing crisis response system; using evidence-based strategies like rapid re-housing, critical time intervention, and diversion; aligning resources with private partners, including both local foundations and community service providers; and focusing energy on helping the most vulnerable neighbors find and maintain permanent housing and connect to resources in their communities.

During the 2011 point in time estimate by the Montgomery County Continuum of Care conducted in January 2019, 441 homeless people were counted residing in Montgomery County. These people would be most impacted by extreme cold, though other residents could also be impacted. Generally, damage does not occur to buildings due to extreme cold, except in the event of the loss of internal heating when utility systems such as water pipes freeze and burst. Nonetheless, facilities need to be maintained to ensure that they operate in appropriate conditions for people. Older water and gas utility lines are most prone to breakage during extreme cold due to stresses placed on them by adjacent frozen soil and fill material. It's evident from this that extreme cold is dangerous and can cause death. Therefore, it's important to understand how many people are exposed to such conditions, and how many buildings exist where potential problems could arise should power be lost.



The impact of weather conditions such as extreme heat and cold can be expressed in terms of deaths and injuries. Generally, one or more deaths each year may be directly attributable to extreme heat and cold. Further heat and cold may further stress health conditions in county residents. Extreme heat coupled with drought may result in significant crop loss.

Development Pressures

Extreme temperatures will have an impact on development in Montgomery County. The built environment will need to adapt to the predicted increase in extreme temperatures, especially heat. This may involve improved building insulation, better air conditioning systems, and energy efficiency measures to counteract the financial cost for more air conditioning. Utilities will need to continue to adapt the power grid to handle the increase electrical needs in the summer. Municipalities will need to ensure their infrastructure can handle the extreme temperatures and determine how they can help their populations cope with extreme heat. This may include establishing more cooling centers and having pools and spray parks available to their residents.

Inequity

Extreme temperatures will more adversely affect those without the socio-economic capital to adapt. Those populations may not be able to afford air conditioning or the increased electric utility bills to pay for the increased cost of running air conditioning. Vulnerable populations may also not have access to cooling centers or pools to help counter the effects of heat. Those who are more vulnerable to extreme temperatures because of medical conditions may not be able to afford the necessarily medical treatments to cope with extreme temperatures.

Climate Change

Montgomery County will experience increased extreme temperatures events due to climate change. This will affect all the county's natural and built environment along with all the residents and visitors to the county. Extreme heat caused by climate change will affect every aspect of life in Montgomery County.

4.3.8-7 Additional Information

[PennsylvaniaStateClimatologist](#)
[North America Region Climate Change Assessment Program](#)
[NRCS/ USDA](#)
[NOAA](#)
[PA Climate Impact Assessment Report](#)
[SocialImpactsofClimateChange-USDA](#)

4.3.9. FLOODING

Flooding is the temporary condition of partial or complete inundation on normally dry land and it is the most frequent and costly of all hazards in Pennsylvania. Flooding events are generally the result of excessive precipitation. General flooding is typically experienced when precipitation occurs over a given river basin for an extended period. Flash flooding is usually a result of heavy localized precipitation falling in a short time period over a given location, often along mountain streams and in urban areas where much of the ground is covered by impervious surfaces. The severity of a flood event is dependent upon a combination of stream and river basin topography and physiography, hydrology, precipitation and weather patterns, present soil moisture conditions, the degree of vegetative clearing as well as the presence of impervious surfaces in and around flood-prone areas (NOAA, 2009). Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of a river. The ice layer often breaks into large chunks, which float downstream, piling up in narrow passages and near other obstructions such as bridges and dams. All forms of flooding can damage infrastructure (USACE, 2007).

4.3.9-1 Location and Extent

Flood sources in Montgomery County include rivers, creeks, and even small drainage paths. Floodplains found in lowlands, adjacent to rivers, streams, and other drainage ways are subject

to recurring floods. Montgomery County contains approximately 1,135 miles of streams and rivers connecting over 4,413 acres of lakes and ponds and 2,633 acres of wetland areas, all within the Delaware River Basin.

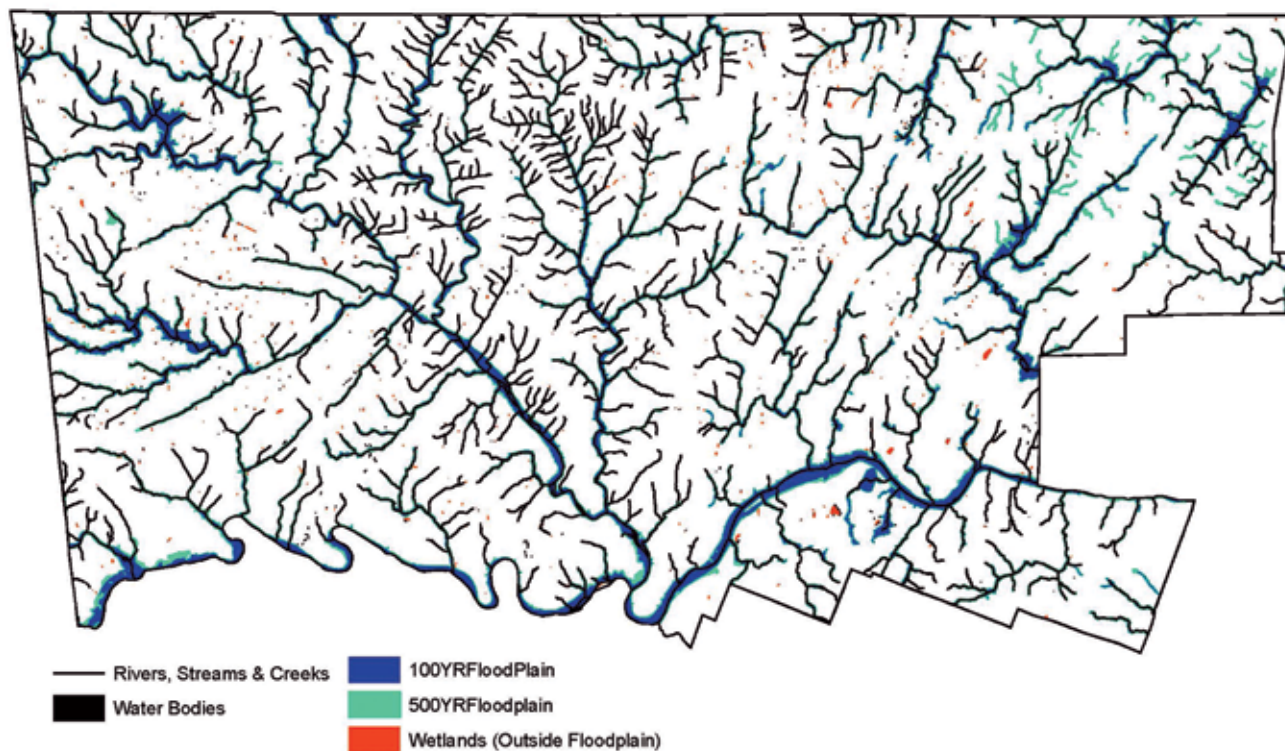
The size of the floodplain is described by the recurrence interval of a given flood. In assessing the potential spatial extent of flooding, it is important to know that a floodplain associated with a flood that has a 1% chance of occurring any year (100-year floodplain) is smaller than the floodplain associated with a flood that has a 0.2%-annual-chance (500-year floodplain) of occurring. The National Flood Insurance Program (NFIP) for which Digital Flood Insurance Rate Maps (DFIRM) are published identifies the 1%- annual-chance flood which is used to delineate the Special Flood Hazard Area and identify Base Flood Elevations.

Table 4.3.9-1 | Structures in the 100- and 500-Year Floodplains

Area	Number of Structures
100-Year Floodplain	5,979
500-Year Floodplain	2,521

Additionally, other structures located out of the defined 1% annual exceedance probability floodplains have also been damaged during floods in the past.

4.3.9-1 | Flood Hazard Areas Montgomery County



4.3.9-2 Range of Magnitude

Both localized and widespread floods are considered hazards when people and property are affected. Injuries and deaths can occur when people are swept away by flood currents or bacteria and disease are spread by moving or stagnant floodwaters. Most property damage results from inundation by sediment-filled water. A large amount of rainfall over a short time span can result in

4.3.9-3 Past Occurrence

Pennsylvania has a long and continuous history of floods. A significant number of the Presidential Disaster and Emergency Declarations in Pennsylvania have been in response to hazard events related to flooding. 24 counties have had an average of one flood event per year. Additional Repetitive Loss data is available in Appendix L.

Table 4.3.9-2 | Historical Flood Insurance Claims and Loss Payments

Municipality	Total Claims Since 1978	Total Losses Paid Since 1978
West Norriton Township	68	\$10,042,486
Upper Providence Township	64	\$5,502,268
Abington Township	50	\$2,248,226
Cheltenham Township	46	\$4,689,993
Whitemarsh Township	44	\$13,856,429
Lower Moreland Township	33	\$8,403,920
Lower Merion Township	31	\$2,644,792
Ambler Borough	30	\$2,936,498
Upper Moreland Township	27	\$4,553,690
Upper Dublin Township	26	\$12,019,422
Hatboro Borough	25	\$3,266,662
Springfield Township	22	\$883,471
Lower Providence Township	20	\$1,808,510
Collegeville Borough	20	\$1,560,482
Pottstown Borough	19	\$1,178,909
Norristown Borough	17	\$1,807,040
Conshohocken Borough	15	\$4,197,185
Bridgeport Borough	14	\$3,751,300
Skippack Township	14	\$1,484,723
Horsham Township	14	\$740,563
Perkiomen Township	12	\$1,186,542
Hatfield Township	12	\$1,132,196
Upper Merion Township	8	\$1,457,138
New Hanover Township	8	\$867,828
Whitpain Township	6	\$1,209,746
Lower Frederick Township	6	\$450,968
Montgomery Township	5	\$640,812
Plymouth Township	4	\$166,003
Lower Gwynedd Township	4	\$401,288
Marlborough Township	4	\$330,081
Green Lane Borough	4	\$238,241
Lower Salford Township	4	\$107,414
Towamencin Township	3	\$188,455
Upper Gwynedd Township	2	\$376,778
Narberth Borough	2	\$28,266
West Conshohocken Borough	2	\$20,402
East Norriton Township	2	\$18,835
Royersford Borough	1	\$322,551
Upper Hanover Township	1	\$141,629

Trappe Borough	1	\$96,339
Bryn Athyn Borough	1	\$88,739
Lower Pottsgrove Township	1	\$35,028
West Pottsgrove Township	1	\$25,506
North Wales Borough	1	\$15,414
Lansdale Borough	1	\$15,337
Upper Frederick Township	1	\$6,757
Douglass Township	0	0
East Greenville Borough	0	0
Franconia Township	0	0
Jenkintown Borough	0	0
Limerick Township	0	0
Pennsburg Borough	0	0
Red Hill Borough	0	0
Rockledge Borough	0	0
Salford Township	0	0
Schwenksville Borough	0	0
Souderton Borough	0	0
Telford Borough	0	0
Upper Pottsgrove Township	0	0
Upper Salford Township	0	0
Worcester Township	0	0

4.3.9-4 Future Occurrence

In Montgomery County, flooding occurs commonly and can take place during any season of the year. Every several years, serious flooding occurs along one or more of Montgomery County's major rivers or streams and it is not unusual for such events to happen several years in succession. Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and related probability of occurrence. Historical records are used to determine the probability of occurrence (percent chance) for a flood of specific extent to occur. The NFIP recognizes the 1%-annual-chance flood, also known as the base flood, as the standard for identifying properties subject to federal flood insurance purchase requirements. A 1%-annual-chance flood is a flood which has a 1% chance of occurring over a given year. DFIRMs and FIRMs published by FEMA can be used to identify areas subject to the 1%- and 0.2%-annual-chance flooding. Areas subject to 2%- and 10%-annual-chance events are not shown on maps; however, water surface elevations associated with these events are included in the flood source profiles contained in associated Flood Insurance Study Reports.

The most recent Flood Insurance Study for Montgomery County is available from the FEMA Map Service Center (<http://www.msc.fema.gov>)

4.3.9-5 Environmental Impacts

Floods are naturally occurring events that can enrich riparian systems by enabling groundwater recharge and the introduction of nutrient rich sediment improving soil fertility. However, the destruction of riparian buffers, changes to land-use and land cover throughout a watershed, and introduction of chemical or biological contaminants resulting from development can lead to the following environmental impacts during a flood:

- Drowning of both humans and animals

- Hazardous material facilities are potential sources of contamination during flood events.
- Waterborne diseases
- Suffocation of tree species non-tolerant to excess water
- Heavy siltation and the migration of stream substrata
- Destruction and change of stream channel
- Damage or loss of crops

4.3.9-6 Vulnerability Assessment

A major concern for those involved in almost any activity in the vicinity of a stream is the area's vulnerability to flooding. While maps identify the 1%- and 0.2%- annual-chance flood hazard areas, many unmapped floodplain areas are also prone to flooding. The potential flooding depth above a streambed depends mostly (but not entirely) on the upstream drainage area. The drainage area includes that portion of the watershed that is located upstream from a point of interest, excluding areas subject to the influence of major flood-control dams.

Table 4.3.9-3 | **Vulnerability of Critical Facilities to Flooding**
(total in 100-Year and 500-Year Floodplain)

	Type	Number of Vulnerable Structures	Percentage of Structures By Type
Emergency	Police Station	1	1.89%
	EMS Stations	0	0.00%
	Fire Stations	2	1.94%
	Hospitals	1	6.25%
	Urgent Care	0	0.00%
	Pharmacies	3	1.81%
Core	Governmental Facilities & Municipal Buildings	3	3.95%
	Education (Nursery To 12)	2	0.66%
	Education (Colleges/ Universities)	1	4.55%
	Assisted Living Facilities	0	0.00%
Infrastructure	Water Facilities (Supply & Sewage)	13	15.85%
	Communication (Cell Tower)	10	4.98%
	Transportation Stations/Stops	123	4.22%
	Energy Generating	0	0.00%

Table 4.3.9-4 | **Potentially Vulnerable Households**

	Residential Units		Structures of Unknown Type	
	1.0% Chance Floodplain	0.2% Chance Floodplain	1.0% Chance Floodplain	0.2% Chance Floodplain
Countywide	2,431	1,204	1,748	647
Estimated	6,150	3,046	–	–

Development Pressures

A development project or new construction can drastically alter how the ground in the area is able to absorb water from rain or melting snow. Any construction on an existing undeveloped parcel, particularly a forested/vegetated parcel, may lead to alterations in drainage despite best management practices. When properties are redeveloped, they are generally subject to the same standards applied to new developments. Thus, the stormwater management on these parcels are modernized and often improved due to redevelopment. However, unrestricted development within flood hazard areas can increase the risk of loss of life, personal injury, property damage and disruption of critical infrastructure and services in the event of a flood.

Inequity

Flooding is the most expensive natural disaster in the United States, according to the National Oceanic and Atmospheric Administration (NOAA), and low-income communities and people of color tend to have considerably less access to resources, such as insurance, to help them recover from floods. In fact, during an E&E News Analysis of federal flood insurance payments it was found that flooding disproportionately harms Black neighborhoods in the US ([Frank, 2020](#)). Additionally, after a flood, women, single-parent families, and the elderly were found to be more vulnerable due to resource availability and difficulties coping with disruptions to long-term care and services ([Rufat, 2015](#)).

Climate Change

With a warming climate the trend of increased frequency and magnitude of heavy precipitation events is highly likely to continue. There are also mostly increasing trends in maximum streamflow in the Northeast consistent with the increase in observed extreme precipitation ([Fourth National Climate Assessment](#)) which increases the risk of flooding.

4.3.10. WAR & CRIMINAL ACTIVITY: GUN VIOLENCE

4.3.10-1 Location and Extent

Gun violence is violence committed with the use of firearms. Gun-related violence may be considered criminal or non-criminal. Criminal violence includes homicide, assault with a deadly weapon, and suicide or attempted suicide. Non-criminal violence includes accidental or unintentional injury and death. ([City of Philadelphia, 2022](#)). Like the City of Philadelphia, Montgomery County considers gun violence a public health problem, and supports the American Public Health Association's assessment that the issue of gun violence is complex and deeply rooted in culture and that a comprehensive public health approach to addressing this crisis is necessary.

Gun violence affects people of all ages and races in the U.S. but has a disproportionate impact on young adults, males and racial/ethnic minorities. Every year, more than 38,000 people are killed in the U.S. from firearms, costing billions of dollars in health expenditures. Gun violence is a leading cause of premature death in the U.S. and results in nearly 85,000 non-fatal injuries annually. Guns are also a weapon of choice for mass homicides and suicide. Gun violence cost the U.S. \$229 billion, or an average of \$700 per gun in America.

4.3.10-2 Range of Magnitude

The most obvious consequence of gun violence is death or injury to people. The extent of damage depends on the type of firearm and proximity of incident to other people. The less obvious consequences of gun violence stem from exposure to it. Exposure to gun violence is associated with PTSD, antisocial behavior, depression, stunted cognitive and emotional development, increased risk for substance use, and increased likelihood of engaging in violence ([EFSGV, 2020](#)).

4.3.10-3 Past Occurrence

Firearm homicide is a complex issue that includes different types of gun violence — domestic

violence, community violence, mass shootings, and police-involved shootings. According to the Montgomery County Department of Health and Human Services, 1 in 3 homes with children have guns, and 80% of unintentional firearm deaths of children under 15 occur at home. According to the CDC, Pennsylvania's firearm mortality rate was 13.6% in 2020.

Table 4.3.10.3-1 | Deaths by Firearms in Montgomery County

DESCRIPTION	2017		2018	
	Suicide	Homicide	Suicide	Homicide
Number of Deaths	43	8	32	12
Male	36	8	31	9
Female	7	0	1	3
Age Range	16-84	16-52	20-91	19-61

Between 2017 and 2018, white males accounted for over 75% of all gun related deaths. Over 75% of gun related deaths were classified as suicide with an average age of 48.2 years and 54.6 years respectively. Data provided by Montgomery County Coroner's office.

4.3.10-4 Future Occurrence

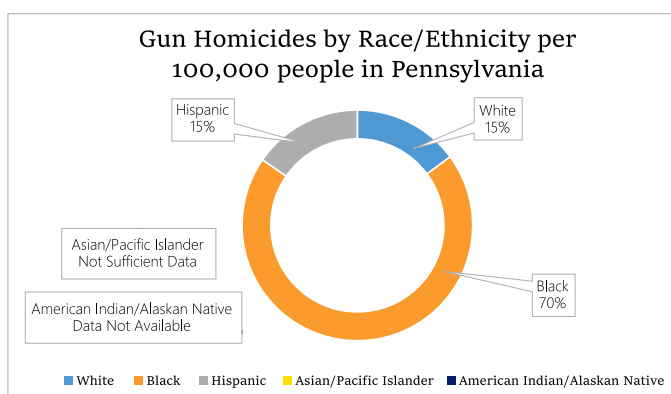
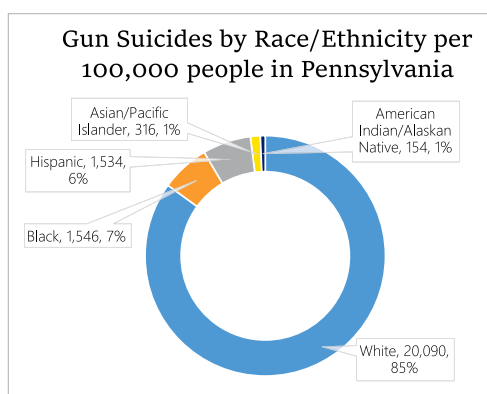
In Pennsylvania, the rate of gun deaths increased 15% from 2010 to 2019, compared to a 17% increase nationwide. The rate of gun suicides increased 20% and gun homicides increased 12%, compared to a 13% increase and 26% increase nationwide, respectively. The Montgomery County Detective Bureau holds gun turn-in events during the year, and the Health and Human Services website lists resources for gun violence prevention, including a link to Project Child Safe, a national comprehensive firearms safety education program. These and other efforts are critical in reducing gun violence in the county.

4.3.10-5 Vulnerability Assessment

On average in Pennsylvania, 62% of gun deaths are suicides and 35% are homicides. This is compared to 60% and 38% nationwide, respectively.

Gun Suicide: An average of 978 people in Pennsylvania die annually by gun suicides and 101 are wounded by gun suicide attempts—a rate of 7.0 suicides and 0.8 suicide attempts per 100,000 people. Pennsylvania has the 34th-highest rate of gun suicides and gun suicide attempts in the US.

Gun Homicide: Annually, an average of 572 people in Pennsylvania die by gun homicides and 1,700 are wounded by gun assaults—a rate of 4.8 homicides and 13.3 assaults per 100,000 people. Pennsylvania has the 19th-highest rate of gun homicides and gun assaults in the US. In Pennsylvania, 76% of all homicides involve a gun, compared to 75% nationwide.



4.3.11. HAILSTORMS

4.3.11-1 Location and Extent

Hailstorm events can occur in all areas of Montgomery County. Hail precipitation is often produced at the front of a severe thunderstorm system or in conjunction with a tornado event. Hailstorms occur when ice crystals form within a low-pressure front due to the rapid rise of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation in the form of balls or irregularly shaped masses of ice. Hailstones are formed most often in thunderstorms with intense updraft, high liquid water content, large vertical extent, large water droplets, and cloud layers below freezing.

4.3.11-2 Range of Magnitude

Hail is described qualitatively and quantitatively by its size and can range from 0.2 inches to 4.5 inches. The size of hail is dependent on the strength of the upward air movement along the front of a thunderstorm, called the updraft. Hailstone nuclei are buoyed or lifted by the updraft and increase in size the longer the stone is held aloft. Weaker updrafts create smaller hailstones while strong updrafts provide a longer amount of time for hailstone nuclei to grow in diameter.

Hailstorms can cause considerable damage to crops, livestock, and property, depending on the size, duration, and intensity of hail precipitation. Automobiles and aircraft are particularly susceptible to damage. Also, people are at risk of severe injury if they do not seek immediate shelter. Since hail precipitation usually occurs during thunderstorm events, the impacts of other hazards associated with thunderstorms (i.e., strong winds, intense precipitation, etc.) often occur simultaneously.

4.3.11-3 Past Occurrence

Figure 4.3.11-1 lists the number of recorded hailstorm events by county between 1950 and 2022 by date and by location. A hailstorm event is defined as a storm with hail of $\frac{3}{4}$ inches or greater in diameter. Upper Providence Township has the highest number of reported hailstorm events, with seven events reported since 1950. Only a handful of other communities have reported more than four hailstorm events since 1950: Abington Township, East Norriton Township, Lower Merion Township and Towamencin Township. To date, no deaths or injuries have been reported from hailstorms in the County.

Figure 4.3.11-1 | **NOAA NCDC Hailstorm Events in Montgomery County between 1950 and 2022**

Sorted by Date			Sorted by Location		
LOCATION	DATE	MAGNITUDE	LOCATION	DATE	MAGNITUDE
Unspecified	4/28/1957	1	Abrams	8/2/2017	0.88
Unspecified	5/24/1962	0.75	Ambler	5/31/2002	1.75
Unspecified	5/13/1975	0.75	Arcola	7/6/2020	1
Unspecified	8/4/1975	1.75	Ardmore	7/6/2021	1
Unspecified	8/1/1977	1	Ardsley	7/6/2020	0.75
Unspecified	11/17/1977	1	Ardsley	7/21/2021	1
Unspecified	11/17/1977	1.5	Audubon	7/6/2020	1.25
Unspecified	6/28/1979	1	Baederwood	7/21/2021	1
Unspecified	9/12/1983	1	Bala Cynwyd	4/6/2009	0.88
Unspecified	9/22/1987	0.75	Bala Cynwyd	6/19/2002	1.75
Unspecified	9/22/1987	0.75	Blue Bell	7/21/2021	1.25
Unspecified	9/22/1987	0.75	Bridgeport	4/24/2006	0.75

Unspecified	7/7/1991	0.75	Bryn Athyn	5/29/2019	1
Royersford	5/29/1995	1.75	Cheltenham	6/11/2001	1.75
Narberth	5/29/1995	0.75	Collegeville	7/18/2006	0.75
Pennsburg	6/20/1995	0.75	Collegeville	7/23/2008	0.88
Melrose Park	4/26/1996	0.75	Collegeville	6/26/2009	0.88
Harleysville	5/11/1996	0.88	Collegeville	4/21/2021	0.88
Horsham	5/11/1996	0.75	Collegeville	6/26/1998	1
Gilbertsville	6/17/1996	0.88	Crestmont	5/29/2019	1
Souderton	7/3/1996	0.75	Eagleville	7/6/2020	1
Hatfield	5/1/1997	1.75	Eagleville	7/6/2021	1
Harleysville	6/2/1998	1	East Greenville	7/23/2008	0.75
Collegeville	6/26/1998	1	East Greenville	8/10/2008	0.88
Glenside	7/17/1998	0.75	Erdenheim	7/6/2020	1
Montgomeryville	5/8/1999	0.75	Fort Washington	8/18/2011	1
Pennsburg	5/13/2000	1.75	Ft Washington	6/12/2007	0.75
Cheltenham	6/11/2001	1.75	Ft Washington	6/12/2007	1
Telford	8/4/2001	1	Gilbertsville	6/9/2011	0.75
Ambler	5/31/2002	1.75	Gilbertsville	6/17/1996	0.88
Plymouth Valley	6/19/2002	0.75	Gilbertsville	5/16/2015	1
Bala Cynwyd	6/19/2002	1.75	Glenside	7/17/1998	0.75
Stowe	7/21/2003	1.75	Green Lane	4/21/2012	0.75
Pottstown	6/22/2004	0.88	Green Lane	5/29/2019	1
Bridgeport	4/24/2006	0.75	Green Lane	8/26/2006	1.75
Collegeville	7/18/2006	0.75	Harleysville	5/11/1996	0.88
King Of Prussia	8/25/2006	1.25	Harleysville	6/30/2009	0.88
Green Lane	8/26/2006	1.75	Harleysville	6/2/1998	1
Plymouth Meeting	6/11/2007	0.88	Hartranft	7/6/2021	0.75
Horsham	6/12/2007	1	Hartranft	7/21/2021	1
Ft Washington	6/12/2007	1	Hatfield	10/2/2018	0.8
Ft Washington	6/12/2007	0.75	Hatfield	5/1/1997	1.75
Collegeville	7/23/2008	0.88	Horsham	5/11/1996	0.75
East Greenville	7/23/2008	0.75	Horsham	8/18/2011	0.88
Pottstown	7/27/2008	0.75	Horsham	6/12/2007	1
Royersford	7/27/2008	0.88	Jeffersonville	7/6/2020	1
East Greenville	8/10/2008	0.88	King Of Prussia	8/11/2018	0.75
Pennsburg	3/29/2009	1	King Of Prussia	8/25/2006	1.25
Wyncote	3/29/2009	0.88	Kulpsville	7/25/2016	0.75
Bala Cynwyd	4/6/2009	0.88	Lansdale	6/15/2009	1
Souderton	6/15/2009	0.75	Limerick Center	8/18/2021	0.75
Lansdale	6/15/2009	1	Mainland	7/25/2016	0.75
Pottstown	6/26/2009	1	Mapleglen	5/29/2019	0.88
Collegeville	6/26/2009	0.88	Marble Hall	7/21/2021	1
Worcester	6/26/2009	0.88	Melrose Park	4/26/1996	0.75
Royersford	6/26/2009	1	Mont Clare	7/6/2020	0.88
Harleysville	6/30/2009	0.88	Mont Clare	7/6/2020	1

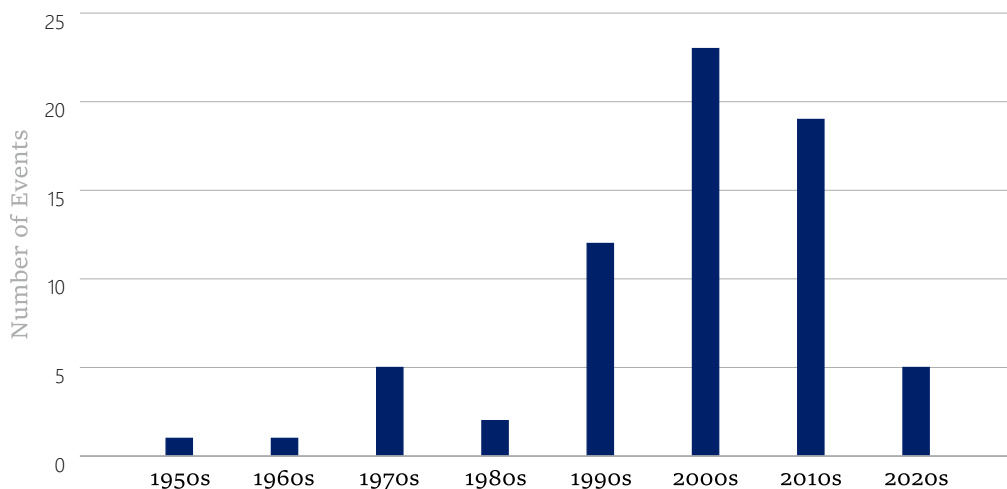
Mont Clare	7/29/2009	1.5	Mont Clare	7/6/2020	1.25
Skippack	8/18/2009	0.75	Mont Clare	7/29/2009	1.5
Pottstown	5/27/2010	1	Montgomeryville	5/8/1999	0.75
Pottstown	5/27/2010	1.5	Montgomeryville	7/14/2014	1
Gilbertsville	6/9/2011	0.75	Moreland Manor	5/29/2019	0.88
Souderton	6/9/2011	1	Narberth	5/29/1995	0.75
Fort Washington	8/18/2011	1	North Hills	5/29/2019	1
Horsham	8/18/2011	0.88	Ogontz	7/21/2021	1
Green Lane	4/21/2012	0.75	Oreland	7/21/2021	1
Pottstown	6/29/2012	0.88	Pennbrook	7/25/2016	1
Pennsburg	7/28/2012	1	Pennsburg	6/20/1995	0.75
Pottstown	8/9/2012	0.75	Pennsburg	3/29/2009	1
Montgomeryville	7/14/2014	1	Pennsburg	7/28/2012	1
Gilbertsville	5/16/2015	1	Pennsburg	5/13/2000	1.75
Skippack	6/8/2015	0.75	Plymouth Meeting	6/11/2007	0.88
Kulpsville	7/25/2016	0.75	Plymouth Valley	6/19/2002	0.75
Pennbrook	7/25/2016	1	Plymouth Valley	7/6/2020	1
Mainland	7/25/2016	0.75	Plymouth Valley	7/21/2021	1
Pottstown	7/13/2017	0.75	Port Providence	7/6/2021	1
Rockledge	8/2/2017	0.88	Pottstown	7/27/2008	0.75
Abrams	8/2/2017	0.88	Pottstown	8/9/2012	0.75
King Of Prussia	8/11/2018	0.75	Pottstown	7/13/2017	0.75
Hatfield	10/2/2018	0.8	Pottstown	6/22/2004	0.88
Stowe	11/2/2018	1	Pottstown	6/29/2012	0.88
Pottstown	3/15/2019	1	Pottstown	6/26/2009	1
Green Lane	5/29/2019	1	Pottstown	5/27/2010	1
Souderton	5/29/2019	0.75	Pottstown	3/15/2019	1
Moreland Manor	5/29/2019	0.88	Pottstown	5/27/2010	1.5
Mapleglen	5/29/2019	0.88	Rockledge	8/2/2017	0.88
Crestmont	5/29/2019	1	Royersford	7/27/2008	0.88
Bryn Athyn	5/29/2019	1	Royersford	6/26/2009	1
North Hills	5/29/2019	1	Royersford	5/29/1995	1.75
Unspecified	6/28/2019	0.75	Schwenksville	7/21/2021	0.88
Ardsley	7/6/2020	0.75	Skippack	8/18/2009	0.75
Erdenheim	7/6/2020	1	Skippack	6/8/2015	0.75
Plymouth Valley	7/6/2020	1	Souderton	7/3/1996	0.75
Eagleville	7/6/2020	1	Souderton	6/15/2009	0.75
Mont Clare	7/6/2020	0.88	Souderton	5/29/2019	0.75
Jeffersonville	7/6/2020	1	Souderton	6/9/2011	1
Mont Clare	7/6/2020	1	Stowe	11/2/2018	1
Arcola	7/6/2020	1	Stowe	7/21/2003	1.75
Mont Clare	7/6/2020	1.25	Telford	8/4/2001	1
Audubon	7/6/2020	1.25	Unspecified	5/24/1962	0.75
Collegeville	4/21/2021	0.88	Unspecified	5/13/1975	0.75
Eagleville	7/6/2021	1	Unspecified	9/22/1987	0.75

Hartranft	7/6/2021	0.75	Unspecified	9/22/1987	0.75
Ardmore	7/6/2021	1	Unspecified	9/22/1987	0.75
Port Providence	7/6/2021	1	Unspecified	7/7/1991	0.75
Wynnewood	7/6/2021	1	Unspecified	6/28/2019	0.75
Schwenksville	7/21/2021	0.88	Unspecified	4/28/1957	1
Hartranft	7/21/2021	1	Unspecified	8/1/1977	1
Marble Hall	7/21/2021	1	Unspecified	11/17/1977	1
Plymouth Valley	7/21/2021	1	Unspecified	6/28/1979	1
Blue Bell	7/21/2021	1.25	Unspecified	9/12/1983	1
Oreland	7/21/2021	1	Unspecified	11/17/1977	1.5
Baederwood	7/21/2021	1	Unspecified	8/4/1975	1.75
Ogontz	7/21/2021	1	Worcester	6/26/2009	0.88
Ardsley	7/21/2021	1	Wyncote	3/29/2009	0.88
Limerick Center	8/18/2021	0.75	Wynnewood	7/6/2021	1

NOAA's records found that approximately 95 percent of hailstorm events occurred during the months of April, May, June, July, August, and September. In addition, approximately 87 percent of historic events occurred during the afternoon (after 1 PM) or evening. Both results are consistent with the relationship between hail and thunderstorms, which most often occur during late spring, summer, and early fall months.

Based on events reported to NOAA hailstorms have increased in frequency since the 1950s. It is notable that in the same number of hailstorms, twenty-six events occurred in the first two years of the 2020s as between 1950 and 1999.

Figure 4.3.11-2 | Number of Municipalities experiencing Hailstorm Events in Montgomery County, 2017 - 2021 (NOAA, 2021)



4.3.11-4 Future Occurrence

Throughout the County hailstorm events are expected to continue to occur annually, primarily between April and September, during the afternoon and evening timeframe. Although the lack of long-term observation and limited modeling makes hailstorm predictions hard; It is reasonable to assume that the overall damage from hailstorm will continue to increase with climate change.

4.3.11-5 Vulnerability Assessment

All of Montgomery County, including all critical infrastructure, is vulnerable to the effects of hail. 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. As a hazard, damage to crops and vehicles are typically the most significant impacts of hailstorms.

Damage to trees and various plants can result from intense hailstorms. In most cases, natural plants and trees can easily recover from hail damage. Certain agriculture crops may be damaged to the extent where crop yield is diminished if hail occurs in the latter part of the spring when young plants have emerged.

Development Pressures

In the County, hailstorms have not and are not expected to cause casualties, or as severe damage as other natural disasters. However, hailstorms are an acute nuisance to homeowners, because of the minor damage hail may cause to property (particularly vehicles). But as previously stated, the most impact will be felt in the agricultural industry. That said, it is not expected that new development will enhance or produce cascading damage from hailstorms.

Inequity

Residents who are dependent on natural resources for their livelihood may be the greatest hit financially by hailstorms. These days, Montgomery County has a total of 596 farms on 30,780-acres (2012 Census of Agriculture) that may experience these detrimental effects of hailstorms on crop yields and pasture productivity. Although no past deaths or injuries have been reported in Montgomery County, anyone unable to seek shelter during a hailstorm would be placed at greatest physical risk such as people experiencing homelessness, people with outdoor occupations or those during an outdoor commute (i.e., walking, cycling). In extreme situations, hail may cause damage to home roofs or cars, people without the economic means or insurance coverage to address damage will be most impacted by a hailstorm.

Climate Change

Hailstorms are dangerous and costly phenomena that are expected to change in response to a warming climate ([Raupach, et al., 2021](#)). While at a local level climate change effects on hailstorms remain highly uncertain, in part due to a lack of long-term observations and limited modeling studies ([University of New South Wales, 2021](#)); North American studies are suggesting that climate change is likely to decrease the number of hailstorms while increasing the size of hail in the storms that do form ([Brimelow et al., 2017](#)).

4.3.12. INVASIVE SPECIES

4.3.12-1 Location and Extent

Invasive species are defined by Federal Executive Order 13112 as “an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health”. These species can be any type of organism: plant, fish, invertebrate, mammal, bird, disease, or pathogen. The damage rendered by invasive species can be significant because they have biological traits that provide them with competitive advantages over native species, particularly because in a new habitat they are not restricted by the biological controls of their native habitat.

The location and extent of invasive threats depends on the preferred habitat of the species as well as the species’ ease of movement and establishment. The Governor’s Invasive Species Council of Pennsylvania (PISC), the lead organization for invasive species threats, has identified over 100 species threats that are or could potentially become significant in Pennsylvania. The presence of invasive species has been reported throughout Montgomery County.

4.3.12-2 Range of Magnitude

Based on past occurrences the magnitude of infestations and invasive species ranges from nuisance to widespread. The threat is typically intensified when the ecosystem or host species is already stressed, such as periods of drought. Invasive species can cause significant changes in the

composition of Pennsylvania's ecosystems and as a result have a significant environmental and economic impacts on Montgomery County. In some extreme cases, invasive species can cause widespread illness or death in humans.

4.3.12-3 Past Occurrence

Habitats within Pennsylvania have been threaten by the invasion of non-native species since the initial European settlements in the 17th century. Currently, over 285 invasive plant species are impacting Pennsylvania. In addition to invasive plants, Pennsylvania now harbors many non-native invasive species of animals including mammal, bird, fish, reptile, and invertebrate species. Once established in a new habitat, most invasive species are nearly impossible to eradicate and some of the major pests are extremely expensive to control. A snapshot of some of Pennsylvania's most problematic invasive species historically are explored below:

Table 4.3.12-1 | Select Past Occurrences

Date	Event Type	Name	Losses/Impacts
2014 - Present	Terrestrial Invertebrates	Spotted Lanternfly (SLF)	Poses a serious economic threat to multiple U.S. industries, including viticulture, fruit trees, ornamentals and timber.
2002 - Present	Terrestrial Invertebrates	Emerald Ash Borer	Ash trees lose most of their canopy within 2 years of infestation and die within 3-4 years.
2001 - Present	Terrestrial Invertebrates	Brown Marmorated Stink Bug	Feeds on a variety of plants, including fruit trees, ornamentals, and some crops. The stink bug can also spread disease.
1999 - Present	Terrestrial Pathogens and Disease	West Nile Virus (WNV)	Infects birds and mammals (including humans). West Nile virus is primarily an avian pathogen and is transmitted among birds by ornithophilic (bird-biting) mosquitoes; including the Asian tiger mosquito and other mosquito species.
1950s – Present	Terrestrial Invertebrates	Hemlock Woolly Adelgid	Destroys Eastern hemlock trees.
1905 - 1929	Terrestrial Pathogens and Disease	Foot And Mouth Disease, Hoof And Mouth Disease	Contagious disease of cattle, swine, sheep, goats, deer, and other cloven-hoofed animals. Foot and mouth disease is the most economically devastating livestock disease in the world and represents a worst-case scenario for livestock diseases because of the variety of species involved, rapid spread, and difficulty in controlling outbreaks.
1890 - Present	Terrestrial Vertebrates	European Starling	Causes \$800 million in agricultural damage in the US annually.
1875 - Present	Terrestrial Plants	Japanese Barberry	Forms dense stands that compete with native trees and herbaceous plants. Provides favorable habitat for ticks.
1869 – Present	Terrestrial Invertebrates	European Gypsy Moth	Defoliates trees and is responsible for killing millions of oak and other species of trees in PA.
1800s - Present	Terrestrial Plants	Kudzu	Kudzu can choke out trees and other plants, is so aggressive and fast-growing, it potentially alters the nitrogen cycle in air and soil where it invades.

[USDA \(United States Department of Agriculture\) National Invasive Species Information Center](#)

4.3.12-4 Future Occurrence

According to the PISC, the probability of future occurrence for invasive species threats is on the rise. A large reason is due to expanded global trade that creates opportunities for many organisms to be transported to and established in new countries and regions. In fact, shipping is one of the primary ways that non-native species spread throughout the world. The impacts from invasive species may be compounded by climate change. It is estimated that Montgomery County and the rest of the region will continue to experience invasive species as well as their induced secondary hazards and health threats in the future.

In Spring 2021, officials from the Pennsylvania Department of Environmental Protection are cautioning about a “rare but dangerous” deer tick virus, detected at elevated levels in ticks for the first time in several areas of the state including Montgomery County ([Kummer, 2022](#)). The virus, known as the Powassan virus, has been found to have an infection rate of up to 92% and can result in encephalitis or meningitis and hospitalization ([Schneck, 2022](#)). The threat posed by this tick-borne virus may be devastating; death has been observed in more than 10% of people with the severe form of the disease.

4.3.12-5 Vulnerability Assessment

Infestation and invasive species are a significant concern in Pennsylvania. However, estimated losses are difficult to quantify; direct impacts vary from species to species and have cascading indirect impacts. All utilities and structures may be at risk from invasive species. For example, trees stressed/weakened by pests may fall on roadways, power lines and buildings. Invasive species can lead to sedimentation and erosion that may clog structures in dams and water treatment facilities. Soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils. Further, plant pests that ravage economically important crops are destructive and pose an increasing threat to food security and the environment.

Development Pressures

Without mitigation, construction activities such as the movement of topsoil, fill, and gravel can introduce new invasive species to project sites. However, properly trained professionals could also eliminate entrenched invasive species and provide fresh arena for the establishment of native vegetation.

Inequity

Residents' dependence on natural resources for their livelihood may be hit the hardest by invasive species. These days, Montgomery County has a total of 596 farms on 30,780-acres (2012 Census of Agriculture) that may experience the detrimental effects of invasive species on crop yields and pasture productivity. Additionally, it is expected that the tourism and outdoor recreation industry will be massively disrupted by invasive species establishment and spread.

Climate Change

Climate change is and will have an important influence on invasive species. Due to the modifications of temperatures, rainfall, humidity and drought, invasive species can establish themselves in previously inhospitable climates. Essentially, invasive species can expand outside their natural range. Secondly, climate change reduces the resilience of habitats to invasive species invasion. And conversely, invasive species can reduce the resilience of natural habitats, agricultural systems, and urban areas to climate change.

4.3.13. LANDSLIDE

4.3.13-1 Location and Extent

Landslides can range from falling rocks to slope failure. Landslides typically occur when soil type and slope of land create unstable conditions. Landslides can also be caused by erosion, slopes weakened through saturation by snowmelt or heavy rains, earthquakes, and other means (USGS, 2019).

According to the Pennsylvania Emergency Management Agency, landslides have occurred in many parts of Pennsylvania but are most abundant and troublesome in much of the western and north central portions of the state and adjacent states. Overall, U.S. Geological Survey finds that Montgomery County has a low incidence of landslides.

However, landslides that do occur within Montgomery County are located in areas containing moderate to steep slopes. Many slope failures are associated with precipitation events – periods of sustained above average precipitation, severe rainstorms, or snowmelt events. Areas experiencing erosion, decline in vegetation cover and earthquakes are also susceptible to landslides. Landslides can also occur on manufactured slopes such as along highways or through development that contributes to slope failure by altering the natural slope gradient, increasing soil water content, or removing vegetation cover. Figure 4.3.13-2 shows the range of at-risk slopes, from moderate to very steep.

Most of the steep slope areas in Montgomery County occur in sparsely developed portions of the county including land along the Perkiomen Creek and Swamp Creek north of Schwenksville, areas of the Perkiomen Creek and Skippack Creek near Arcola, portions of the Schuylkill River near Mont Clare, along Mount Joy in Valley Forge National Historical Park in Upper Merion, and areas in Lorimer Park along the Pennypack Creek in Abington Township. Populated areas with steep slopes occur in the Lower Schuylkill River corridor primarily in Lower Merion Township and West Conshohocken Borough.

Figure 4.3.13 - 1 | **Pennsylvania Landslide Incidence And Susceptibility, 2018**

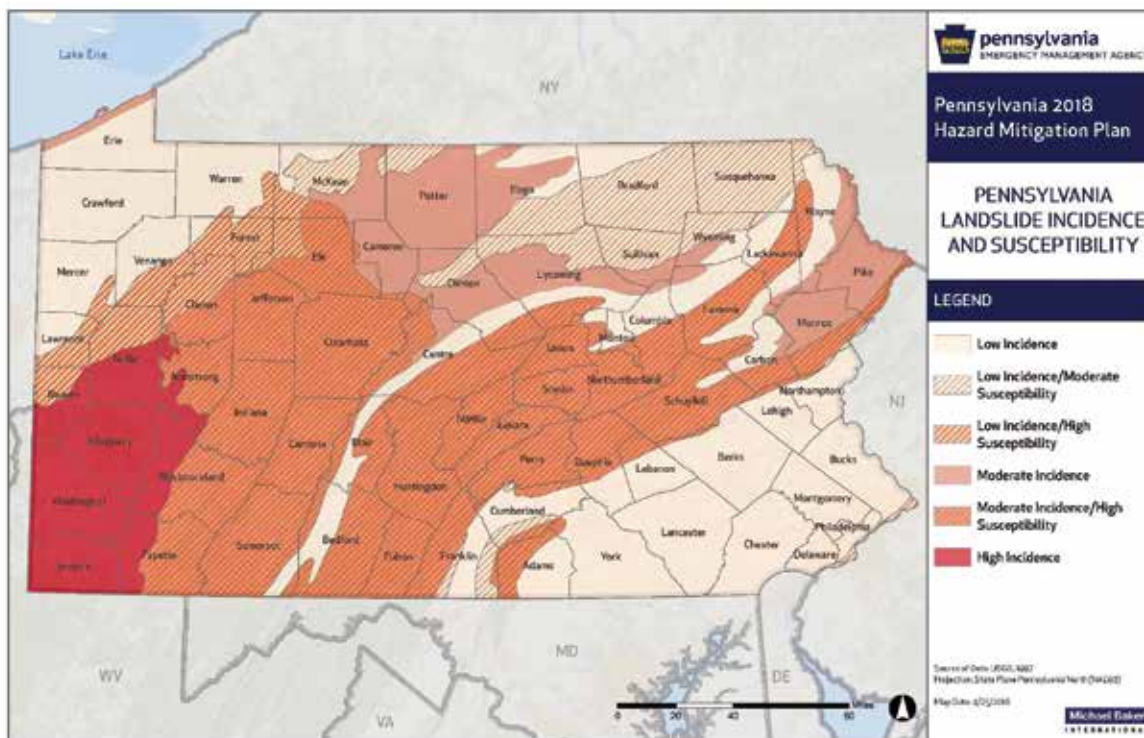
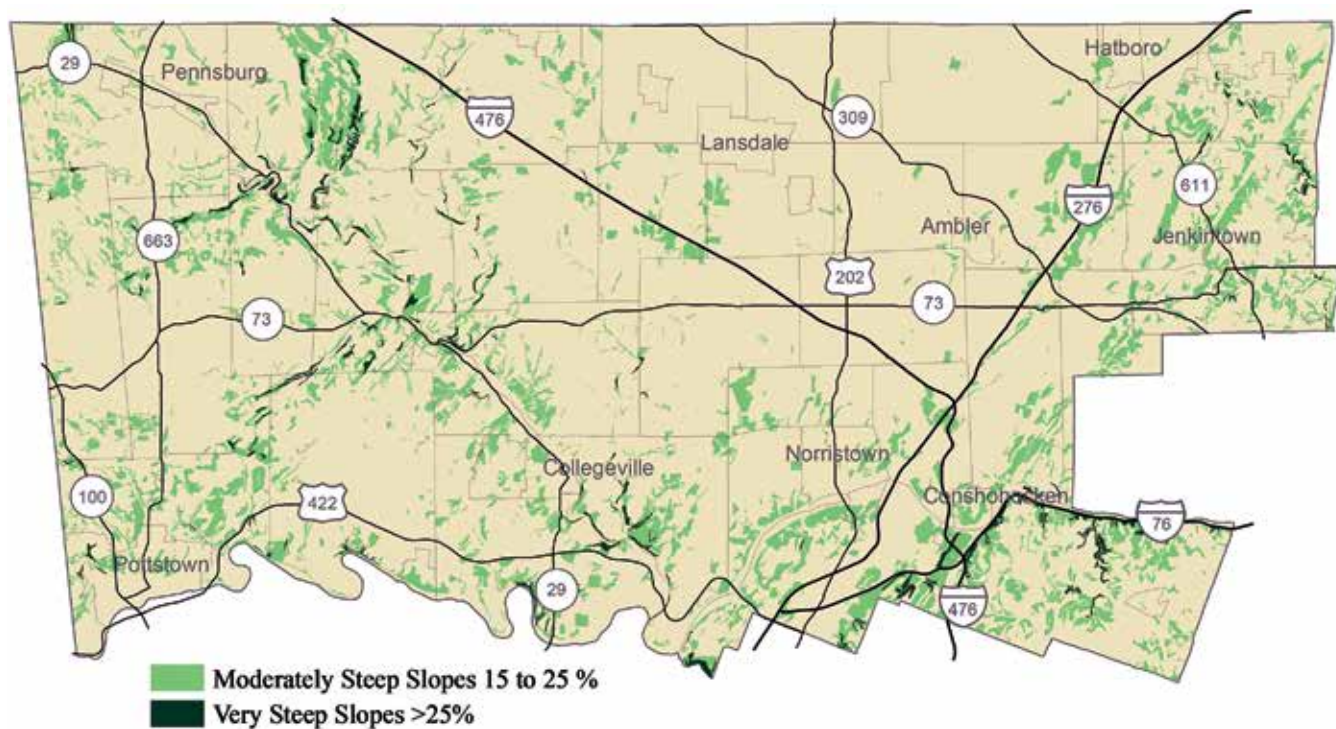


Figure 4.3.13 - 2 | **Moderate To Very Steep Slopes in Montgomery County**



4.3.13-2 Range of Magnitude

Landslides cause damage to transportation routes, utilities, and buildings. They can also create travel delays and other side effects. Fortunately, deaths and injuries due to landslides are rare in Pennsylvania. All of the known deaths due to landslides have occurred when rockfalls or other slides along highways have involved vehicles. Storm-induced debris flows are the only other type of landslide likely to cause death and injuries. As residential and recreational development increases on and near steep slopes, the hazard from these rapid events will also increase. In addition, landslides can potentially have disastrous flood effects when they descend into water bodies, diverting or entirely blocking water flows.

4.3.13-3 Past Occurrence

The U.S. Geological Survey's searchable landslide inventory does not illustrate any reported landslides in Montgomery County. Most incidents in Montgomery County are isolated, consisting of only small volumes of material and leading to localized disruptions to utilities. However, there have been two significant landslides in Montgomery County: January 27, 2015, and January 2, 2007. Most recently, heavy rains concentrated on a steep north-facing slope in West Conshohocken Borough resulted in a landslide and fallen trees. Subsequently, Balligomingo Road between Route 23/Front Street and Portland Road was closed for mud removal and slope stabilization. In the later event, a mudslide near the Schuylkill River in Lower Merion Township caused a derailment of a freight train; no hazardous materials leaks or serious injuries occurred. Both of these areas have been remediated, and the road and rail line are open.

4.3.13-4 Future Occurrence

Based on historical prevalence of landslides and lack of landslide-prone terrain, the annual occurrence of landslide events in Montgomery County is considered unlikely (less than 1% annual chance). It has been observed that steep slopes existing in Montgomery County are highly vegetated and thus are naturally stabilized by extensive roots systems and drainage diversions. However, climate change and human activities such as building roads and structures with inadequate grading or drainage plans have the potential to alter Montgomery County's future risk for landslides. When landslides occur across Montgomery County, the damage and magnitude of the events will vary widely.

4.3.13-5 Vulnerability Assessment

Landslides can impact Montgomery County's infrastructure, economy, and the well-being of the community. Landslides can directly cause injury or death, property damage, and natural resource damage. In landslides debris such as sediments, rocks and mud can disrupt transportation networks and damage waterways. Debris flow can also cause flooding by blocking stream channels, forcing copious amounts of water to back up. Overall, areas with a densely built environment and aging infrastructure may incur greater damage if inflicted by a landslide. Additionally, steep slopes adjoining major railroads and highway systems have a particularly elevated risk; landslides and rockfalls can cause death in vehicles hit by rocks or can cause collision in vehicles avoiding debris flow. However, it is important to note that there have been only two documented landslides in the last two decades. One closed Balligomingo road, which has since been reopened, the other derailed rail cars stopped on a rail line. No injuries or release of material occurred related to that event.

Municipal governments determine guidelines for construction in steep slope areas. A community can reduce its vulnerability to landslides by geologic investigations, good engineering practices, and effective enforcement of land-use management regulations.

Development Pressures

As development increases on and near steep slopes, the potential hazard associated with these rapid events may increase. Even so, municipal guidelines can aid in the avoidance or mitigate of landslide events. To date many municipalities in Montgomery County do limit the amount and type of development that can occur on steep slope areas through various zoning or subdivision ordinances. Nonetheless, any alterations to the natural slope or in the vicinity of a steep slope has the capacity to change its condition from stable to unstable.

Inequity

As with other extreme weather events, landslides will exacerbate societal and systemic inequalities. It is expected that landslides in Montgomery County are extremely localized, affecting only a handful of households or businesses. Standard homeowner, renters and business policies typically exclude landslides, mudflows, and flooding. Ultimately this can create a major disparity in response to landslides because of financial status and the excessive cost of home repair.

Climate Change

Rainfall is the most predominant trigger of landslides, and it is anticipated that landslide impacts will be exacerbated in a change climate due to enhanced frequency, severity, and duration of rain events. Rainfall and snowmelt contribute to soil erosion and saturation of soil, thereby leading to slope instability.

4.3.14. HURRICANE, TROPICAL STORM, NOR'EASTER

Hurricanes, tropical storms and nor'easters are all closed circulation storms which develop around a low-pressure center in the tropics or off the East Coast. The winds in them rotate counterclockwise so that storms generally begin with strong winds arising out of the southeast and end with wind from the west. Even though these are primarily coastal storms, they are large and can have a significant impact on in-land areas such as Montgomery County. In some cases, though wind conditions may diminish as storms impact inland areas, the rainfall can become more intense as storms slow inland.

4.3.14-1 Location and Extent

Pennsylvania does not have any open-ocean coastline. However, the impacts of coastal storm systems such as hurricanes, tropical storms, and nor'easters can extend well inland. Tropical storm systems (i.e., hurricanes, tropical storms, tropical depressions) impacting Pennsylvania develop in tropical or sub-tropical waters of the Atlantic Ocean, Gulf of Mexico, or Caribbean Sea. Nor'easters are extra-tropical storms which typically develop from low-pressure centers off the Atlantic Coast north of North Carolina during the winter months. In some cases, the center of circulation for these storm systems where wind and precipitation effects are often the most intense can track inland and move directly through Pennsylvania. However, due to the size of these storms, the Commonwealth can be affected even when circulation centers pass at a distance of several hundred miles to the east. In either case, these storms are regional events that can impact very large areas, anywhere from hundreds to thousands of miles in extent over the life of the storm. Montgomery County and other communities in the eastern portion of Pennsylvania are more affected by coastal storm systems than western communities in the state. However, these storms have the potential to impact all communities across the Commonwealth.

4.3.14-2 Range of Magnitude

Hurricanes are large storms that can spread up to 300-400 miles wide. They combine very high winds and heavy rains and typically form in the Atlantic Ocean in the late summer to early fall. Hurricanes have caused the most damage in the Caribbean Sea and the Gulf of Mexico, though hurricanes have also caused significant damage all along the Atlantic coast and hundreds of miles inland. Hurricanes are ranked according to their maximum winds using the Saffir–Simpson Hurricane/Wind Scale. A category 1 storm will have the lowest wind speeds (74-95 miles per hour) while the extremely dangerous category 5 storm wind speeds will exceed 157 miles per hour. Generally, a category 3 or greater hurricane is a major hurricane. As hurricanes make landfall, they quickly lose intensity but often unleash torrential rains. Far away from coastal areas, the rain falls may cause more significant impacts than the diminished winds.

Tropical storms that impact Montgomery County are usually the remnants of larger hurricanes that make landfall as far away as the Gulf Coast. These cyclonic storms contain winds ranging from 39 to 73 miles per hour and have the potential to provide substantial amounts of rainfall in a short period of time depending upon the track of the storm.

Though Nor'easters could form at any time of the year, they are most potentially damaging when they form in the winter causing blizzard conditions. For more on winter storms see Section 4.3.14.

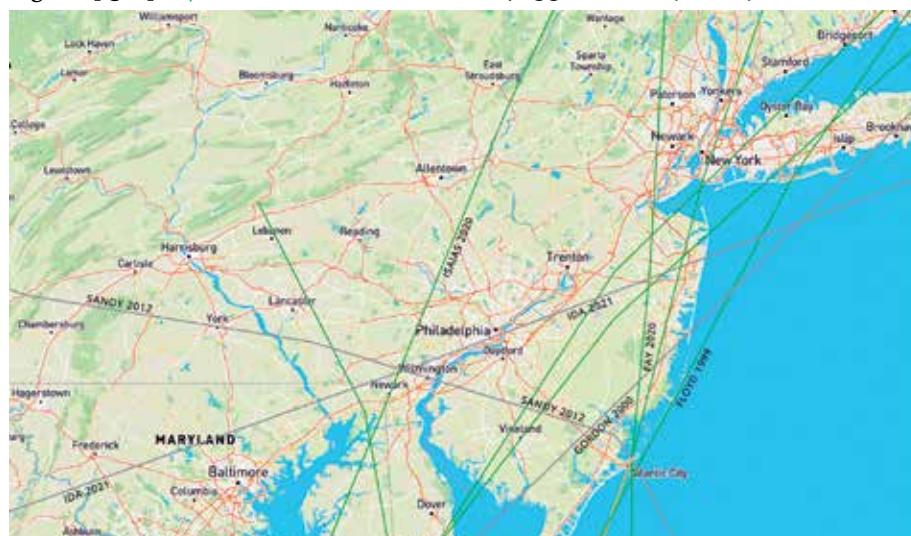
Figure 4.3.14-1 | **Saffir-Simpson Hurricane/Wind Scale**

Category	Winds	Summary
1	74-95 mph	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap, and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.
2	96-110 mph	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks
3	111-129 mph	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156 mph	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with the loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted, and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

4.3.14-3 Past Occurrence

Tropical storms and hurricanes are known by their names. Up until 1979 all storms were given female names, now both male and female names are used. Most hurricanes and tropical storms that impact Montgomery County did not directly hit the county. A recent example of such a storm is Hurricane Ida (August 26 to September 4, 2021). The impacts of Hurricane Ida were severe. Eight and a quarter inch of rain fell, there were 452 water rescue calls 38,000 homes lost power, and three deaths in the county were attributed to the hurricane. Like Hurricane Ida, Hurricane Agnes (June 14-23, 1972) is one of the most significant tropical storm events to impact the Commonwealth, the storm track for Agnes remained to the east of Pennsylvania and New Jersey until making landfall near New York City and traveling into upstate New York. Other tropical cyclones which did not track through Pennsylvania but caused significant damage to Montgomery County include Superstorm Sandy (October 28-29, 2012), Tropical Storm Lee (September 5, 2011), Hurricane Irene (August 28, 2011), Ivan (2004), Tropical Storm Allison (June 16, 2001), Hurricane Floyd (September 16, 1999) and Eloise (1975). It may be rare for a hurricane or tropical storm to track through Montgomery County, Hurricane Isais (July 28 to August 5, 2020) did so causing over six inches of rain to fall in Norristown and the Perkiomen Creek at Graterford to experience record flood heights.

Figure 4.3.14-2 | **Historic Hurricane Tracks, 1992 – 2022 (NOAA)**



4.3.14-4 Future Occurrence

Historical events, recent trends, and scientific modeling indicate more frequent occurrence of tropical cyclones, storms, and hurricanes is highly likely. There has been an increase in North Atlantic hurricane activity since the 1970s and models indicate more frequent storms and/or stronger storms. The variability in hurricane activity in the Atlantic is due to natural variability in ocean circulation, volcanic eruptions, and Saharan dust, as well as climate change resulting from greenhouse gases emissions. While an exact prediction of future occurrences is impossible, it is safe to assume that Montgomery County will be affected by hurricanes and tropical storms with more frequency and the possibility of stronger storm events.

4.3.14-5 Environmental Impacts

The environmental impacts associated with coastal storms in Pennsylvania are consistent with those described for flood hazards in Section 4.3.4.5 and wind hazards in Section 4.3.11.5 and for nor'easters the impacts are described as part of the winter storm hazards in Section 4.3.13.5.

4.3.14-6 Vulnerability Assessment

The vulnerability of the county to hurricanes and tropical storms is similar to the combined vulnerability of the county to flooding and high winds, both significant features in coastal storms. For nor'easters, the impact would be similar to winter storms.

Development Pressures

Hurricanes often cause destruction to buildings and infrastructure. Using FEMA's Hazus software version 4.0, the PA State Hazard Mitigation Plan estimates a potential direct building losses from hurricane wind hazards (Average Annualized Loss) for Montgomery County of 2.9 million dollars and potential business interruption losses from hurricane wind hazards (Average Annualized Loss) of 198 million dollars. When building damage requires repair or new construction, it is important when designing buildings moving forward that they are built to better withstand climate disasters like worsening hurricanes.

Inequity

Neighborhoods that have higher populations of low income and racially oppressed people tend to be more impacted by climate disaster. Hurricane Katrina was a notable national example of hurricanes causing irreparable damage to predominantly low-income Black neighborhoods, with the impacts still seen today. When analyzing elevated risk areas, or areas impacted by storm events, these populations should be prioritized.

Climate Change

Hurricanes and tropical storms have been getting more intense and more frequent as climate change accelerates. Climate change will require more preparation, more mitigation actions, and adaptation to prepare for this hazard.

4.3.14-7 Additional Information

[National Oceanic and Atmospheric Administration Hurricane Research Division](#)

[American Meteorological Society](#)



Brookdale Avenue Levee and Pump House, Cheltenham

4.3.15. LEVEE FAILURE

A levee is an elongated built embankment or wall parallel to a stream or water course which prevents the lateral expansion of floodwater perpendicular to the flow of the water course. It is usually earthen and located along riverbanks in broad flood plain areas.

4.3.15-1 Location and Extent

In the event of a levee failure, the extent of inundated area depends primarily on the size of the water body and amount of water being contained by the levee, the amount of water released as a result of the levee breach or over topping, and the ground topography landward of the levee.

The National Levee Database maintained by the US Army Corps of engineers lists 199 levee systems in Pennsylvania. The total length of these systems is 160 miles, and the average age is 58 years. This inventory lists two systems in Montgomery County with an average age of 70 years. One of these is a 0.24-mile-long levee associated with the Lansdale Sanitary Treatment Plant along the West Branch of Neshaminy Creek.

The second is the more significant of the two and is located along Brookdale Avenue in Cheltenham Township. According to the Database, the levee includes 950 feet of earthen levee with a pump station at its downstream end, plus longer sections of earth channel and concrete channels upstream of the levee. The purpose of the embankment is to deter flood water from entering the leveed area. The drainage features allow water that flows into the leveed area to pass through the levee system when the water level in the creek is low. When the water level in the creek is high, and if rainfall lands on the leveed area, the pumping stations pump that water through the levee to the creek.

The levee system was constructed by the Commonwealth of Pennsylvania in 1952. The levee system is operated and maintained by the Township of Cheltenham. The project has performed as designed since construction. The creek has risen to 50% of the levee height at least 10 times and overtopped the levee crest once. The Commonwealth of Pennsylvania is actively pursuing an effort to raise the levee.

4.3.15-2 Range of Magnitude

A levee failure causes flooding in landward areas adjacent to the levee system. The failure of a levee or other flood protection structure could be devastating depending on the level of flooding for which the structure is designed and the amount of landward development present. In some instances, the magnitude of flooding could be more severe under a levee failure event compared to a normal flooding event. If an abrupt failure occurs, water depths and velocities could change dramatically resulting in catastrophic losses. Properties located in the area of reduced-risk landward of a levee system are not subject to the mandatory flood insurance purchase requirement of the National Flood Insurance Program. Thus, regardless of whether a levee is accredited, there is concern that property in these areas lack flood insurance. In the event of a failure, it is likely that inundated properties will not be insured.

4.3.15-3 Past Occurrence

There are no known significant historic levee failures in Montgomery County.

4.3.15-4 Future Occurrence

Similarly to dam failures, given certain circumstances, a levee failure can occur at any time. However, the probability of future occurrence can be reduced through proper design, construction and maintenance measures. Most levees are designed to meet a specified level of flooding. While FEMA focuses on mapping levees that will reduce the risk of a 1% annual chance flood, other levees may be designed to protect against smaller or larger floods. Design specifications provide information on the percent-annual-chance flood that a structure is expected to withstand, provided that it has been adequately constructed and maintained.

4.3.15-5 Vulnerability Assessment

Development Pressures

The age and state of repair for levees should be considered in new development projects. If a project is proposed near a levee with high risk of breaking, considerations should be made for what the implications of levee failure would be on the development.

The Brookdale Avenue Levee is 70 years old and protects a leveed area consisting of 35 residential buildings. The population at risk in the leveed area was calculated to be 126, and the value of property in the leveed area was calculated to be \$107.7M.

Inequity

After Hurricane Katrina, there were numerous analyses done to understand how race and income relate to levee failure. One study revealed that most of the levee failures occurred in low-income predominantly Black neighborhoods ([Pappas, 2019](#)). This is part of a larger trend of racial inequality in how infrastructure is built and maintained ([Norwood, 2021](#)). As flooding risk increases and levees are even more strained, special attention must be put towards how racial and socioeconomic inequality affect the situation.

Climate Change

As climate change accelerates, levee failure becomes a greater risk. Flooding and extreme weather events are happening more frequently and are causing more destruction over time. Levees play a crucial role in mitigating flooding and their failure causes exponentially more destruction, as seen in New Orleans during Hurricane Katrina. According to the Army Corps of Engineers, the US levee system received a D grade for 2021 and requires about 115 billion dollars to repair ([Masters, 2021](#)). If these updates are not made, the damage to property and human life will be enormous.

4.3.16. LIGHTNING STRIKE

Lightning is an atmospheric discharge of electricity. Though there are several forms of lightning, the type of greatest concern to local emergency management responders is cloud-to-ground lightning which is a great discharge of electricity between a cumulonimbus cloud and the earth including building strikes.

4.3.16-1 Location and Extent

Lightning events occur across Montgomery County. Different areas experience varying event frequencies, but in all cases, lightning strikes occur primarily during the summer months. While the impact of flash events is highly localized, strong storms can result in numerous widespread events over a broad area. In addition, the impact of an event can be serious or widespread if lightning strikes a particularly significant location, such as a power station or large public venue. Eastern and Southern areas of Montgomery County area at greater risk for death, injury, or damage to lightning than Western and Central sections of the Montgomery County due to higher population density.

4.3.16-2 Range of Magnitude

Each year, lightning is responsible for the deaths of almost fifty people, injuries to several hundred more, and millions of dollars in property damage in the United States ([NOAA NWS, 2021d](#)). In many cases, lightning events have caused heart damage. Inflated lungs and brain damage have also been observed from lightning fatality history. Loss of consciousness, amnesia, paralysis, and burns are reported by many who have survived. Deaths and injuries to livestock and other animals, thousands of forest and brush fires, as well as millions of dollars in damage to buildings, communications systems, power lines, and electrical systems are also the result of lightning.

4.3.16-3 Past Occurrence

Records from the [National Centers for Environmental Information \(NCEI\)](#) (formerly the National Climatic Data Center) show that there were 49 lightning events in 25 municipalities across Montgomery County between 1950 and 2021 (Table 4.3.16-1). During those years, the NCEI reported that in Montgomery County, lightning strikes have caused three injuries and \$2,893,520 in damages. The highest reported loss in property damage occurred in Franconia Township in 2005 due to the total destruction of a home by fire ignited by a lightning strike. In this instance, seven separate fire companies responded to the strike and no deaths or injuries occurred.

Table 4.3.16-1 | **Past Lightning Strike Events in Montgomery County By Municipality** ([NOAA NCEI, 2022](#))

Municipality	Reported Events (Date)	Injuries	Reported Damage (\$)
ABINGTON	7/7/2003	0	10,000
	7/27/2004		
	9/6/2014		
CHELtenham	5/6/1998	0	0
EAST GREENVILLE	7/1/2005	0	0
EAST NORRITON	5/31/1998	0	0
FRANCONIA	5/6/1998	0	860,000
	6/6/2005		
GREEN LANE	2/9/2008	0	5,000
LANSDALE	6/1/2006	0	0
LIMERICK	8/10/1998	0	165,000
	7/17/2005		
	6/9/2009		

LOWER GWYNEDD	6/1/1998	1	100,000
LOWER MERION	6/26/1998	0	100,500
	5/13/2000		
	8/25/2006		
	3/28/2017		
LOWER PROVIDENCE	6/23/2015	0	5,000
LOWER SALFORD	9/28/2006	0	50,000
MONTGOMERY	6/12/1996	2	141,000
	4/1/1998		
	5/25/1998		
	5/25/1998		
	7/27/2008		
	8/7/2008		
NARBERTH	8/14/2005	0	135,000
NEW HANOVER	8/14/2005	0	1,000
	6/1/2006		
PLYMOUTH	5/26/2001	0	500,000
POTTSTOWN	8/14/2005	0	177,000
	6/1/2006		
	7/25/2010		
	7/15/2015		
TOWAMENCIN	8/7/2008	0	10,000
UPPER HANOVER	8/10/2008	0	10,000
UPPER MORELAND	6/1/1998	0	0
UPPER MERION	5/2/1998	0	100,010
	7/23/2008		
	8/2/2017		
UPPER PROVIDENCE	6/1/2006	0	0
WEST NORRITON	5/31/1998	0	0
	6/26/1998		
WHITEMARSH	8/14/2005	0	520,010
	8/19/2011		
	8/2/2017		
WORCESTER	4/1/1998	0	4,000
	5/25/1998		
	5/31/1998		

To date, no deaths and three injuries have been reported from lightning strikes in the County. Over the course of three events in two municipalities (Lower Gwynedd Township and Montgomery County), three people suffered minor injuries. In two cases, a person was indirectly shocked and hospitalized for minor injuries. In the third case, a firefighter was hospitalized due to suffering smoke inhalation.

4.3.16-4 Future Occurrence

The future occurrence of lightning activity in Montgomery County is anticipated, primarily between April and September. The number of lightning events are influenced by the frequency of a severe thunderstorm occurrence. Therefore, potential future changes in climate and weather conditions may impact the future occurrences of lightning strikes. According to the Pennsylvania Climate Impacts Assessment Update, thunderstorms are projected to increase in frequency ([Shortle et al, 2015](#)). However, the future occurrence of lightning activity is not forecasted as lightning strikes are frequent and widespread and forecasters' understanding of the cloud electrification process is incomplete ([NOAA NSSL, 2022](#)).

4.3.16-5 Vulnerability Assessment

The potential for lightning strikes will continue to exist for all municipalities in the County. The direct and indirect losses associated with these events include injury and loss of life, damage to structures and infrastructure, agricultural losses, utility failure (power outages), and stress on community resources.

Installing surge protection in critical electronic lighting or information technology systems can lessen losses. Lightning protection devices and methods such as lightning rods and grounding can be installed on a community's communications infrastructure and other critical facilities to reduce losses ([PEMA 2019](#)).

Development Pressures

In general, population and building density have a correlation with hazard vulnerability and loss. The urban areas of Montgomery County are at greater lightning risk than others due to higher population and building density. Taller buildings can act as lightning rods; therefore, they naturally have experienced greater vulnerability and loss during past lightning strike events ([PEMA, 2013](#)). The precise vulnerability of lightning strikes will depend on a facility's height relative to surrounding buildings, as well as the absence or presence of a lightning rod or other lightning channeling technology in the structure.

Inequity

All assets, including people, structures, critical facilities and lifelines are exposed and potentially vulnerable. But residents' dependent on natural resources for their livelihood may be the greatest hit financially by lightning strikes and associated fires. Although no past deaths or injuries have been reported in Montgomery County, anyone unable to seek shelter during a lightning strike would be placed at greatest physical risk such as people experiencing homelessness, people with outdoor occupations or those during an outdoor commute (i.e., walking, cycling). Additionally, lightning strikes and secondary impacts can amplify power grid or other aging infrastructure inequities.

Climate Change

Warmer atmospheres absorb a greater quantity of moisture so increased humidity in the air means harsher, more powerful thunderstorms and thus more likelihood of lightning. In fact, studies suggest that the number of lightning strikes will increase by about 12% for every degree of rise in global average air temperature ([Romps et al., 2014](#)).

4.3.17. NUCLEAR INCIDENTS

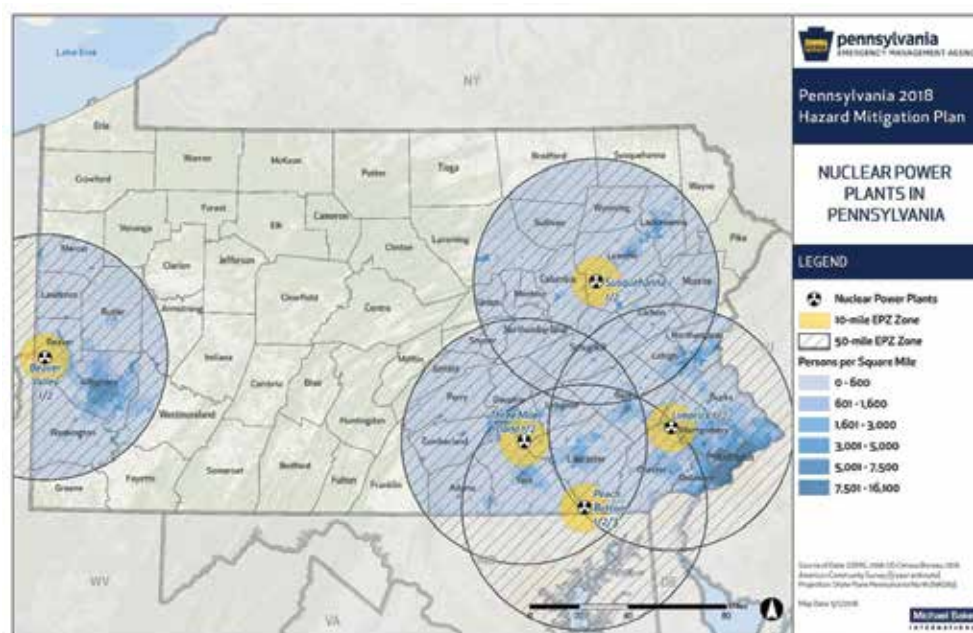
Radiological release incidents refer to events involving the release of significant levels of radioactivity or exposure of workers or the general public to radioactivity. The Limerick Nuclear Power Station located in Limerick Township is the largest potential source of radiological exposure, yet there are other facilities in the county including medical and research facilities that possess potentially radioactive materials.

4.3.17-1 Location and Extent

Nuclear accidents/incidents can be placed into three categories: 1) Criticality accidents which involve loss of control of nuclear assemblies or power reactors, 2) Loss-of-coolant accidents which result whenever a reactor coolant system experiences a break or opening large enough so that the coolant inventory in the system cannot be maintained by the normally operating make-up system, and 3) Loss-of-containment accidents which involve the release of radioactivity. The primary concern following such an incident or accident is the extent of radiation, inhalation, and ingestion of radioactive isotopes which can cause acute health effects (e.g., death, burns, severe impairment), chronic health effects (e.g., cancer), and psychological effects.

FEMA, PEMA and county governments have formulated Radiological Emergency Response Plans that include a Plume Exposure Pathway Emergency Planning Zone (EPZ) with a radius of about ten miles from each nuclear power facility and an Ingestion Exposure Pathway EPZ with a radius of about fifty miles from each facility. The exact size and configuration of the EPZ may vary in relation to local emergency response capabilities, topography, road networks, and political boundaries. That said, although Figure 4.3.17-1 shows Montgomery County present in EPZ zones of two power stations, Montgomery County municipalities are not include in Emergency Response Plans for Peach Bottom Atomic Power Station in Peach Bottom Township, York County.

Figure 4.3.17.1 | **Nuclear Power Plants in Pennsylvania**



The Montgomery County Department of Public Safety, Office of Emergency Management assists the 21 municipalities that comprise the 10-mile Emergency Planning Zone (EPZ) with emergency planning concerning the Limerick Generating Station. As governed by Title 35, each municipality is required to have an Emergency Operations Plan (EOP). Those municipalities that are included in the EPZ of a nuclear power plant must also have a Radiological Emergency Response Plan (RERP) as an annex to their EOP. The RERP is continually updated, and all responding agencies receive training yearly and exercise the plan biannually to ensure readiness.

There are 867,889 Montgomery County residents (2022 Census estimate). The Plume Exposure Pathway Zone (EPZ), a 10-mile radius from the Limerick Generating Station, includes 439,796 people (including some in Chester County). The entire county is in the 50-mile Ingestion Pathway EPZs from the Limerick Plant.

4.3.17-2 Range of Magnitude

The Nuclear Regulatory Commission uses four classification levels of magnitude for nuclear incidents:

- **UNUSUAL EVENT** – Events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection. No releases of radioactive material requiring off-site response or monitoring are expected unless further degradation of safety system occurs.
- **ALERT** – Events are in process or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life-threatening risk to site personnel or damage to site equipment because of intentional malicious dedicated efforts of a hostile act. Any releases are expected to be limited to small fractions of the Environmental Protection Agency (EPA) Protective Action Guideline exposure levels.
- **SITE AREA EMERGENCY** – Events are in process or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or security events that result in intentional damage or malicious acts: (1) toward site personnel or equipment that could lead to the likely failure of or; (2) prevent effective access to equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA Protective Action Guide exposure levels beyond the site boundary.
- **GENERAL EMERGENCY** – Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity or security events that result in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guide exposure levels offsite for more than the immediate site area.

In addition to the Limerick Power Station, there are other facilities including medical facilities within the county that contain radioactive materials. The use and storage of radioactive materials at these locations are controlled by the Nuclear Regulatory Commission and the Pennsylvania Department of Environmental Protection.

4.3.17-3 Past Occurrence

The accident at the Three Mile Island Generating Station (near Harrisburg PA) in March 1979 remains the nation's only nuclear incident above the Alert level and is the worst nuclear incident on record in the Commonwealth and the nation. During this incident, equipment malfunctions, design-related problems, and worker errors led to a partial meltdown of the TMI Unit 2 reactor core. A Presidential Commission was convened to explore the accident at Three Mile Island and examine the costs of the accident long-term impact to the broader community. A minimum cost estimate of nearly one billion was found with the major cost associated with replacement power and plant refurbishment.

Other foreign nuclear accidents, the fire at the Chernobyl reactor in the Ukraine and most recently the Tsunami that crippled the Fukushima Dai-Ichi power plant have informed the nuclear industry about the potential vulnerability of nuclear power systems in extreme conditions. As a result of Fukushima, several measures have already been undertaken to provide additional backup power supply and portable equipment at the Limerick Plant.

4.3.17-4 Future Occurrence

Nuclear power plant accidents are always possible. The calculated probable frequency of degraded core or core meltdown set by the US Nuclear Regulatory Commission for modern nuclear power plants is set at 1:100,000 years, though some operating plants in the nation exceed that standard. Nuclear incident occurrences may also occur as a result of intentional actions; these acts are addressed under Section 4.3.23. Terrorism.

Across the United States, numerous Unusual Event and Alert classification level events occur each year at the 100+ nuclear facilities that warrant notification of local emergency managers. Of these, Alert emergencies occur less frequently. For example, in 1997, there were forty notifications of Unusual Events and three Alert events nationwide. Based on historical events, Site Area Emergency and General Emergency incidents are very rare.

4.3.17-5 Vulnerability Assessment

Nuclear disasters stemming from Limerick Power Station are generally thought to be very unlikely but also very dangerous. The risk of this happening at nuclear power plants in the United States is small because of the diverse and redundant barriers and safety systems in place at nuclear power plants, the training and skills of the reactor operators, testing and maintenance activities, and the regulatory requirements and oversight of the U.S. Nuclear Regulatory Commission. An uncontrolled nuclear reaction in a nuclear reactor could result in widespread contamination of air and water and contribute to physical damage of buildings, infrastructure and utilities.

Those at most immediate risk includes the 181,163 Montgomery County residents and 258,633 Chester County residents in the 10-mile Plume Exposure Pathway EPZ of the Limerick Plant. This area also includes nine school districts with a total of forty-five schools, five nursing homes and one medical facility. Populations in this area and first respondents may be exposed to very high levels of radiation which can cause acute health effects such as skin burns and acute radiation syndrome. In the long-term health effects such as cancer and cardiovascular disease may occur. Additionally, all agricultural lands in the County, approximately 30,780 acres, would be compromised during a nuclear incident as well as portions of Chester County's agricultural lands.

Development Pressures

New construction of residential units or commercial properties will increase the population in the 10-mile radius. Although new construction itself will not affect a nuclear power plant, new development may put a larger amount of people at higher risk during a failure.

Inequity

Inequity concerns are most prevalent in the 10-mile Emergency Planning Zone; individuals living around nuclear power plants face potential health risk stemming from day-to-day operations and failures. Residential areas in the adjacent 10 miles should be easy to evacuate therefore persons with mobility disabilities or lack of access to adequate transportation are reliant on local emergency planning. And for non-English speakers, difficult language barriers can become dire amid a nuclear failure.

Often power plants, hazardous waste sites and other polluting industrial facilities disproportionately sit in low-income and minority neighborhoods. Census data compiled in the Delaware Valley Regional Planning Commission's Equity Analysis doesn't point to the Limerick Power Station sitting in a minority community or low-income community; however, it does highlight an above regional average concentration of residents under the age of 18 years old in the surrounding Township. That said, youth populations are less able to be independent and more reliant on adults and local emergency services during an evacuation as well as are at a great risk that adults to develop cancer after being exposed to radiation.

Additionally, according to a longitudinal study of employee records at a nuclear weapons facility, female and minority workers were less likely than their white male colleagues to be monitored for occupational job exposure. It is expected that unequal access to medical services is likely to exacerbate occupational job exposure.

Climate Change

Extreme weather events caused by climate change—such as floods, storms, heat waves and droughts—have and will continue to affect the operation and efficiency of nuclear power plants as well as the entire electrical grid. Weather and climate-related hazards may affect a nuclear plant directly, but indirect effects can be just as important because they affect the surroundings or limit accessibility to the plant (e.g., floods or snowstorms), or because of cascading problems originating from some other source (e.g., a dam break upstream) or because they affect the electrical grid (e.g., disruptions through falling trees) with consequences for off-site power and/or emission of electric power generated at the plant.

4.3.18. OPIOID ADDICTION

Opioid addiction occurs when an individual becomes physically dependent on an opioid, a class of drugs that reduces pain. Opioid is used as a broad term and includes opiates, which are drugs naturally extracted from certain types of poppy plants, and narcotics. Opioids can also be synthetically made to emulate opium. According to the Drug Enforcement Administration (DEA) opioids come in various forms: tablets, capsules, skin patches, powder, chunks in various colors from white to shades of brown and black, liquid form for oral use and injection, syrups, suppositories, and lollipops. The Centers for Disease Control and Prevention (CDC) defines the following as the three most common types of opioids: Prescription Opioids: Opioid medication prescribed by doctors for pain treatment.

- **Prescription opioids:** can be synthetic-oxycodone (OxyContin) or hydrocodone (Vicodin), or natural, like morphine.
- **Fentanyl:** A powerful synthetic opioid that is 50 to 100 times more powerful than morphine and used for treating severe pain. Illegally made and distributed fentanyl is becoming more prevalent.
- **Heroin:** An illegal natural opioid processed from morphine and is also becoming more commonly used in the United States.

Opioids are highly addictive. They block the body's ability to feel pain and can create a sense of euphoria. Additionally, individuals often build a tolerance to opioids, which can lead to misuse and overdose.

4.3.18-1 Location and Extent

Opioid addiction impacts the entire Commonwealth. Nationally, Pennsylvania is among four of the hardest hit states from opioid-related deaths, along with West Virginia, Ohio, and New Hampshire. The CDC estimates that nearly 38 out of every 100,000 Pennsylvania residents died from opioid-related overdoses in 2016, higher than the national rate of opioid-related deaths of approximately 20 out of 100,000 people. In Pennsylvania, overdoses caused by opioids have become the leading cause of accidental death, surpassing automobile accidents (CDC, 2017).

People under the age of 35 have been particularly vulnerable to the opioid crisis. According to a joint intelligence report prepared by the DEA Philadelphia Division and the University of Pittsburgh, between 2015 and 2016 in Pennsylvania, fentanyl use increased 380 percent among 15- to 24-year-olds while heroin use increased 970 percent in the 25- to 34-year age range. The report also documented a higher percentage of drug-related deaths attributed to opioid use in Pennsylvania's rural communities at 42 percent, compared to 34 percent in urban communities.

4.3.18-2 Range of Magnitude

Opioid addiction can lead to overdose, which can be fatal. The most dangerous side effect of an opioid overdose is depressed breathing. The lack of oxygen to the brain causes permanent brain damage, leading to organ failure, and eventually, death. Signs and symptoms include respiratory depression, drowsiness, disorientation, pinpoint pupils, and clammy skin.

Opioid addiction can also be passed from mother to child in the womb. This condition, known as neonatal abstinence syndrome, has increased five-fold from 2000 to 2012, according to the National Institute on Drug Abuse (NIDA), resulting in an estimated 22,000 babies in the United States born with this condition (NIDA, 2017).

First responders—paramedics, police officers, and fire fighters, are also affected by Pennsylvania's opioid addiction crisis. In addition to the crisis consuming time and resources, first responders also face exposure risk, particularly to synthetic fentanyl. According to the DEA, it takes two to three milligrams of fentanyl to induce respiratory depression, arrest, and possibly death. Since fentanyl is indistinguishable from several other narcotics and powdered substances, first responders must take extra precaution when dealing with calls related to drug abuse (DEA, 2017).

One of the worst examples of the impacts of the opioid crisis occurred in March 2018 when thirteen people in York County died from opioid related overdoses in 10 days, six of which occurred within 48 hours. The county coroner suspected that a particularly potent batch of heroin or fentanyl was to blame (Sentinel 2018). Similarly, the City of Hazelton, in Luzerne County, experienced five opioid overdoses in 12 hours with two resulting in death on May 4, 2018. The Hazelton police chief

warned citizens about a potentially deadly batch of heroin, possibly laced with fentanyl (WNEP 2018).

4.3.18-3 Past Occurrence

There were 91,799 drug-involved overdose deaths reported in the U.S. in 2020. Synthetic opioids other than methadone (primarily fentanyl) were the main driver of drug overdose deaths with a 6-fold increase from 2015 to 2020. In Pennsylvania, of the 5,170 overdose deaths identified in 2020, 85 percent (4,398) were confirmed to be opioid-related, an 18 percent increase in opioid-related deaths compared to 2019 (3,741). Table 4.3.18.1 lists the overdose death rate per 10,000 people in Montgomery County. Drug-related overdose and death statistics account for all drug types, however, as noted above, most drug-related deaths involve opioids.

Figure 4.3.18-1 | Overdose Death Rate per 10,000 People

Year	Rate per 10,000 Population
2017	210
2018	188
2019	207
2020	219
2021	187

Source: PA Department of Health

Though the opioid addiction crisis is complex and unprecedented, it is widely acknowledged that the opioid crisis began in the late 1990s when pharmaceutical companies introduced opioid-based pain medication, such as OxyContin, Percocet, and Vicodin. As these drugs became more frequently prescribed, misuse and overdose increased, and it became clear that prescription opioids were highly addictive. (NIDA, 2018).

4.3.18-4 Future Occurrence

Pennsylvania has seen a steady rise in opioid related deaths over the last several years, with drug-related death rates increasing 102 percent between 2014 and 2017. If opioid related deaths continue to increase at this pace, then the Commonwealth could experience an estimated 10,000 drug-related deaths in the year 2020. However, future occurrences of opioid addiction and misuse, overdose, and fatalities are unclear as the state moves forward with overdose prevention initiatives. In January 2018, Governor Tom Wolf declared Pennsylvania's opioid addictions epidemic a disaster emergency. This declaration should enhance coordination and data collection between state and local responders, improve tools for families and first responders, and expand treatment access. The declaration also improves access to Naloxone, a lifesaving drug that reverses the effects of a drug-overdose. In addition, a new Opioid Coordination Group has is housed within the Pennsylvania Emergency Management Agency. (PA DOH, 2018). Overall, the probability of future opioid overdose and death is highly likely as defined by the Risk Factor Methodology (see Section 4.1).

4.3.18-5 Vulnerability Assessment

Since fentanyl can be ingested orally, inhaled through the nose or mouth, or absorbed through the skin or eyes, any substance suspected to contain fentanyl should be handled with extreme caution. Exposure to a small amount of fentanyl can lead to respiratory depression or death. Fentanyl-related substances have been found in powders, pills, capsules, liquids, and on blotter paper. The DEA recommends that all first responders carry a Personal Protective Equipment (PPE) kit that includes: nitrile gloves, N-95, dust masks, sturdy eye protection, paper coveralls and shoe protection, and naloxone injectors. The DEA also suggests using extreme caution when using police dogs, as they are at serious risks to health complications from inhaling fentanyl and fentanyl-related substances (DEA, 2017).

Fentanyl and fentanyl-related substances are hazardous materials and should be treated as such. Contact with fentanyl can impact first responders and family and friends of opioid users. Depending

on the potency of the drug, it can take as little as the equivalent of a few grams of table salt to cause health complications (DEA, 2017).

According to a recent study, environmental scientists at the Cary Institute of New York found traces of opioids and other drugs in streams, rivers, and lakes. These traces came from human urine and feces, and medications that have been flushed down the toilet. However, the ecological and environmental impacts are unknown. The United States Environmental Protection Agency (EPA) suggests while the risks of pharmaceuticals found in wastewater, ambient water, and drinking water is low, further research is needed (EPA, 2014).

Losses in the opioid addiction crisis stem from lost wages, productivity, and resources rather than losses to buildings or land. Locally, many Pennsylvania counties have seen an increase of time and resources devoted to the opioid epidemic as overdose and response increases however there is no comprehensive tracking mechanism to record total local losses associated with the opioid crisis.

Development Pressures

While development pressures are not expected to have an impact on opioid addiction, new construction can provide opportunities to locate supportive services in communities with needs.

Inequity

Socioeconomic status and other demographic factors have a major impact on opioid access/use and opioid treatment options, and opioid overdose rate. In the past, white Americans make up the majority (roughly 80%) of opioid overdose victims; however, the number of opioid-related deaths among minorities is on the rise (Addison, 2019). In fact, it was found that the rate of opioid deaths among Black people increased by 38% from 2018 to 2019, while rates for other racial and ethnic groups did not rise (Penaloza, 2021). Further, across the country opioid overdoses were concentrated in more economically disadvantaged zip codes, indicated by higher rates of poverty and unemployment as well as lower education and median household income (Grinspoon, 2021).

Studies conducted in emergency departments across the country found significant disparities in prescribing practices; meaning minority patients were less likely to be prescribed pain medication and thus less likely to be over-prescribed opioids (Brigham and Women's Hospital, 2015; Morden, et al., 2021). Additionally, the complexities of racial disparities in the U.S. health care system are also observed in treatment access and treatment outcomes. Historically, low-income and minorities have less access to addiction care and lower recovery rates.

Climate Change

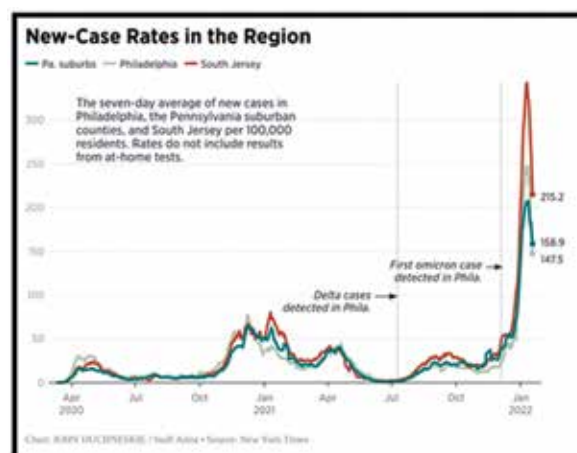
The effect of climate change on an individual at risk of or an individual physically dependent on opioid in the short-term or long-term is unclear. However, it is important to note that exposure to extreme or prolonged weather-related events can be stressful, traumatic, and triggering for individuals.

However, in central America, narcotic traffickers have been directly responsible for the ecological destruction of up to 30 percent of all recent forest losses as well as the associated loss of environmental services—like water and soil protection (McSweeney and Nielsen, 2020). As traffickers shift to new locations, local food producers expected to be pushed out and environmental degradation continued, leading to water scarcity, malnutrition and even starvation (Garcia, 2021)

4.3.19. PANDEMIC AND INFECTIOUS DISEASE

Pandemic is the widespread occurrence of disease over a large geographical area, which affects the full spectrum of the population over a short period of time. A disease or condition is not a pandemic merely because it is widespread or kills many people; it must also be infectious.

The first case of Zika Virus was reported in Montgomery County in 2016. Zika virus is primarily spread through the bite of an infected Aedes species mosquito; it can also be transmitted sexually, or through a blood transfusion, or from a mother to her baby during pregnancy.



Common symptoms are fever, rash, joint pain, and conjunctivitis (red eyes). The illness is usually mild with symptoms lasting for several days to a week and only about one in five people infected with Zika will get sick.

COVID-19 is caused by a coronavirus called SARS-CoV-2. It is believed that the virus originated in the Wuhan province of China in November 2019.

4.3.19-1 Location and Extent

The exact size and extent of an infected population is dependent upon how easily the illness spreads, the mode of transmission and the amount of contact between infected and uninfected individuals. The transmission rates of pandemic illnesses are often higher in denser areas where there are large concentrations of people. The transmission rate of infectious disease will depend on the mode of transmission of a given illness. Pandemic events can also occur after other natural disasters, particularly floods, when there is the potential for bacteria to grow and contaminate water.

Historically, the three most likely threats of pandemic and infectious disease to affect Montgomery County have been: West Nile virus, influenza, and Zika virus. With this update of the MCHMP, Coronavirus Disease (COVID-19) is recognized as an additional pandemic threat. West Nile Virus is a vector-borne disease that can cause headache, high fever, neck stiffness, disorientation, tremors, convulsions, muscle weakness, paralysis, and, in its most serious form, death. The virus spreads via mosquito bite and is aided by warm temperatures and wet climates conducive to mosquito breeding. Influenza ("the flu") is a contagious disease that is caused by the influenza virus and most commonly attacks the respiratory tract in humans. On March 17, 2020, there were 96 cases in the state of Pennsylvania, more than half of which were in the Philadelphia area, with Montgomery County holding the highest number.

Following its detection in 2019, the Coronavirus quickly spread, and by March 2020, the virus had reached almost every country worldwide, with the most cases in the United States. Community infections were detected in many cities and towns. This led to a statewide shutdown of schools and businesses and the cancellation of large events in late March and early April. Only life sustaining services were permitted to remain open, including medical facilities, pharmacies, and grocery stores. People were advised to remain home as much as possible to slow transmission rates. The virus infected all age ranges at about the same rate, although people with underlying health conditions and the elderly population are more vulnerable to the virus. Montgomery County officials and the Office of Public Health (OPH) reported on two presumptive positive cases of Coronavirus in Montgomery County on March 8, 2020. The first death from COVID-19 in the county occurred on March 21. At that time there were 110 cases of coronavirus in the county.

New variants of the virus reached the United States in January 2021. The CDC notes that these variants spread more easily and quickly than other variants, which may lead to a rapid increase in COVID cases (CDC, 2021a). It is currently unknown how new variants will interact with existing vaccines. Older adults and people who have severe underlying medical conditions like heart or lung disease or diabetes seem to be at higher risk for developing more serious complications from COVID-19 illness.

Table 4.3.19.1 | Incidence of Covid-19 Cases

Location	Total cases	Cases per 1M people	Deaths
Worldwide	612,856,738	78,816	6,529,079
United States	95,566,521	289,985	1,050,691
Pennsylvania	3,222,783	251,881	46,970
Montgomery County	181,575	219,511	2,438

**The number of new cases reported for the most recent day of complete data, within the last 3 days*

Sources: Our World in Data, The New York Times, Wikipedia

4.3.19-2 Past Occurrence

Deaths occurred in the United States as a result of the Spanish Flu, Asian flu, Hong Kong Flu, and Swine Flu outbreaks (Table 4.3.19-2). The Spanish Flu claimed 500,000 lives in the United States, and there were 350,000 cases in Pennsylvania – 150,000 were in Philadelphia alone. Most deaths resulting from the Asian flu occurred between September 1957 and March 1958; there were about 70,000 deaths in the United States and approximately 15% of the population of Pennsylvania was affected. The first cases of the Hong Kong Flu in the U.S. were detected in September of 1968 with deaths peaking between December 1968 and January 1969 (Global Security, 2009). More recently, 10,940 cases of 2009 H1N1 (Swine Flu) were confirmed in Pennsylvania, resulting in 78 deaths.

Table 4.3.19-2 | **List of Significant Influenza Outbreaks**

Date	Virus Name/Subtype
1918-1920	Spanish Flu/H1N1
1957-1958	Asian Flu/H2N2
1968-1969	Hong Kong Flu/H3N2
2009-2010	Swine Flu/A/H1N1

West Nile Virus arrived in the United States in 1999 and was first detected in Pennsylvania in 2000 when mosquito pools, dead birds and/or horses in 19 counties tested positive for the virus. Since then, the number of positive counties, human cases, and West Nile deaths has fluctuated with the temperature and precipitation each year.

The first case of Zika Virus in Montgomery County was reported in April 2016. The first case of Covid-19 infection in the county was reported in March 2020.

4.3.19-3 Future Occurrence

The precise timing of pandemic influenza is uncertain, but occurrences are most likely when the Influenza Type A virus makes a dramatic change, or antigenic shift, that results in a new or “novel” virus to which the population has no immunity. This emergence of a novel virus is the first step toward a pandemic. As has been experienced with Covid-19, several antigenic shifts can occur over a relatively short period of time (several months to a few years), resulting in ‘waves’ of infection.

Future occurrences of West Nile Virus are unclear. At the time of this Plan update, the coronavirus pandemic appears to be waning. Instances of the virus have been generally decreasing due to aggressive planning and eradication efforts, but a new variant could result in a new wave of infections. Also, as the population of the county continues to grow and travel throughout the world, the potential for disease introduction into the county increases.

Future pandemics may also emerge from other diseases, especially invasive pathogens that Pennsylvanians do not have natural immunity to.

4.3.19-4 Vulnerability Assessment

Development Pressures

Development may be impacted by disease outbreaks if there is a quarantine in place. Construction workers cannot come in to work unless proper protection strategies are in place which can slow down the job. Supply chains may also be impacted, which can also hinder development.

Inequity

The COVID-19 pandemic revealed glaring structural inequities in how low income and racially oppressed people experience medical emergencies. In the US, Black and Indigenous people had the highest rates of illness, death, and long-term disability after contracting the disease (CDC, 2020). If more outbreaks like this one occur, similar trends will be exacerbated, and proper remediation efforts should be made.

Climate Change

As the climate crisis accelerates, scientists predict that pandemics and infectious diseases will worsen. Some scientists suggest that as global temperatures rise and extreme weather conditions increase, the range of the virus in the United States will grow (Epstein, 2001). There are also concerns that higher temperatures allow for disease carrying insects and species to inhabit more of the globe allowing for further spread of disease.

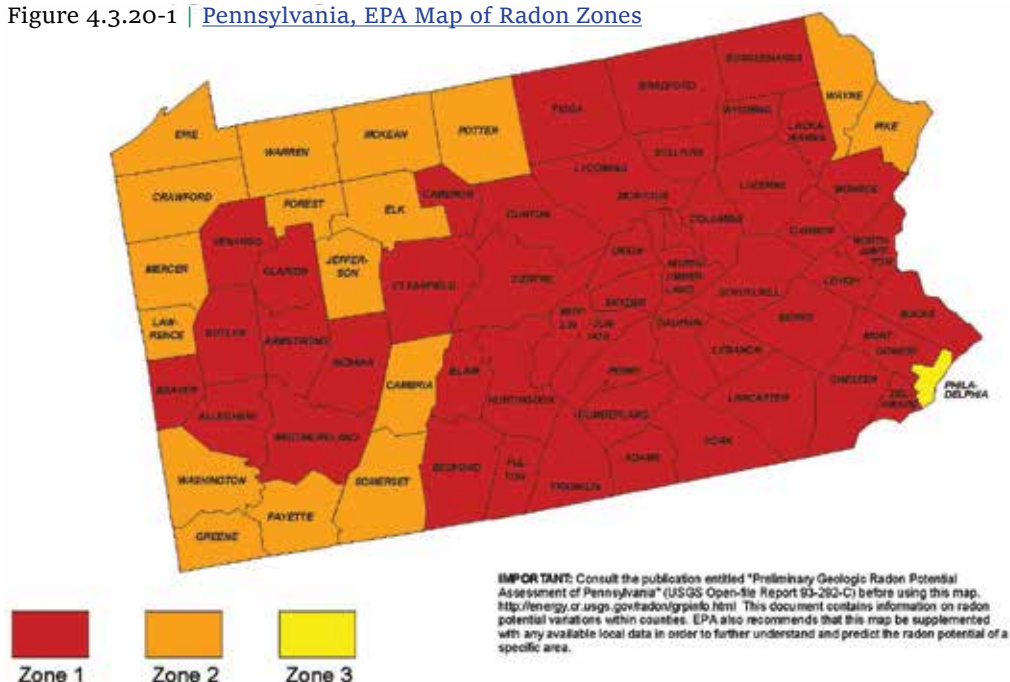
4.3.20. RADON EXPOSURE

Pennsylvania has one of the most serious radon problems in the United States. Radon is a naturally occurring radioactive gas that is odorless, tasteless and invisible. This gas is produced by the breakdown of uranium in soil and rock that can lead to lung cancer in people exposed over a long period of time. Most exposure comes from breathing in radon gas that enters homes and buildings through foundation cracks and other openings. ([PA DEP, Radon Division](#))

4.3.20-1 Location and Extent

U.S. EPA has estimated that the national average indoor radon concentration at 1.3 pCi/L and has established an action level at 4 pCi/L. Meaning, that at or above 4 pCi/L, the EPA recommends corrective measures be introduced to reduce exposure to radon gas. Unfortunately, the average indoor concentration in Pennsylvania basements is about 7.1 pCi/L, and 3.6 pCi/L on the first floor. And according to the DEP, approximately 40% of Pennsylvania homes have elevated radon levels.

Figure 4.3.20-1 | [Pennsylvania, EPA Map of Radon Zones](#)



All of Montgomery County lies within Radon Zone 1, or the highest zone for potential radon exposure, as designated by the EPA, U.S. Geological Survey, and the Association of America State Geologist. Radon in Pennsylvania only appears to come from natural soil emissions; not dissolved radon in water supplies, uranium-rich building materials or natural gas releases. The PA DEP recommends that all homeowners test for radon, regardless of your local zip code result.

4.3.20-2 Range of Magnitude

Radon exposure is possible throughout the County. Building and property owners should test for and mitigate elevated radon levels as part of routine maintenance. While there are no immediate symptoms from exposures to radon, radon is the number one cause of lung cancer among non-

smokers. The EPA estimates radon causes about 21,000 lung cancer deaths each year in the United States and is the second leading cause of lung cancer. Smokers are at higher risk of developing radon-induced lung cancer, the only health effect which has been definitively linked with radon exposure. Lung cancer would usually occur years (5-25) after exposure. There is no evidence that other respiratory diseases, such as asthma, are caused by radon exposure and there is no evidence that children are at any greater risk of radon induced lung cancer than adults.

4.3.20-3 Past Occurrence

In 1984, routine monitoring of employees leaving the Limerick nuclear power plant in Montgomery County showed that readings on a PECO employee frequently exceeded the expected radiation levels. However, only natural radioactivity was detected on him. It was found that radon levels in his home in Berks County were found to be about 2,500 pCi/L (picocuries per liter), much higher than the 4 pCi/L guideline of the Environmental Protection Agency (EPA) or even the 67 pCi/L limit for uranium miners. As a result of this event, the Reading Prong geological section of the New England province where the employee lived became the focus of the first large-scale radon investigation in the world.

The current data on abundance and distribution of radon as well as exposures in Pennsylvania is considered incomplete. The following sixty-one (61) of eighty-three (83) zip codes have reported over thirty test results to the PA DEP. It is important to note that the PA DEP only publishes average and maximum values.

Table 4.3.20-1 | **Radon Level Tests and Results by Zip Codes**

Zip Code	Location	Area in Home	Number of Tests	Maximum Results (pCi/L)	Average Results (pCi/L)
18041	East Greenville	Basement	494	138.1	4.9
		First Floor	114	14.8	2.4
18054	Green Lane	Basement	464	53.6	4.6
		First Floor	96	19.8	2.5
18070	Palm	Basement	91	145.3	9.4
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
18073	Pennsburg	Basement	1048	125.5	4.6
		First Floor	177	34.3	2.2
18074	Perkiomenville	Basement	774	67.4	3.6
		First Floor	145	25.3	2.0
18076	Red Hill	Basement	268	22.8	3.5
		First Floor	53	13.2	1.8
18084	Sumnertown	Basement	33	11.3	4.0
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
18915	Colmar	Basement	187	33.1	3.2
		First Floor	35	6.6	2.1
18936	Montgomeryville	Basement	306	27.7	3.4
		First Floor	101	17.4	1.7
18964	Souderton	Basement	1946	70.2	3.8
		First Floor	429	10.4	1.8
18969	Telford	Basement	2100	174.8	3.8
		First Floor	512	60.1	2.1
19001	Abington	Basement	3336	91.6	3.4
		First Floor	1191	36.9	2.1
19002	Ambler	Basement	7439	150.1	4.3
		First Floor	1791	99.1	2.5
19003	Ardmore	Basement	2566	49.4	2.6
		First Floor	700	8.4	1.3

19004	Bala Cynwyd	Basement	2515	87.5	4.2
		First Floor	575	14.6	2.0
19006	Huntingdon Valley	Basement	4453	176.0	4.6
		First Floor	1160	37.5	2.5
19009	Bryn Athyn	Basement	113	43.7	7.9
		First Floor	40	15.4	3.8
19012	Cheltenham	Basement	1553	90.5	3.4
		First Floor	434	70.9	2.4
19025	Dresher	Basement	1414	137.1	3.9
		First Floor	378	22.8	2.0
19027	Elkins Park	Basement	2749	106.2	4.7
		First Floor	753	27.4	2.1
19031	Flourtown	Basement	1193	99.8	4.6
		First Floor	306	31.0	2.6
19034	Fort Washington	Basement	1593	85.0	4.1
		First Floor	454	65.6	2.5
19035	Gladwyne	Basement	1312	84.2	4.6
		First Floor	314	100.3	3.3
19038	Glenside	Basement	5085	363.8	3.9
		First Floor	1344	282.3	2.4
19040	Hatboro	Basement	2825	76.6	3.6
		First Floor	766	19.6	2.0
19041	Haverford	Basement	1369	96.2	4.0
		First Floor	343	39.9	1.9
19044	Horsham	Basement	2619	155.0	4.2
		First Floor	1003	38.4	2.1
19046	Jenkintown	Basement	3584	106.2	5.7
		First Floor	887	39.5	3.4
19066	Merion Station	Basement	1640	42.5	4.1
		First Floor	385	15.1	1.8
19072	Narberth	Basement	2589	76.2	4.6
		First Floor	656	39.1	2.4
19075	Oreland	Basement	1900	61.5	4.0
		First Floor	548	13.3	2.4
19090	Willow Grove	Basement	2630	44.0	2.4
		First Floor	899	89.9	1.5
19095	Wyncote	Basement	1186	134.6	6.2
		First Floor	329	49.2	3.4
19096	Wynnewood	Basement	3707	32.7	3.2
		First Floor	934	52.0	1.8
19401	Norristown	Basement	4157	302.0	3.1
		First Floor	1198	23.5	1.8

19403	Norristown	Basement	8121	439.8	4.8
		First Floor	1938	56.1	2.5
19404	Norristown	Basement	77	33.5	4.2
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19405	Bridgeport	Basement	594	46.4	3.2
		First Floor	108	28.0	1.9
19406	King of Prussia	Basement	3639	427.2	4.5
		First Floor	882	141.8	2.6
19407	Audubon	Basement	258	86.2	8.1
		First Floor	83	45.7	3.9
19408	Eagleville	Basement	69	27.1	5.9
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19422	Blue Bell	Basement	5398	250.0	4.0
		First Floor	1570	42.1	2.1
19426	Collegeville	Basement	10022	270.7	4.4
		First Floor	1712	85.5	2.5
19428	Conshohocken	Basement	3018	81.9	3.8
		First Floor	731	30.5	2.2
19436	Gwynedd	Basement	59	21.4	3.8
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19437	Gwynedd Valley	Basement	403	44.0	5.4
		First Floor	101	9.5	2.3
19438	Harleysville	Basement	4570	65.1	3.8
		First Floor	1069	80.8	2.3
19440	Hatfield	Basement	2687	395.1	3.4
		First Floor	700	18.2	1.7
19444	Lafayette Hill	Basement	2666	219.7	3.9
		First Floor	785	63.0	2.6
19446	Lansdale	Basement	11375	891.6	4.3
		First Floor	3145	113.0	2.0
19450	Lederach	Basement	74	85.1	6.1
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19453	Mont Clare	Basement	121	256.0	10.2
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19454	North Wales	Basement	5776	114.2	3.8
		First Floor	1684	22.6	1.9
19456	Oaks	Basement	164	62.2	4.9
		First Floor	41	30.2	2.6
19462	Plymouth Meeting	Basement	1756	249.0	4.3
		First Floor	537	32.1	2.4
19464	Pottstown	Basement	6465	438.0	4.2
		First Floor	924	27.5	2.3

19468	Royersford	Basement	5314	126.1	4.6
		First Floor	789	50.0	2.8
19473	Schwenksville	Basement	2728	87.5	3.7
		First Floor	478	42.4	2.1
19474	Skipack	Basement	483	38.8	3.0
		First Floor	148	23.9	1.3
19477	Spring House	Basement	107	24.0	4.2
		First Floor	43	4.3	1.5
19478	Spring Mount	Basement	48	8.4	2.0
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19490	Worcester	Basement	336	49.4	5.5
		First Floor	93	17.5	2.7
19492	Zieglerville	Basement	105	58.8	7.9
		First Floor	Insufficient Data	Insufficient Data	Insufficient Data
19525	Gilbertsville	Basement	2384	191.8	4.3
		First Floor	222	12.3	2.4

4.3.20-4 Future Occurrence

Data from PADEP's Radon Division indicates that 67% of the county's households are at a moderate to high risk of radon exposure. Radon exposure is likely given present soil, geologic, and geomorphic factors across Pennsylvania (50 to 89% annual probability.) Development in areas where previous radon levels have been significantly high will continue to be more susceptible to exposure. However, new incidents of concentrated exposure may occur with future development or deterioration of older structures. The next plan update should correlate building age to possible exposure in these areas. Exposure can be limited with proper testing for both past and future development, and appropriate mitigation measures (PEMA, 2010).

4.3.20-5 Vulnerability Assessment

Future occurrences of radon exposures will continue across Montgomery County. Since radon testing typically occurs during a home inspection, renters and long-time homeowners may be more unaware of radon levels. Potential impacts include adverse human health effects and the financial costs of radon mitigation. Health exposure would be comparable to the risk of smoking from one to twenty cigarettes each day. Additionally, the U.S. EPA estimates the cost of radon mitigation systems to be approximately \$1,200.00 for each household with elevated radon levels.

Development Pressures

The PA statewide building code does not require radon-resistant new construction. However, some municipalities may have adopted this portion of the building code. Unless new construction is built utilizing a full radon-resistant system, radon in new homes can be as prevalent as radon in older homes.

Inequity

As with other air pollutants, the burden of radon exposure and mitigation disproportionately affects residents with lower socio-economic status and minority populations. A recent study out of Minnesota confirms that residents in low-income neighborhoods and renters are less able to complete radon testing and apply mitigation strategies. Additionally, because amount of exposure time to radon is core to the onset of disease, residents with disabilities that leave them unable to leave their home for long periods of the time will be considerably more at risk. Additionally, since exposure to the combination of radon gas and cigarette smoke creates a greater risk for lung cancer than either factor alone, inequalities in smoking will persist through populations impacted by radon.

Climate Change

The U.S. EPA suspects that climate change may affect the deposition rate of radon in a building both directly by changing radon decay rates and indirectly. For example, air conditioning contributes to “closed house conditions” (reducing airflow) and could lead to higher radon concentrations.

4.3.21. SUBSIDENCE, SINKHOLES

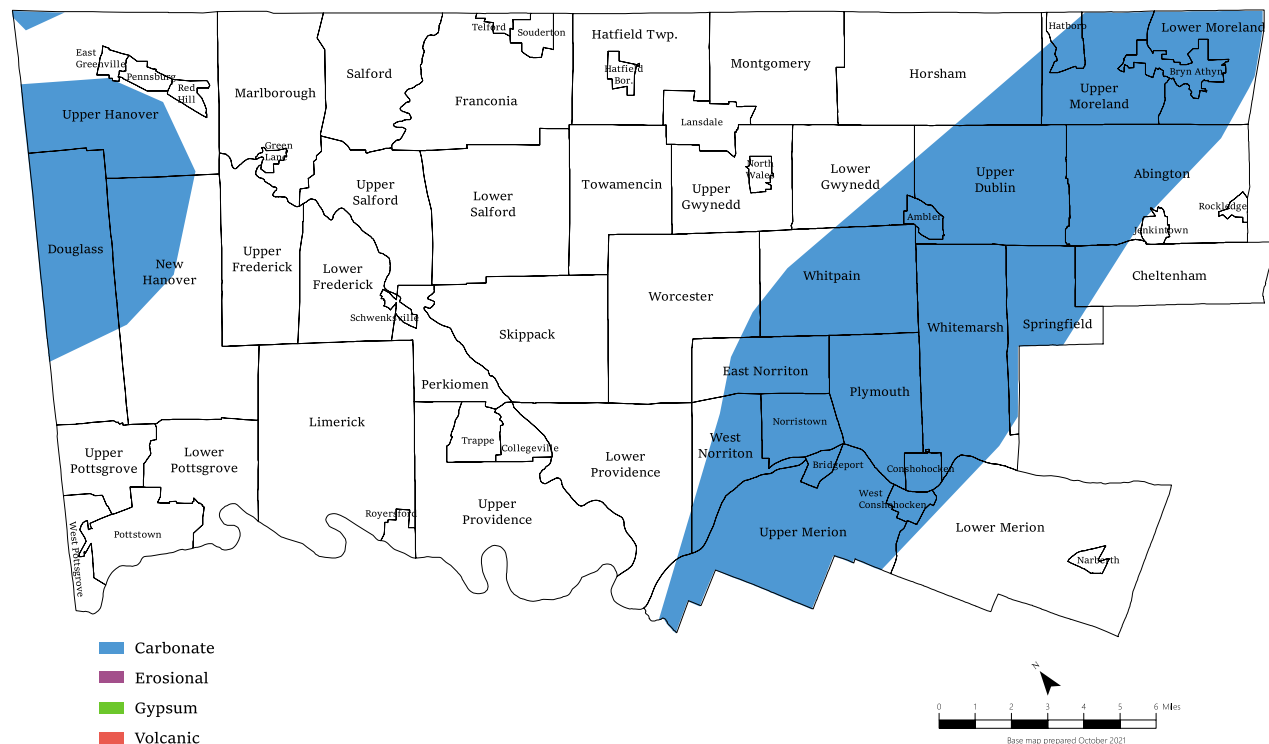
Subsidence and sinkhole formation are natural geologic processes that commonly occur in areas with underlying limestone bedrock and other rock types that are soluble in water. Water passing through naturally occurring fractures dissolves these materials leaving underground voids. Subsidence occurs when this process progresses slowly. With sinkholes, the overburden on top of the void collapses under its own weight into the void below. This can result in damage to structures with low strain tolerances.

Karst topography describes a landscape that contains characteristic structures such as sinkholes, linear depressions, and caves. In addition to natural processes, human activity such as water, natural gas, and oil extraction can cause subsidence and sinkhole formations. (FEMA, 1997).

4.3.21-1 Location and Extent

Generally, there are two common causes of subsidence in Pennsylvania: 1) dissolution of carbonate rock such as limestone or dolomite and 2) mining activity. Mining activity in Montgomery County has been minimal with the only known underground mines occur in the vicinity of the John James Audubon Center property in Lower Providence Township. Most sinkholes occur above karst topography which is present primarily along the trajectory of the PA Turnpike (I-276) and the area surrounding Douglass Township (see Figure 4.3.21.1). Structural defects caused by piping or other below-ground stormwater infrastructure can cause a system to become at least temporarily unstable and can lead to sinkholes.

Figure 4.3.21-1 | **Karst Areas in Montgomery County**



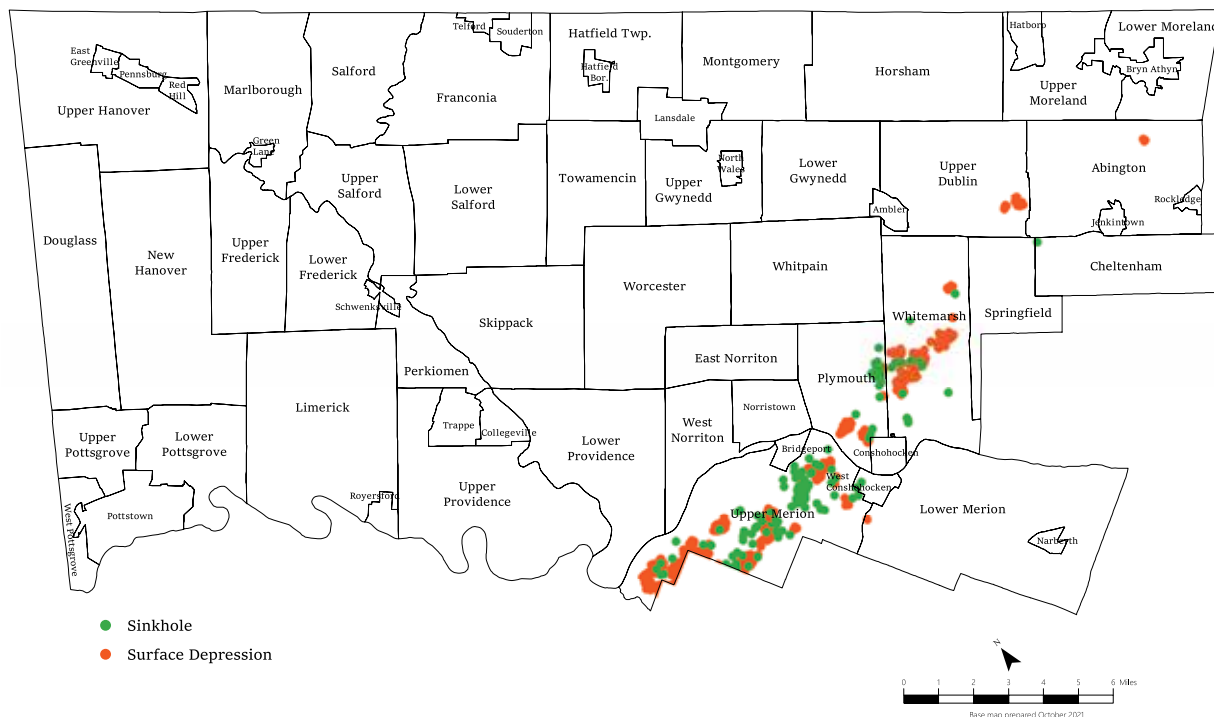
4.3.21-2 Range of Magnitude

No two subsidence areas or sinkholes are exactly alike. Variations in size and shape, time they occur (i.e., gradually or abruptly), and their proximity to development ultimately determine the magnitude of damage incurred. 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. Primarily, problems related to subsidence include the disruption of utility services and damage to private and public property, including buildings, roads, and underground infrastructure. 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. If mitigation measures are not taken, the cost to fill in and stabilize sinkholes can be significant although sinkholes are limited in extent.

4.3.21-3 Past Occurrence

According to PA's Department of Conservation and Natural Resources hundreds of sinkholes and surface depressions have formed in Montgomery County (see Figure 4.3.21-2) The distribution of sinkholes and surface depressions, reported to PA DCNR, generally lies parallel the Pennsylvania Turnpike. The inventory represents the best available data. However, it is not guaranteed that areas without identifiable signs have no history of sinkholes and surface depressions. Pennsylvania's Department of Environmental Protection noted that sinkholes and surface depressions may occur often, and cause limited damage and thus be included in the inventory. These minor events would be primarily related to failing infrastructure such as water main breaks or collapsed pipes.

Figure 4.3.21-2 | **Sinkholes & Surface Depressions in Montgomery County**



Several events have occurred over the past five years, 2017-2022, that have received media attention due to the severity and disruption to traffic patterns (Table 4.3.22-1). These events did not result in any injuries or deaths but did produce millions in damages. Many reported subsidence and sinkhole formations are related to heavy rain or surface flooding events.

Table 4.3.21-1 | **Reported Subsidence & Sinkhole Events Between, 2017-2022**

Municipality	Location	Status
Plymouth Township	Chemical Road between Metroplex Boulevard and Germantown Pike	Closed March 2021 Reopened December 2021
Upper Merion Township	1-76 West Distributor Lane	Closed June 2021 Reopened October 2021
Upper Merion Township	Church Road between Henderson Road and Gulph Road	Closed November 2021
Plymouth Township; Whitemarsh Township	Butler Pike between Flourtown Road and Germantown Pike	Closed August 2018 Reopened December 2021
Borough of Norristown	Norristown High Speed Line at the DeKalb Street Station	Occurred due to Tropical Storm Isaias
Borough of Norristown	Near Pennsylvania American water main in Norristown	Occurred due to Hurricane Ida; Caused rupture in water main
Schwenksville Borough	Near Bank and Post Office	Old, stacked stone culvert/pipe under a few buildings fails triggering sinkholes

4.3.21-4 Future Occurrence

Based on geological conditions and current mining activity in Pennsylvania, the annual occurrence of subsidence and sinkhole events in areas of the Commonwealth underlined by carbonate rock or where mining occurs is considered likely (50% to 90% annual probability). The precise location of future occurrences is difficult to predict given the site-specific conditions that contribute to sinkhole development. Several signs, however, can signal potential development. These include:

- Slumping or falling fence posts, trees, or foundations
- Sudden formation of small ponds
- Wilting vegetation
- Discolored well water
- Structural cracks in walls, floors

4.3.21-5 Vulnerability Assessment

Sinkholes and surface depressions can impact Montgomery County's infrastructure, economy and the well-being of the community. The potential cost of a sinkhole event can vary from a few thousand dollars to ten million dollars depending on the infrastructure damaged and the nature of the repair. Responding to a sinkhole or surface depression event is the responsibility of the underlying property owner. Homeowners' insurance often does not cover damages attributed to sinkholes. Since 1987, sinkhole insurance has been available within Pennsylvania and may serve to eliminate the financial burdens placed on the homeowner.

Municipal governments determine guidelines for construction in high-subsidence areas. A community can reduce its vulnerability to subsidence or sinkholes by implementing solutions such as land use controls, insurance programs and subsidence-resistant designs. Zoning laws have been enacted in Upper Merion Township, Plymouth Township and Whitemarsh Township to regulate development within highly karst areas.

The presence of sinkholes can result in increased potential for groundwater contamination. Due to their porous nature, sinkholes are sometimes used as instruments for enhancing groundwater recharge. However, if hazardous materials are spilled at a recharge point, groundwater can quickly be contaminated due to the lack of soil substrate which normally would slow migrating contaminants. Vegetation is usually damaged during abrupt subsidence events. However, regrowth takes place over time. Land subsidence can also result in more frequent and expansive flooding and changes in river canal and drain flow systems (PEMA, 2018).

Development Pressures

Urbanization of karst terrains generally increases the frequency and magnitude of sinkhole flooding

and the probability of collapse. Karstic terrains impose constraints on land use; mismanagement whether through unsupervised development, improper waste disposal, or other means, will often damage groundwater resources, ecosystems, or man-made structures built on karst. In Montgomery County many areas with known karst terrain have imposed zoning laws that minimize the effect of new development of land prone to sinkholes and reducing the potential of cascading damage to the neighboring communities.

Inequity

Sinkholes can result in the partial and complete collapse of over ground structures in damages to infrastructure, cause high economic losses, evacuation and displacement of residents and can in some rare cases lead to the loss of lives. Past planning and development that disregarded karst topography as a risk factor to homeowners may disproportionately affect populations. Neighborhoods in karst terrain areas with improper stormwater management will be more often affected by sinkholes than others. Economically disadvantaged households and municipalities will be more challenged to attain sinkhole insurance or apply any mitigation or repair measures. Additionally, during a sinkhole event households may be isolated which would pose a challenge for populations with special needs that require assistance in daily activities.

Climate Change

More heavy rain is one of the hallmark signs of climate change. Heavy rain and surface flooding can trigger sinkhole collapse even in normally stable areas. Additionally, it has been found that prolonged drought can make conditions favorable for sinkholes to form. As occurrences of extreme weather events such as heat waves and large storms are likely to become frequent and more intense, it is expected that sinkhole formation and destabilization will intensify.

4.3.22 TERRORISM

Terrorism is the use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber-attacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons. Cyber-attacks have become an increasingly pressing concern.

4.3.22-1 Location and Extent

There are many important considerations in evaluating terrorism hazards, such as the existence of facilities, landmarks, or other buildings of international, national, or regional importance. Military and civilian government facilities, international airports, large cities, and high-profile landmarks are considered high-risk targets, according to FEMA. Other targets can include large public gatherings, water and food supplies, utilities, and corporate centers. Terrorists can also use cyber-attacks or send explosive, chemical, or biological agents through the mail (FEMA, 2013). Terrorism can take many forms and terrorists have a wide range of personal, political, or cultural agendas. Any location could therefore be a potential terrorist target.

Of particular concern to Montgomery County are the many critical facilities including police stations, hospitals, military installations, fire stations, schools, wastewater treatment plants, and nuclear power generation stations along with critical infrastructure such as bridges, tunnels, electric generation and distribution facilities, public water supplies, and government buildings. Damage to these facilities and infrastructure could cripple transportation routes and commerce. Additionally, there are over 3,300 SARA Title III facilities in the state as well as many transportation routes vital to the entire nation traversing the Montgomery County, making intentional hazard material releases a potential threat to citizens and the environment.

4.3.22-2 Range of Magnitude

The term "terrorism" refers to intentional, criminal, and malicious acts, and the Federal Bureau of Investigation (FBI) categorizes it as either:

International terrorism: Violent acts committed by individuals and/or groups inspired by or associated with designated foreign terrorist organizations or nations, and

- Domestic terrorism: Acts carried out by individuals and/or groups inspired by or associated with primarily U.S.-based movements that support extremist ideologies of a political, religious, social, racial, or environmental nature.
- FEMA defines the three main goals of terrorism as causing public fear, convincing citizens that the government cannot protect against terrorism, and making the motivating causes known to the public. Terrorist attacks can take many forms.

FEMA identifies the following as some of the common tactics of terrorism:

- Agriterrorism – food contamination or destruction of crops via pest introduction or disease agents
- Arson/incendiary attack
- Armed attack
- Assassination
- Biological agent
- Chemical agent
- Cyberterrorism
- Conventional bomb
- Hijackings
- Intentional hazardous material release
- Kidnapping
- Nuclear bomb
- Radiological agent

Explosives have been a prominent method of conducting terrorism, but intelligence suggests that the possibility of biological or chemical terrorism is increasing. The FBI has found that the Internet, the rise of social media, and domestic extremists known as Homegrown Violent Extremists (HVEs) are reshaping terrorism and changing its form (FBI 2018).

The severity of terrorist incidents depends upon the method of attack, the proximity of the attack to people, animals, or other assets and the duration of exposure to the incident or attack device. For example, chemical agents are poisonous gases, liquids or solids that have toxic effects on people, animals, or plants. Many chemical agents can cause serious injuries or death. In this case, severity of injuries depends on the type and amount of the chemical agent used and the duration of exposure.

Biological agents are organisms or toxins that have illness-producing effects on people, livestock and crops. Some biological agents cannot be easily detected and may take time to develop. Therefore, it can be difficult to know that a biological attack has occurred until victims display symptoms. In other cases, the effects are immediate. Those affected by a biological agent require the immediate attention of professional medical personnel. Some agents are contagious which may result in the need for victims to be quarantined.

In recent years, cyber terrorism has become a larger threat than in years past. Dr. Dorothy Denning defined cyberterrorism in her testimony before the Special Oversight Panel on Terrorism as “generally understood to mean unlawful attacks and threats of attack against computers, networks, and the information stored therein when done to intimidate or coerce a government or its people in furtherance of political or social objectives. Further, to qualify as cyberterrorism, an attack should result in violence against persons or property, or at least cause enough harm to generate fear.”

These acts can range from taking control of a host website to using networked resources to directly cause destruction and harm. Cyber terrorists can be difficult to identify because the internet provides a meeting place for individuals from various parts of the world. Individuals or groups planning a cyber-attack are not organized in a traditional manner, as they are able to effectively communicate over long distances without delay.

An active shooter, as defined by the U.S. Department of Homeland Security, is an individual actively engaged in killing or attempting to kill people in a confined area. In most cases, active

shooters use firearms and there is no pattern or method to their selection of victims. Recent high-profile incidents involving active shooters include: No substantive research has yet been compiled to address the potential vulnerability to an active shooter incident. Some of these incidents have occurred in public places, and some in places that are considered more restricted (like elementary schools and high schools). There is no discernible pattern to the location chosen by the shooters.

PEMA has identified the worst-case scenario for a terrorism event in Pennsylvania would be if a “dirty bomb” combining radioactive material with conventional explosives were to be detonated in Center City Philadelphia at lunchtime on a weekday. At that time of day and location, a significant number of individuals would be exposed to the bomb’s radiation both at the time of detonation and after the fact as the radiation spread. The explosive device could damage or even topple buildings, spark utility outages citywide, and/or ignite large-scale urban fires.

4.3.22-3 Past Occurrence

Montgomery County has not experienced terrorism on a large scale resulting in significant numbers of injuries or deaths. No documented terrorist act has occurred in the Commonwealth of Pennsylvania either. On occasion, bomb threats have been received at schools, religious facilities, and government buildings. These threats often lack credibility but are treated as authentic; the bomb squad searches the facility, and the area is secured. There have also been instances of standoffs between gunman and police, some with a hostage involved, but these are infrequent, their impact local, and are most often resolved by local law enforcement. For example, in September 2022 a gunman barricaded himself in a closed restaurant in the Montgomeryville Mall. In July 2022, a gunman barricaded himself in a house in New Hanover Township. Both incidents were resolved by local authorities. Various Divisions of the Montgomery County Department of Public Safety are available to provide support and response assistance during major incidents.

Based upon past occurrences the rates of fatality from terrorism are very low compared to other safety threats. For example, the average person faces the following odds of fatality from sources other than terrorism:

- 260 times more likely to be struck and killed by lightning
- 4,700 times more likely to die in an airplane or spaceship accident
- 129,000 times more likely to die in a gun assault
- 407,000 times more likely to die in a motor vehicle incident
- 6.9 million times more likely to die from cancer or heart disease

4.3.22-4 Future Occurrence

An important consideration in estimating the likelihood of a terrorist incident is the existence of facilities, landmarks, or other buildings of national or strategic importance. Montgomery County contains a single National Historical Park (Valley Forge), a single Nuclear Generating Facility (Limerick) and the largest mall on the East Coast. Therefore, the likelihood of a national-level terrorist attack is of low likelihood.

Based on events, Montgomery County can expect to experience several suspicious activities each year. Note that this estimate is based on the occurrence of past events over a short period of time and is not the result of detailed statistical sampling.

Although previous suspicious events have not resulted in what are considered significant terrorist attacks, the severity of a future incident cannot be predicted with a sufficient level of certainty. Prediction of terrorist attacks is almost impossible because terrorism is a result of human factors. As long as there are fringe groups with radically different ideas than that of the government or general population, terrorism is a possibility.

4.3.22-5 Vulnerability Assessment

Since the probability of terrorism occurring cannot be quantified in the same way as that of many natural hazards, it is not possible to assess vulnerability in terms of likelihood of occurrence. Instead, vulnerability is assessed in terms of specific assets. By identifying potentially at-risk terrorist

targets in Montgomery County, planning efforts can be put in place to reduce the risk of attack. All communities in the Montgomery County are vulnerable on some level, directly or indirectly, to a terrorist attack. Site-specific assessments should be based on the relative importance of a particular site to the surrounding community or population.

Acts of terrorism can lead to forced or spontaneous evacuations of residents, depending on the severity of the incident. If there were a threat of an attack, people living near potential targets could be advised to evacuate or they could choose on their own to evacuate to an area not considered a likely target (FEMA 2011). Certain areas may experience an increase in population as people move out of the impacted area and into an area of refuge. This could lead to a strain on resources such as shelters reaching capacity, higher volume of patients at hospitals and clinics, and an increase in demand for water, food and lodging. Measuring the economic impact of a terrorist attack on the Lehigh Valley is difficult. The initial impact can be measured in immediate costs, such as costs related to response to the event and those associated with immediate loss of productivity that results from closed businesses. The full economic impact includes long-term costs such as terrorism mitigation activities. Additionally, a terrorist attack in a neighboring county or elsewhere in the state could lead to indirect economic impacts in the Montgomery County.

Development Pressures

Often land development can lead to higher density places, simply residential and commercial development at a density that is higher than what is typically found in the existing community. New development may supplement existing shopping centers, main streets or other public attractions (trails, parks) but lead to higher crowd densities; not necessary all the time but may vary during the day or night, and seasonally. Experience from security professionals show that density locations or environment may be considered potentially more attractive to terrorist attack by virtue of crowd density and as a result perceived impact ([Home Office, 2012](#)).

Inequity

Overall, residents that live in more density populated areas or that are employed in facilities, landmarks, or other buildings of national or strategic importance will be more at risk during a international terrorism incidents. Domestically, the U.S. Department of Homeland Security concluded that “racially and ethnically motivated violent extremists—specifically white supremacist extremists (WSEs)—will remain the most persistent and lethal threat” ([Homeland Threat Assessment, 2020](#)). Meaning, that residents in non-majority racial, ethnic, religious and political groups are more at risk to be targeted by individual intending to commit acts of domestic terror ([The White House, 2021](#)). The Center For Strategic & International Studies have specifically identified the Black, immigrant, Muslim and Jewish communities as possible targets ([CSIS, 2020](#)). Additionally, the number of incidents targeting law enforcement, military and government facilities and personal have been increasing.

Climate Change

A [2010 report](#) prepared by the US Joint Forces Command warned of the dangers that can result when natural disasters “collide” with existing structural challenges like urban sprawl and civil unrest. In recent years, UN Secretary-General Antonio Guterres explained “climate change is not the source of all ills, but it has a multiplier effect and is an aggravating factor for instability, conflict and terrorism” ([UN News, 2021](#)). More locally, the National Consortium for the Study of Terrorism and Responses to Terrorism, established by the Department of Homeland Security, found that climate change and terrorism may interact in three ways: 1) Climate change as an indirect contributor to terrorism; 2) Climate change as an ideological driver of terrorism; and 3) Climate change as a means for terrorist exploitation to control or coerce populations ([Boyd, et al., 2022](#)). As a member of the UN Security Council, the United States is working to support Government’s strategies to prevent and counter terrorism and violent extremism in a manner that aligns with global efforts to tackle climate change and to pre-empt and mitigate its effects ([UN ODC, 2022](#)).



4.3.23. TRANSPORTATION CRASHES

Transportation crashes can result from any form of air, rail, water or road passenger or freight travel. Though most crashes are small and do not impact the community at large except for temporary traffic congestion, larger crashes involving trucks or several vehicles, can result in the release of hazardous materials, long term traffic congestion, and the destruction of key pieces of transportation infrastructure.

4.3.23-1 Location and Extent

Transportation vehicle crashes are defined as crashes involving highway, air and rail travel. As the keystone state, Pennsylvania has one of the largest transportation systems in the nation. Montgomery County likewise has an extensive highway system as well covering over 3,668 miles. In 2021, there were 704,491 registered vehicles in the county. The latest data on commuting indicates that on a typical workday about 287,307 workers commute into the county, while 189,634 commute out of the county for work in neighboring counties. Overall, in 2019, 90,673 more people commuted into the county than out. In addition, 172,370 commute within the county, living and working here. The county also contains several interstate highways including I-476, I-76, and I-276. Sections of the Pennsylvania Turnpike in the county carry over 120,000 vehicles per day, more than twice the average traffic on areas of the turnpike outside of the county. The sheer number of roadway miles coupled with the high volume of traffic creates the potential for serious crashes along the county's roads and bridges.

With the five airports servicing the county and the number of commercial air traffic flyovers that occur every day, the potential extent of air transportation crashes is countywide. Yet the recent closure of the Willow Grove Naval Air Station greatly reduces air traffic over portions of the county and lowers the potential for aviation crashes.

Rail crashes can occur anywhere along the 51.93 miles of rail lines providing passenger rail service and 91.04 linear miles of track providing exclusively freight rail service in Montgomery County or the three rail freight yards. Rail transportation accident impacts have different characteristics depending upon whether it is freight or passenger service.

4.3.23-2 Range of Magnitude

Significant passenger vehicle, air, and rail transportation crashes can result in a wide range of outcomes from damage solely to property to serious injury or death. Some air incidents are nonfatal and cause minor injuries or property damage. Past air crashes in the vicinity of Willow Grove Naval air station have involved multiple fatalities and the destruction of several structures. Most motor vehicle crashes in Montgomery County are non-fatal, but vehicle accidents are a daily occurrence in many locations throughout the county. In 2021, there were 7,919 reported crashes in the county. Railway and roadway crashes have the potential to result in hazardous material releases since many chemicals

and flammable liquids are transported through the county. Transportation accidents can also result in broader infrastructure damage. The worst type of transportation crashes generally involves large quantities of flammable materials and hazardous materials. Not only can these accidents result in fatalities, but they could result in the destruction of key transportation infrastructure and surrounding buildings as well as causing off-site pollution and exposure to toxic releases. Fortunately, the county has not encountered one of these worst-case transportation crash scenarios.

4.3.23-3 Past Occurrence

Vehicular transportation crashes are a daily occurrence in the Commonwealth. According to PennDOT, there were 129,395 crashes in Pennsylvania in 2016. This has increased to 117,899 crashes statewide in 2021.

Since Montgomery County is the third most populous county in the state with an extensive road network and significant expressways, it is no surprise that the county accounted for 6.7% of all Pennsylvania traffic crashes in 2021. The general decline in total accidents and fatalities reflects the significant investment made by federal, state, county and municipal government to improve motor vehicle safety. Steps such as installing cable median barriers along highways such as US Route 422, rumble strips along road edges and center lines throughout the county, and the removal of hazardous obstacles near roadways have contributed to improved safety conditions in the county. On the other hand, when economic conditions improve and gasoline prices drop, people tend to drive more miles, and this creates opportunities for more crashes. Driving distracted from mobile devices also creates opportunities for crashes. Data on the number and severity of crashes from 2016 to 2020 are presented below.

Figure 4.3.23-1 | **Crash Severity Data**

	2016	2017	2018	2019	2020
Reported Crashes	129,395	128,188	128,420	125,267	104,475
Total Fatalities	1,188	1,137	1,190	1,059	1,129
Suspected Serious Injury	4,397	4,227	4,534	4,680	4,436
Suspected Minor Injury	26,284	27,237	33,551	35,539	30,727
Possible Injury	23,050	22,629	17,290	15,188	10,745
Unknown Severity	29,240	26,519	22,844	20,836	15,340

Aviation accidents are the least frequent type of transportation accident yet can be the deadliest. The National Transportation Safety Board, the federal agency responsible for aviation accident information, indicates that from 2017 to 2022, there were 112 air transportation crashes in Pennsylvania. Fifteen of these accidents involved at least one fatality. Most of these crashes involved small aircraft and many resulted in only minimal injuries. Montgomery County contains five airports. Crash data are presented in Figure 4.3.23.2 below.

Figure 4.3.23-2 | **Airplane Crash Data 2017 - 2022**

Date	Location	Injury/Damage
10/1/2021	Pottstown	No injuries, Substantial damage to aircraft
7/1/2021	Pottstown	No injuries, Substantial damage to aircraft
7/20/2020	Pottstown	No injuries, Substantial damage to aircraft
9/22/2020	Pottstown	No injuries, Substantial damage to aircraft
12/29/2020	Stowe	No injuries, Substantial damage to aircraft
8/8/2019	Hatboro	Fatality, Aircraft destroyed
9/24/2017	Ambler	Serious injury, Substantial damage to aircraft

According to the Federal Railroad Administration (FRA), there have been 261 accidents involving railroads in Pennsylvania from 2017 to 2020. Eighteen fatalities were reported, most of these involved pedestrians crossing tracks at unauthorized points and being struck by passenger trains. The FRA reports 8 train accidents occurred in Montgomery County from 2017 to 2021. Most of the train incidents in the county involved SEPTA trains. Norfolk Southern Corporation and Amtrak were involved in a few cases. None train crashes in that period resulted in a release of hazardous materials.

4.3.23-4 Future Occurrence

With the volume of goods and people moving through Montgomery County, transportation accidents will continue to occur routinely, especially passenger vehicle crashes. At the same time, five-year trends indicate that rail and motor vehicle transportation crashes have been decreasing. Highway traffic crash reduction may be a result of various safety programs, vehicle code enforcement, and highway improvements made by Penn DOT, the PA Turnpike Commission, Montgomery County, and local municipalities. Also, improvements to vehicle safety equipment have contributed to reductions in fatalities and injuries. The use of cell phones, particularly texting while driving, is a source of distraction that could lead to increased vehicle accidents in the future.

The number of rail crashes nationally has been stable or declining over the past several years. This is a result of safety initiatives and infrastructure improvements by the rail providers, particularly SEPTA.

With the closure of Willow Grove Naval Air Station, aviation crashes in the county will likely be low. The existing airports serving the county support very little air traffic comprised of small planes only.

4.3.23-5 Environmental Impacts

Due to the range of magnitude, the environmental impacts of transportation crashes can vary greatly. In the case of a simple motor vehicle crash, train derailment, or aviation accident, the environmental impact may be minimal. However, if the crash involves any type of vehicle moving chemicals or other hazardous materials, the impact will be considerably larger and may include an explosion or the release of potentially hazardous material. For a complete discussion of the environmental impacts of hazardous materials releases, see Section 4.3.23.

4.3.23-6 Vulnerability Assessment

Vulnerability for transportation crashes is different for each of the three major modes of transportation in Montgomery County. For this analysis, vulnerability for highway accidents was defined as jurisdictions falling within a ¼ mile of Interstate and limited access highways likely to yield deadly crashes. The estimated county population residing within a quarter mile of limited access highways is 64,870.

Vulnerability for air traffic accidents is defined as jurisdictions falling within five miles of both public and private airports and heliports with at least one runway.

Since most aviation incidents occur during take-off and landing, jurisdictions located within 5 miles of airports are more vulnerable to air transportation crashes. Jurisdictional vulnerability for air transportation accidents is most significant within the five-mile hazard zone around each airport. In order to combat the hazards of aviation incidents, the Pennsylvania Legislature enacted Act 164 of 1984 which requires municipalities to place land use restrictions in areas around an airport to restrict development that could interfere with airport regulations and navigation. This restriction on development 10,000 feet around airports is designed to prevent the creation of airport hazard areas. It appears that municipalities in the county have complied with these requirements.

Critical areas for rail incidents are based on the location and activity of various rail lines. Three class I railroads operate in the county. These are Norfolk Southern, Canadian Pacific and CSX. Norfolk Southern owns the significant Harrisburg Line along the Schuylkill River, the Morrisville Line paralleling the Pennsylvania Turnpike, and the Abrams Yard in Upper Merion Township. Freight rail providers also have operating rights on some SEPTA commuter rail lines in the county. Amtrak operates high speed regional rail service on the Main Line through Lower Merion Township. SEPTA operates commuter rail service along seven lines through Montgomery County. These include:

Airport Line	Glenside to the Philadelphia International Airport
Warminster Line	Central Philadelphia to Warminster
Lansdale/ Doylestown Line	Central Philadelphia to Doylestown
Paoli Line	Central Philadelphia to Thorndale

Norristown Line
Cynwyd Line
Fox Chase Line

Central Philadelphia to Norristown
Central Philadelphia to Cynwyd
Central Philadelphia to Fox Chase

Like highway crashes, jurisdictions that are vulnerable to rail crashes are those located within ¼-mile of rail lines. There are over 82,182 county residents living within a quarter mile of rail lines servicing freight traffic.

Growing concern has arisen in the county about the safety of crude oil shipments from various oil reserves in Western Pennsylvania and North Dakota among other locations.

Development Pressures

As development continues in Montgomery County, there is the potential for more residents and buildings to be built in areas that are vulnerable to transportation crashes. In the developed eastern portion of the county, developable land is scarce, and there is pressure to develop the remaining lands. Some of these areas are adjacent to rail lines, and along major highways. As these areas develop, there will be the potential for transportation accidents to occur in these areas

Inequity

Housing located along major highways and rail lines may be priced lower than other areas, due to exposure to noise, vehicle exhaust, and other issues. Vulnerable populations may not be able to afford housing elsewhere and may feel compelled to purchase/rent homes in these areas, exposing them to the threat of transportation accidents.

Climate Change

Climate change is causing more frequent storms with increasing severity that could cause more transportation accidents. As storm tracking improves and storm protocols improve, transit accidents can be avoided.

4.3.23-7 Additional Information

PA DOT Traffic Accident Statistics

Montgomery County Comprehensive Plan – Transportation Plan Aviation Chapter

Montgomery County Comprehensive Plan – Transportation Plan Public Transit and Highways Chapters



4.3.24. URBAN FIRE AND EXPLOSION

The phrase, Urban fire and explosion refers to fires taking place within structures, facilities or developed areas. From a hazard mitigation planning perspective, fires considered in this section are those that involve very large structures or multiple structures.

4.2.24-1 Location and Extent

Urban fire and explosion hazards incorporate vehicle and building/structure fires as well as

overpressure rupture, overheating or other explosions that do not ignite. This hazard occurs in denser, more urbanized areas statewide and most often occurs in residential structures (US Fire Administration). Urban fires can more easily spread from building to building in these denser areas. Furthermore, urban fires are a more significant threat in the many areas of the Commonwealth with a significant proportion of buildings over 50 years of age. Figure 4.3.24-1 illustrates the concentration of residential structures over 50 years old in Montgomery County. Urban fires and explosions often begin as a result of other hazards, particularly storms, lightning strikes, drought, transportation accidents, hazardous materials releases, criminal activity (arson), and terrorism.

4.3.24-2 Range of Magnitude

The current extensive networks of roads and streets and the number of local fire companies and departments should provide swift access to fire events. However, urban fires have the potential to cause extensive damage to residential, commercial or public property.

Damage ranges from minor smoke and/or water damage to the destruction of buildings. People are often displaced for several months to years depending on the magnitude of the event. Fires and explosions can also cause injuries and death. In Pennsylvania, the fire mortality rate is approximately 13.9 deaths per million residents, or about 180 fire-related deaths per year. This is the 21st highest fire mortality rate in the nation and is higher than the national average of 13.3 deaths per million residents (US Fire Administration, 2019). Generally, the number of fire incidents, fatalities and injuries from fire has been dropping since 2005.

Figure 4.3.24-1 | **Residential Housing Age by Municipality**

Municipality	Total Residential Units	Units Built on or Before 1961	Percentage	Units Built After 1961	Percentage
Amber	1,788	1465	81.94%	323	18.06%
Bridgeport	1,346	1098	81.58%	248	18.42%
Bryn Athyn	293	199	67.92%	94	32.08%
Collegeville	1,169	295	25.24%	874	74.76%
Conshohocken	3,166	2223	70.21%	943	29.79%
East Greenville	992	510	51.41%	482	48.59%
Green Lane	151	126	83.44%	25	16.56%
Hatboro	2,333	1782	76.38%	551	23.62%
Hatfield Borough	801	437	54.56%	364	45.44%
Jenkintown	1,592	1099	69.03%	493	30.97%
Lansdale	4,529	3299	72.84%	1,230	27.16%
Narberth	1,365	1213	88.86%	152	11.14%
Norristown	8,504	7609	89.48%	895	10.52%
North Wales	1,080	878	81.30%	202	18.70%
Pennsburg	969	401	41.38%	568	58.62%
Pottstown	7019	5992	85.37%	1,027	14.63%
Red Hill	909	293	32.23%	616	67.77%
Rockledge	826	689	83.41%	137	16.59%
Royersford	1,338	937	70.03%	401	29.97%
Schwenksville	424	168	39.62%	256	60.38%
Souderton	1,869	1321	70.68%	548	29.32%
Telford	1,327	728	54.86%	599	45.14%
Trappe	1,329	296	22.27%	1,033	77.73%
West Conshohocken	596	379	63.59%	217	36.41%

Abington	18,212	14,581	80.06%	3631	19.94%
Cheltenham	10,104	8,452	83.65%	1652	16.35%
Douglass	3,249	786	24.19%	2463	75.81%
East Norriton	4,835	1,934	40.00%	2901	60.00%
Franconia	4,252	818	19.24%	3434	80.76%
Hatfield Township	4,699	1,238	26.35%	3461	73.65%
Horsham	7,999	2,236	27.95%	5763	72.05%
Limerick	6,188	1,008	16.29%	5180	83.71%
Lower Frederick	1,783	522	29.28%	1261	70.72%
Lower Gwynedd	3,680	1,032	28.04%	2648	71.96%
Lower Merion	19,520	14,055	72.00%	5465	28.00%
Lower Moreland	4,266	1,610	37.74%	2656	62.26%
Lower Pottsgrove	4,025	955	23.73%	3070	76.27%
Lower Providence	7,056	2,089	29.61%	4967	70.39%
Salford	859	252	29.34%	607	70.66%
Marlborough	1,272	466	36.64%	806	63.36%
Montgomery	9,114	575	6.31%	8539	93.69%
New Hanover	3,736	834	22.32%	2902	77.68%
Perkiomen	2,942	461	15.67%	2481	84.33%
Plymouth	5,298	2,813	53.10%	2485	46.90%
Lower Salford	4,533	711	15.68%	3822	84.32%
Skippack	3,701	534	14.43%	3167	85.57%
Springfield	6,604	5,385	81.54%	1219	18.46%
Towamencin	5,687	755	13.28%	4932	86.72%
Upper Dublin	8,750	2,795	31.94%	5955	68.06%
Upper Frederick	1,212	311	25.66%	901	74.34%
Upper Gwynedd	5,311	1,077	20.28%	4234	79.72%
Upper Hanover	2,357	567	24.06%	1790	75.94%
Upper Merion	9,037	4,406	48.76%	4631	51.24%
Upper Moreland	6,722	4,862	72.33%	1860	27.67%
Upper Pottsgrove	1,910	530	27.75%	1380	72.25%
Upper Providence	7,250	1,182	16.30%	6068	83.70%
Upper Salford	1,063	369	34.71%	694	65.29%
West Norriton	5,865	2,264	38.60%	3601	61.40%
West Pottsgrove	1,253	820	65.44%	433	34.56%
Whitemarsh	5,704	2,871	50.33%	2833	49.67%
Whitpain	6,473	1,697	26.22%	4776	73.78%
Worcester	3,223	774	24.01%	2449	75.99%
Total	255,459	122,064	47.78%	133,395	52.22%

Source: Montgomery County Board of Assessments

In the most serious urban fire events, the extreme heat of a fire event can damage the underlying infrastructure. For example, in 1996, an eight-alarm tire fire ignited in Philadelphia under Interstate 95 produced extreme heat that caused the bridge to buckle and shut down the highway for two months

while the bridge was repaired. The governor declared this event a disaster shortly after it occurred.

4.3.24-3 Past Occurrence

Urban fire events occur daily in communities across Pennsylvania. According to the information compiled by the Office of the State Fire Commissioner, in 2010 there were approximately 20,000 fire calls in the county, over 7,770 involving structures and 3,330 involving vehicles. Over 500 calls included explosions. This information is based on all fire company reports submitted to the Pennsylvania Fire Information Reporting System (PennFIRS). Unfortunately, it appears that incomplete submissions are made with information from several Montgomery County fire companies going unreported.

Pennsylvania leads the United States in the number of fire-related deaths in 2021 and is continuing to lead again this year. A missing item contributing to some of the deaths is working smoke detectors. More than 70 people have died in fires across Pennsylvania this year, according to data compiled by the U.S. Fire Administration. More than a dozen victims have been under the age of 18.

Explosions are rare in the County. When they do occur, they make regional headlines, and attract the attention of the public, emergency response personnel, and safety agencies. For example, a chemical warehouse in Royersford caught fire on September 15th, 2018. The Royersford Fire Department said that the sprinkler systems were very effective in controlling the blaze until crews arrived. That, along with the swift response from first responders, helped quell the potentially hazardous blaze. Also, on May 26, 2022, a home exploded in the 400 block of Hale Street in Pottstown. The house was destroyed, and several adjacent homes were severely damaged, according to the Pottstown Mercury.

4.3.24-4 Future Occurrence

Many factors contribute to the cause of urban fires and explosions. Most fires are caused by cooking. Other significant residential fire causes include heating and electric system malfunction. In non-residential structures, fires are also caused by carelessness or are intentionally set. Due to the various factors, urban areas in Pennsylvania are considered at risk to one degree or another. Minor urban fires can be expected every day in Montgomery County. Major fires will continue to occur several times a year, particularly in dense, urban areas with aging building stock. However, the probability of future occurrences may decrease with the construction of new buildings to meet building codes which address fire prevention, detection and extinguishment. Also, continued efforts to increase public awareness of the dangers of urban fires will help to mitigate injury, death, and property loss. Even with these efforts, the probability of future occurrence may increase slightly in some communities whose populations are growing and where new areas are developed.

4.3.24-5 Environmental Impacts

The impact of urban fire and explosion events vary based on the size of the incident and the type of structure being burned. There may be environmental impacts related to hazardous materials when a fire event or explosion releases dangerous materials. There are additional economic consequences related to this hazard. Urban fires and explosions may result in lost wages due to temporarily or permanently closed businesses, destruction and damage involving business and personal assets, loss of tax base, recovery costs, and lost investments in destroyed property.

The secondary effects of urban fire and explosion events relate to the ability of public, private and non-profit entities to provide post-incident relief. Human services agencies (community support programs, health and medical services, public assistance programs and social services) can be affected by urban fire and explosion events as well. Effects may consist of physical damage to facilities and equipment, disruption of emergency communications, loss of health and medical facilities and supplies, and an overwhelming demand for service by victims who are suffering from the effects of the urban fire, including loss of their home or place of business.

4.3.24-6 Vulnerability Assessment

The areas of the county that have the highest population densities coupled with the oldest residential buildings are most vulnerable to urban fire threats. Vulnerability thresholds for Pennsylvania municipalities occur when population densities are over 8,000 persons per square mile and are in communities with 68 percent or more of residential structures older than 50 years. Only Norristown and Narberth Borough meet both the population density and housing age criteria. Another source of urban fire is due to vacancies and unattended properties. There are very few vacancies or abandoned

buildings in the county. Overall, the county is well served by professionally trained and well-equipped fire companies. Over the past, several Montgomery County fire companies have merged to strengthen their abilities to service their community. In the future, fire companies need to continually recruit new members as the average age of fire fighters increases.

Development Pressures

Developers must consider fire risk when designing new buildings. Some areas have higher fire risk than others which will have implications for development. Additionally, developers should be considering the flammability of their building materials to minimize fire risk and spread. Developers may also want to build on sites where fires have occurred in the past depending on the situation.

Inequity

The US Fire Administration report, *Fire in the United States 2008-2017* notes that the elderly remain at high risk of death from fire, and that males, African Americans and American Indians/Alaskan Natives remain at a higher risk of death from fire than the general population. The report recommends that the focus for fire injury prevention should be on adults 25–64 and those 80–84.

Fires are often more dangerous if buildings are not built and designed to minimize fire damage. Oftentimes, low-income housing is built using materials that catch fire and spread quickly which can lead to more destruction and harm for low-income people. The risk of fire is increasing as the weather becomes more severe which means more audits need to be conducted of building materials and at-risk areas. Additionally, low-income communities have historically and will continue to struggle with recovering from fire damage and finding new places to live if their housing was jeopardized.

Climate Change

Fire risk is increasing as higher temperatures and drought increase due to climate change. This means that cities and urban areas in the county will experience more days at higher risk for fire outbreaks. Additionally, stronger winds are becoming more common which can also increase the spread of fires.

4.3.24-7 Additional Information

[Office of the PA Fire Marshall](#)

4.3.25. UTILITY INTERRUPTION

4.3.25-1 Location and Extent

Utility interruption is the impairment of the ability of various types of energy and communication systems to provide service to their customers. Utility interruption may result from various types of weather conditions, fuel or resource shortage, electromagnetic pulse, information technology failure, support system accident or failure, or major power or conveyance system accident or failure.

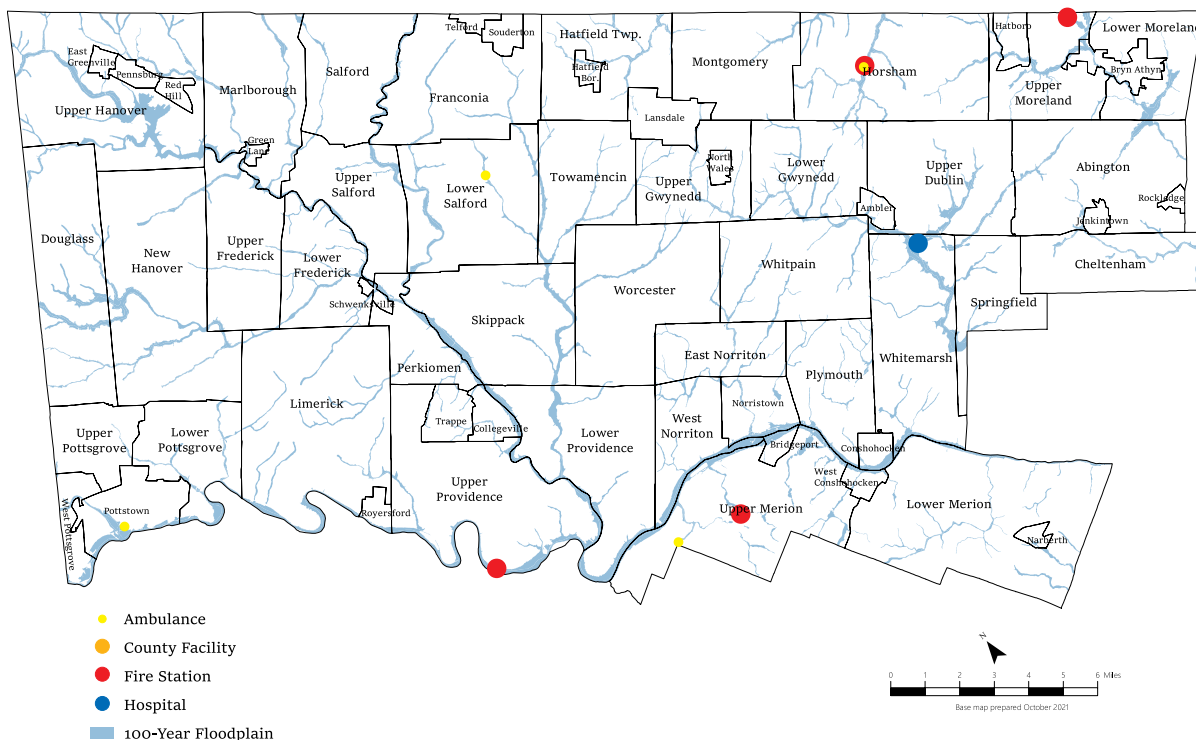
Utility interruptions occur throughout Montgomery County but usually are small-scale, localized incidents. Utility interruptions are possible anywhere there is utility service but are typically secondary to other natural hazard events, particularly flooding events, extreme weather events and transportation accidents. That said, utilities interruptions have the potential to affect a significant number of residents year-round.

According to the 2019 American Community Survey, there are 321,373 occupied housing units in Montgomery County. Survey responses indicate that 51.9% of these households use natural gas as their main heating fuel, while 26.4% use electricity to heat their home and 15.8% use fuel oil. This means that should a utility interruption occur, nearly 302,412 households (94.1%) could be without heat or cooling.

Most households, businesses, and industrial facilities are distributed electricity via PECO Energy, Met-Ed and PPL Electric Utilities. The impact on drinking water supply during a power outage depends on the source of water and the type of system. In most situations, public water supply will remain active during a short power outage and often utilities have numerous backup power systems. It is estimated that less than 15% of the county relies on individual portal water supply wells which utilize electric pumps and as a result will not operate during a power outage.

Emerging utilities over concern include cellular coverage and internet service; each of these are subject to outages of a few minutes to weeks. Currently, cellular coverage across Montgomery County is provided by AT&T Wireless, T-Mobile, and Verizon Wireless. And numerous internet service providers operate throughout Montgomery County including the following: XFINITY, Windstream, VerizonFios and HughesNet.

Figure 4.3.25-1 | **Critical Utility Structures**



4.3.25-2 Range of Magnitude

The most severe utility interruptions will be regional or widespread power and telecommunications outages. With the loss of power, electrically powered equipment and systems will not be operational. Examples may include: lighting; HVAC and ancillary support equipment; communication (e.g., public-address systems, telephone, computer servers, and peripherals); ventilation systems; fire and security systems; refrigerators, sterilizers, trash compactors, office equipment; and medical equipment. Power outages can cause food spoilage, loss of heat or air conditioning, basement flooding (sump pump failure), lack of light, loss of water (well pump failure), lack of phone service, or lack of internet service. However, this is most often a short-term nuisance rather than a catastrophic hazard.

The severity of a utility interruption can be compounded with extreme weather events, especially winter weather events. Interruptions can also be more severe for special needs populations that are dependent on electronic medical equipment. Utility interruptions can significantly hamper first responders in their efforts to provide aid in a compound disaster situation, especially with losses of telecommunications and wireless capabilities. Telecommunications interruptions will also hinder first responders' efforts. Additionally, an internet outage could be crippling to the economy of the state; for example, the Department of the Treasury no longer cuts checks except when necessary. Instead, payroll and invoicing are done electronically.

In a possible worst-case scenario, a winter storm event causes widespread power outages, leaving citizens without heat during subzero temperatures. The power outage also means that elderly populations or others at risk of health problems due to the lack of heat are unable to call for assistance or leave their homes. Power lines are unable to be repaired because of the magnitude of the storm, and the power outage lasts for several days.

4.3.25-3 Past Occurrence

Utility interruptions are largely minor, routine events, but there has been one Presidential Declaration of Emergency and two Gubernatorial Disaster Declarations in which a utility interruption was a major component of a disaster. A series of bankruptcies in 1972 led to the major steam heat provider in Lower Merion Township cutting off heat to residents with no intention of resuming service in the wintertime; the governor declared the event a disaster. In January 1977, the nation's gas shortage coupled with severe winter weather led to a President's Declaration of Emergency.

Utility interruptions will continue to occur annually with minimal impact. Widespread utility interruption events usually occur approximately once every five years, usually as a secondary effect of an extreme weather event. These interruptions should be anticipated, and first responders should be prepared during severe weather events. Likewise, all critical facilities should have adequate backup generator facilities in place with sufficient fuel supplies to provide power to core facilities for over a week. The impact of power outages during extreme weather conditions, both cold and hot weather, should be anticipated in all emergency plans for critical facilities. Sometimes disastrous situations can arise through the failure of gas and electric utilities.

The Pennsylvania Utilities Commission (PUC) requires electric utilities to report all disruption and to stay within a 10% range of the PUC established disruption benchmark. Generally, PECO, PPL and Metropolitan Edison have worked to minimize disruptions in accordance with these requirements. PECO experienced 3 of their top ten power outage events from August 2020 to September 2021. These included:

- **September 1, 2021:** Hurricane Ida remnants caused widespread flooding which caused PECO to take the Perkiomen Substation offline, putting most of the Perkiomen Valley in the dark. Altogether the most customers PECO had out in Montgomery County was at one time around 86,000. The power outage resulted in numerous basements flooding due to lack of operational sump pumps.
- **July 21, 2021:** A power summer storm delayed SEPTA regional rail service, ripped off industrial facility roofs and knocked off power to more than 42,000 Montgomery County customers.
- **August 4, 2020:** Tropical Storm Isaias brought tornadoes, flashfloods and power outages to the Philadelphia region. At the height of outages over 23,000 Montgomery County customers remained without power.

Pipeline and Hazardous Materials Safety Administration tracks pipeline incidents in Pennsylvania. Since 2017, there have been three public fatalities/one industry fatalities and six public injuries/four private injuries as well as over \$36,000,000 in damages. Past pipeline incidents occurring in Montgomery County include:

1. **November 24, 1950 (Lower Providence Twp):** Natural gas pipeline ruptured causing fire that destroyed two neighboring homes.
2. **January 27, 1971 (West Conshohocken Township):** Natural gas pipeline exploded killing five people and including fifty people. Fifteen homes were destroyed and twenty-five were damaged.
3. **October 7, 1986 (Upper Merion Township):** Petroleum pipeline ruptured spilling thousands of barrels of gasoline and resulted in the closure of several major roadways and the evacuation of area homes.

4.3.25-4 Future Occurrence

Utility interruptions will continue to occur annually with minimal impact. Widespread utility interruption events usually occur approximately once every five years, usually as a secondary effect of an extreme weather event. These interruptions should be anticipated, and first responders should be prepared during severe weather events. Research by the NOAA suggests that climate change may cause more extreme storms, like the March 2018 nor'easters, to occur in Pennsylvania.

Aging infrastructure also adds to the risk of potential utility interruptions. Population growth, urbanization and climate change can put strain on existing assets used to deliver utilities. In many utility systems, significant portions of the equipment and facilities date from the growth periods of the 1950s and 1960s that followed World War II. As this equipment ages, it deteriorates from the constant wear and tear of service. As it ages, it reaches a point at which it will either fail on its own or as a result of outside forces (storms, loads it was designed to handle but no longer can, etc.). These failures cause service interruptions and can require expensive emergency repairs. In addition, as repairs have

taken place along transmission routes, there is often a mix of new and old equipment along the line, as repair and not replacement is generally the choice made to resolve an issue.

The wholesale replacement of a system is not a feasible solution for utility companies. This would require the interruption of services while the replacement occurs, as well as accessing the existing system (which may lie under roads, private property, or other inconvenient places). Utility companies face the challenge of managing the issue of the aging infrastructure. They are tasked with reducing the effects of aging equipment while also controlling the deterioration of the existing system as much as possible. This balance will be tenuous as transmission equipment continues to age and break down. These breakdowns will likely lead to more frequent utility disruptions as time goes by.

4.3.25-5 Vulnerability Assessment

All jurisdictions are vulnerable on some level to utility interruptions, but because this hazard often occurs in conjunction with other hazards, jurisdictions that have been identified as more vulnerable during weather-related events may be more vulnerable to a utility interruption. Interruptions may affect the ability of the government to function, especially if backup power generation/supply is inadequate or unavailable. Meaning efficient and effective communication that is essential to first responders may be challenged during a utility interruption. Heating loss/severe cold and electricity loss can directly impact the health and safety of at-risk populations like young children, the elderly and disabled individuals. Additionally, a significant reduction in the supply of any energy resource would impose serious personal and economic hardship on individuals, businesses, and industry.

The most significant environmental impact associated with utility interruptions involves the release of hazardous materials. This hazardous material may be released in a pipeline accident or when a material is in transit. Utility pipelines carrying flammable materials have the possibility of exploding or starting a fire.

Development Pressures

New development and its associated populations shift may strain utilities by increasing or decreasing their customer base.

Inequity

The power outage means that elderly populations or others at risk of health problems due to the lack of heat are unable to call for assistance or leave their homes. Prolonged power outages can be life-threatening to individuals who rely on electricity-dependent technology and reside at home without access to an emergency generator.

Minorities and in particular Black Americans are more at risk for disconnections, add-on utility fees, inefficient housing and more. UMass Amherst found that areas with a high share of minority population were four times more likely to have suffered a power outage during the recent Texas blackout compared to predominantly white areas.

A set of socio-economic factors such as income, age, and gender constrain ownership and access to cellular and internet services. Cellular and internet services are critical to report other utility interruptions.

Climate Change

Climate change presents challenges to the reliability of our electricity supply. These include downed lines due to storms, electrical infrastructure failing due to flooding or extreme heat, and failures due to circuit overloads as demand peaks in hotter summer heat waves and winter cold snaps.

Associated extreme precipitation events create well-known water quality challenges by increasing sediment and pathogen loads, urban stormwater runoff and sewer overflows. Water utilities will also be potentially impacted through a variety of means including flood damage and pipe breaks due to soil drying and settling.

4.3.26. WILDFIRE

A wildfire is a raging, uncontrolled fire that spreads through vegetation, particularly woodlands, ultimately endangering property and residents. The term does not apply to ground fires that occur naturally in the environment and have little long-term impact on the environment. Wildfires can

begin through natural means from lightning or can be a result of human activity such as a spark from a machine or carelessly discarded cigarette. In remote areas, wildfires can go unnoticed for some time as they grow and become stronger. Dry periods in the early spring and late summer/early autumn are the most conducive times for wildfires. Once ignited, wildfires can spread rapidly especially during windy conditions. Improper forest management techniques that allow the accumulation of dead limbs, leaves, and other fuel can enable wildfires to grow strong and cause long-term damage to the forest. Controlled burns can safely reduce the amount of available fuel and reduce wildfires.

4.3.26-1 Location and Extent

Open fields, grass, dense brush and forest-covered areas are typical sites for wildfire events. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands. The greatest potential for wildfires occurs in the spring months of March, April and May, and the autumn months of October and November. In the spring, bare trees allow sunlight to reach the forest floor, drying fallen leaves and other ground debris. In the fall, dried leaves are also fuel for fires. Most wildfires in Pennsylvania are caused by people, often by debris burns. Several fires have started in people's backyards and traveled through dead grasses and weeds into bordering woodlands. Ninety-two percent of Pennsylvania wildfires burn less than acres and are suppressed within the first burning period (that part of each 24-hour period when fires spread most rapidly; typically, from 10:00 AM to sundown).

4.3.26-2 Range of Magnitude

Wildfire events can range from small fires that can be managed by local firefighters to large fires affecting many acres of land. Large events may require evacuation from one or more communities and necessitate regional or national firefighting support. The impact of a severe wildfire can be devastating to local property. They often destroy property, valuable timber, forage and recreational and scenic values. Pennsylvania landowners occasionally lose their lives to wildfires and several structures have been lost to wildfire events annually. Approximately 34.5% of the county is either woodlands or vacant/agricultural lands. Located mostly in the western half of the county, these lands are most susceptible to wildfire. In addition to the risk wildfires pose to the general public and property owners, the safety of firefighters is always a concern.

4.3.26-3 Past Occurrence

DCNR wildfire data for Pennsylvania records 536 wildfires in 2019, 1,508 in 2020, and 1,371 in 2021. Together, these fires destroyed 71 structures, injured 32 people, and resulted in 6 deaths. DCNR Forest District 17, of which the county is a part, saw 443 Spring fires burning 363.2 acres, and 82 Fall fires burning 63.9 acres, between 2017 and 2022. The National Interagency Fire Center records 5 wildfires in Montgomery County during roughly the same period, although one of them was a 135-acre prescribed burn in Valley Forge National Historical Park. Generally, wildfires in the county have been small and quickly extinguished. The <https://data.goerie.com/wildfire-history/> website shows four wildfire locations (not counting the prescribed burn): Green Lane Borough, Marlborough Township, Limerick Township, and Pennsburg Borough. None of these fires consumed more than an acre, and no injuries were reported.

4.3.26-4 Future Occurrence

Since most fires are caused by human activity, small brush fires are often swiftly reported to one of the numerous fire departments or companies servicing the county before they can grow into large wildfires. Also, since the county does not have large expanses of forests or field areas where wildfires could grow without being detected, the potential for a significant future wildfire is unlikely. As of 2020, 20 percent of the county is forested, though most of the wooded areas are modest sized parcels which are generally monitored by the property owners and are easily accessible from roads.

4.3.26-5 Environmental Impacts

Vegetation loss is often a concern, but it may not be a serious impact since vegetation re-growth occurs naturally over time. The most significant environmental impact is the potential for severe erosion, silting of stream beds and reservoirs and flooding due to ground-cover loss following a fire. During a fire, heavy particulates and smoke result and could cause air quality problems in the immediate vicinity.

4.3.26-6 Vulnerability Assessment

The Pennsylvania Department of Conservation of Natural Resources (DCNR), Bureau of Forestry conducts jurisdictional assessments of wildfire hazard throughout the Commonwealth. Hazard is defined by fuel, topography, and local weather that impact wildfire ignition and/or behavior. Through this analysis the county appeared to have a high vulnerability. Another component of jurisdictional vulnerability involves examining the number of past wildfire occurrences and their respective acres burned. The acreage burned in the past is very low and would suggest that the overall impact and vulnerability is low. As discussed above, the county does not have any large expanses of forests and is very well served by local fire companies who can readily access any local fires.

4.3.26-7 Additional Information

DCNR

4.3.27. WINTER STORMS

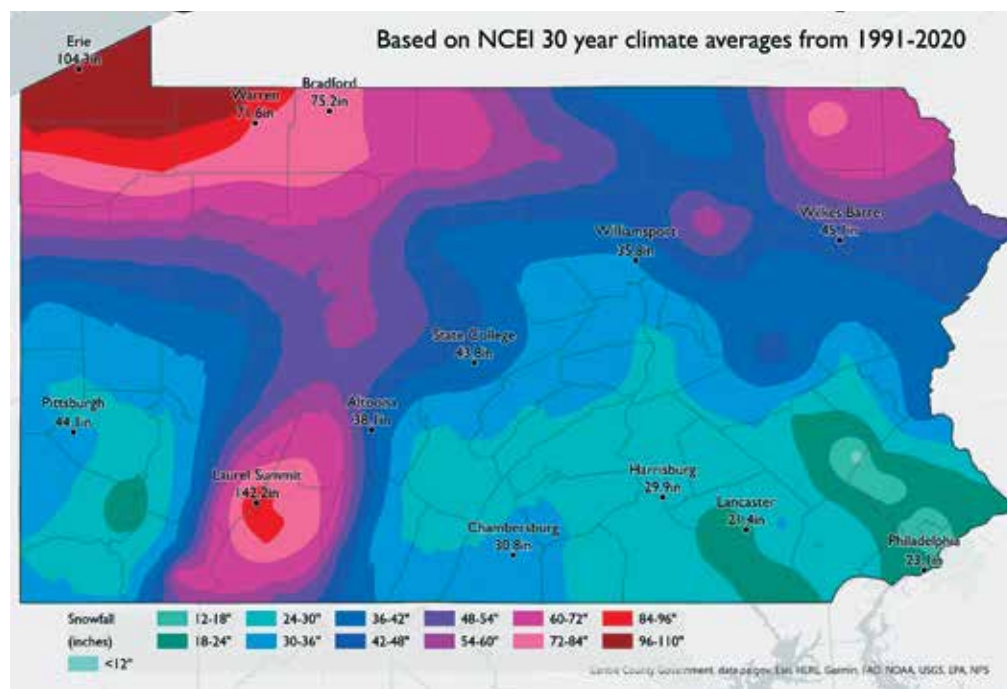
4.3.27-1 Location and Extent

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. A winter storm can range from a moderate snowfall or ice event over a period of a few hours to blizzard conditions with wind-driven snow that lasts for several days. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow.

Winter storm events can impact a large geographical area, more than the county alone. Generally, an event most often covers a large portion or all of Pennsylvania. In many cases, surrounding states and even the greater northeastern U.S. region are affected. However, the impacts of winter storms are not evenly distributed throughout Montgomery County depending on local atmospheric regimes and underlying surface conditions (such as elevation, exposure to solar radiation, slope angle and terrain curvature).

Winter snowfall across Montgomery County and the entire Southeast portion of Pennsylvania is extremely variable; typically ranging between 10 inches to 30 inches annually (see Figure 4.3.27-1). The snowfall season is from November through April, and amounts are normally below one inch during October and May. The greatest monthly snowfall occurs in March as moisture supply begins to increase with rising temperatures.

Figure 4.3.27-1 | **Pennsylvania Average Annual Snowfall (1981 – 2010)**



4.3.27-2 Range of Magnitude

Winter storms consist of cold temperatures, heavy snow or ice and sometimes strong winds. Due to their regular occurrence, these storms are considered hazards only when they result in damage to specific structures or cause disruption to traffic, communications, electric power, or other utilities. A winter storm can adversely affect roadways, utilities, business activities, and can cause loss of life, frostbite and freezing conditions. Seventy percent of the fatalities during winter storms are related to traffic crashes. Other common victims of winter storms are males over 40 years of age, who often die from heart attacks brought about due to over-exertion occurring during snow shoveling and other activities.

They can result in the closing of secondary roads, loss of utility services and depletion of oil heating supplies. Some of the worst traffic disruptions due to heavy snowfall are within developed portions of the county where snow removal is difficult due to the lack of locations to place the snow. These disruptions in electricity and energy supply may create dangerously cold conditions for county residents and difficulties in transporting people to warm locations.

4.3.27-3 Past Occurrence

The Commonwealth of Pennsylvania has a long history of severe winter weather. Eight of the sixty-three (63) Presidential Disaster and Emergency Declarations issued in Pennsylvania have been in response to winter storms (see Table 4.3.27.2). The worst winter storm in the country on record, called the Storm of the Century, occurred on March 11-14, 1993, and stretched from Canada to the Gulf of Mexico but was worst in the Eastern United States, including all of Pennsylvania.

Table 4.3.27-2 | Significant Winter Storm Events & Snowfall Extremes in Montgomery County

Type of Event	Date	Declaration Type	Est. Snowfall Ranges (IN)
Snowstorms	January 29, 1977	Emergency	Unknown
Severe Snowfall & Winter Storm	March 13, 1993	Emergency	12 - 20
Severe Winter Storm	January 4, 1994	Major Disaster	4 - 8
Blizzard of 96	January 6, 1996	Major Disaster	20 - 30
Snow	February 14, 2003	Emergency	18 - 25
Severe Winter Storms & Snowstorms	February 5, 2010	Major Disaster	25 - 29
Severe Winter Storm	February 4, 2014	Emergency	9 - 15
Severe Winter Storms & Snowstorms	January 22, 2016	Major Disaster	18 - 26

Based on official and unofficial data reported by the National Weather Service

In Montgomery County, the Blizzard of 1996, remains the largest one-day snowfall event with accumulation of up to thirty (30) inches measured Palm weather station in Pennsburg PA. Two- and three-day snowfall maximums were both recorded in during the March 20, 1958 nor'easter which dumped over thirty-four (34) inches over a couple of days. Despite less extreme snowfall, icy and windy conditions during the February 2014 storm led to service disruptions to approximately 57% of PECO's Montgomery County and Bucks County electrical customers. In all cases, past extreme winter storm events have led to multi-day closure of roads, businesses, and schools.

More recently, in the past five years, Montgomery County witnessed more than a dozen or so winter storms with the following events causing business and school closures, power outages and other damage:

- February 7, 2021: Quick Hitting Winter Storm
- March 28, 2021: Cold Front with Widespread Wind Damage
- December 16-17, 2020: Winter Storm

- February 7, 2020: Cold Front with Widespread Wind Damage
- November 15-16, 2018: Winter Storm
- March 1 – 3, 2018: Winter Storm

4.3.27-4 Future Occurrence

Based on geography, location, past event history, and climate projections, it is anticipated that Montgomery County will continue to experience winter storm events annually. In the future annual winter precipitation is predicted to increase which could cause greater impacts during periods below freezing. This means that the likelihood of severe snowstorms occurring may increase in the future.

4.3.27-5 Vulnerability Assessment

Winter storms and blizzards bring extreme cold, freezing rain, snow, ice and high winds are able to immobilize the County. Winter storms are highly variable but often can impact Montgomery County's infrastructure, economy and the well-being of the community. Ice and snow can accumulate on any structure such power lines telecommunication infrastructures, and tree limbs, and therefore directly cause infrastructure, property and natural resource damage. Accumulation of ice and snow can also affect mass transit infrastructure creating dangerous conditions for commuters, commercial and emergency vehicles. Often winter storms can also contribute to a loss of utility service, a loss in business productivity and reduction in commerce and shipping.

In addition to damage costs, municipal governments have typically incurred significant expenses to perform snow plowing and deicing of roads. Environmental impacts from winter storms often include damage to shrubbery and trees due to heavy snow loading, ice build-up, and/or high winds which can break limbs or even bring down large trees. An indirect effect of winter storms is the treatment of roadway surfaces with salt, chemicals and other de-icing materials which can impair adjacent surface and ground waters. This is particularly a concern in highly urban areas. Another important secondary impact for winter storms is building or structure collapses. Winter storms have a positive environmental impact as well; gradual melting of snow and ice can provide excellent groundwater recharge if the soil is not completely frozen. Otherwise, sudden melting can create significant flooding conditions. Snow melt flooding is made worse due to drains clogged by snow and ice.

Development Pressures

Urban areas tend to suffer more economic and physical damage than suburban and rural areas because of the heavier concentration of structures, utilities and transportation infrastructure. Controversy, new construction leading to the removal of dilapidated structures or dead trees would reduce the vulnerability of a community during a winter storm event.

Inequity

People experiencing homelessness are crucially vulnerable during winter weather events. Snow, ice and cold temperatures can lead to loss of life to those without shelter and can close other crucial resources such as communal water fountains and public restrooms. Even if a person isn't experiencing homelessness when the temperature drops, staying safe and warm and performing everyday activities can be challenging and dangerous. Young children, older adults, and the chronically ill are most at risk of having cold-related health problems.

Winter roads can be dangerous and having to drive somewhere during a winter storm can be a real burden. Families cash strapped and dependent on an in-person job, emergency response workers, caretakers or other persons required to drive have exacerbated risk during winter storm events. Winter storms often require people to shelter in-place socio-economic inequalities that exist between households such as food insecurity, lack of access to communication/technology and basic utility deficiencies will persist.

Climate Change

Climate change is expected to cause winter weather to be warmer and the length of Montgomery County's snow season to decrease. But heavy seasonal snow and extreme snowstorms are still expected to continue and even to occur with greater frequency. This is because warmer temperatures cause more water to evaporate from the land and oceans, which leads to more precipitation, larger storms, and more variation in precipitation in some areas. More specifically in Montgomery County precipitation is projected to increase by five (5) to seven (7) inches annually by the end of the century with the largest increase projected over the winter months (approximately 50% intensification). That means on days below freezing, an increase in snowfall or severe winter storms would be expected (i.e., record snowstorms).

Capability Assessment

Hazard mitigation is most effective when it is based on an inclusive, integrated, comprehensive, long-term plan that is developed before a disaster occurs. The capability assessment was updated from the 2017 Plan to reflect current capacities and resources. It provides a detailed evaluation of applicable federal, state, and local regulatory, financial, and technical resources available to support hazard mitigation. The more robust update to this section is new integration sheets that show how key partners across the Commonwealth and across levels of government support integrated mitigation plan implementation. The sheets highlight accomplishments, ongoing work, opportunities and actions moving forward.

5.1 Update Process Summary

A capability assessment evaluates the capabilities and resources that are already in place at the municipal, county, state, and federal levels to reduce hazard risk and identifies where improvements can be made to increase disaster resistance in a community.

For the 2022 Plan, the 2017 Plan Capability Assessment section was reviewed, and information updated as appropriate. Capabilities were categorized under four headings: Planning and Regulatory; Administrative and Technical; Financial; and Education and Outreach. The 2017 Plan did not include the Education and Outreach Capability category. For the 2022 Plan, county community planners were surveyed to provide an updated assessment of the mitigation planning capabilities of each community; including a self-assessment of capability for each category.

The Planning Team were provided with the Capability Assessment and encouraged to make all necessary revisions to best represent the capacity of each community. Descriptions of the plans and programs in place in Montgomery County, and their relation to hazard mitigation, are included in the 2022 Plan. The 2022 Plan also includes the latest information not included in the 2017 Plan; compliance with the National Flood Insurance Program. A discussion on the integration of hazard mitigation planning into local plans and programs, including the county comprehensive plan, and incorporation of existing studies, reports and technical information into the hazard mitigation plan have been added to this section.

This chapter discusses the capabilities of the various levels of government serving the residents of Montgomery County to mitigate hazards. Current mitigation activities ongoing in the county are also described. It evaluates the capacity and resources that are already available to mitigate the impact of hazards which could occur in Montgomery County. The capabilities of government at municipal, county, and federal levels are assessed. The assessment also underscores areas where there are gaps in service and response that may need improvement.

One of the most important concepts in planning for disaster threats is the coordination of all the various entities involved in emergency management. Coordination of emergency services personnel and equipment can be particularly important in response to a large disaster that strikes vast areas of the county. A major disaster, at a minimum, requires coordination between fire, police, public works, and ambulance services, as well as coordination with other specialized personnel including water rescue teams, tactical heavy equipment rescue teams, hazardous materials specialists, bomb squads, special weapons and tactics teams, radiation specialists, or evacuation planners. In addition, a major incident could trigger the need for coordination at various levels of government. Depending on the scope and nature of an incident, federal, state, county, and local governments may all be involved. A method of coordinating emergency situation response is the Incident Command System (ICS). The Incident Command System provides coordination by utilizing a top-down command structure and enables the evaluation of a situation in terms of the impact on the safety of response personnel. The system fosters the use of common terminology and coordination of communications.

All levels of government are required to adopt or utilize the National Incident Management System (NIMS). The ICS described above is an element of the NIMS. The county Commissioners have mandated that the county agencies operate under NIMS and utilize the ICS during all emergency events.

5.2 Legal Context

The following is a summary of the federal, state, and local disaster mitigation and emergency management laws. Many of these laws are referenced and/or described in more detail throughout this chapter or in other areas of the plan.

5.2.1. FEDERAL LAWS

Robert T. Stafford Disaster Relief and Emergency Assistance Act: Authorizes technical, financial, logistical, and other assistance from the federal government to state and local governments during declared major disasters and emergencies.

Disaster Mitigation Act: Amended the Stafford Act and the Public Works Act, which provides grants for economic development, to require local governments to prepare hazard mitigation plans as a precondition for receipt of Hazard Mitigation Grant Program project funds.

National Flood Insurance Act: Established the National Flood Insurance Program (NFIP), which allows residents of participating communities to purchase flood insurance in exchange for the implementation and enforcement by state and local communities of floodplain management ordinances.

Biggert-Waters Flood Insurance Reform Act and the Homeowner Flood Insurance Affordability Act of 2014: Requires the NFIP to raise subsidized insurance rates to actuarial rates in an effort to make the program more financially stable. The Homeowner Flood Insurance Affordability Act of 2014 (HFIAA) made the transitions to paying more for insurance more gradual.

Pandemic and All-Hazards Preparedness Act: Provided new authorities for programs such as development and acquisition of medical countermeasures and the establishment of a quadrennial National Health Security Strategy.

Nationwide Programmatic Environmental Documents: Required compliance with the National Environmental Policy Act (NEPA) of 1969 in order for project to receive funding.

Administrative Directives: Federal guidelines are in place to assist state and local governments with mitigation, preparedness, response, and recovery programs. Relevant federal guidelines include the National Incident Management System, which provides standard procedures for incident command; the National Response Framework, which provides response and recovery guidelines; and the National Disaster Recovery Framework, which provides a recovery framework.

5.2.2. STATE LAWS

Pennsylvania Flood Plain Management Act (DCED): Encourages sound land use practices within the floodplain. The Act requires which municipalities with SFHAs to participate in the NFIP meeting the minimum standards. The Act establishes higher regulatory standards for hazardous materials and high-risk land uses and currently designates DCED as the State NFIP Coordinator.

Pennsylvania Emergency Management Service Code, Title 35: Covers PEMA's overall legal responsibilities for emergency management. Title 35 addresses PEMA's responsibilities before, during, and after disaster.

Pennsylvania Hazardous Material Emergency Planning and Response Act (DEP, PEMA, PA DLI, and Local Emergency Planning Committees, or LEPCs): The Superfund Amendments and Reauthorization Act 165 of 1986 and amended in 2011 (SARA) combats only one specific type of disaster - hazardous materials. SARA Title III requires every facility, public or private, that routinely has on-hand more than a threshold quantity of certain acutely hazardous chemicals to report the name, amount, and location of the chemical to the county, state, and federal environmental protection agencies. It then requires facilities to develop an on-site emergency response plan.

Pennsylvania Radiation Protection Act (PEMA and DEP, Bureau of Radiation Protection): Specifically addresses radiation, control of radioactive sources, and accidental releases of radiation from any of the nuclear powered electric generating facilities in Pennsylvania.

Counterterrorism Planning, Preparedness and Response Act (PEMA, OHS, PSP, and DOH): Provides for counterterrorism planning, preparedness, and response; imposing powers and duties on PEMA, DOH, counties, and municipalities; and providing for the organization of various response teams.

Public Safety Emergency Telephone Act (PEMA and PUC): Provides a toll-free standard number (911) accessible from both land and cellular phones for any individual in the Commonwealth to gain rapid, direct access to emergency services.

Pennsylvania Construction Code Act (Department of Labor & Industry and Office of the Fire Commissioner): Establishes the basic requirements for the Uniform Construction Code (UCC), which applies to the construction, alteration, repair, demolition, or change of occupancy of buildings.

Storm Water Management Act (DEP): Requires all counties in Pennsylvania to prepare and adopt watershed-based storm water management plans and requires municipalities to adopt and implement ordinances to regulate development in a way which is consistent with the local Act 167 plan.

Marcellus Shale Drilling Regulations (DEP, Bureau of Oil and Gas Management): Gives the Bureau of Oil and Gas Management in the Pennsylvania Department of Environmental Protection along with county conservation districts and either the Susquehanna River Basin Commission or the Delaware River Basin Commission the authority to regulate the oil and gas industry in Pennsylvania to protect the environment and citizens of the Commonwealth.

5.2.3. LOCAL ORDINANCES

It is important to note that Pennsylvania adopted Home Rule Law in 1972. Home Rule impacts how municipal governments interact with the county and state government. With Home Rule, municipalities have the authority to exercise governance in any area not specifically limited by state law, rather than in a non-Home Rule state where municipalities act only where specified by state law. An example of where Pennsylvania state law does set requirements for municipalities is the Municipal Planning Code.

Pennsylvania Municipalities Planning Code Act (DCED): Boroughs, townships, and counties have the authority to individually or jointly prepare zoning, subdivision, land development, floodplain management, and other ordinances, as well as official zoning maps, all of which can be used as tools to guide growth and minimize development in hazard prone areas.

5.3 Capability Assessment Findings

5.3.1. PLANNING AND REGULATORY CAPABILITY

Table 5.3.1-1 | **Planning and Regulatory Capabilities**

Municipalities	Comprehensive Plan	Capital Improvement Plan	Economic Development Plan	Continuity of Operations Plan	Open Space Management Plan (& Parks Rec/ Greenways)	Natural Resources Protection Plan	Transportation Plan
County-wide	Yes (2021)	Yes (2022)	Yes (2005)	Yes "Restart MontCo" (2021)	Yes "Trails, Parkland, and People" (2015)	Yes "Water Resources Plan" (2015)	Yes, County Transportation Program
Abington	Yes (2007)	[Information requested from township 4/15]	Yes, Roslyn Community Revitalization Plan (2010)	[Information requested from township, 4/15]	Yes, "Open Space, Recreation, and Environmental Protection Plan" (2006)	Yes, "Open Space, Recreation, and Environmental Protection Plan" (2006)	Yes, several, including: Abington Master Bicycle Plan, Walk-Park-Train Abington, Old York Road Corridor Improvement Plan
Ambler	Yes (2013)	?	Yes, Redevelopment Area Plan (2003), TRID Plan (2012)	No	Yes (2019)	No	No
Bridgeport	Yes (2020)	No	Yes, Revitalization Plan (2003)	No	Yes (2005)	No	No
Bryn Athyn							
Cheltenham	Yes (2005), In Progress (2020-Present)	No	Commercial District Enhancement Plan	No	Yes, 2006	No	No
Collegeville	Yes, Central Perkiomen Valley Regional Comprehensive Plan (2014)	No	Revitalization Plan (2010)	No	Yes, 2006	Sustainability Plan (2014)	Yes, DVRPC Enhancing Local Mobility in Collegeville, 2011
Conshohocken							
Douglass	Yes, PMRPC Comp Plan (2015)	No	Yes (2012)	No	Yes, 2006	No	No
East Greenville	Yes, UPVRPC Comp Plan (2011)	No	Yes, Revitalization Plan (2010)	No	Yes (2019)	No	No
East Norriton	Yes (2019)	No	No	No	Yes (2005)	No	No
Franconia							
Green Lane	Yes, UPVRPC Comp Plan (2011)	No	No	No	No	No	No
Hatboro	Yes, (2019)	I think so?	No	No	Yes (2020)	No	Yes, Trail Plan 2020
Hatfield Boro							
Hatfield Twp							
Horsham	Yes (2011), U/D in progress	No	WGNAS Redevelopment Plan (2012); Horsham Business Parks Master Plan (2016)	No	Yes (2003, 2005)	No	No
Jenkintown	Yes (2018)	No	Yes, Revitalization Plan (2010)	No	Yes (2006)	No	Yes, Traffic Calming Report (2007)
Lansdale	Yes (2021)	Yes, Capital Plan (2019)	Yes, Revitalization Plan (2009).	Information Requested 4/15 from EMC	Yes (2005)	No	Yes, Comprehensive Parking Study (2012)
Limerick	Yes (2009)				Yes (2022)	No	No
Lower Frederick	Yes (2022)		No		Yes (2005 w/ 2015 update)	Yes (2022)	No
Lower Gwynedd							
Lower Merion	Yes (2016)	Yes	Yes (numerous, district-specific)	No	Yes, Open Space & Environmental Resource Protection Plan (2005)	Yes, Open Space & Environmental Resource Protection Plan (2005)	No
Lower Moreland							

Historic Preservation Plan	Farmland Preservation Plan	Evacuation Plan	Disaster Recovery Plan	Emergency Operations Plan	Subdivision & Land Development Ordinance	Zoning Regulations	Building Code	Fire Code
No	Yes (2021)	No	No	No	No	No	No	No
		No	No	Yes	Yes	Yes	Yes (Uniform Construction Code)	Yes
No	No	No	No	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes (2015 International Building Code)	Yes (1984)
No	No	No	No	Yes (2014)	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	No	No	No	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	No	No	No	No ?	Yes	Yes	Yes	Yes
No	No	No	No	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes, revisions U/D	Yes	Yes	Yes
No	No	Information Requested 4/15 from EMC	Information Requested 4/15 from EMC	Information Requested 4/15 from EMC	Yes	Yes	Yes (Uniform Construction Code)	Yes
No	No	No	No	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	No	No	No	Yes (2020)	Yes, rewrite U/D	Yes	Yes	Yes

Municipalities	Comprehensive Plan	Capital Improvement Plan	Economic Development Plan	Continuity of Operations Plan	Open Space Management Plan (& Parks Rec/ Greenways)	Natural Resources Protection Plan	Transportation Plan
Lower Pottsgrove	Yes, PMRPC Comp Plan (2015)	No	Yes, "Community Revitalization Plan" 2007	No	No	No	No
Lower Providence	Yes (2002), In Progress (2020-present)	Yes	No	No	Yes (2021)	No	No
Lower Salford	Yes "Indian Valley Regional" (2016)	No	No	No	Yes (2006)	No	No
Marlborough	Yes, UPVRPC Comp Plan (2011)	No	No	No	No	No	No
Montgomery	Yes (2008), In progress (2021-present)	Yes	No	No	Yes (2006)	No	No
Narberth	Yes (2019)	Yes	Yes (2007 - Montgomery Ave); (2002 - Haverford Ave)	No	Yes (2006)	No	No (Parking Study, 2017)
New Hanover	Yes (2021)	No	No	No	Yes "NHT Parks, Recreation, and Open Space Master Plan" (2015)	No	No
Norristown	Yes (2009)	Yes	Yes - Redevelopment Area Plan (2018)	No	Yes (2005)	No	No
North Wales	Yes (2018)	No	Yes "revitalization Plan" (2012)	No	No	No	No
Pennsburg	Yes, UPVRPC Comp Plan (2011)	No	Yes "Getting back to Main St" (2010)	No	No	No	No
Perkiomen	Yes, CPVRPC Comp Plan (2014)		No	No	Yes (2006)	No	No
Plymouth	Yes (2019)	No	No	No	Yes (2019)	Yes (1995)	Yes, TSA (2012)
Pottstown	Yes, PMRPC Comp Plan (2015) and Borough Comp Plan (2014)		No (KEEP for along Keystone Blvd (2019))	No	Yes (2006)	No	No
Red Hill	Yes, UPVRPC Comp Plan (2011)	No	Yes, Revitalization Plan (2018)	No	No	No	No
Rockledge	Yes (2007)	No	Yes (2012)	No	Yes (2006)	Yes (2006)	Yes (2007)
Royersford	Yes (2017)	No	No	No	No	No	Active Transportation Plan in progress
Salford							
Schwenksville	Yes "Central Perkiomen Valley Regional Comprehensive Plan" (2014)	Yes	Yes (2010)	No	Yes (2005)	Yes (2005)	No
Skippack	Yes (2012)	No	No	No	Yes (2012)	Yes (2012)	Yes (2012)
Souderton	Yes "Indian Valley Regional" (2016)	No	U/D	No	Yes (2006)	No	No
Springfield	Yes (2014)	No	No	No	Yes (2008)	No	No
Telford	NO	No	?	?			
Towamencin	Yes (1989)	Yes (2007)	No	No	Yes (2006)		
Trappe							
Upper Dublin	Yes (2010)	No	No	No	Yes "Open Space and Environmental Resource Protection Plan" (2005)	Yes "Open Space and Environmental Resource Protection Plan" (2005)	No (TDM Plan for Fort Washington Office Park, 2017)
Upper Frederick	Yes (2020)						
Upper Gwynedd	Yes (2021)	No	No	No	No	No	No
Upper Hanover	Yes, UPVRPC Comp Plan (2011)	No	No	No	No	No	No

Municipalities	Comprehensive Plan	Capital Improvement Plan	Economic Development Plan	Continuity of Operations Plan	Open Space Management Plan (& Parks Rec/ Greenways)	Natural Resources Protection Plan	Transportation Plan
Upper Merion	Yes (2005) Update underway	No	No	No	Yes (2006)	Yes "Stormwater Management Plan" (2018)	
Upper Moreland	Yes (2020)	No	Yes (2014)	No	Yes "Master Trail Plan" (2020)	Yes "TMDL & Pollutant Reduction Plan" (2020)	No
Upper Pottsgrove	Yes, PMRPC Comp Plan (2015)						
Upper Providence	Yes (2020)						
Upper Salford	Yes "Indian Valley Regional" (2016)	No	No	No	Yes (2007)	Yes "Greenways Guidebook" (2013); "Spring Mountain Conservation Plan" (2001)	No
West Conshohocken	2019 Vision Plan				2006	No	No
West Norriton	Yes (2010)	No	Yes, West Main Street Vision Plan (2019)	No	Yes (2006)	No	No
West Pottsgrove	Yes, PMRPC Comp Plan (2015)	No	No (KEEP, 2019 for along Keystone Blvd)	No	Yes (2007)	No	No
Whitemarsh	Yes, (2019)						
Whitpain	Yes (2016)	No	No	No	Yes (2021)	No	No
Worcester	Yes (to be adopted 2022)	Yes (2022)	No	No	Yes (2005 Greenway Plan, 2006 Open Space Plan)		Yes, Act 209 Study (2013)
DESCRIPTION		A capital improvement 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 or municipal governments and should include a budget with identified priorities.	"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. The plan: 1) defines realistic goals and objectives, 2) establishes a defined time frame to implement goals and objectives, 3) communicates those goals and objectives to the organization's constituents, 4) ensures effective use of the organization's resources; 5) provides a baseline from which progress can be measured and 6) builds consensus around future goals and objectives."	Continuity of operations planning is the process of developing advanced arrangements and procedures that enable an organization to continue its essential functions, despite events that threaten to disrupt them. The continuity discipline aims to identify emergency or unconventional means to replace or work around those deficiencies in the short term until the organization can be reconstituted on a normal basis.	An open space management plan is designed to preserve, protect and restore largely undeveloped lands in their natural state, and to expand or connect areas in the public domain such as parks, greenways and other outdoor recreation areas. In many instances open space management practices are consistent with the goals of reducing hazard losses, such as the preservation of wetlands or other flood-prone areas in their natural state in perpetuity.	Natural resource protection plans are designed to protect woodlands, steep slopes, waterways, floodplains and wetlands by prohibiting or severely limiting development in these areas. Emergency managers and community planners have been made more aware of the benefits of protecting these areas as mitigation measures over the last few decades.	A transportation plan plays a fundamental role in a state, region, or community's vision for its future. It includes: 1) a comprehensive consideration of possible strategies; 2) an evaluation process that encompasses diverse viewpoints; 3) the collaborative participation of relevant transportation related agencies and organizations; and 4) open, timely, and meaningful public involvement. Creating such a plan is a cooperative process designed to foster involvement by all users of the system, such as businesses, community groups, environmental organizations, the traveling public, freight operators, and the general public, through a proactive public participation process. This collaborative effort helps to better allocate resources for infrastructure improvements and provide efficient routes for both people and materials in the event of a disaster.

Historic Preservation Plan	Farmland Preservation Plan	Evacuation Plan	Disaster Recovery Plan	Emergency Operations Plan	Subdivision & Land Development Ordinance	Zoning Regulations	Building Code	Fire Code
No	No	No	No	Yes	Yes	Yes	Yes	Yes
No	No	No	No	Yes	Yes	Yes (U/D)	Yes	Yes
No	No	No	No	Yes	Yes	Yes	Yes	Yes
No	No	No	No	No	1977	1976	2004	2009
No	No	No	No	Yes (2019)	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	No	No	No	No	Yes	Yes	Yes	Yes
No	Yes (2006 Open Space Plan)	No	No	No	Yes	Yes	Yes	Yes
This type of plan describes 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. A historic preservation plan may include measures to retrofit or relocate historic treasures out of hazard impact areas.	Farmland preservation measures are important to hazard mitigation. Farms and forest land are important for recharging the community's aquifer and providing habitat for local wildlife. In addition, farmland reduces or eliminates future hazard vulnerability by maintaining the land as open space.	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. Such plans address various evacuation situations, such as evacuation plans for dam safety, hazardous material spills and radiation releases.	A Disaster Recovery Plan is a comprehensive set of measures and procedures that ensure essential resources and infrastructure are maintained or backed up by alternatives during various stages of a disaster. It is another step to ensure the preparedness and ability to respond quickly and effectively to restore the community's essential services. The plan addresses the public sector's responsibilities, including temporary shelter, refuse disposal, overall damage assessment, restoration of utility services, reconstruction priorities, financial assistance, as well as dealing with emergency demands.	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).	Subdivision and land development ordinances (SALDOs) are intended to regulate the development of housing, commercial, industrial, or other uses, including associated public infrastructure. Within these ordinances, the criteria on how land will be divided, the placement and size of roads and the location of infrastructure can reduce exposure of development to hazard events.	"Zoning ordinances allow for local communities to regulate the use of land to protect the interests and safety of the general public. Zoning ordinances can be designed to address unique conditions or concerns within a given community. They may be used to create buffers between structures and high risk areas, limit the type or density of development, and/or require land development to consider specific hazard vulnerabilities."	Building codes regulate construction standards for new construction and substantially renovated buildings. Standards can be adopted that require resistant or resilient building design practices to address hazard impacts common to a given community. In 2003, the Commonwealth of Pennsylvania implemented Act 45 of 1999, the Uniform Construction Code (UCC), a comprehensive building code that establishes minimum regulations for most new construction, including additions and renovations to existing structures. Effective December 2009, the Commonwealth adopted regulations of the 2009 International Code Council's codes.	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: 1) building materials that may be used; 2) the presence and number/ type of fire extinguishers; 3) means of egress; and 4) hazardous materials storage and use.

Table 5.3.1-2 | **Watersheds & Stormwater Management Planning**

Municipalities	Watershed Boundaries Within Municipality	Act 167 Plan (Date of Adoption)	PRP/TMDL Plans	NPDES MS4	Stormwater Management Plans Or Other Criteria	Act 167 Stormwater Management Plan
Abington	Wissahickon Creek; Sandy Run; Tookany Creek; Pennypack Creek	Pennypack Creek Watershed (2009); Tookany/Tacony-Frankford Watershed (2005); Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Adopted by the Board of Commissioners of the Township of Abington 1-14-2016 by Ord. No. 2100.	Wissahickon Watershed, Tookany/Tacony-Frankford
Ambler	Wissahickon Creek	Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Ordinance Number 1108, 10-17-2017	Wissahickon Watershed
Bridgeport	Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes	SDLD Article IX Section 495-53	
Bryn Athyn	Pennypack Creek	Pennypack Creek Watershed (2009);	Southampton Creek (Nonpoint Source/Point Source; 2008)	Yes	Ordinance Number 665 of 2014	Pennypack Creek
Cheltenham	Wissahickon Creek; Tookany Creek	Wissahickon Creek Watershed (2014); Tookany/Tacony-Frankford Watershed (2005)	Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Ord. No. 2202-10 (Adopted 5-19-2010)	Wissahickon Watershed, Tookany/Tacony-Frankford
Collegeville	Lower Perkiomen Creek			Yes	Ord. No. 568 (Adopted 3-5-2014)	
Conshohocken	Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes	Ord. 1-2008, 3/26/2008	
Douglass	Upper Perkiomen Creek; Swamp Creek; Schuylkill River	Swamp Creek Watershed (2006)	Green Lane Reservoir (Nonpoint Source; 2003); Schuylkill River (Fish Consumption; 2007)	Yes	Ord. No. 2015-01 (Adopted 3-2-2015)	Swamp Creek
East Greenville	Upper Perkiomen Creek		Green Lane Reservoir (Nonpoint Source; 2003)	Yes	1-28-2014 by Ord. No. 2014-02	
East Norriton	Stony Creek Sawmill Run	Stony Creek/Saw Mill Run (1992)		Yes	3-25-2014 by Ord. No. 551	Stony Creek/Saw Mill Run
Franconia	East Branch Perkiomen Creek; West Branch Neshaminy Creek; Skippack Creek	East Branch Perkiomen Creek Watershed (2004); Neshaminy Creek Watershed (2010)	Indian Creek (Nonpoint Source/Point Source; 2008); Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	Ordinance 377 on August 18, 2014	East Branch Perkiomen Creek, Neshaminy Creek
Green Lane	Upper Perkiomen Creek; Unami/Ridge Valley Creek			Yes	3-13-2014 by Ord. No. 2014-01	
Hatboro	Pennypack Creek	Pennypack Creek Watershed (2009)		Yes	Ordinance 440 of March 3, 2004	Pennypack Creek
Hatfield Boro	West Branch Neshaminy Creek	Neshaminy Creek Watershed (2010)		Yes	12-19-2012 by Ord. No. 641	Neshaminy Creek
Hatfield Twp	West Branch Neshaminy Creek; Skippack Creek	Neshaminy Creek Watershed (2010)	Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	2-25-2004 by Ord. No. 521.	Neshaminy Creek
Horsham	Little Neshaminy Creek; Wissahickon Creek; Sandy Run; Pennypack Creek	Pennypack Creek Watershed (2009); Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Chapter 190: Ord. No. 2014-1 (Adopted 1-8-2014)	Wissahickon Watershed

Municipalities	Watershed Boundaries Within Municipality	Act 167 Plan (Date of Adoption)	PRP/TMDL Plans	NPDES MS4	Stormwater Management Plans Or Other Criteria	Act 167 Stormwater Management Plan
Jenkintown	Tookany Creek; Pennypack Creek	Pennypack Creek Watershed (2009); Tookany/Tacony-Frankford Watershed (2005)		Yes	Chapter 154: Ord. No. 2005-3 (Adopted 4-25-2005); TTF: Ord. No. 2010-2 (Adopted 5-3-2010); Pennypack: Ord. No. 2013-10 (Adopted 12-16-2013)	Wissahickon Watershed
Lansdale	West Branch Neshaminy Creek; Skippack Creek; Wissahickon Creek	Neshaminy Creek Watershed (2010); Wissahickon Creek Watershed (2014)	Skippack Creek (Nonpoint Source/Point Source; 2005); Wissahickon Creek (Point Source/Nonpoint Source; 2003)	Yes	6-18-2014 by Ord. No. 2014-1855	Wissahickon Creek, Neshaminy Creek
Limerick	Swamp Creek; Schuylkill River; Lower Perkiomen Creek	Swamp Creek Watershed (2006)	Schuylkill River (Fish Consumption; 2007)	Yes	Ord. No. 356 (Adopted 12-16-2014)	
Lower Frederick	Upper Perkiomen Creek; Swamp Creek; Lower Perkiomen Creek	Swamp Creek Watershed (2006)		Yes	8-2-2016 by Ord. No. 16-04	Swamp Creek
Lower Gwynedd	Little Neshaminy Creek; Wissahickon Creek	Neshaminy Creek Watershed (2010); Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Nonpoint Source; 2003)	Yes	6-21-2005 by Ord. No. 434	Wissahickon Watershed
Lower Merion	Schuylkill River	Lower Merion Drainage Area (1997)	Glanraffan Creek Watershed (Nonpoint Source; 2003); Schuylkill River (Fish Consumption; 2007)	Yes	Chapter 121: Ord. No. 1787 (Adopted 2-16-1977)	Lower Merion Drainage Area
Lower Moreland	Pennypack Creek; Poquessing Creek	Pennypack Creek Watershed (2009); Poquessing Watershed (2012)	Southampton Creek (Nonpoint Source/Point Source; 2008)	Yes	5-13-2014 by Ord. No. 682	Wissahickon Watershed
Lower Pottsgrove	Swamp Creek; Schuylkill River	Swamp Creek Watershed (2006)	Schuylkill River (Fish Consumption; 2007)	Yes	Ord. No. 307 (Adopted 3-3-2014)	
Lower Providence	Schuylkill River; Lower Perkiomen Creek; Skippack Creek; Stony Creek Sawmill Run	Stony Creek/Saw Mill Run (1992)	Skippack Creek (Nonpoint Source/Point Source; 2005); Schuylkill River (Fish Consumption; 2007)	Yes	12-7-2017 by Ord. No. 646	Stony Creek/Saw Mill Run
Lower Salford	East Branch Perkiomen Creek; Lower Perkiomen Creek; Skippack Creek	East Branch Perkiomen Creek Watershed (2004)	Indian Creek (Nonpoint Source/Point Source; 2008); Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	3-2-2005 by Ord. No. 2005-1	East Branch Perkiomen Creek
Marlborough	Upper Perkiomen Creek; Unami/Ridge Valley Creek		Green Lane Reservoir (Nonpoint Source; 2003)	Yes	Chapter 202: Ord. No. 05-01 (Adopted 9-14-2005)	
Montgomery	West Branch Neshaminy Creek; Little Neshaminy Creek; Wissahickon Creek	Neshaminy Creek Watershed (2010); Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Nonpoint Source; 2003)	Yes	Chapter 206, Ord. No. 15-291, Adopted 1-4-2016	Neshaminy Creek

Municipalities	Watershed Boundaries Within Municipality	Act 167 Plan (Date of Adoption)	PRP/TMDL Plans	NPDES MS4	Stormwater Management Plans Or Other Criteria	Act 167 Stormwater Management Plan
Narberth	Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes	Yes, amended for 167 Plans	Darby-Cobbs Watershed
New Hanover	Upper Perkiomen Creek; Swamp Creek; Schuylkill River	Swamp Creek Watershed (2006)	Green Lane Reservoir (Nonpoint Source; 2003); Schuylkill River (Fish Consumption; 2007)	Yes	Ord. 07-07, 7/23/2007, § 102	Swamp Creek
Norristown	Schuylkill River; Stony Creek Sawmill Run	Stony Creek/Saw Mill Run (1992)	Schuylkill River (Fish Consumption; 2007)	Yes	Ordinance 21-06 passed on 6/15/2021 formed a stormwater authority to collect fees to fund stormwater management; Stormwater Ordinance is Chapter 276	Stony Creek/Saw Mill Run
North Wales	Wissahickon Creek	Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Ord. 807 adopted 2017	Wissahickon Watershed
Pennsburg	Upper Perkiomen Creek		Green Lane Reservoir (Nonpoint Source; 2003)	Yes	3-1-2004 by Ord. No. 2-04	
Perkiomen	Upper Perkiomen Creek; East Branch Perkiomen Creek; Lower Perkiomen Creek	East Branch Perkiomen Creek Watershed (2004); Neshaminy Creek Watershed (2010)		Yes	5-3-2005 by Ord. No. 189	
Plymouth	Schuylkill River; Stony Creek Sawmill Run	Stony Creek/Saw Mill Run (1992)	Schuylkill River (Fish Consumption; 2007)	Yes	Ord. No. 1598, 3-9-2015	Stony Creek/Saw Mill Run
Pottstown	Manatawny Creek; Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes	Ord. 2125, 7/14/2014	
Red Hill	Upper Perkiomen Creek		Green Lane Reservoir (Nonpoint Source; 2003)	Yes	Ord. 2013-499, 7/10/2013	
Rockledge	Tookany Creek; Pennypack Creek	Pennypack Creek Watershed (2009); Tookany/Tacony-Frankford Watershed (2005)		Yes		Pennypack Creek, Tookany/Tacony-Frankford Creek
Royersford	Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes	Ord. No. 897 (Adopted 10-9-2018), Chapter 408	
Salford	Unami/Ridge Valley Creek; East Branch Perkiomen Creek	East Branch Perkiomen Creek Watershed (2004)		Yes	Ordinance 104, 2008	East Branch Perkiomen Creek
Schwenksville	Swamp Creek; Lower Perkiomen Creek	Swamp Creek Watershed (2006)		Yes	4-10-2014 by Ord. No. 375	Swamp Creek
Skippack	East Branch Perkiomen Creek; Lower Perkiomen Creek; Skippack Creek	East Branch Perkiomen Creek Watershed (2004)	Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	Ord. No. 282 (Adopted 5-12-2004)	East Branch Perkiomen Creek
Souderton	East Branch Perkiomen Creek; West Branch Neshaminy Creek; Skippack Creek	East Branch Perkiomen Creek Watershed (2004); Neshaminy Creek Watershed (2010)	Indian Creek (Nonpoint Source/Point Source; 2008); Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	No. 652, February 7, 2005 (Update underway)	East Branch Perkiomen Creek

Municipalities	Watershed Boundaries Within Municipality	Act 167 Plan (Date of Adoption)	PRP/TMDL Plans	NPDES MS4	Stormwater Management Plans Or Other Criteria	Act 167 Stormwater Management Plan
Springfield	Schuylkill River; Wissahickon Creek; Sandy Run; Tookany Creek	Tookany/Tacony-Frankford Watershed (2005); Wissahickon Creek Watershed (2014)	Schuylkill River (Fish Consumption; 2007); Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Adopted 4-14-2004	Wissahickon Creek
Telford	East Branch Perkiomen Creek; Skippack Creek	East Branch Perkiomen Creek Watershed (2004)	Indian Creek (Nonpoint Source/Point Source; 2008); Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	Chapter 23, Adoption Date unclear	East Branch Perkiomen Creek
Towamencin	West Branch Neshaminy Creek; Skippack Creek	Neshaminy Creek Watershed (2010)	Skippack Creek (Nonpoint Source/Point Source; 2005)	Yes	10-25-2000 by Ord. No. 00-8	
Trappe	Schuylkill River; Lower Perkiomen Creek		Schuylkill River (Fish Consumption; 2007)	Yes	3-4-2014 by Ord. No. 427	
Upper Dublin	Little Neshaminy Creek; Wissahickon Creek; Sandy Run; Pennypack Creek	Neshaminy Creek Watershed (2010); Pennypack Creek Watershed (2009); Wissahickon Creek Watershed (2014)	Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes		Wissahickon Watershed, Neshaminy Creek, Pennypack Creek
Upper Frederick	Upper Perkiomen Creek; Swamp Creek	Swamp Creek Watershed (2006)	Green Lane Reservoir (Nonpoint Source; 2003)	Yes		Swamp Creek
Upper Gwynedd	Skippack Creek; Little Neshaminy Creek; Wissahickon Creek	Neshaminy Creek Watershed (2010); Wissahickon Creek Watershed (2014)	Skippack Creek (Nonpoint Source/Point Source; 2005); Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Chapter 162: Ord. No. 2004-2 (Adopted 3-22-2004); Chapter 161 (Skippack): Ord. No. 2014-11 (Adopted 10-27-2014); Chapter 163 (Wissahickon): Ord. No. 2016-09 (Adopted 2-22-2016); Chapter 164 (Neshaminy): Ord. No. 2014-12 (Adopted 8-25-2014)	Wissahickon Watershed
Upper Hanover	Upper Perkiomen Creek	Perkiomen Creek Headwaters (2009)	Green Lane Reservoir (Nonpoint Source; 2003)	Yes		Perkiomen Creek Headwaters
Upper Merion	Schuylkill River	Valley Creek Watershed (2010)	Trout Creek (Point Source; 1999); Schuylkill River (Fish Consumption; 2007); Valley and Little Valley Creek (Fish Consumption; 2001)	Yes		
Upper Moreland	Sandy Run; Pennypack Creek	Pennypack Creek Watershed (2009); Wissahickon Creek Watershed (2014)	Southampton Creek (Nonpoint Source/Point Source; 2008); Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes		Wissahickon Watershed
Upper Pottsgrove	Swamp Creek; Manatawny Creek; Schuylkill River	Swamp Creek Watershed (2006)	Schuylkill River (Fish Consumption; 2007)	Yes		

Municipalities	Watershed Boundaries Within Municipality	Act 167 Plan (Date of Adoption)	PRP/TMDL Plans	NPDES MS4	Stormwater Management Plans Or Other Criteria	Act 167 Stormwater Management Plan
Upper Providence	Schuylkill River; Lower Perkiomen Creek		Schuylkill River (Fish Consumption; 2007)	Yes		
Upper Salford	Upper Perkiomen Creek; Unami/Ridge Valley Creek; East Branch Perkiomen Creek; Lower Perkiomen Creek	East Branch Perkiomen Creek Watershed (2004)		Yes		East Branch
West Conshohocken	Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes		
West Norriton	Schuylkill River; Stony Creek Sawmill Run	Stony Creek/Saw Mill Run (1992)	Schuylkill River (Fish Consumption; 2007)	Yes	Ord. No. 594 (Adopted 7-13-2004)	Stony Creek/Saw Mill Run
West Pottsgrove	Manatawny Creek; Schuylkill River		Schuylkill River (Fish Consumption; 2007)	Yes		
Whitemarsh	Schuylkill River; Wissahickon Creek; Sandy Run	Wissahickon Creek Watershed (2014)	Schuylkill River (Fish Consumption; 2007); Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes		Wissahickon Watershed
Whitpain	Schuylkill River; Stony Creek Sawmill Run; Wissahickon Creek	Stony Creek/Saw Mill Run (1992); Wissahickon Creek Watershed (2014)	Schuylkill River (Fish Consumption; 2007); Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes	Ord. No. 350	Wissahickon Watershed, Stony Creek/Saw Mill Run
Worcester	Skippack Creek; Stony Creek Sawmill Run; Wissahickon Creek	Stony Creek/Saw Mill Run (1992); Wissahickon Creek Watershed (2014)	Skippack Creek (Nonpoint Source/Point Source; 2005); Wissahickon Creek (Point Source/Non-point Source; 2003)	Yes		Wissahickon Watershed, Stony Creek/Saw Mill Run

Table 5.3.1-3 | *National Flood Insurance Program Compliance*

Municipalities	Participating Community	Policies In Force	Total Premium And Coverage	Total Claims Between 1978 - 2019	Total Paid Between 1978 - 2019
Abington	Yes	288	\$75,116,700	50	\$2,248,225.72
Ambler	Yes	46	\$14,031,000	30	\$2,936,497.62
Bridgeport	Yes	27	\$5,255,600	14	\$3,751,300.49
Bryn Athyn	Yes	2	\$600,000	1	\$88,738.72
Cheltenham	Yes	122	\$33,611,700	46	\$4,689,993.1
Collegeville	Yes	19	\$3,979,400	20	\$1,560,482.25
Conshohocken	Yes	30	\$13,138,700	15	\$4,197,185.09
Douglass	Yes	18	\$4,667,900	0	\$0
East Greenville	Yes	1	\$250,000	0	\$0
East Norriton	Yes	2	\$378,000	2	\$18,834.76
Franconia	Yes	49	\$13,570,000	0	\$0
Green Lane	Yes	9	\$2,142,000	4	\$238,241.38
Hatboro	Yes	6	\$1,137,900	25	\$3,266,661.75
Hatfield Boro	Yes	114	\$26,809,300	7	\$468,338.74
Hatfield Twp	Yes	14	\$3,244,800	5	\$663,857.55
Horsham	Yes	50	\$15,097,600	14	\$740,563.11
Jenkintown	Yes	98	\$27,405,300	0	\$0
Lansdale	Yes	4	\$1,025,000	1	\$15,337.38
Limerick	Yes	12	\$3,110,000	0	\$0
Lower Frederick	Yes	14	\$3,597,200	6	\$450,968.01
Lower Gwynedd	Yes	21	\$4,801,000	4	\$401,287.64
Lower Merion	Yes	60	\$18,868,600	31	\$2,644,791.62
Lower Moreland	Yes	447	\$123,272,200	33	\$8,403,920.35
Lower Pottsgrove	Yes	293	\$79,711,300	1	\$35,028.07
Lower Providence	Yes	14	\$3,407,100	20	\$1,808,509.64
Lower Salford	Yes	37	\$8,401,600	4	\$107,414.08
Marlborough	Yes	19	\$5,736,200	4	\$330,081.14
Montgomery	Yes	18	\$4,114,900	5	\$640,811.82
Narberth	Yes	37	\$9,929,000	2	\$28,265.64
New Hanover	Yes	28	\$7,324,200	8	\$867,827.96
Norristown	Yes	33	\$9,031,000	17	\$1,807,040.01
North Wales	Yes	35	\$9,040,100	1	\$15,414.47
Pennsburg	Yes	9	\$2,615,000	0	\$0
Perkiomen	Yes	2	\$455,000	12	\$1,186,542.45
Plymouth	Yes	20	\$5,121,000	4	\$1,666,003.2
Pottstown	Yes	4	\$1,663,800	19	\$1,178,908.59
Red Hill	Yes	2	\$1,061,000	0	\$0
Rockledge	Yes	35	\$15,849,300	0	\$0
Royersford	Yes	100	\$22,578,900	1	\$322,551.31
Salford	Yes	1	\$350,000	0	\$0
Schwenksville	Yes	1	\$28,000	0	\$0
Skippack	Yes	1	\$350,000	14	\$1,484,723.39
Souderton	Yes	11	\$5,511,200	0	\$0
Springfield	Yes	2	\$790,000	22	\$883,471.29

Telford	No	20	\$5,351,900	0	\$0
Towamencin	Yes	2	\$170,000	3	\$188,454.65
Trappe	Yes	94	\$24,616,900	1	\$96,338.98
Upper Dublin	Yes	73	\$15,979,100	26	\$12,019,422.13
Upper Frederick	Yes	3	\$292,000	1	\$6,757.26
Upper Gwynedd	Yes	286	\$76,928,800	2	\$376,777.69
Upper Hanover	Yes	136	\$47,159,000	1	\$141,629
Upper Merion	Yes	4	\$1,700,000	8	\$1,457,138.02
Upper Moreland	Yes	49	\$15,237,900	27	\$4,553,689.52
Upper Pottsgrove	Yes	16	\$4,248,600	0	\$0
Upper Providence	Yes	106	\$40,733,400	64	\$5,502,267.96
Upper Salford	Yes	101	\$33,894,600	0	\$0
West Conshohocken	Yes	1	\$350,000	2	\$20,401.71
West Norriton	Yes	104	\$22,456,200	68	\$10,042,485.88
West Pottsgrove	Yes	5	\$1,388,100	1	\$25,505.98
Whitemarsh	Yes	7	\$3,555,000	44	\$13,856,429.21
Whitpain	Yes	83	\$23,888,300	6	\$1,209,745.93
Worcester	Yes	3	\$579,300	0	\$0

5.3.2. EMERGENCY MANAGEMENT

Montgomery County contains 62 municipalities including 38 townships and 24 boroughs. Under the requirements of Pennsylvania Title 35 (Emergency Management Code) specific roles and responsibilities are assigned to municipalities to provide local emergency services including:

- Authorization to establish a local emergency management organization which is responsible for emergency response and recovery.
- Ability to declare a local disaster emergency upon finding that a disaster has occurred or is imminent.
- Requirement to appoint an emergency management coordinator who is responsible for the preparation of plans, administration, and operation of the local management organization.
- Adoption of appropriate intergovernmental agreements with other municipalities to address shared roles and responsibilities.

A listing of municipal facilities is provided in Appendix E.

Montgomery County Municipalities have developed agreements, facilities and networks for disaster response. The various types are listed here.

Mutual Aid Agreements: Many municipalities have formally adopted mutual aid plans. It is a practice of MC DPS to facilitate mutual aid agreements among all jurisdictions.

Emergency Operations Centers: Each municipality has an equipped emergency operations center which will be utilized as a command center in the event of a local incident. Typically these are housed in the municipal building, public safety building, or local fire company.

Local Emergency Services: Various municipal emergency services are provided at a local level, including police, fire, public works, and ambulance. Every municipality and school district has adopted comprehensive emergency management plans, which itemize local resources and response protocols. All municipalities operate under the NIMS.

Public Safety: Most municipalities in the county are served by local police departments. The 11 municipalities without local public safety staff are:

East Greenville Borough, Lower Frederick Township, Perkiomen Township, Red Hill Borough, Salford Township, Skippack Township, Trappe Borough, Upper Frederick Township, Upper Hanover Township, Upper Salford Township, and Worcester Township. These municipalities are covered by the

Pennsylvania State Police barracks located in Skippack and Upper Merion Township.

Over 1,200 full time public safety officers are employed by Montgomery County municipalities. Local public safety departments work closely with each other and with the county district attorney's office on various special crime task force units. Most municipal police departments cooperate on training and recruiting through the Montgomery County Consortium. They also utilize the training facilities at the Montgomery County Public Safety Campus in Plymouth Township.

Fire Control: There are 104 fire stations spread around Montgomery County. Fire stations in Montgomery County are listed in Appendix M. Several fire stations have been expanded or reconstructed over the past decade to provide improved service.

The local fire companies within Montgomery County are staffed either partially or completely by volunteers. Some municipalities employ full-time or part-time paid professional firemen. Also, slightly more than half of the municipalities in the county employ a paid Fire Marshal. In many cases, local volunteer fire companies are affiliated with one municipality. Fire companies in rural areas may serve several municipalities. Some of the county fire companies are undergoing consolidations with other fire companies to provide more efficient service in their regions. Some fire companies are equipped and trained to provide additional teams for water rescue, hazardous materials incidents, and technical rescue.

Emergency Medical Services: Emergency medical assistance services are provided by private non-profit organizations serving multi-municipal areas. Ambulance services are a part of the emergency medical services which include paramedics, emergency medical technicians, and quick responders. These units are coordinated by MC DPS. There are 21 ambulance operators providing prompt service to county residents. Most portions of the county can be accessed by a trained emergency medical assistance team and ambulance within eight minutes. If a victim has life threatening injuries, rapid transport will be made by emergency service helicopters for direct access to hospitals in the region that are equipped with heliports.

Communications/ Monitoring Systems: Municipalities and local emergency responders currently operate with various monitoring and communications systems. All utilize the county 2800mHz system which has been upgraded since the 2017 Plan. In addition, some also support their own radio communication systems.

Municipal Code Enforcement and Public Works Departments: Both the code enforcement and public works departments in each municipality play a role in responding to and mitigating disasters at the local level. Zoning and building permit decisions are made by the municipal code officer. All 62 municipalities have zoning and subdivision ordinances. Road and bridge maintenance is performed by the public works department or municipal road superintendent. Additionally public works departments in some municipalities maintain storm sewers, stormwater management basins, stream channels, and other public facilities that pertain to flooding. Public works department personnel deploy traffic barriers and other controls during road flooding and other disasters that could potentially impact public areas in the municipality. Often, they are the first on the scene to manage the damage from various types of disasters. These activities include removing debris from roadways, repairing infrastructure, and stabilizing damaged public facilities. Snow and ice removal during winter storms is also an important function of the public works departments in Montgomery County, and often requires significant overtime work for staff. Public works department personnel often perform initial post-disaster inspections and damage assessments. In some of the larger developed municipalities, shade trees are routinely trimmed by professional arborists or public works personnel.

Montgomery County

Montgomery County Public Safety Department: Most incidents caused by hazards will require emergency response services from fire, police, and ambulance personnel and impact more than one municipality. A major incident, such as the Limerick Township tornado in 1994, or the flooding in Upper Moreland and Abington Townships caused by Hurricane Floyd in 1999 are examples of situations where fire, police, and emergency medical services were needed from several public responders to address a large incident. This section will briefly describe services and issues related to the general provision and coordination of emergency service performed by the MC PSD.

MC PSD operates through six divisions: Administration, Emergency Communications, Emergency Medical Services, Emergency Management, Fire Academy, and Law Enforcement. Five of these six divisions are described below.

Emergency Communications: As one of the core functions of MC PSD, Montgomery County provides 24/7 enhanced 911 dispatch service from the Montgomery County Emergency

Operations Center (EOC) located in Eagleville. In 2016 the center received nearly 800,000 calls for police, fire, and ambulance service. The Emergency Communications Division is one of only 16 of over 6,000 nationwide to have dual accreditation from the Association of Public-Safety Communications Officials and the Commission on Accreditation of Law Enforcement Agencies.

Montgomery County has completed a \$36.4 million upgrade to the emergency management dispatch system. The new 800 megahertz system uses 30 radio communications sites and provides wider coverage to handle the increased emergency communications needs of the county. As part this effort, the county has distributed new radios to municipalities and emergency responders.

Emergency Medical Services (EMS): The County's EMS system is coordinated by the Emergency Medical Services Division in accordance with Pennsylvania's Act 45 of 1985. This division works closely with the emergency medical service providers described above to improve services and avoid duplication. As part of their work, County EMS staff inspect and license 113 Emergency Services Provider vehicles. They also coordinate the readiness and response for mass casualty and mass care incidents. County EMS staff also coordinate local emergency service providers in the administration of drugs to sedate delirious patients and to administer antidotes for opioid overdose victims.

Emergency Management: The Montgomery County Emergency Management Division is responsible for coordinating 62 emergency management agencies and oversees the HAZMAT team, Urban Search and Rescue Team, Training and Exercises, Radiation Planning, and Community Outreach. During emergency events, the Emergency Management staff helps navigate the complexities of the response and recovery. This division works closely with municipalities, day care centers, and schools to assist them with planning, response, mitigation and recovery from disaster emergencies. To date, the county has been successfully in assisting each municipality and school district in the preparation of a local emergency plan. Most of the nearly 300 day care centers in the county also have emergency plans. The Emergency Management Division also works closely with Exelon to maintain the evacuation plan for the area surrounding the Limerick Nuclear Reactor.

Fire Academy: The county operates the Fire Academy at the Public Safety Training Campus located at 1175 Conshohocken Road in Plymouth Township with full-time and several part-time professional instructors. The campus contains several facilities that are used for education and training for the fire, rescue, police departments, and ambulance companies in Montgomery County. In a typical year, the Fire Academy offers several hundred classes that can include thousands of attendees. This usually translates to nearly 60,000 combined hours of fire, rescue and hazardous materials training. The Montgomery County Fire Academy is one of 18 institutions in Pennsylvania recognized by the State Fire Academy as an educational training agency (ETA) authorized to conduct emergency service training to first responders.

Law Enforcement: The Law Enforcement Division also operates at the Montgomery County Public Safety Training Campus, where it provides various law enforcement agencies with quality training consistent with national standards in conjunction with the Police Chiefs Association and District Attorney's office. In addition to providing classroom training, students use the tactical response training center including two (50- and 100-meter) indoor shooting ranges, a live fire shoot house, and a classroom with a firearms simulator. This facility allows law enforcement officers and other first responders to train for a barricaded person, officer down, hostage rescue or weapons of mass destruction incidents. The facility is currently expanding to include new training opportunities, such as water rescues and trench rescues.

The Law Enforcement Division personnel also conduct the School Safety and Security Program that assists all public and non-public schools and institutes of higher learning to establish a safe, secure and healthy learning environment. The C.I.A.S.S. program offered by the MC PSD provides a countywide law enforcement alert system.

Emergency Operations Center: MC PSD's EOC is in Eagleville. The center includes the offices for the department, the 911 call center, an emergency operations control room, and houses various

types of equipment and vehicles needed to respond to different type of events. The center has been upgraded to serve as a command post to dispatch emergency responders and for coordination and distribution of resources and equipment needed to address an emergency incident. Highly trained and experienced personnel in the EOC provide expertise in the following: transportation, firefighting, communications, public works and engineering, emergency management, mass care and housing, resource support, public health and medical services, search and rescue, oil and hazardous materials response, energy, public safety and security, community recovery and mitigation, and external affairs. When activated, the EOC works closely with the 911 center to ensure the coordination of activities and the gathering of information about the impacts of the disaster. In 2011, the emergency operations center was recognized as an accredited facility by the Commission for the Accreditation of Law Enforcement Agencies (CALEA). The EOC maintains its accreditation through CALEA.

Monitoring and Communications Systems: The county can receive disaster-related information and provide updates and warnings using the following systems:

- 800-MHz Radio System – Montgomery County has an 800-megahertz communication system which has recently been upgraded to enhance coverage, capacity, and technological improvements for emergency communications. All emergency service providers will now be able to utilize the improved system with the new radios distributed to them by the county.
- Storm Ready, designated by the National Weather Service (NWS), includes methods for monitoring, warning, and responding to natural hazard situations. As part of Storm Ready, the county has hosted Skytran training.
- The Emergency Alert System can be used to broadcast messages and alerts on AM radio and scroll messages across TV screens.
- 1,000 weather radios procured using Homeland Security funding are positioned within special needs and special population facilities to provide advance warning of approaching storms or conditions. Units have also been deployed in municipal buildings, school districts, and daycare centers.
- The NWS weather radio system has been upgraded to include signals that blanket Montgomery County from three distinct weather monitoring locations: Mount Holly/Philadelphia, Hibernia Park/Chester County (a new site), and Allentown.
- Roam Secure - is a web-based text messaging, instant alert mechanism that can reach people via e-mail, Blackberry/Trio devices and text cell phones. Montgomery County will utilize this to alert responders and groups about natural and manmade hazards and events. The system is internet based and can alert personnel to events by type, i.e., severe weather, as well as by geographical area.
- RACES - Radio Amateur Civil Emergency Services (RACES) is a network of amateur radio operators who donate their services in the time of natural disaster. They can provide additional communications services for various responders or agencies that need assistance. This service can provide backup communications if other systems fail.
- County Law Enforcement Alert System (CLASS) was developed to provide a two-way emergency alert capability for every school in the county.
- ReadyNotifyPA is a text messaging system used to send emergency communications directly to cell phones, pagers, BlackBerrys, PDAs and/or e-mail accounts when there is an emergency occurs.

Emergency Operations Plan: Montgomery County has an Emergency Operations Plan, adopted in April 2012, to document the appropriate response procedures during various disaster events. EOC operations and other activities are guided by this plan.

Mutual Aid and Joint Planning: Montgomery County has mutual aid agreements with surrounding counties and is currently participating with other Philadelphia area counties in the SEPA RTF. Montgomery County is also involved in Delaware Valley Working Group, a cooperative that plans for the response to various disasters that could strike the three states along the Delaware River. Current regional projects include a communication link between all emergency operation centers within the three states in the Delaware Valley. Surge capacity planning for all hospitals, pandemic planning, and regional mass evacuation plans continue to be prepared.

Montgomery Health Department: MCHD provides information and educational materials on disease outbreaks, severe weather, water conservation, radon, West Nile Virus, and other health issues. Throughout the year, warnings are issued by MCHD prior to extreme hot or cold conditions. A task force with representatives from government, business, water purveyors, and environmental groups convened during drought conditions is managed by the health department to address water conservation. MCHD and MC PSD, working with an advisory committee, developed a plan in 2006 to outline county actions in the event of an outbreak of a deadly contagious disease. The advisory committee was reconvened in 2009 and renamed the Emergency Preparedness Advisory Committee to encompass a response to all hazards, both natural and human caused. After 2009, the committee essentially reformed after changes in the Health Department directorship and has worked since as the senior advisory group of county elected officials, DPS and PH.

The Health Department has also established the Montgomery County Medical Reserve Corps' (MRC) program to develop a network of local volunteer medical and non-medical residents who can contribute their skills and expertise throughout the county to prepare for and respond to public health emergencies, as well as assist with other Health Department initiatives to improve the health of the community.

MCHD also distributes Potassium Iodide to schools, businesses and persons living within a 10-mile radius of the Limerick Generating Station. Potassium Iodide (known as KI) is a compound that can prevent damage to the thyroid gland in the event of exposure to radioactive iodine releases.

5.3.3. PARTICIPATION IN THE NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Flood insurance does not stop flood losses; instead, it changes how flood losses are reimbursed. FEMA, through private insurance companies and with assistance from the states, operates the National Flood Insurance Program (NFIP). Through this program, any residential property owner, including those living outside of the area identified as the one-percent-annual chance (formerly referred to as "100-year") floodplain on the Flood Insurance Rate Maps (FIRM), may purchase flood insurance on their structure and personal property. To be eligible, an individual's community must first adopt a floodplain ordinance that conforms to NFIP regulations. At present, all 60 of the Montgomery County municipalities with floodplains and flooding problems are eligible. Although Telford and Red Hill Boroughs have no designated floodplain areas, Red Hill chose to participate in the flood insurance program and has an ordinance in place. Telford Borough did not participate and has no floodplain ordinance. As municipalities administer floodplain management and enforce ordinances, they have the opportunity to promote flood hazard mitigation measures. Yet few municipal websites feature any flood-related content, other than a link to FEMA's website, despite two recent significant storm events – Isaias in 2020 and Ida in 2021. A goal for the next plan update is to develop content, including links to the county's flood-related webpages, for municipalities to post on their website to address compliance and advocate for communities to include this on their website as a resource for residents.

According to FEMA data, there are currently 688 repetitive loss and severe repetitive loss structures in Montgomery County (see Appendix L for a breakdown of this data). This is significantly less than the repetitive loss and severe repetitive loss structures listed in the county in 2012. The current number may be even less since it appears that some of the properties listed have either been removed or elevated out of the flood hazard area.

The NFIP supports itself on the premiums paid by the policyholders. For owners of property within the one-percent-annual-chance floodplain, the NFIP is the only way they may purchase flood insurance. Property owners that have federal loans for buildings within the floodplain are generally required to carry floodplain insurance. Also, many lending institutions require flood insurance on all mortgaged property in flood plains.

Over the years, the Federal Emergency Management Agency has incorporated incentives for better floodplain management into the flood insurance program. For example, the Community Rating System offers discounts of up to 50% on flood insurance premiums if communities undertake a proactive flood loss reduction program. Actions include adopting stringent floodplain management regulations and developing floodplain management controls. No municipalities in Montgomery County qualify for reduced rating.

Even with all these incentives, on average about 20% of the properties within the 1% chance floodplain in Pennsylvania are covered by flood insurance. It appears that a much higher percentage of flood risks are insured in the county. Even still, some properties within the most frequently flooded areas of the county are without insurance coverage.

5.3.4. PLANNING AND REGULATORY CAPABILITY

Montgomery County Planning Commission: The Montgomery County Planning Commission (MCPC) offers professional planning services to address land use management, transportation, environmental preservation, open space and farmland protection, site design, and community growth. The planning commission works with municipalities, businesses, and various organizations to maintain the high quality of life experienced in Montgomery County. Since its inception in 1950, the major focus of the planning commission has been to promote orderly development while preserving valuable county amenities. Professional planners on staff develop county plans, model ordinances, and other informational publications as well as provide technical assistance and services to the 62 municipalities. Through planning assistance contract agreements with municipalities, county planners are employed as municipal planners in over half of the townships and boroughs. Since 2000, four regional planning commissions have been formed and are staffed by county planners.

The planning commission performs specific functions discussed below that aid in the county's hazard mitigation efforts. In the future, key aspects of this plan will be incorporated into other plans when appropriate.

Comprehensive Plan: On January 15, 2015, the Montgomery County Commissioners adopted *Montco 2040: A Shared Vision* as required in the Municipalities Planning Code (MPC) sections 301 (a). The plan provides an overall framework for local municipal plans and provides guidance on issues that transcend local boundaries, such as highways, public transportation, flooding, trails, growth and redevelopment trends, shopping needs, impact of large developments, overall housing needs, natural systems, and economic growth.

The plan includes three themes: Connected Communities, Sustainable Places and Vibrant Economy. Fifteen goals are established connected with these themes. Two goals in particular are relevant to the Hazard Mitigation Plan. These include: 1) Improve stormwater management and reduce the impact of flooding and 2) Enhance community character and protect neighborhoods. The Montco 2040 Implementation Grant Program was started in 2016 to assist municipalities in making targeted physical improvements that achieve real progress toward the goals of the comprehensive plan. In 2018 an increased funding allotment of \$1.5 million became available on a competitive grant basis for municipalities and their partners to make real progress on the goals of the comprehensive plan affecting their local communities. A new focus category, Adaptation and Resiliency, is being introduced to address negative environmental changes through projects such as floodplain mitigation, streambank restoration, green streets, and community gardens.

Natural Resources Protection: The planning commission staff has undertaken several projects aimed at protecting the environment and restoring natural systems. Over the course of 2020 – 2021, the county worked with all 62 municipalities to bring their floodplain ordinances into compliance with FEMA regulations. Key to this effort was a model floodplain ordinance the planning commission created that also included standards to protect natural resources in the floodplain. A riparian corridor protection ordinance has been prepared, and several municipalities in the county have adopted ordinances based on the model. In addition, the staff has prepared a stream corridor restoration guidebook to help municipalities and non-profit organizations restore degraded stream corridors. In developing this guidebook, the planning commission partnered with non-profit organizations in stream bank restoration and replanting efforts. The planning commission has also worked with several municipalities and local watershed associations in the replanting stormwater basins.

A Natural Areas Inventory update of the 1996 Montgomery County Natural Diversities Inventory was prepared by the Morris Arboretum staff in 2008. The natural areas inventory identifies 13 significant conservation landscapes which contribute to the county's natural diversity. The inventory will be used as a basis for protecting these sites.

Multi-Regional Greenway Study: In 2015, MCPC and Natural Lands received grant funding from DCNR to develop a Multi-Regional Greenway and Stewardship Study. As part of its efforts, MCPC staff have identified existing greenway corridors located within the four planning regions, which include 24 Montgomery County municipalities that comprise the northern half of the county. MCPC staff has also conducted field studies to identify opportunities to enhance the greenway sections along the main street sections of the study area. Natural Lands has conducted evaluations of designated municipal parks and is developing stewardship recommendations to preserve the natural resources and features found in the parks.

Open Space Preservation Program: The Montgomery County Commissioners adopted the Trails, Parkland, and People 2015 Implementation Recommendations for a Healthy Montgomery County Plan establishing a \$15.3 million open space preservation initiative. This initiative places strong emphasis on the preservation of greenways and the establishment of trails.

Montgomery County Planning Commission

Planning Education and Technical Assistance: The planning commission offers regular education forums and provides technical assistance to all appointed municipal planning commission members, municipal staff, and elected officials. Three planning courses, each nine hours long, are offered throughout the year for newly appointed and elected officials. The planning commission distributes four newsletters annually addressing key planning issues. A series of model ordinances has been published to provide local elected and appointed officials with strategies for achieving the recommendations of the county and municipal comprehensive plans. Fact sheets and reports on technical issues are also distributed periodically. The planning commission also maintains a detailed web site with important information and links to better address the concerns that municipal leaders have.

Pennsylvania Emergency Management Agency (PEMA)

PEMA is the state government agency responsible for the development and implementation of the state's disaster preparedness program. PEMA also handles the coordination and management of disaster recovery operations. Like the county and local governments, the state also operates an emergency operations center which would serve as the main point of contact for large incidents, emergencies, and disasters that impact multiple counties. The state center works to support the county centers by sharing warning information and gathering requests for resources to be filled by other state and federal agencies.

PEMA provides various types of training and education programs for county and local emergency management officials. They also work through the State Fire Commissioner's office and state fire academy to address firefighting training needs. On October 21, 2013, Pennsylvania's hazard mitigation plan was approved by U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA). The state is currently being revised to meet its 5-year update requirement.

US Army Corps of Engineers

The Corps of Engineers designs and maintains various facilities that reduce flood damage, enhance water navigation, protect natural resources, and provide recreation. The Corps provides technical support to various federal agencies and municipal government. In the past the Philadelphia office of the US Army Corps of Engineers has aided Montgomery County municipalities in performing feasibility studies and design work to reduce flood impacts in vulnerable locations.

United States Geological Survey (USGS)

The USGS develops various maps and technical reports on natural resource conditions throughout the United States. The local USGS office in southeastern Pennsylvania in Downingtown, PA has performed a variety of studies on water quality and supply. This regional USGS office was helpful to the county in the establishment of the groundwater monitoring network currently in use to better forecast potential drought conditions. They also maintain the stream gauges that are instrumental in flood forecasting.

National Weather Service

The National Weather Service, which is housed within the National Oceanic and Atmospheric Administration provides weather, hydrologic, and climate forecasts and warnings. County and local emergency managers have 24-hour access to weather information provided by the NWS.

5.3.5. FISCAL CAPABILITY

Federal Government Federal Emergency Management Agency (FEMA): FEMA, now part of the Department of Homeland Security, is charged with planning for, responding to, and providing services to mitigate future disasters. FEMA provides funding, technical assistance, and deploys personnel to directly assist in disaster response and recovery. FEMA also works in partnership with other organizations including the American Red Cross and the United States Army Corps of Engineers. FEMA manages the following grant programs:

Hazard Mitigation Grant Program: Grant funds under this program are made available to states by FEMA after each federal disaster. These funds can only be used in the area subject to the federal disaster declaration and will only cover 75% of the eligible costs. Examples of fundable projects include acquisition and demolition of flood prone structures and flood proofing or flood elevation. Individuals or homeowners cannot apply directly; a local government must apply on their behalf.

Flood Mitigation Assistance Program: States and local government can use flood mitigation assistance program funds to reduce or eliminate disaster vulnerability to developed areas. This program is funded annually and is only available to National Flood Insurance Program insured properties. This grant funding is limited and will only cover 75% of the eligible costs. Funding is channeled through FEMA and will only be awarded for property in municipalities with a FEMA approved hazard mitigation plan.

Pre-Disaster Mitigation Program: The pre-disaster mitigation program is an annually funded competitive grant program. No disaster declaration is required. Federal funds under this program will cover 75% of the project's cost up to \$3 million. A FEMA approved local hazard mitigation plan is required for funding under this program.

Federal Disaster Assistance Programs: After a disaster, different forms of assistance are made by local, state, and federal government. The types and level of assistance depend upon the severity of the damage and the types of declarations that result from the disaster event. When the President of the United States declares a disaster event, the following funding resources can be made available to eligible victims:

Individual Assistance – includes loans provided through the US Small Business Administration to homeowners, residents, and businesses to cover uninsured losses. Renters can be eligible for personal property losses. Building owners can receive loans up to \$200,000 to repair or replace buildings and up to \$40,000 to replace personal property with an additional 20% for mitigation. Businesses may obtain loans to repair buildings and replace machinery, equipment, and supplies. Even non-profit institutions are eligible for these funds. An economic injury disaster loan can be used by small businesses as working capital to restart their operations.

Public Assistance – provides cost reimbursement aid to local governments and certain non-profit agencies that participated in disaster response and recovery activities. This program is largely funded by FEMA. It should be noted that several municipalities have indicated that it would be helpful for someone from the County to be designated to assist municipalities with that process following a disaster.

5.3.6. POLITICAL CAPABILITY

Montgomery County contains 62 municipalities which are governed by various boards, commissions or councils. All municipalities have professional staff which advise the boards and provide information to enable them to make policy decisions.

5.3.7. EDUCATION AND OUTREACH

Education and outreach will be employed to implement mitigation activities and communicate hazard-related information. Examples include fire safety programs that fire departments deliver to students at local schools; participation in community programs, and activities conducted as part of hazard awareness campaigns. In addition to these activities, the county has a communication tool called "Ready Montco" used to alert residents about hazards and other important community news. Residents can sign up for the free alerts online at: <https://www.montcopa.org/3311/ReadyMontco>.

5.3.8. PLAN INTEGRATION

Plan integration recognizes that hazard mitigation is most effective when it works in concert with other plans, regulations, and programs. Per FEMA, plan integration is described as the regular consideration and management of hazard risks in a community's existing planning framework. The planning framework is the collection of plans, policies, codes, and programs that guide land use and development, how those are maintained and implemented, and the roles of a range of partner agencies to evaluate and update them. Effective integration of hazard mitigation occurs when the

planning framework fosters development that does not increase risks from known hazards or leads to redevelopment that reduces risk from known hazards. Existing planning mechanisms are further discussed in Chapter 7.

Mitigation Strategy

6.1 Update Process Summary

The county recognizes the fact that hazards exist and will impact the lives of residents, workers, and visitors in Montgomery County. By developing a mitigation strategy, the county and participating municipalities are seeking to substantially reduce the impact of these hazards. Through the recommended actions in this plan, the county and local municipalities are making an investment in the future quality of life in the county. Hazard mitigation starts with the avoidance of hazards, though in some cases avoidance is impossible. In these situations, the strategy will be to reduce the impact of the hazard to people and property. To accomplish this, there are roles for all levels of government, businesses, and individual residents.

Within the preceding chapters, the hazard identification, vulnerability analysis, and capability assessment, there has been some discussion about past actions taken to address some of the various hazards that are likely in the county. Additional discussion about potential mitigation goals and measures resulted from the workshop meetings and municipal surveys. Also, the planning team reviewed past proposals that were recommended in previous plans, studies, and reports to see if they were still relevant to address current conditions. A listing of the various studies reviewed appears in the Appendix P.

In the 2017 Hazard Mitigation Plan, four goals were established with appropriate action items for each. Several action items from the previous plan have been implemented or are under development. These include:

- Completed acquisition of 2 properties in Perkiomen Township and Upper Frederick Township that will remove three structures from the floodplain (the Deep Creek property is comprised of 2 parcels, each has a structure—one is a farmhouse and the other is a bungalow). Demolition is scheduled for 1st quarter 2023.
- Acquired and demolished a single-family residence that was located in the floodplain in 2019 (Murray property at 51 Park Ave in Schwenksville).
- A floodwall has been installed around the Spence property at 6007 West Valley Green Road, Flourtown (in Whitemarsh Township), as part of a trail project.

Other actions include bridge replacements improving stream channel conditions; increased flood warning road signage throughout the county; installation of road closure gates and other structures; improvements to various stormwater management systems; and various street drainage and stormwater management improvements developed by municipalities. In addition, The U.S. Geological Survey (USGS) and National Weather Service (NWS) began adding monitoring and communications equipment to the Delaware River Basin's flood alert system in 2001. This upgrade includes a new stream gauge for the Schuylkill River at Norristown, and improved hydrologic data for stream gauges at the Perkiomen Creek at Graterford.

This section begins with a statement of four goals and objectives to address hazard vulnerabilities described in Chapter 4. These goals and objectives are similar to the goals and objectives in the 2017 Plan. Potential strategies to be taken to address each goal are discussed later in this section. A listing of actions is found at the end of Section 6.4, along with an indication of the status of the action: Complete (action is done, being maintained), Ongoing (action is being implemented) Recommended (has not taken place, but is still recommended).

6.2 Mitigation Goals and Objectives

Four goals are described below. The first addresses the insufficiency of information about past disasters and the need to have a better understanding and collective knowledge about potential future hazards. Developing a culture that understands and knows how to act when confronted with various hazards is the essence of the second goal. The third seeks to reduce the county's overall vulnerability to hazards that might occur in the future, both human caused and natural. The last goal focuses on flooding, overwhelmingly the most significant hazard facing Montgomery County.

Goal #1: Develop a better understanding of the potential disasters that could occur in Montgomery County

During the preparation of the original mitigation plans in 2007, 2012, 2017, and this plan update, it was evident that concise and accurate information is not available to the Montgomery County Public Safety Department regarding properties subject to hazard impact. The county continues to expand GIS information and analytical tools, yet additional GIS information is still needed to evaluate hazard vulnerability. Needed data include first floor structure elevations for most buildings in the county, and an evaluation of the impact of climate change on floodplain boundaries. The county should continue to pursue the digitization of all habitable structures in the floodplain over the next five years. Fortunately, the county has 2-foot contour data for the entire county, digital flood plain insurance rate maps (FIRMs) and building footprint information. Also there is a need to tie hazard data to other county data bases, particularly the Board of Assessment data for the county.

The county should continue to investigate the use of the various types of software and disaster assessment models to further refine information on potential losses from various forms of disaster.

Also, the county can provide additional information out to the public safety community through various convenient digital platforms.

Objectives for Goal #1

1. Ensure that all key county and municipal officials and the general public are aware of hazard mitigation
2. Improve awareness and information associated with the threats to Montgomery County.

Goal #2: Ensure that the public understands potential hazards and is aware of which actions to be taken to minimize their risks.

No public safety action can be fully effective without the complete involvement, understanding, and participation of the public. Understanding hazards requires lifelong learning, so that appropriate response can be second nature. There are many forums and venues for emergency management and hazard awareness information. Certainly, the learning could start in primary and secondary education levels and be part of the community outreach efforts of many types of existing institutions such as community groups, local government forums, faith based organizations, business groups, and social clubs. Also there is a wide array of media that can be deployed in getting the message out effectively.

With the advent of new forms of communications technologies, there are new opportunities for expanding the county's ability to contact and inform local residents and visitors in the county.

Objectives for Goal #2

1. Make hazard mitigation a core value in the county
2. Improve warnings systems that reach all county residents and travelers in the county

Goal #3: Significantly reduce the risk of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from all hazards.

Various mitigation strategies are discussed for each potential hazard that might impact the county. Ongoing actions being taken to implement various mitigation measures along with potential strategies are described. Since flooding poses the greatest threat to the county, a more detailed description of actions is presented for flood mitigation under Goal #4. Public information and warning initiatives that would address all hazards are discussed under Goal #2. Building code regulation is also important for most types of hazards. Under the Pennsylvania Uniform Building Code, Montgomery County municipalities are no longer empowered to revise their building codes to address hazard vulnerability. They are dependent upon the state to keep codes up-to-date and responsive to hazards likely to occur in Pennsylvania.

An over-arching concern that applies to many of the hazards discussed in the following sections is the continued need for funding for hazard and emergency response providers. Ambulance squads are finding it more and more difficult to sustain services through billing for service. If additional fire/ambulance/response squads close, the remaining squads will have a larger service area and experience greater pressure in meeting those needs.

Geologic-Related Hazards

Geologic hazards are generally addressed through various structural improvements and limitations on the location and design of buildings. Since most building in the county is undertaken by private companies, local governments can address the reduction of hazard damage primarily through enactment and enforcement of various building codes and design standards.

Earthquake: The primary mitigation strategy for earthquakes requires the establishment of up-to-date building codes by the state and consistent enforcement of them. Currently each municipality relies on the Uniform Construction Code established by the state and has a building inspector enforcing it. Additional training and technical assistance could improve current building code enforcement efforts to address potential natural disasters such as earthquake. Since the threat of earthquakes is very low, Montgomery County does not anticipate any actions that specifically address them.

Landslide: Many municipalities in the county limit the amount and types of development that can occur on steep sloped areas through various requirements in the zoning or subdivision ordinances. Additionally, municipalities and the Montgomery County Conservation District enforce erosion and sediment controls during all land disturbance activities. Furthermore, steeply-sloped areas are generally priorities for preservation through acquisition with county open space funding made available to municipalities and private non-profit organizations. At this time, each municipality has updated their open space plan to address resource protection priorities. Montgomery County intends to continue to work with municipalities in various resource protection efforts that will, among other things, lessen the potential for landslide activity.

Radon: Radon testing is now performed during home inspections for most house sales in the county. For the past 5 years, the annual rate of housing sales in the county averages 3.5% of the existing housing stock. At that rate, a significant number of homes in the county were probably tested for radon and remediated if radon levels warranted as conditions of the real estate transactions. Also, testing has been performed on various public buildings particularly ones utilizing basement facilities.

Mitigation measures involving air vents and fans have been installed in buildings with high levels of radon. In most cases, a system with pipes and a fan is used to reduce radon. This type of sub-slab depressurization system does not require major changes in a home. The costs for it generally range from \$500-\$2500, with an average of \$1000.

MCHD, PA DEP and DCNR widely provide information about radon hazards. The United States Environmental Protection Agency (EPA) has also promoted radon awareness.

Options for additional radon mitigation could include expanded education, assistance in testing, and local requirements to test certain buildings, such as those used by the public. Education efforts include the use of existing outreach vehicles, such as municipal web sites, newsletters, and press releases to better acquaint residents about the dangers of radon and the potential ways to mitigate it.

Financial and technical assistance to older residents and lower or moderate income families could be provided by municipalities or various county social service departments. Additionally, municipalities could require radon tests and remediation through the use and occupancy permit or apartment inspection process. Montgomery County is proposing to assist municipalities in efforts to provide additional information to residents about radon.

Subsidence: Subsidence is a localized issue that primarily affects Upper Merion, Whitemarsh, Cheltenham, and Plymouth Townships. Upper Merion Township, which includes the largest limestone/dolomite area in the county, has developed zoning based upon the potential hazards caused by karst geology. They have also established special provisions in their stormwater management ordinance which limits the recharge of water into areas with sinkhole potential. Continued review of plans to ensure that buildings and stormwater management systems won't cause sinkhole formation, along with mapping of sinkholes that do form, are important mitigation strategies in Upper Merion, Whitemarsh, Cheltenham, and Plymouth Townships. Montgomery County will continue to work with these communities in performing various development and land use reviews under the Municipalities Planning Code to address subsidence hazards.

Weather-Related Hazards

Weather related natural hazards include windstorms, thunderstorms, tornadoes, lightning, snow and ice storms, and rain. No mitigation measure is readily available to alter the frequency or intensity of weather related hazards. Mitigation efforts have to make developed areas more resistant to damage caused by these weather events.

Severe Wind: For the past several years, all municipalities in the county have had building codes in place that address the impact of high winds on buildings. Continued enforcement of these codes will be an important mitigation action. Additionally, since street trees often are affected by wind storms, landscaping requirements and street tree plantings should take into account potential wind damage. The selection of tree species and the maintenance of street trees are important in lessening wind damage. The involvement of the electric utilities in tree maintenance is also important. Montgomery County will continue to assist municipalities in providing advice about urban forestry issues that pertain to potential tree damage from wind through a model landscaping ordinance and future forums.

Tornadoes: Early warning is critical in preparing for a tornado. Despite the best building codes and new building materials, no structure can withstand a strong tornado. The National Weather Service typically provides warnings to the public when weather conditions exist that could touch off a tornado. The municipalities and county play a role in disseminating this information and informing the public about the potential risks of a tornado. Since the threat of tornadoes is low, Montgomery County does not anticipate any new projects to address them other than continuing to provide extreme weather warning information and education.

Lightning: All municipalities in the county have adopted building codes which, among other things, address lightning protection measures. These provisions should be strictly enforced. In addition, continued reminders to the public are important to prevent unsafe behavior during lightning storms. Montgomery County will continue efforts to provide extreme weather warning information and education.

Winter Storms: Each municipality owns and maintains a variety of snow clearing equipment and has developed a solid reputation for keeping roads passable during most winter storms. State roads are handled by the Pennsylvania Department of Transportation (PennDOT) and their contractors. The county also maintains a network of roads with county employees and private contractors. The local building codes in place take snow into account to ensure that new development can sustain heavy snow loads. Utility companies, particularly the electric companies and electric departments servicing the county, have been able to handle a variety of winter storms in the past. With newer subdivisions in the county utilizing underground electric lines, less vulnerability exists for storm damage in these portions of the county. Montgomery County will continue to provide extreme weather warning information and education. It will also foster coordination with the various power companies servicing the county to better address the impacts of winter storms on homeowners and businesses.

Hurricanes: Early warning of hurricanes is important to enable people in unsafe areas to evacuate and to prepare their properties to withstand the impact of a hurricane. Fortunately, the county has been well served by government as well as private weather information providers that have the ability to accurately forecast hurricanes. Montgomery County does not propose any new projects to address the threat of hurricanes other than continuing to provide extreme weather warning information, education, and coordination. The flooding impacts from hurricanes are addressed below.

Extreme Cold Weather: The county declares code blue warnings during extreme cold conditions to better educate county residents to prevent exposure to extreme cold. Resources through the non-profit Community Action Development Commission (CADCOT), which provides services to the county's low-income residents, are available for emergency utility costs and weatherization to prevent the impact of extreme cold conditions. In addition, cold weather can cause a variety of problems including water and gas main breaks. Most utilities servicing the county have been proactive in systematically replacing older pipelines to prevent these types of problems from occurring. Montgomery County will continue efforts to provide education and assistance during extreme cold conditions.

Extreme Heat: The county periodically issues code red warnings (during extreme heat conditions). The Montgomery County Department of Aging and Adult Services works to ensure that low-income elderly residents are prepared for these extreme temperature conditions through energy assistance and electric fan distribution programs. In addition, CADCOT provides emergency utility assistance to the county's low income families. The Montgomery County Planning Commission has developed a vulnerability assessment for disadvantaged sectors of the population, in conjunction with DVRPC. The Planning Commission will be working with two municipalities on a trial basis to develop implementation strategies to reduce the impact of heat events. Montgomery County will continue efforts to provide education and assistance during extreme heat conditions.

Drought: The USGS maintains a state-wide network of groundwater monitoring wells that contains at least one well in each county. Groundwater is used to indicate drought status in a manner similar to stream flows. The Montgomery County Health Department also has developed a countywide groundwater monitoring network to supplement the state system. This monitoring network includes 19 wells, several of which are on public property, located in different geological settings throughout the county. Since July 2005, the health department has been measuring the elevation of the groundwater at each well on a monthly basis to determine changes in the water table. The planning commission and health department have also been actively promoting water conservation through educational outreach materials including public service announcements and written materials. The County Planning Commission has also advocated the interconnection of public water supply systems to enhance reliability during drought conditions.

The Secretary of Department of Environmental Protection on behalf of the Governor can declare a drought warning. When sufficient data becomes available from the county groundwater monitoring network, the county may also issue localized drought warnings based upon the findings of the health department working with the USGS regional office. During a declared drought, the Montgomery County Drought Task Force meets regularly to coordinate various response measures and make recommendations to address the impact of the drought. The Montgomery County Drought Task Force is chaired by a representative of the Public Safety and Health Departments.

The Montgomery County Comprehensive plan acknowledges the need to protect available groundwater and surface water supplies. Water resource protection strategies including water conservation, recharge of stormwater, and stream corridor preservation will help make Montgomery County more resistant to future droughts. Many of these recommendations can be incorporated into the subdivision and land development process at the municipal level to ensure that new development does not make the county more vulnerable to drought conditions. The Pennsylvania Water Resources Plan contains several water conservation measure recommendations.

Wildfires: The most effective way to reduce damaging wildfires is through effective land management. Healthy wood lots do not contain significant amounts of dead wood which could fuel fires. Additionally, old fields and pastures should be mowed at least once each year to break down dead vegetation. Well-maintained woodlands and meadows will provide easy access to trucks and other vehicles used for fighting fires. The county promotes good land management through its open

space and agriculture preservation programs. To be eligible under the agricultural land preservation program, farmers must maintain an up to date conservation plan. Farm easements are inspected yearly. Montgomery County does not anticipate actions to address wildfires since the threat of them is low. The county will continue to maintain existing park land and open space to reduce the threat of wildfires.

Human Caused Hazards: Various types of hazards are tied to maintenance or use of the built environment: buildings, dams, transportation systems, nuclear power plants, and energy systems, and communication systems. Though entities responsible for these structures diligently maintain and operate them, problems can arise as systems age or as human errors are made. Various forms of oversight, including the enforcement of building codes and other types of operating regulations work to minimize problems.

Other types of human-caused events may arise from willful action taken to disrupt society or result from collective behavior that gets out of control. Sometimes it is not clear why some human hazards arise, such as attacks on the internet. In responding to these forms of hazard, measures must fully account for the wide array of human thoughts and motivations.

A well-trained public safety staff at various levels of state, county and local government is essential in meeting any future challenges of civil disobedience or terrorism.

Objectives for Goal #3

1. Ensure that new buildings are constructed and maintained in a manner in which they remain resistant to damage from natural hazards
2. Reduce the occurrences and impact of power outages
3. Reduce the potential impact from dam failure
4. Reduce the occurrences of transportation accidents
5. Reduce the occurrences and impact of terrorist and civil disturbance actions
6. Reduce the occurrences and impact of hazard materials release events
7. Reduce the potential for landslides
8. Reduce the impact of drought
9. Reduce the impact of a nuclear incidents in the county
10. Reduce fatalities and injuries caused by extreme heat and cold events
11. Reduce building and infrastructure damage and loss of life caused by land subsidence
12. Minimize the impact of winter storms on infrastructure and safe travel
13. Reduce the impact from a pandemic in the county
14. All critical facilities and infrastructure should continue to function during various hazard events
15. Funding sources should be identified and applied to insure the continued operation of well-provisioned emergency response providers.

Goal #4: Encourage and promote actions to minimize the impact of floods within the county.

Based upon the vulnerability analysis addressed previously, flooding is viewed as the most significant hazard facing the county. Consequently, a separate goal has been developed for flooding and a detailed description of efforts that are underway to address flooding is provided below. In addition, other potential mitigation strategies that exist for reducing the impact of floods are discussed.

Emergency Services Flood Warning System: A flood warning system consists of converting flood forecasts issued by the National Weather Service into timely flood warnings and evacuation notices prior to flooding. Components of this effort include: emergency communication, flood stage forecast mapping, flood warning, and emergency plans. The primary responsibility for flood warning and evacuation lies with the state, county, and local offices of emergency management. Emergency managers maintain an emergency communications network and work with the tools

available to them for flood response. Flood stage forecast mapping, floodplain structure reviews, and evacuation plans, in addition to education of community officials, are needed to improve flood warning and evacuation efficiency. Also flood routing information is essential for safely routing traffic during flood conditions. The news media, radio, and television, provides a valuable communication link in this work. While FEMA participates in flood mitigation and post flood assistance, they do not provide warning/evacuation notices. The National Weather Service and the U.S. Army Corps of Engineers provide assistance to communities in developing flood warning systems and response plans. In some cases, businesses located in floodplains have independently developed flood warning and response systems.

The U.S. Geological Survey (USGS) and National Weather Service (NWS) began adding monitoring and communications equipment to the Delaware River Basin's flood alert system in 2001. This upgrade includes a new stream gauge for the Schuylkill River at Norristown, and improved hydrologic data for stream gauges at the Perkiomen Creek at Graterford. DRBC's Flood Advisory Committee continues to evaluate flood warning deficiencies within the basin. These include equipment deficiencies and general needs related to monitoring, modernized technology, and improved public outreach. The goals of the flood warning improvements program are to upgrade the precipitation and stream gauging network, complete flood stage forecast mapping, and increase public understanding of flood preparedness.

A listing of all active continuous-record gauges in the county is provided below. In addition, other active continuous-record gauges located out of the county on streams which flow into the county are also listed below in Table 6.2.1-1. It should be noted that Wissahickon Creek has 2 USGS gauges that can be used to forecast flooding conditions. One is listed below, and the other is farther downstream towards the mouth of the creek. These should be integrated into communications with emergency management and warning systems.

Table 6.2.1-1 | USGS Gage Stations in Montgomery County

USGS Gage Number	Gauge Name and Location	Drainage Area (Square miles)	Beginning Year	Precipitation Gauge
1467031	Pennypack Creek at Horsham	3.48	2010	no
1467036	Pennypack Creek Trib at Hatboro	4.36	2010	no
1467039	Pennypack Creek at Willow Grove	22.2	2010	no
14670413	Pennypack Creek at Bethayres	35.3	2010	no
1472000	Schuylkill River at Pottstown	1,147	1927	yes
1472198	Perkiomen Creek at E. Greenville	38	1981	no
1472199	West Branch Perkiomen Creek at Hillegass	23	1981	no
1473470	Stony Creek at Sterigere Street at Norristown	20.4	2019	no
1473500	Schuylkill River at Norristown	1,760	2001	yes
1472810	East Branch Perkiomen Creek near Schwenksville	58.7	1991	no
1473000	Perkiomen Creek at Graterford	279	1914	yes
1473110	Skippack Creek at Evansburg	52.9	1995	no
1473900	Wissahickon Creek at Fort Washington	40.8	1962-68, 2000	no

The flood warning network is effective in predicting flooding within larger streams and rivers where the flood peaks take longer to develop. For most of the smaller creeks in the county, flood warning is difficult since the streams are subject to flash floods which can occur in minutes with little advance warning. The only effective type of warning system for most of the smaller streams in the county would involve the use of weather forecasts or Doppler images to make future predictions about the potential for flash floods in certain vulnerable areas.

Preventative Activities Building Code Development and Enforcement: Each municipality within the county uses the Pennsylvania Uniform Construction Code maintained by the Department of Labor and Industry. Municipal code staff will need to continue to adequately enforce adopted building codes to ensure that only properly flood proofed buildings are erected in the floodplain. Also, code officers should uniformly enforce the requirements that buildings that are substantially destroyed by floods or other occurrences are rebuilt in accordance with flood proofing standards.

Drainage System Maintenance: Local storm drains need to be periodically maintained by their owners. The removal of debris from inlets, storm sewers, bridge culverts, and drainage channels is important in ensuring sufficient conveyance capacity in stormwater systems and streams. Outlet structures in impounding basins should be periodically inspected and cleaned. During recent storms in the county, specific localized flooding incidents were directly attributed to clogged inlet structures. In addition, many Montgomery County municipal governments, in complying with the requirements of their MS4 Permit, periodically inspect components of their stormwater management system. This responsibility could be expanded to occur periodically or after rain events to address blockages and potential flood hazards.

Land Use Management: The primary natural determinants of flooding include: slope, soils, geology, and climate. Changes to the natural environment brought about through the development process often result in increased impervious cover making it especially difficult for rainwater to recharge the ground water. Instead of recharging the ground, rainwater falling on developed surfaces will concentrate and may create stormwater problems. Promoting infiltration facilities and porous pavement will help restore hydrology to a degree. Watershed-wide, extensive green stormwater infrastructure projects could have a cumulative effect on minimize flooding long-term, and should be supported.

Acquisition and Demolition of Structures: The purchase of a property and removal of structures on it is often times the only effective way to eliminate a flood hazard in developed watersheds. In the past, municipalities within the county have obtained funds to purchase homes from home owners willing to be relocated. The homes are demolished and the ground is restored as a natural floodplain. In some cases, this land is used as public open space. Since federal and state funding for voluntary buy-outs is limited, municipalities should also consider innovative land use techniques to encourage redevelopment that eliminates flood prone structures. Bonuses or transfer of development tools might be effective in providing sufficient incentives.

Montgomery County has grown over the past 60 years—more than doubling in population. Even more than population growth, the county has added numerous businesses, stores, parking lots and roads, all of which greatly add to the amount of impervious surface. In the future, the county will continue to grow, not only with new housing but with new offices, stores, factories, schools and roads. These changes will alter natural drainage patterns and create additional stormwater. In addition, as land available for development becomes scarcer in developing areas, pressure to develop adjacent to and even in the floodplain increases. While municipalities cannot preclude all development within the floodplain, they can require adequate flood proofing of structures, and the provision of flood alert and evacuation plans for such development. The Montgomery County Comprehensive Plan (Montco 2040) adopted by the commissioners in 2015 establishes designated growth areas and overall land use policies to guide future development.

Stormwater Management: Effective stormwater management is achieved through the control of runoff as close as possible to its point of origin. Stormwater is characterized by volume, peak runoff rates, quality, the velocity of its flow, and the time it takes for it to concentrate at any location. Development of the land changes all of these characteristics in ways that are often damaging for the environment and cause flooding. Stormwater management measures seek to reestablish predevelopment stormwater flow characteristics to eliminate these potential negative impacts. Traditionally stormwater management has included detention basins and has focused on new development as opposed to modifications to existing development.

Counties are required to prepare stormwater management plans for designated watersheds under Act 167 of 1978. Of the 17 designated watersheds in Montgomery County, the county has adopted 12 stormwater management plans. Once the plans are adopted, municipalities must implement the recommendations of the plans through ordinances. The county is also required to update plans every five years.

There are many techniques for stormwater management, including natural landscaping, eliminating lawn mowing in floodplains and stream buffers, diverting gutter downspouts to lawns instead of driveways, and use of porous paving. These and other strategies are part of the Low Impact Development (LID) approach promoted by PADEP. The objective is to reduce creation of

runoff, and to slow what runoff is generated to allow maximum time for infiltration. The LID approach is appropriate for new and infill development.

Stormwater programs are the most important feature in preventing additional flood damage due to new development and can serve to reduce flood damage if applied to existing development. The retrofitting of stormwater management facilities in urban areas is an especially difficult problem since many areas have extensive impervious coverage. However, Stormwater management has additional benefits for water quality control and enhancement of infiltration to groundwater.

Recently, Representative Joseph Webster has succeeded in getting funds allocated for a flood study in the Perkiomen watershed. This has been initiated in response to severe flooding experienced along the main stem of the Perkiomen and some of its tributaries during Hurricane Ida and several unnamed summer downpours. In 2022, Representative Webster's local office, a stormwater advocate and the county planning commission began amassing support from the 53 municipalities and 4 counties that comprise the watershed. The funding secured by Representative Webster will fund the development of a scope of work for the flood study, as well as efforts to identify and compile the needed data. Once the scope of work is complete, additional funds for flood control and mitigation will be sought.

Retrofitting: structures can be retrofitted and flood proofed to reduce future flood damage. The most commonly used flood proofing technique is to raise a structure one foot or more above the 1% yearly chance flood elevation. While this can be effective in urbanized areas along water courses with predictable flood elevation data, elevating is no guarantee against future flood loss. Changes in watershed characteristics or the lack of precision in the flood elevation estimate can result in the flooding of elevated structures. During several recent storms, residential property owners with elevated structures were still vulnerable to property damage resulting from flooded vehicles and damage to various accessory structures in their yard. Furthermore, rescues are often required when residents of elevated homes are trapped by rising floodwaters. Other forms of flood proofing such as sealing off openings can be effective in protecting historic structures that can't be moved or structures that need to be located along a stream or river such as recreation facilities or utilities.

Floodplain Management: The Pennsylvania Flood Plain Management Act, adopted in 1978 as Act 166, encourages proper management of floodplains throughout Pennsylvania. Every municipality with flood prone areas is required to participate in the National Flood Insurance program. Municipalities do this by enacting floodplain management regulations that at the least comply with minimum standards adopted by the Pennsylvania Department of Community and Economic Development (DCED). Currently all 62 municipalities in the county that are eligible under the National Flood Insurance Program have adopted the minimum floodplain management standards. Under Act 166, municipalities may adopt more restrictive floodplain management requirements. The county's model floodplain ordinance prohibits development or placement of fill in the floodplain, except by conditional use.

The Montgomery County Planning Commission will continue to work with municipalities to prohibit all new development in floodplains, except for the development of elevated flood proofed buildings on brownfields sites in redevelopment areas that are part of economic revitalization initiatives. Even with comprehensive codes, it is important for municipalities to continue to enforce provisions of their floodplain ordinances that address the rebuilding of substantially damaged structures within the floodplain.

New revised and modernized Flood Insurance Rate Maps (FIRMs) were adopted by FEMA on March 2, 2016. In response to the new maps, each municipal flood plain ordinance was updated and adopted to be fully compliant with appropriate federal and state requirements. Assistance in the ordinance updates was provided by the Montgomery County Planning Commission staff. Currently each of the 62 municipalities in the county are fully compliant with the National Flood Plain Insurance Program. The county's website features flood-related information including maps of areas that experience critical flooding (<https://www.montcopa.org/2922/Critical-Flood-Area-Maps>), and also a Flooding Primer webpage that includes links to FloodFactor and other resources. The county's Emergency Management Flooding webpage (<https://www.montcopa.org/3175/Flooding>) provides useful information for county residents, including links to FEMA's Map Service Center, the National Flood Insurance Program (NFIP), and the county's community warning system, ReadyMontco. The county will work with municipalities to get this and similar information posted on municipal websites for the public to use.

Flood Control Structures: The purpose of a flood control structure is to physically constrain or to convey flood waters. Flood control structures include dams, levees, lined stream channels, and

storm sewers. Dams and levees have been used for centuries to open floodplains to agriculture and settlement, and in the case of dams, to detain flood waters for gradual release or for use as water supply, recreation, and the generation of hydroelectric power. In certain locations, dams and levees can be highly effective in flood loss reduction.

Though effective, one drawback to the use of dams and levees for flood loss reduction is that they are very expensive and require substantial land area. Secondly, local cost sharing requirements and environmental issues have slowed construction of new facilities in recent years. Flood control dams and levees are not necessary where there is no floodplain development to start with.

Structures funded by the Natural Resources Conservation Service (NRCS) are generally maintained by state or county sponsors. In the early 1960s Montgomery County participated in several NRCS (formerly SCS) projects in the Neshaminy, Wissahickon, and Perkiomen watersheds. The only project to be implemented, in part, was the Neshaminy basin project. Through that project eight flood control basins were developed in central Bucks County. Two other basins one in Bucks and the other in Montgomery County were never developed. A portion of Montgomery County benefits from one of the flood control structures developed as part of the Neshaminy project.

Upper Dublin Township constructed two flood control structures on Pine Run and Rapp Run to protect the Fort Washington Business Park.

Several municipalities including Abington Township, Springfield Township and Whitemarsh Townships have installed various stormwater management and flood control structures to address localized flooding.

Norristown and Lower Merion Township also have flood control basins. The Norristown basin was constructed along the Saw Mill Run and protects portions in the eastern end of the municipality. The Lower Merion Township basin is located on Remington Road along the Indian Creek. Several of the municipalities in the Wissahickon, Pennypack, and Tookany Creek watersheds have installed various stormwater basins and control structures to reduce localized flood impact. A levee was built in Cheltenham Township near Brookdale Avenue.

Stream channel modification is performed to enhance channel stability from a geomorphologic perspective. In combination with watershed floodplain management, this approach has become a part of flood loss reduction activities in areas around the country. In the past channelization and other stream channel improvements have also been employed in eastern Montgomery County and in Lower Merion Township.

Natural Resources Protection: Various natural resources associated with aquatic systems should be protected. These resources can include riparian corridors and wetlands. Measures to protect these resources include best management practices, erosion and sediment control regulations, land use controls, and riparian corridor protection standards. The county planning commission has developed a model guidebook and ordinance for riparian corridor protection which has been used by several municipalities to adopt stream protection codes. The county planning commission has also published a model subdivision and land development ordinance which provides appropriate standards addressing floodplain corridor protection, stormwater management, steep slope protection and other measures to ensure that the placement of roads and infrastructure minimizes the impact of various types of hazards. The county planning commission has also developed a Land Preservation model ordinance and guidebook. By employing a cluster option, a developer has more flexibility in siting new development while setting aside open space areas which can also contain significant natural resources such as floodplains and stream corridors. The county conservation district performs erosion and sediment control reviews. Also various land use regulations and techniques such as transfer of development rights could be used.

Acquisition of floodplain properties and the conversion of these properties to passive land uses not damaged by flooding is a form of natural resource protection. Because of the multiple objectives for stream corridors, including tourism and recreational uses, there are various sources of money that may be available for floodplain acquisition. These include money for parklands and open space, as well as money from the Federal Emergency Management Agency's Hazard Mitigation Grants Program. Over the past several decades, several small stream corridor improvement projects have been undertaken in the eastern portion of the county. These projects have been implemented through partnerships between the municipalities and both PA DEP and the US Army Corps of Engineers.

Public Information Programs: A broad-based public awareness and understanding of hazards is needed to reduce risks, particularly during floods. Often times, the poor choices made by the public during floods create situations where lives and property are placed at risk. Much of the flood risks occur among motorists who attempt to drive through floodwaters or homeowners who fail to heed evacuation warnings. Also, some homeowners place fences, sheds, automobiles, and outdoor equipment in flood prone areas of their property. These items get swept away in the floodwaters and occasionally block bridge openings and culverts, further elevating floodwaters. A number of public awareness initiatives have been successfully employed in other flood prone areas of the country. These programs include: street signage, maps and displays, library projects, direct mailings such as fliers, youth environmental education, real estate disclosure, and commuter awareness. The American Red Cross has disseminated flood awareness information in the Sandy Run and Pennypack Creek watersheds.

With the passage of an amendment to the Pennsylvania Motor Vehicle Code during June 2012, local police will have the opportunity to fine motorists who drive past or around a sign or traffic control device closing a road due to a hazardous condition. Additionally, if a person who ignores safety precautions and requires rescue, they will be subject to pay the full costs of fire, police and medical services required in the rescue. This law creates a further opportunity to build a public information initiative to catch the attention of drivers during rain events.

Objectives for Goal #4

1. Reduce the number of structures subject to flood inundation
2. Effectively manage stormwater and restore stream channels to reduce flooding.
3. Eliminate flooded conditions along the transportation system in the county
4. Reduce traveler injuries and fatalities during flood events
5. Continue to comply with the Federal Flood Insurance Program

These goals are consistent with the hazard mitigation goals formulated in Pennsylvania Hazard Mitigation Plan, Montgomery County Comprehensive Plan, and the general policies adopted by Commonwealth.

6.3 Identification and Analysis of Mitigation Techniques

There are four categories of mitigation actions. The relevancy of each action group to the hazards reviewed in the plan is shown in Table 6.3.1-1.

- **Local plans and regulation:** This includes government administrative or regulatory actions or processes that influence the way land and buildings are developed and built, and public activities to reduce hazard losses. Examples include planning, zoning, building codes, subdivision regulations, hazard-specific regulations (such as floodplain regulations), capital improvement programs, open space preservation, and stormwater regulations.
- **Structure and Infrastructure:** These are actions that involve modifying or removing existing buildings or infrastructure to protect them from a hazard. Examples include structure acquisition, elevation, relocation; retrofitting; flood-proofing; and shatter-resistant glass use. While this category predominantly includes techniques that constitute a “sticks and bricks” approach to property protection, it also includes insurance.
- **Public Education and Awareness:** Including actions to inform citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Examples include performing hazard mapping, implementing outreach projects, disseminating library materials, providing real estate disclosures, establishing hazard information centers, and developing educational programs for school-age children or for adults.
- **Natural Systems Protection:** This includes efforts to minimize hazard losses, and preserve or

restore the functions of natural systems. Examples include sediment and erosion control, stream corridor restoration, forest and vegetation management, wetlands restoration or preservation, slope stabilization, and historic property and archeological site preservation.

Table 6.3.1-1 | **General Hazard Mitigation Strategy Matrix**

Type	Local Plans and Regulations	Structure and Infrastructure	Public Education and Awareness	Natural Protection
Drought			x	x
Earthquake		x	x	
Extreme Temperature			x	
Flood, Flash Flood, Ice Jam	x	x	x	
Hailstorm			x	
Hurricane, Tropical Storm, Nor'easter	x		x	
Landslide	x	x	x	x
Lightning Strike			x	
Pandemic	x		x	
Radon Exposure		x	x	
Subsidence, Sinkhole	x		x	x
Tornado, Wind Storm			x	
Wildfire			x	
Winter Storm		x	x	
Building or Structural Collapse			x	
Civil Disturbance			x	
Dam Failure			x	
Cyber Security Disruption			x	
Environmental Hazard	x		x	x
Levee Failure			x	
Radiological Release Incidents			x	
Terrorism		x	x	
Transportation Crash		x	x	
Urban Fire and Explosion	x		x	
Utility Disruption		x	x	
Gun Violence	x		x	
Opioid Addiction	x		x	

6.4 Mitigation Action Plan

The Goals and Projects from the 2017 plan have all been included in the 2022 Action Plan. While a few have not yet been initiated, most are underway or have been completed and are being maintained. Information for each project is provided in the chart below including type, county priority, number, implementers, general time frame, budget, and overall description/status. Most of the listed projects propose actions that would provide county-wide benefits. As noted in the following chart, status has been indicated as follows: Recommended - action is recommended, but has not taken place at this time. Ongoing - action had been implemented at some level and will continue to be so. Complete - action has been done, though some sustained effort is underway to promote or maintain

Priorities were assigned to each action from a county perspective. Local municipalities may also choose to assign priorities to various projects. This may be helpful when a municipality has more than one project in their community. County priorities were based upon social, technical, administrative, political, legal, economic, and environmental criteria (STAPLEE) considerations along with the cost to benefit outcome and time for the county.

- **Social criteria.** The public must support the overall implementation strategy and specific mitigation actions.
- **Technical criteria.** Such factors as technical feasibility of the proposal to reduce losses over the long term with minimal secondary impacts.
- **Administrative criteria.** Anticipated staffing, funding, and maintenance for each mitigation action must be considered.
- **Political criteria.** The political leadership of the communities must support the overall implementation strategy and specific mitigation actions.
- **Legal criteria.** Implementing bodies must have the legal authority to undertake proposed actions.
- **Economic criteria.** Funding and budget constraints must be considered.
- **Environmental criteria.** Negative environmental impacts from actions must be avoided or be effectively mitigated.

Mitigation activity projects were also evaluated to the extent that they are able to maximize the benefits according to a cost/ benefit review. For example, low cost activities that support cross jurisdiction and multi-hazard benefits are assigned a high priority based upon a benefit cost review. Also, low cost activities that enhance public awareness or motivate actions to be taken by others in avoiding multiple hazards are considered high benefit cost priority. The STAPLEE Worksheets are included in Appendix R. Detailed economic benefit analysis for each activity is beyond the scope of this plan.

Goal #1: Develop a better understanding of the potential disasters that could occur in Montgomery County

Project Number	Municipal Priority	County Priority	Municipality	Project Type	Description/Status
<i>Objective 1a: Ensure that all key county and municipal officials and the public are aware of hazard mitigation</i>					
1a-1		High	Countywide	Conduct Annual Hazard Mitigation Plan Training	Ongoing - The Public Safety Department continues to offer a training class in the Hazard Mitigation Planning each year to municipal emergency management personnel and appropriate corporate and institutional personnel. (yearly at internal cost of \$5,000/yr.)
1a-2		Medium	Countywide	Hazard Mitigation Plan Availability	Complete - The 2017 Hazard Mitigation Plan is available in county libraries and on the website. The 2022 plan will be similarly distributed (year 1 at a cost of \$1,000)

Objective 1b: Improve overall awareness and information associated with potential threats to Montgomery County

1b-1		Medium	Countywide	Monitor and Map Rescue Attempts	Ongoing - Public Safety and Planning maintain rescue data. GIS tracking for all rescue attempts needed to assess problem areas. (begin year 1 at an internal cost of \$3,000)
1b-2		Medium	Countywide	Maintain GIS database of properties impacted by hazards	Ongoing - Public Safety and Planning maintain Repetitive Loss data. Additional hazard data for individual properties that are impacted by various hazards should be collected and mapped. (begin year 1 at an internal cost of \$8,000)
1b-3		Medium	Countywide	County Groundwater Network Monitoring	Complete/Ongoing - Department of Health continues to monitoring groundwater levels around the county. https://www.montcopa.org/561/Groundwater-Monitoring (yearly at an internal cost of \$8,000)
1b-4		Medium	Countywide	Riparian Corridor Forest Canopy Study	Ongoing - The Planning Commission continues to monitor all forest cover via aerial photography. Health monitoring should be undertaken for riparian areas. (every 10 years at a cost of \$16,000)
1b-5		Medium	Countywide	Fire Company Reporting	Ongoing - The county and municipalities should encourage all fire companies to report fire response information on PennFIRS. (on-going, no cost estimate)
1b-6		Low	Upper Merion, Plymouth, Cheltenham and Whitemarsh Townships	Sink Hole GIS Data Base Map	Complete/Ongoing - The Planning Commission, Public Safety Department and four primarily impacted municipalities have worked with the PA Geological Survey to establish a sinkhole GIS data base. Mapping is updated as needed (year 3-5 at an internal cost of \$4,000)
1b-7		High	Countywide	Building Information for GIS	Ongoing - Building footprint data has been acquired for the county. Aquisition of building footprints and first floor elevation data for flood prone areas of the county should be pursued. (3-5 year)
1b-8		Medium	Countywide	Monitoring and coordination	Ongoing - Public Safety maintains "WebCAD Active Incidents" (https://www.montcopa.org/264/Active-Incident-WebCAD)
1b-9		Medium	Countywide	Information Management	Ongoing - The county maintains a listing of specific mitigation projects including flood prone buildings to elevate or remove and drainage improvement projects.

Goal #2: Ensure that the public understands potential hazards and is aware of which actions to be taken to minimize their risks.

Project Number	Municipal Priority	County Priority	Municipality	Project Name	Description/Status
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Objective 2a: Make hazard mitigation a core value

2a-1		High	Countywide	Internet and Social Media Outreach	Ongoing - ReadyMontco for emergencies and disasters, and MontcoSAFER, alerts for employees and responders, are maintained through Everbridge. (on-going at an internal cost of \$10,000/ yr.)
2a-2		High	Countywide	Critical Facilities Addressing	Ongoing - Public Safety developed Smart911 that presents a Safety Profile to 911 staff when called. Periodic verification of locations and addresses of critical facilities continues. All critical facilities addresses should be shared with utilities to ensure that sites can be properly located for quick emergency utility restoration.

2a-3		Medium	Countywide	Flood Plain Evacuation Education	Complete/Ongoing - County and municipal websites and Everbridge communications inform residents in flood prone areas of the need to safely evacuate prior to flood conditions and not rely upon rescue services.
2a-4		High	Countywide	Emergency management plans	Ongoing - County Public Safety Department periodically confirms that all critical facilities in the county have up-to-date emergency response plans in place and their occupants are aware of potential hazards that could affect them. (each year at an internal cost of \$5,000)
2a-5		High	Countywide	Hazard Awareness promotion	Ongoing/Should be expanded - Public Safety, Department of Health, Communications, and Planning participate in various community and youth events to promote hazard awareness and distribute the Emergency Preparedness guide. Additional opportunities should be identified. (yearly at an internal cost of \$5,000)
2a-6		Medium	Countywide	Public Awareness/Warning - Radon	Ongoing - The Department of Health should coordinate with the PADEP to promote radon awareness. (yearly at \$5,000/yr.)
2a-7		Medium	Countywide	Public Awareness/Warning	Recommended - Public Safety and Planning, working with the municipalities and the National Weather Service, should investigate technology that can better predict flash floods. (year 3-5 no budget)
2a-8		Medium	Countywide	Citizens Corps	Recommended - Public Safety should promote opportunities for people to participate in a range of measures to make their families, their homes, and their communities safer from the threats of crime, terrorism, and disasters of all kinds.

Objective 2b: Improve warning systems that reach all county residents and travelers through the county

2b-1		Medium	Countywide	Expand use digital contact warning systems	Complete/Ongoing - Public Safety has expanded the use of Everbridge and Smart 911 App for emergency warnings and weather information to Emergency Response personnel, residents, businesses, institutions, and visitors to the county.
2b-2		Medium	Countywide	Special Needs Population	Ongoing - The county continues to encourage special needs persons to sign up with the county Everbridge communication system.
2b-3		Medium	Countywide	Enhance Obedience to Hazardous Conditions Control Device Law	Recommended - Municipal and State police should enforce the law establishing penalties for ignoring hazardous condition control devices. Education and outreach about the law should also be provided to prevent public from driving around public safety barriers (on-going, no budget)
2b-4		Medium	Countywide	Warning Signage	Ongoing/Recommended - Municipalities should continue to install signage on roads and public properties to explain potential hazard conditions such as road flooding. (year 1, overall cost of \$50,000-\$100,000)
2b-5		High	Countywide	Public Awareness/Warning	Recommended - Public Safety and Communications, working with various business organizations should establish a county-wide education program for commuters to better educate them about driving in the county during flood conditions. (year 3, no cost estimate)
2b-6		High	Regional	Public Awareness/Warning	Recommended - Public Safety and Communications should develop a plan to improve coordination with neighboring counties and municipalities adjacent to county borders. This would include insuring compatibility among the communication systems of various emergency response agencies.

Goal #3: Significantly reduce the risk of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from all hazards

Project Number	Municipal Priority	County Priority	Municipality	Project Type	Description/Status
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Objective 3a: Ensure that new buildings are constructed and maintained in a manner in which they remain resistant to damage from hazards

3a-1		High	Countywide	Continue to enforce building codes	Recommended - Municipal code officials should receive annual training and resources (related to building resiliency and mitigation of structures) to effectively enforce building codes. (yearly, no budget)
3a-2		Medium	Countywide	Building Code modernization	Complete - The county and municipalities advocated for adoption of revisions to the 2018 International Construction Code as part of the state Uniform Construction Code. Other model codes, such as the International Fire Code, should be promoted.

Objective 3b: Reduce the occurrences and impact of power outages

3b-1		High	Countywide	Coordination during utility outages	Ongoing - The County Public Safety Department should work with municipal emergency coordinators and representatives of power companies to improve the flow of information about power outages. (during storm events, internal cost of approximately \$25,000/ year)
3b-2		Medium	Countywide	Landscaping Ordinance	Under Revision - The Planning Commission is revising its model ordinance for landscaping and tree protection to aid municipalities. (year 2-4 at an internal cost of \$10,000)
3b-3		Medium	Countywide	Landscaping	Ongoing as part of Development Reviews - The County Planning Commission should work with municipalities to ensure that all proposed vegetation near power lines complies with appropriate design requirements to avoid interference with electrical transmission.
3b-4		Medium	Countywide	Emergency Power Supply	Recommended - Emergency managers should work to ensure that all critical facilities have adequate back up power supplies with sufficient fuel to energize critical electrical power needs for at least two weeks during a utility power outage.

Objective 3c: Reduce the potential impact from dam failure

3c-1		Medium	Countywide	Dam Safety	Recommended - Public Safety should coordinate with the Department of Environmental Protection (DEP) to ensure that the Emergency Action Plans for the significant dams in the county are available and up to date. (yearly at an internal cost of \$5,000)
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Objective 3d: Reduce the occurrences of transportation crashes

3d-1		Medium	Countywide	Transportation Safety Design	Ongoing - Planning should promote transportation safety in design reviews of new developments. (on-going at an internal cost of \$5,000)
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Objective 3e: Reduce the occurrences of terrorist and civil disturbance actions

3.00E-01		High	Countywide	Philadelphia Regional Counter Terrorism Task Force	Ongoing/Expanded - Public Safety works through the Southeastern Pennsylvania Regional Task Force to address Terrorism threats and response. The Task Force's focus has broadened to include an all-hazards approach. (on-going at an internal cost of \$5,000)
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3.00E-02		Medium	Countywide	Tactical Weapon Training	Ongoing - The Public Safety Department working with the Police Chiefs Assn. should continue various tactical weapon training. (on-going, no budget)
3.00E-03		Medium	Countywide	Civil unrest response training	Ongoing - Emergency Response Team members receive 300 hours of specialized training (Special Weapons and Tactics (SWAT), response to active shooter incidents, counter-terrorism and weapons of mass destruction)

Objective 3f: Reduce the occurrence and impact of hazard material release incidents

3f-1		Medium	Countywide	Hazardous Material Emergency Response	Ongoing - Public Safety should continue to offer various types of training to first responders and other business personnel in addressing hazardous material. (yearly at an internal cost of \$10,000)
3f-2		Medium	Countywide	Hazardous Waste Collection	Ongoing - Montgomery County should continue to provide household hazardous waste collection events. (4-6 collection events per year at a total cost of \$400,000 to \$500,000). The development of a permanent collection site is being pursued at one or more sites around the county.

Objective 3g: Reduce the potential for landslides

3g-1		Low	Countywide	Steep Slope Ordinances	Ongoing - The Planning Commission should offer assistance to municipalities in developing land use controls to limit development in steep slope areas, including development of a model Steep Slope Ordinance. (year 3-5 at an internal cost of \$7,000)
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Objective 3h: Reduce the impact of drought

3h-1		Medium	Countywide	Water Supply interconnections	Ongoing - The Planning Commission and Department of Health, along with the municipalities should work with public water suppliers to ensure that water service systems are interconnected to allow for the transfer of water during a drought.
3h-2		High	Countywide	Drought Task Force	Ongoing - The Department of Health should continue to convene the Water Resources Task Force.
3h-3			Countywide	Well Development Standards	Recommended - The county should advocate for passage of a state-wide well construction law to ensure the proper development of all water supply wells.

Objective 3i: Reduce the impact of a nuclear incident in the county

3i-1		High	Limerick EPZ	Limerick Power Station EPZ evacuation	Ongoing - Public Safety should ensure that the evacuation plans for the Limerick Power Station are up-to-date
3i-2		High	Limerick EPZ	Limerick Power Station	Ongoing - Public Safety and municipal officials, along with state and federal officials should continue the nuclear incident training exercises at the Limerick Power Station

Objective 3j: Reduce fatalities and injuries caused by extreme heat and cold events

3j-1		Medium	Countywide	Heat and Cold Warnings	Ongoing - The County Commissioners should continue issuing code red and code blue warnings for extremely hot and cold weather. (on-going, no budget)
3j-2		Medium	Countywide	Sensitive Population Services	Ongoing - Health and Human Services will continue to coordinate various services to sensitive population groups to reduce the health impacts associated with extreme weather conditions.
3j-3		Medium	Countywide	Sensitive Population Services	Ongoing - Health and Human Services, Planning, and DVRPC should address heat island and flooding impacts to disadvantaged neighborhoods (https://www.montco-pa.org/3942/Climate-Change-Potential-Vulnerability-A)

Objective 3k: Reduce building and infrastructure damage and loss of life caused by land subsidence

3k-1		Medium	Upper Merion, Plymouth, Whitmarsh and Cheltenham Townships	Sinkhole prevention	Recommended - Municipalities in limestone and dolomite geological areas should adopt and maintain zoning and stormwater ordinances that address the potential for sinkhole formation. Also, municipalities should be aware that aging infrastructure can lead to leaking pipes and sinkhole formation.
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Objective 3l: Minimize the impact of winter storms on infrastructure and safe travel

3l-1			Countywide	Snow and Ice removal	Recommended - PADOT, the PA Turnpike Commission, Roads and Bridges, and each municipality should continue to maintain sufficient capacity for the removal of snow and the treatment of roads to ensure safe travel during winter storm events.
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Objective 3m Reduce the impact from a pandemic in the county

3m-1		Medium	Countywide	Medical Staff Training	Recommended - Evaluation of operations during the Covid-19 pandemic should identify specific actions to be taken in advance of future pandemics. Emergency medical staff should be provided first receiver training to understand how to manage mass casualty patients who dropped off directly at hospital facilities without being prescreened by emergency medical technicians.
3m-2		Medium	Countywide	Pandemic Plan Update	Recommended - The Department of Health, and Public Safety should update county pandemic plan

Objective 3n: All critical facilities and infrastructure should continue to function during various hazard events

3n-1		Medium	Countywide	County and municipal facilities hazard evaluation	Recommended - Assets and Infrastructure, and all municipalities should inventory all essential government properties for hazard vulnerability and establish a plan to address found vulnerabilities. (year 1, internal cost estimate of \$15,000 for county portion)
3n-2		Medium	Countywide	Emergency Preplan	Recommended - Public safety professionals in the county should continue to develop and update existing preplans for high hazard chemical facilities, rail lines and yards, and major highways. (on-going, no budget)
3n-3		Medium	Countywide	Critical Infrastructure design	Recommended - All municipalities, Assets and Infrastructure, and other public service entities should ensure that all infrastructure is designed to function safely during severe weather events
3n-4		Medium	County Government	Critical Infrastructure design	Ongoing - Permitting of a hydroelectric facility is being pursued for the Norristown Dam. The potential for this dam to provide electric service to the courthouse complex via a microgrid should be investigated to provide a sustainable and resilient source of power for operation during storm outages

Goal #4: Encourage and promote actions to minimize the impact of floods within the county.

Project Number	Municipal Priority	County Priority	Municipality	Project Type	Description/Status
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Objective 4a: Reduce the number of structures subjected to flood inundation.

4a-1		High	All with flood damage	Acquire and remove homes in floodplain	Ongoing - Public Safety, and municipalities should work to remove homes in the floodplain that have sustained damage from past floods through voluntary buyout programs. Various sources of funding should be sought for this action. (Immediately as funding opportunities arise.) Repetitive loss and severe repetitive loss properties should be considered priorities for removal. Potential projects listed in Table 6.4.1-1
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4a-2		Medium	All with flood damage	Elevation/ Flood Proofing	Ongoing - Public Safety, and municipalities should seek to direct financial assistance to residents to elevate homes in the floodplain that have sustained damage from past floods. This option should only be pursued if removal is infeasible and safe ways to access the elevated structure during hazard events exist. (Immediately with any disaster declaration funding projects, budget based upon estimated elevation costs). All repetitive loss and severe repetitive loss properties should be considered priorities for elevation when removal is not feasible) Potential projects listed in Table 6.4.1-1
4a-3		Low	Countywide	Innovative land use tools to reduce development in flood prone areas	Recommended - Planning Commission should work with municipalities to develop land use tools to encourage the removal of buildings within flood plain areas. (Year 2,3, internal cost estimate at \$5,000)
4a-4		Medium	Countywide	Repetitive Loss Property Data	Ongoing - Planning Commission shall review and recommend corrections to the listings of repetitive Loss Property Data
4a-5		Medium	Countywide	General Floodplain data	Recommended - Planning Commission will encourage municipal websites to provide flood information for county residents: links to FEMA's Map Service Center, the National Flood Insurance Program (NFIP), and the county's community warning system, ReadyMontco

Objective 4b: Effectively manage stormwater and improve stream channels to reduce flooding

4b-1		High	Various Municipalities	Flood Control Structures and channel improvements	Ongoing - Municipalities are encouraged to construct flood control structures, stormwater detention basins, and channel improvements in appropriate locations in accordance with county model floodplain ordinance requirements to protect developed sections of the floodplain downstream where relocation is infeasible. Other potential projects should be considered to stabilize roads, sanitary sewer, and other infrastructure (a flood study in the Perkiomen Creek watershed has been proposed.).
4b-2		Low	Riverfront Communities	Public Awareness/ Warning	Ongoing - Public Safety, and municipalities should educate residents along the Schuylkill River about warning system opportunities. (3-5 year with an internal budget of \$5,000)
4b-3		Low	Countywide	Stormwater basin effectiveness study	Recommended - Planning should work with municipalities and other organizations to study the effectiveness of stormwater basins in the county or a portion of the county. A study has been proposed to identify stormwater planning and facilities deficiencies (year 3-5 with an internal cost of \$15,000)
4b-4		High	Countywide	Stream corridor management	Recommended - Municipalities and PADOT should routinely inspect and maintain stream corridors, drainage ways, drainage structures, stormwater basins, bridges, and culverts to identify and remove, if possible, impediments to flood flow. (yearly or more frequently depending upon conditions, costs dependent upon level of debris)
4b-5		High	Countywide	Stream corridor Natural Resources Protection	Ongoing - Municipalities and the county should continue to preserve open space along the Schuylkill River and along stream corridors. (the county has approved funding capital funds for open space projects, some municipalities have separate open space funding initiatives)
4b-6		High	Countywide	Countywide Land Use Management	Ongoing - Planning and the 62 municipalities and 4 planning regions, should promote stormwater low-impact development in accordance with local and county comprehensive plans. (ongoing, no budget established)

4b-7		High	Countywide	Stormwater Management	Ongoing - Planning should complete/maintain stormwater management plans for all designated watersheds if state funding is provided. ARPA funds acquired for match in grant applications (year 1, \$400,000)
4b-8		Low	Countywide	Drainage	Recommended - Planning, and municipalities should investigate ways to coordinate stormwater release rates to better coordinate flood control efforts at a local and watershed level. (year 3-5, no budget)
4b-9		Medium	Countywide	Flood Studies	Ongoing - Public Safety, Planning, municipalities, and other organizations should develop appropriate studies to analyze local hydrological and hydraulic conditions to better define flood mitigation opportunities. A scope of work is being developed for the Perkiomen Creek Flood Study with some funding from PADEP. Additional funding should be sought for plan preparation and implementation. (year 2 - 5)
4b-10		High	Countywide	Drainage and Infrastructure Projects	Recommended - Municipalities should develop and implement projects to reduce localized flooding as identified in municipal survey responses.
4b-11		Medium	Countywide	Act 167 funding	Ongoing - The county should lobby for adequate state funding for the Stormwater Management Planning in accordance with Act 167.
4b-12		Medium	Countywide	Stream bed management	Ongoing - The county should advocate for an expeditious permitting process to allow municipalities to clean out accumulated silt and gravel bars and other debris that impact stream flow.
4b-13		High	Countywide	Montco 2040 Implementation Grant Program	Ongoing - Planning should continue to provide grant funding to municipalities to make targeted physical improvements that address the goals of the county's comprehensive plan, including adaptation and resiliency through projects such as floodplain mitigation, streambank restoration, green streets, and community gardens.

Objective 4c: Eliminate flooded conditions along the transportation system in Montgomery County

4c-1		Medium	Countywide	PENNDOT Road improvements	Ongoing - Montgomery County should encourage PENNDOT to make road and bridge improvements to minimize the impact of flooding.
4c-2		High	Countywide	County Bridge maintenance	Ongoing - Assets and Infrastructure should inspect county bridges periodically and after major storm events to ensure that there is no blockage to flood waters. (yearly and potentially more frequently, \$15,000 internal cost for inspections)
4c-3		Medium	Schuylkill River Communities	Schuylkill River Flood Level Markers	Recommended - Public Safety, and municipalities should investigate the feasibility of placing visible flood markers with elevation points along the Schuylkill River to assist local public safety personnel in making decisions about road closures. Other visible markers should be placed at critical stream crossing and bridges throughout the county. (year 3-5, no budget)

Objective 4d: Reduce traveler injuries and fatalities during flood events.

4d-1			Countywide	Road Closure Barriers and Gates	Ongoing - Public Safety, and municipalities should work to install appropriate and uniform barrier systems including keyed gate structures, at roads to be closed during flood events. The design and location of these facilities should prevent interference with adjoining electric transmission lines. (year 2-5, \$1 million)
4d-2		High	Lower Wissahickon Creek Communities	Safe Flood Routes	Recommended - Public Safety, Planning, DVRPC, and municipalities should work to develop a commuter safe route system study for the Lower Wissahickon Creek Area. (budget \$50,000)
4d-3		High	Countywide	Emergency Routing Information	Recommended - County and local emergency management personnel should cooperate with on-line traffic routing information services to broadcast critical transportation information during local disasters.

Objective 4e: Continue to comply with the National Flood Insurance Program

4.00E-01		High	Countywide	Flood Plain Model Ordinance	Ongoing - Planning and the Conservation District should promote the model floodplain ordinance for use by municipalities during ordinance updates. 61 municipalities adopted the original model or a variation of it. (year 1-2, internal cost of \$10,000)
4.00E-02		Medium	Countywide	Federal Flood Insurance	Ongoing - Public Safety, and Planning should promote participation in the Federal Flood Insurance Program. (on-going, no budget)
4.00E-03		Medium	Selected Municipalities	Federal Flood Insurance	Ongoing - The County Planning Commission should work with selected municipalities to become eligible for inclusion in the Community Rating System (CRS)
4.00E-04		Medium	Countywide	Federal Flood Insurance	Ongoing - Municipal code officers should participate in training on administering the floodplain ordinance

* Recommended - action is recommended, but has not taken place at this time. Ongoing - action had been implemented at some level and will continue to be so
Complete - action has been done, though some sustained effort is underway to promote or maintain

Table 6.4.1-1 | Potential Structure Elevation and Removal Projects

Municipality	General Location
Abington Township	Houses within the 500 block of WANAMAKER RD
Abington Township	House(s) within the 800 block of LLANFAIR RD
Abington Township	House(s) within the 100 block of MEETINGHOUSE RD
Abington Township	House(s) within the 2700 block of ROSSITER AVE
Ambler Borough	House(s) within the 100 and 400 Block of S MAIN ST
Ambler Borough	House(s) within the Unit Block of TENNIS AVE
Ambler Borough	House(s) within the Unit block of E BUTLER AVE
Bridgeport Borough	House(s) within the 200 block of DEKALB ST
Cheltenham Township	House(s) within the 200 block of CHURCH RD
Cheltenham Township	House(s) within the 8000 block of HIGH SCHOOL RD
Cheltenham Township	House(s) within the 500 Block of SHOEMAKER RD

Municipality	General Location
Cheltenham Township	House(s) within the unit block of NORTH AVE
Cheltenham Township	House(s) at the 800 block of GLENSIDE AVE
Collegeville Borough	House(s) on 1ST AVE
Collegeville Borough	House(s) within the 100 block of CHESTNUT ST
Conshohocken Borough	House(s) on WASHINGTON AVE
Conshohocken Borough	House(s) within the unit block of COLWELL LN
Hatboro Borough	House(s) within the unit and 300 block of HORSHAM RD
Hatboro Borough	House(s) within the 300 block of S YORK RD
Hatboro Borough	House(s) within the 300 block of S YORK RD
Hatboro Borough	House(s) within the unit block of MILL RD
Hatboro Borough	House(s) within the unit block of DRUMMERS WAY
Hatboro Borough	House(s) within the 500 block of S WARMINSTER RD
Hatfield Township	House(s) within the unit block of E BROAD ST
Hatfield Township	House(s) within the 2700 block of LENHART RD
Horsham Township	House(s) within the 200 block of MCKEAN RD
Horsham Township	House(s) within the 100 block of WOODLAWN AVE – between BLAIR MILL RD & the dead-end.
Horsham Township	House(s) within the 300 block of SUMMER AVE – between WOODLAWN AVE & LEARY DR
Horsham Township	House(s) within the 300 block of COTTAGE AVE – between SUMMER AVE & HORSHAM RD
Horsham Township	House(s) on GARDEN AVE – in the area of GARDEN AVE & SUMMER AVE
Horsham Township	House(s) on LEARY DR – in area of LEARY DR & SUMMER AVE (Leary Trailer Park – Manufactured homes)
Horsham Township	House(s) within the 300 Block of OLIVE AVE – between LEARY DR & LAUREL AVE
Horsham Township	House(s) on Laurel AVE – in the area between LAUREL AVE/OLIVE AVE to EASTON RD
Horsham Township	House(s) on BIRCH AVE – in the area of BIRCH AVE & EASTON RD
Horsham Township	House(s)/Properties on HORSHAM RD – between EASTON RD & DRESHER RD
Horsham Township	House(s) on Old Mill RD – between DRESHER RD & the dead-End
Horsham Township	House(s) on Blair Mill Road – between HOME RD & CRESTVIEW AVE
Horsham Township	House(s) on Home Road – in the area of HOME RD & BLAIR MILL RD
Horsham Township	House(s) on Colonial Road – between COACH RD & the dead-End
Horsham Township	House(s) on Coach Road – in the area of WITMER RD & COACH RD
Horsham Township	House(s) on Lamplighter Road – in the area of WITMER RD & LAMPLIGHTER RD
Horsham Township	House(s) on DAVIS GROVE RD – between KEITH VALLEY RD & the bridge over Park Creek
Lower Frederick Township	House(s) within the unit block of MAIN ST

Municipality	General Location
Lower Gwynedd Township	House(s) within the unit block of MILL RACE
Lower Merion Township	House(s) within the 1200 block of W WYNNEWOOD RD
Lower Merion Township	House(s) within the 200 block of RIVER RD
Lower Moreland Township	House(s) within the 2300 block of VALLEY RD
Lower Moreland Township	House(s) within the 200 block of CLEARVIEW AVE
Lower Providence Township	Hosue(s) in the 3500 and 3600 block of ARCOLA RD
Lower Providence Township	House(s) within the 1500 block of GERTRUDE ST
Lower Providence Township	House(s) within the unit block of INDIAN HEAD AVE
Lower Providence Township	House(s) within the 1500 block of PAWLINGS RD
Lower Providence Township	House(s) within the 200 block of PINETOWN RD
Lower Providence Township	House(s) within the 100 block of TYSON MILL RD RR 2
Lower Providence Township	House(s) on GETRUDE AVE
Municipality of Norristown	House(s) within the unit block of DEKALB ST
Municipality of Norristown	Building at the 500 block of W WASHINGTON ST
Perkiomen Township	Houses within the unit block of SKIPPACK PIKE
Plymouth Township	Building within the 200 block of W GERMANTOWN PIKE
Skippack Township	House(s) within the 4900 SKIPPACK PIKE
Springfield Township	House(s) within the unit block of BROOKSIDE RD
Towamencin Township	House(s) within the 1600 block of OLD FORTY FOOT RD
Upper Dublin Township	House(s) within the 300 block of RANDOLPH AVE
Upper Dublin Township	House(s) within the 1300 block of S BETHLEHEM PIKE
Upper Dublin Township	Buildings on VIRGINIA DR
Upper Merion Township	House(s) within the 1000 block of JONES RD
Upper Moreland Township	House(s) within the 500 block of S WARMINSTER RD
Upper Moreland Township	House(s) within the unit block of HORSHAM RD
Upper Moreland Township	House(s) within the 800 block of S YORK RD
Upper Moreland Township	House(s) within the unit block of BONNET LN
Upper Providence Township	House(s) within the 200 and 300 block of CANAL ST
Upper Providence Township	House(s) within the 300 and 400 block of HOLLOW RD
Upper Providence Township	House(s) within the 400, 800, and 900 block of PORT PROVIDENCE RD
Upper Providence Township	House(s) within the 100 block of WALNUT ST
Upper Providence Township	House(s) within the 400 block of LOWER INDIAN HEAD RD
Upper Providence Township	House(s) within the unit block of YERKES RD

Municipality	General Location
Upper Providence Township	House(s) with the 100 block of W 1ST AVE
Upper Providence Township	House(s) within the unit block of BROWER AVE
West Norriton Township	House(s) within the unit block of EAST and WEST INDIAN LA
Whitemarsh Township	House(s) within the 400, 500, and 700 block of S BETHLEHEM PIKE
Whitemarsh Township	House(s) within the unit block of MILITIA WAY
Whitemarsh Township	House(s) within the 400 block of MILITIA HILL RD
Whitemarsh Township	House(s) within the unit block of STENTON AVE
Whitemarsh Township	House(s) within the 6200 block of W VALLEY GREEN RD
Whitemarsh Township	Buildings within the 500 block of PENNSYLVANIA AVE

Table 6.4.1-2 | **Potential Flood Drainage Improvement Projects**

Municipality	Flood Drainage Improvement Areas
Ambler Borough	6 area drainage improvements identified in the 2014 Stormwater Plan by Temple University
Abington Township	Various drainage improvements listing in the capital budget starting on page 365
Cheltenham Township	Construct Flood Control Dams identified in the USACOE study
Cheltenham Township	Replacement of Sewer Main along Tookany Creek and bank stabilization work
Lower Merion Township	Dredge Remington Avenue Stormwater Basin
Municipality	Flood Drainage Improvement Areas
Pottstown Borough	Replace large arch culverts subject to collapse
Pottstown Borough	Expand capacity of Culvert in the 300 block of HANOVER ST
Schwenksville Borough	Expand capacity of culvert on CENTENNIAL ST
Whitpain Township	Drainage improvements on the 1700 Block of YOST RD
Whitpain Township	Drainage improvements on STENTON AVE between PENLLYN BLUE BELL PIKE and WALTON RD

Plan Maintenance

7.1 Update Process Summary

The current plan update is based on information available to the county at the time it was prepared. As new information becomes available or as new opportunities emerge, the plan may need to be reevaluated and revised. As with any plan, this document is meant to be used and revised to remain relevant and responsive to the hazard mitigation needs of the county and each municipality.

7.2 Monitoring, Evaluating, and Updating the Plan

The Montgomery County Public Safety Department and Planning Commission will work with each municipality to maintain this plan. This process will be coordinated by Public Safety and Planning Commission staff working through the Hazard Mitigation Plan Committee which will meet twice a year and after significant disasters to evaluate the relevancy and effectiveness of the plan. Meeting minutes documenting progress towards implementing actions identified in the plan will be submitted to PEMA and FEMA after each bi-annual meeting of the Hazard Mitigation Plan Committee. Municipalities will be periodically surveyed as part of the plan update process. Critical issues to evaluate periodically include, but are not limited to, the following:

- Information gathering and documentation of improvements of risk and capability data and mitigation strategies progress or alterations.
- Relevancy of the plan goals
- Changes in the availability of technical information and tools to evaluate disaster vulnerability
- Changes to GIS mapping tools to improve the ability to evaluate flood risk vulnerability
- Changes in local capabilities or resources to address mitigation needs
- Impact of natural disasters and potential mitigation actions
- Problems or changes in the implementation of recommended actions

Based upon their review, the planning committee may initiate a revision to the plan to make changes to the recommendations, project prioritization, hazard vulnerability characterization, or substantially alter key analyses included in the plan. At a minimum, the county recognizes its obligation to revise the plan at five year intervals. The plan revision process would include the full involvement of each municipality and the public.

In the plan maintenance and evaluation process, the county will utilize forms consistent with the forms provided by FEMA. These forms address many of the factors described above.

7.3 Incorporation into Other Planning Mechanisms

The previous plan was made part of the county's overall emergency management plans and summarized in the Montgomery County Comprehensive Plan which was adopted in 2015. Other relevant county and municipal policy documents will also reference the plan as appropriate. The Public Safety Department and Planning Commission will work with each of the 62 municipalities to ensure that the recommendations of this plan is incorporated into various local policies, programs and plans.

61 of the 62 Montgomery County municipalities have a comprehensive plan that is used to guide actions taken in determining future land use, infrastructure development, park and recreation facilities expansion and development, and in the establishment of various public facilities and programs servicing the municipality among other things. The Pennsylvania Municipalities Planning Code, initially adopted in 1968, establishes requirements for the content of a comprehensive plan and for the process to develop one. Furthermore Section 301(c) of the MPC requires municipalities to review their comprehensive plans every 10 years. Section 603 (j) requires municipalities to adopt zoning ordinances that are generally consistent with their adopted comprehensive plans.

As municipalities review their comprehensive plans, they should incorporate strategies for making their communities more resilient to future threats as described in this Hazard Mitigation Plan. The Montgomery County Planning Commission will also incorporate elements of the 2017 Hazard Mitigation Plan in updates to the Montgomery County Comprehensive Plan.

Under the MPC, the Montgomery County Planning Commission and local municipal planning commissions established in all Montgomery County municipalities are given the opportunity to review and comment on all proposed actions involving changes in comprehensive plans, zoning ordinances, subdivision and land development ordinances, and proposed subdivisions and land development plans. During this review process, the Montgomery County Planning Commission will specifically address the compliance of the proposed action with the 2017 Montgomery County Hazard Mitigation Plan as well as generally good practice in improving local community resiliency to future threats. Additionally, the Montgomery County Planning Commission provides direct planning consultancy in over half of the municipalities in the county and in all of the four regional planning commissions. Planners serving these municipalities will also work closely to ensure that the 2017 Montgomery County Hazard Mitigation Plan is used to guide municipal policy.

7.4 Continued Public Involvement

Copies of the plan will be made available on the Montgomery County internet site. Paper copies of it will also be disseminated. Future community meetings will be held as needed to discuss the plan. Appropriate county personnel will be available for periodic presentations to the public, municipal officials, and various service groups to discuss hazard mitigation. The Public Safety Department and County Planning Commission will continue to use social media to promote the plan and expand public awareness of it.

Plan Adoption

8.1 County Plan Adoption

The Montgomery County Board of Commissioners adopted the plan on _____. The commissioners' adoption resolution is included in Appendix TBD.

8.2 Municipal Plan Adoption

The model municipal adoption ordinance is included in Appendix TBD. This model is offered to assist municipalities in the adoption process. County staff was available to visit each municipality to present the plan update to their governing body as part of the adoption process.

Appendices

- A** Bibliography
- B** Local Mitigation Plan Review Crosswalk
- C** Public Involvement
- D** Emergency Declarations
- E** Critical Facilities
- F** Mitigation Action Progress Report Form
- G** STAPLEE Forms
- H** County Resolution
- I** Municipal Resolution
- J** Municipal Contracts

Appendix A – Bibliography

The following American Planning Association (APA) guides and reference documents were used to prepare this document:

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 - APA, PAS Report 576 Planning For Post-Disaster Recovery: Next Generation – March, 2015
 - APA, PAS Report 584 Subdivision Design And Flood Hazard Areas - October, 2016
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LOCAL MITIGATION PLAN REVIEW TOOL HHPD FY2020

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

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

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

Jurisdiction: Montgomery County, Pennsylvania	Title of Plan: Montgomery County 2022 Hazard Mitigation Plan Update	Date of Plan: 3-13-23
Local Point of Contact: Drew Shaw	Address: Montgomery County Planning Commission One Montgomery Plaza Suite 201 425 Swede Street Norristown, PA 19401	
Title: Environmental Planning Section Manager		
Agency: Montgomery County Planning Commission		
Phone Number: (610) 278-3733	E-Mail: drew.shaw@montgomerycountypa.gov	

State Reviewer: Ernest Szabo Telephone: (717) 651-2159 Email: erszabo@pa.gov	Title: PEMA State Hazard Mitigation Planner	Date:
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FEMA Reviewer:	Title:	Date:
Date Received in FEMA Region (insert #)		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

SECTION 1: REGULATION CHECKLIST

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

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
ELEMENT A. PLANNING PROCESS				
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1))		Section 3, <i>Planning Process</i> , pgs. 29-35		
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))		Section 3.2, <i>The Planning Team</i> , pgs. 29-30 Section 3.3, <i>Meetings and Documentation</i> , pgs. 31-32 Appendix C		
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))		Section 3.4, <i>Public & Stakeholder Participation</i> , pg. 32 Section 3.5, <i>Multi-Jurisdictional Planning</i> , pgs. 32-35		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))		Section 1.4, <i>Authority and Reference</i> , pgs. 2-3 Section 2.5, <i>Land Use and Development</i> , pgs. 24-37 Section 5.3, <i>Planning and Regulatory Capability</i> , pgs. 136-148 Section 5.3.8, <i>Plan Integration</i> , pg. 155		
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))		Section 7, <i>Plan Maintenance</i> , pgs. 181-182		
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))		Section 7.2, <i>Monitoring, Evaluating, and Updating the Plan</i> , pgs. 181-182		
<u>ELEMENT A: REQUIRED REVISIONS</u>				
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT				
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i))		Section 4.2, <i>Hazard Identification</i> , pgs. 34-40. Section 4.3, <i>Hazard Assessment</i> pgs. 40-131		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))		Section 4.3, <i>Hazard Assessment</i> , pgs. 40-131.		
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))		Section 4.3, <i>Hazard Assessment</i> , pgs. 40-131.		
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))		Section 4.3.9, <i>Flooding</i> , pgs. 71-77, Section 5.3.3, pg. 152, Chapter 6, <i>Mitigation Strategy</i> pgs. 174-175		
<u>ELEMENT B: REQUIRED REVISIONS</u>				
ELEMENT C. MITIGATION STRATEGY				
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3))		Section 5.3 <i>Capability Assessment</i> , pgs. 136-148 Section 5.3.4. <i>Planning and Regulatory Capability</i>		
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii))		Section 4.3.9, <i>Flooding</i> , pgs. 71-77 Section 5.3.3, <i>Participation in the National Flood Insurance Program</i> , pg. 152, and Tables 5.3.1-3, pgs. 147-148 <i>NFIP Compliance</i>		
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))		Section 6.2, <i>Mitigation Goals and Objectives</i> , pgs. 158-167		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii))		Section 6.4, Mitigation Action Plan, pgs. 169-180		
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))		Section 6.4, Mitigation Action Plan, pg. 169		
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))		Section 5.3, Charts 5.3.1 and 5.3.2, pgs. 136-146		
<u>ELEMENT C: REQUIRED REVISIONS</u>				
ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)				
D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3))		Section 2.2, Community Infrastructure pgs. 16-19 Section 2.4 Populations and Demographics pgs. 19-22 Section 4.2 Hazard Identification, pgs. 46, 50, 56, 60, 63, 71, 77, 83, 85, 87, 90, 95, 98, 101, 103, 11, 115, 119, 123, 130		
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))		Section 5.3.2, Emergency Management, pgs. 148-152 Section 6.1, Update Process Summary, pg.157		

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))	Section 4.2, Hazard Identification pgs. 38-40 Section 6.4 Mitigation Action Plan, pgs. 164-177			
ELEMENT D: REQUIRED REVISIONS				
ELEMENT E. PLAN ADOPTION				
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))	Once approved by PEMA/ FEMA, Montgomery County will adopt the Plan by resolution, Section 8.1, County Plan Adoption, pg. 183			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))	Municipalities will adopt the plan by resolution, Section 8.2, Plan Adoption, pgs. 183			
ELEMENT E: REQUIRED REVISIONS				
OPTIONAL: HIGH HAZARD POTENTIAL DAM RISKS				
HHPD1. Did Element A4 (planning process) describe the incorporation of existing plans, studies, reports, and technical information for eligible high hazard potential dams?	Section 2.2, Community Infra-structure, pg. 17			
HHPD2. Did Element B3 (risk assessment) address eligible high hazard potential dams in the risk assessment?	Section 4.3.4-1, Loca-tion and Extent, pg. 53			
HHPD3. Did Element C3 (mitigation goals) include mitigation goals to reduce long-term vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?	Section 6, Mitigation Goals and Objective, Goal #3, Obj. 3c pg. 172			

1. REGULATION CHECKLIST		Location in Plan (section and/or page number)	Met	Not Met
Regulation (44 CFR 201.6 Local Mitigation Plans)				
HHPD4. Did Elements C4-C5 (mitigation actions) address HHPDs prioritize mitigation actions to reduce vulnerabilities from eligible high hazard potential dams that pose an unacceptable risk to the public?				
<u>REQUIRED REVISIONS</u>				
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)				
F1.				
F2.				
<u>ELEMENT F: REQUIRED REVISIONS</u>				

SECTION 2: PLAN ASSESSMENT

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

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

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

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

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

A. Plan Strengths and Opportunities for Improvement

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

Element A: Planning Process

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

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

Element B: Hazard Identification and Risk Assessment

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

- 1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
- 2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
- 3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

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

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

Element C: Mitigation Strategy

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

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

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

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

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

B. Resources for Implementing Your Approved Plan

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

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

Montgomery County HMP Update Advisory Committee

Name:	Agency:	Name:	Agency:
Sara Schmidt	LGS	Montgomery County Departments and Representation	
Suzanne Ryan	PECO	Drew Shaw	MCPC
Phil Joel	PECO	Jon Leshner	MCPC
Jessica Buck	Montgomery County Conservation District	Ellis Foley	MCPC
		Donna Fabry	MCPC
Ross Snook	Master Watershed Steward - Penn State Ext	Joe Anna Haelig	MCDPS
Tom McAneney	Abington EMC	Jason Wilson	MCDPS
Jeffrey		Matt Maillie	MCDPS
Wentworth	Collegeville EMC		
Brendan		Megan Young	MCOPH
Brazunas	Upper Merion EMC	Sam Korman	MCOPH
Chris Melville	Schwenksville EMC/Fire Marshal		
Michael		Erin McDermott	MCOPH
Rohlfing	Lower Providence EMC	Kyle Schmeck	MCOPH
Tom O'Donnell	Norristown EMC/Fire Chief	Barbara O'Malley	MC COO
Willard Troxel	Upper Gwynedd PW		
William		Dave Zellers	MC Commerce
Bradford	Limerick PW		
Mary Newsom	Delaware Valley Chapter American Red Cross	Tom McDonald	MC Sheriffs Office
Luke Rodgers	Salvation Army Greater Philadelphia	Dave Clifford (or rep)	MC Assets and Infrastructure
Armand Alessi	Main Line Health	Anthony Olivieri (or rep)	MC ITS
Mike Green	Holy Redeemer Hospital		

Montgomery County

Natural Hazards Mitigation Plan

Municipal Survey Form

Please provide as much information as you are able

Municipality: _____

Contact Person: _____ Phone #: _____

What natural hazards are your municipality vulnerable to? (Please circle appropriate letter – H= high vulnerability; M= moderate vulnerability; L= low vulnerability):

Earthquake	H	M	L	Hail	H	M	L
Radon	H	M	L	Extreme Cold Weather	H	M	L
Landslide	H	M	L	Extreme Heat	H	M	L
Wind	H	M	L	Drought	H	M	L
Lightning	H	M	L	Wildfire	H	M	L
Tornadoes	H	M	L	Flooding	H	M	L
Winter Storms	H	M	L	Sinkholes	H	M	L
Hurricanes	H	M	L				

Are there other types of natural hazards that threaten your municipality?

Are there specific locations in your municipality subject to damage from natural hazards?

Area affected by natural hazards (list below or note on the attached map)

Address/location	Hazard type	Description
<i>Example: 888 Main St.</i>	<i>Flooding</i>	<i>House flooding 3 times in last 5 years</i>

Provide information about infrastructure, including roads, bridges, sewer facilities, and water mains, that are damaged by natural hazards?

What critical facilities, i.e. hospitals, nursing homes, schools, in your municipality have been damaged by natural hazards?

Identify any specific studies or reports that describe natural hazard conditions in your municipality?

What has your municipality done to address natural hazard vulnerable areas?

What actions should be taken to address these problem areas? (Please list specific projects on attached forms)

Other comments or remarks:

Hazard Mitigation Project Opportunity Form

Date: _____

Name of Project: _____

Municipality: _____

County: _____

Project Contact

Title: _____

Agency: _____

Location (address) of Project: _____

Latitude: _____ Longitude: _____

Lot Number: _____ Block Number: _____

Parcel Number: _____

or Tax Parcel ID: _____

Elevation: _____ Certificate Y/N

Is the property within the 100-year floodplain? Y/N

The property is located on FIRM Panel Number: _____

Flood Insurance Y/N Date of Insurance Verification: _____

Brief Description of Project:

Brief Description of Problem to be Solved:

Total Estimated Cost: _____

Assessment Value and Date: _____

Source of Funding for Non-Federal Share:

Community Ranking Score: _____ Date: _____

Hazard Mitigation Questionnaire - Municipalities

Municipal Managers,

The Montgomery County Hazard Mitigation Plan update is currently underway. The Plan identifies and evaluates risks and vulnerabilities associated with human-made and natural hazards and the resulting disasters. The County has assembled a team which has singled out the following hazard topics for revision as well as the inclusion of a new chapter on Invasive Species:

4.3.4 Flood, Flash Flood, Ice Jam (Flooding/Severe Precipitation Events)

4.3.3 Extreme Temperature (Heat)

4.3.9 Pandemic and Infectious Disease

4.3.16 Civil Disturbance

4.3.17 Cyber Security Disruption

Please help us plan for future disasters by completed this survey regarding hazards (will take approximately 15 minutes). This survey is designed to gather information from around Montgomery County to help us better coordinate activities and reduce the risk of injury or property damage.

If you are able, please visit our [data collection application](#). In this application you will be able to view flood prone areas reported in past surveys 2012 (yellow) and 2017 (red). In addition, you can add point, polygon, or line data to further article problem areas in your municipality.

We would like to thank you in advance for your cooperation and participation.

Question Title

1. What geologic, weather, or climate change hazard is your municipality most vulnerable to?

	High vulnerability	Moderate vulnerability	Low vulnerability
Earthquake	<input type="radio"/> Earthquake High vulnerability	<input type="radio"/> Earthquake Moderate vulnerability	<input type="radio"/> Earthquake Low vulnerability
Radon	<input type="radio"/> Radon High vulnerability	<input type="radio"/> Radon Moderate vulnerability	<input type="radio"/> Radon Low vulnerability

	High vulnerability	Moderate vulnerability	Low vulnerability
Landslide	<input type="radio"/> Landslide High vulnerability	<input type="radio"/> Landslide Moderate vulnerability	<input type="radio"/> Landslide Low vulnerability
Wind	<input type="radio"/> Wind High vulnerability	<input type="radio"/> Wind Moderate vulnerability	<input type="radio"/> Wind Low vulnerability
Lightning	<input type="radio"/> Lightning High vulnerability	<input type="radio"/> Lightning Moderate vulnerability	<input type="radio"/> Lightning Low vulnerability
Tornadoes	<input type="radio"/> Tornadoes High vulnerability	<input type="radio"/> Tornadoes Moderate vulnerability	<input type="radio"/> Tornadoes Low vulnerability
Winter Storms	<input type="radio"/> Winter Storms High vulnerability	<input type="radio"/> Winter Storms Moderate vulnerability	<input type="radio"/> Winter Storms Low vulnerability
Hurricanes	<input type="radio"/> Hurricanes High vulnerability	<input type="radio"/> Hurricanes Moderate vulnerability	<input type="radio"/> Hurricanes Low vulnerability
Hail	<input type="radio"/> Hail High vulnerability	<input type="radio"/> Hail Moderate vulnerability	<input type="radio"/> Hail Low vulnerability
Extreme Cold Weather	<input type="radio"/> Extreme Cold Weather High vulnerability	<input type="radio"/> Extreme Cold Weather Moderate vulnerability	<input type="radio"/> Extreme Cold Weather Low vulnerability
Extreme Heat	<input type="radio"/> Extreme Heat High vulnerability	<input type="radio"/> Extreme Heat Moderate vulnerability	<input type="radio"/> Extreme Heat Low vulnerability
Drought	<input type="radio"/> Drought High vulnerability	<input type="radio"/> Drought Moderate vulnerability	<input type="radio"/> Drought Low vulnerability
Wildfire	<input type="radio"/> Wildfire High vulnerability	<input type="radio"/> Wildfire Moderate vulnerability	<input type="radio"/> Wildfire Low vulnerability
Flooding	<input type="radio"/> Flooding High vulnerability	<input type="radio"/> Flooding Moderate vulnerability	<input type="radio"/> Flooding Low vulnerability
Sinkholes	<input type="radio"/> Sinkholes High vulnerability	<input type="radio"/> Sinkholes Moderate vulnerability	<input type="radio"/> Sinkholes Low vulnerability


Question Title

2. Are there other types of geologic, weather, or climate change hazards that threaten your municipality?



Question Title

3. Are there specific locations in your municipality subject to damage from geologic, weather, or climate change hazards? Please specify hazard and location. If you are capable please utilize the ArcMap App to provide exact locations challenged by flooding.



Question Title

4. Provide information about infrastructure, including roads, bridges, sewer facilities, and water mains, that are damaged by geologic, weather, or climate change hazards?



Question Title

5. What critical facilities (i.e. hospitals, nursing homes, schools) in your municipality have been damaged by geologic, weather, or climate change hazards?



Question Title

6. Identify any specific studies or reports that describe geologic, weather, or climate change hazard conditions in your municipality?

Question Title

7. What has your municipality done to address geologic, weather, or climate change hazard vulnerable areas?

Question Title

8. What actions should be taken to address these problem areas?

Question Title

9. What biologic, infrastructure or social hazards is your municipality vulnerable to?

	High vulnerability	Moderate vulnerability	Low vulnerability
Structure Collapse	<input type="radio"/> Structure Collapse High vulnerability	<input type="radio"/> Structure Collapse Moderate vulnerability	<input type="radio"/> Structure Collapse Low vulnerability
Cyber Security	<input type="radio"/> Cyber Security High vulnerability	<input type="radio"/> Cyber Security Moderate vulnerability	<input type="radio"/> Cyber Security Low vulnerability
Terrorism	<input type="radio"/> Terrorism High vulnerability	<input type="radio"/> Terrorism Moderate vulnerability	<input type="radio"/> Terrorism Low vulnerability

	High vulnerability	Moderate vulnerability	Low vulnerability
Urban Fire/Explosion	<input type="radio"/> Urban Fire/Explosion High vulnerability	<input type="radio"/> Urban Fire/Explosion Moderate vulnerability	<input type="radio"/> Urban Fire/Explosion Low vulnerability
Civil Disturbance	<input type="radio"/> Civil Disturbance High vulnerability	<input type="radio"/> Civil Disturbance Moderate vulnerability	<input type="radio"/> Civil Disturbance Low vulnerability
Dam Failure	<input type="radio"/> Dam Failure High vulnerability	<input type="radio"/> Dam Failure Moderate vulnerability	<input type="radio"/> Dam Failure Low vulnerability
Radiological Release	<input type="radio"/> Radiological Release High vulnerability	<input type="radio"/> Radiological Release Moderate vulnerability	<input type="radio"/> Radiological Release Low vulnerability
Transportation Accidents	<input type="radio"/> Transportation Accidents High vulnerability	<input type="radio"/> Transportation Accidents Moderate vulnerability	<input type="radio"/> Transportation Accidents Low vulnerability
Utility Disruptions	<input type="radio"/> Utility Disruptions High vulnerability	<input type="radio"/> Utility Disruptions Moderate vulnerability	<input type="radio"/> Utility Disruptions Low vulnerability

Question Title

10. Are there other biologic, infrastructure, social types of hazards that threaten your municipality?

Question Title

11. What has your municipality done to address these biologic, infrastructure, social hazard vulnerable areas?

Question Title

12. What actions should be taken to address these problem areas?

Question Title

13. Please comment on the inclusion of Invasive Species in the HMP Update. Have invasive species challenged your municipality, what have you done to address invasive species, and what actions will you take in the future? Please be specific about the type of invasive species either native or non-native (e.g. bamboo, callery pear, laternfly, deer ticks).

Question Title

14. Other comments or remarks:

Done

ONLINE SURVEY PREVIEW: <https://www.surveymonkey.com/r/5SB2VDW>

Hazard Mitigation Questionnaire - Municipalities

Municipal Managers,

The Montgomery County Hazard Mitigation Plan update is currently underway. The Plan identifies and evaluates risks and vulnerabilities associated with human-made and natural hazards and the resulting disasters. The County has assembled a team which has singled out the following hazard topics for revision as well as the inclusion of a new chapter on Invasive Species:

4.3.4 Flood, Flash Flood, Ice Jam (Flooding/Severe Precipitation Events)

4.3.3 Extreme Temperature (Heat)

4.3.9 Pandemic and Infectious Disease

4.3.16 Civil Disturbance

4.3.17 Cyber Security Disruption

Please help us plan for future disasters by completed this survey regarding hazards (will take approximately 15 minutes). This survey is designed to gather information from around Montgomery County to help us better coordinate activities and reduce the risk of injury or property damage.

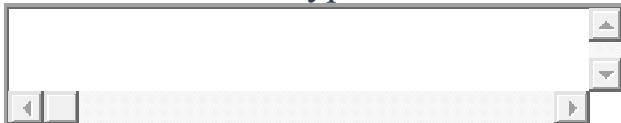
If you are able please visit our data collection application at: <https://montcopa.maps.arcgis.com/apps/Editor/index.html?appid=b5a03b7884dd438fad42b4bbe802ad2b>. In this application you will be able to view flood prone areas reported in past surveys 2012 (yellow) and 2017 (red). In addition you can add point, polygon, or line data to further article problem areas in your municipality.

We would like to thank you in advance for your cooperation and participation.

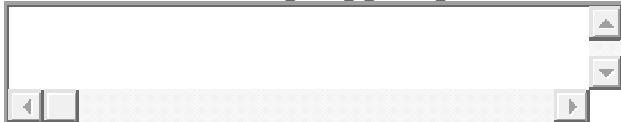
1. What natural hazards is your municipality most vulnerable to?

	High vulnerability	Moderate vulnerability	Low vulnerability
Earthquake	<input type="radio"/> Earthquake High vulnerability	<input type="radio"/> Earthquake Moderate vulnerability	<input type="radio"/> Earthquake Low vulnerability
Radon	<input type="radio"/> Radon High vulnerability	<input type="radio"/> Radon Moderate vulnerability	<input type="radio"/> Radon Low vulnerability
Landslide	<input type="radio"/> Landslide High vulnerability	<input type="radio"/> Landslide Moderate vulnerability	<input type="radio"/> Landslide Low vulnerability
Wind	<input type="radio"/> Wind High vulnerability	<input type="radio"/> Wind Moderate vulnerability	<input type="radio"/> Wind Low vulnerability
Lightning	<input type="radio"/> Lightning High vulnerability	<input type="radio"/> Lightning Moderate vulnerability	<input type="radio"/> Lightning Low vulnerability
Tornadoes	<input type="radio"/> Tornadoes High vulnerability	<input type="radio"/> Tornadoes Moderate vulnerability	<input type="radio"/> Tornadoes Low vulnerability
Winter Storms	<input type="radio"/> Winter Storms High vulnerability	<input type="radio"/> Winter Storms Moderate vulnerability	<input type="radio"/> Winter Storms Low vulnerability
Hurricanes	<input type="radio"/> Hurricanes High vulnerability	<input type="radio"/> Hurricanes Moderate vulnerability	<input type="radio"/> Hurricanes Low vulnerability
Hail	<input type="radio"/> Hail High vulnerability	<input type="radio"/> Hail Moderate vulnerability	<input type="radio"/> Hail Low vulnerability
Extreme Cold Weather	<input type="radio"/> Extreme Cold Weather High vulnerability	<input type="radio"/> Extreme Cold Weather Moderate vulnerability	<input type="radio"/> Extreme Cold Weather Low vulnerability
Extreme Heat	<input type="radio"/> Extreme Heat High vulnerability	<input type="radio"/> Extreme Heat Moderate vulnerability	<input type="radio"/> Extreme Heat Low vulnerability
Drought	<input type="radio"/> Drought High vulnerability	<input type="radio"/> Drought Moderate vulnerability	<input type="radio"/> Drought Low vulnerability
Wildfire	<input type="radio"/> Wildfire High vulnerability	<input type="radio"/> Wildfire Moderate vulnerability	<input type="radio"/> Wildfire Low vulnerability
Flooding	<input type="radio"/> Flooding High vulnerability	<input type="radio"/> Flooding Moderate vulnerability	<input type="radio"/> Flooding Low vulnerability
Sinkholes	<input type="radio"/> Sinkholes High vulnerability	<input type="radio"/> Sinkholes Moderate vulnerability	<input type="radio"/> Sinkholes Low vulnerability

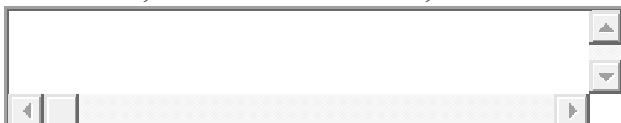
2. Are there other types of natural hazards that threaten your municipality?



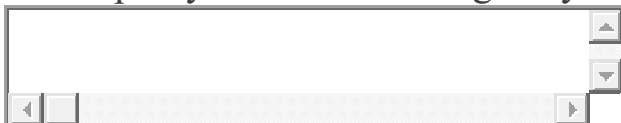
3. Are there specific locations in your municipality subject to damage from natural hazards? Please specify hazard and location. If you are capable please utilize the ArcMap App to provide exact locations challenged by flooding.



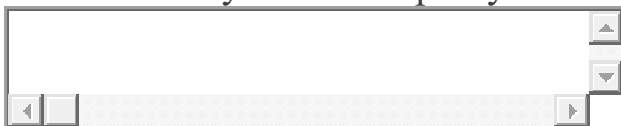
4. Provide information about infrastructure, including roads, bridges, sewer facilities, and water mains, that are damaged by natural hazards?



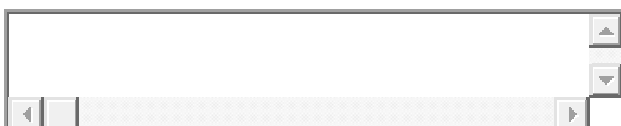
5. What critical facilities (i.e. hospitals, nursing homes, schools) in your municipality have been damaged by natural hazards?



6. Identify any specific studies or reports that describe natural hazard conditions in your municipality?



7. What has your municipality done to address natural hazard vulnerable areas?

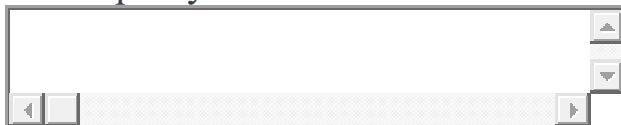


8. What actions should be taken to address these problem areas?

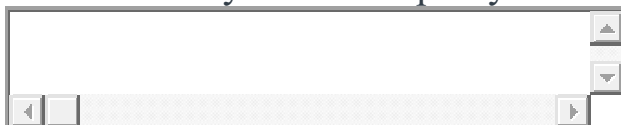
9. What human-made hazards is your municipality vulnerable to?

	High vulnerability	Moderate vulnerability	Low vulnerability
Structure Collapse	<input type="radio"/> Structure Collapse High vulnerability	<input type="radio"/> Structure Collapse Moderate vulnerability	<input type="radio"/> Structure Collapse Low vulnerability
Cyber Security	<input type="radio"/> Cyber Security High vulnerability	<input type="radio"/> Cyber Security Moderate vulnerability	<input type="radio"/> Cyber Security Low vulnerability
Levee Failure	<input type="radio"/> Levee Failure High vulnerability	<input type="radio"/> Levee Failure Moderate vulnerability	<input type="radio"/> Levee Failure Low vulnerability
Terrorism	<input type="radio"/> Terrorism High vulnerability	<input type="radio"/> Terrorism Moderate vulnerability	<input type="radio"/> Terrorism Low vulnerability
Urban Fire/Explosion	<input type="radio"/> Urban Fire/Explosion High vulnerability	<input type="radio"/> Urban Fire/Explosion Moderate vulnerability	<input type="radio"/> Urban Fire/Explosion Low vulnerability
Civil Disturbance	<input type="radio"/> Civil Disturbance High vulnerability	<input type="radio"/> Civil Disturbance Moderate vulnerability	<input type="radio"/> Civil Disturbance Low vulnerability
Dam Failure	<input type="radio"/> Dam Failure High vulnerability	<input type="radio"/> Dam Failure Moderate vulnerability	<input type="radio"/> Dam Failure Low vulnerability
Radiological Release	<input type="radio"/> Radiological Release High vulnerability	<input type="radio"/> Radiological Release Moderate vulnerability	<input type="radio"/> Radiological Release Low vulnerability
Transportation Accidents	<input type="radio"/> Transportation Accidents High vulnerability	<input type="radio"/> Transportation Accidents Moderate vulnerability	<input type="radio"/> Transportation Accidents Low vulnerability
Utility Disruptions	<input type="radio"/> Utility Disruptions High vulnerability	<input type="radio"/> Utility Disruptions Moderate vulnerability	<input type="radio"/> Utility Disruptions Low vulnerability

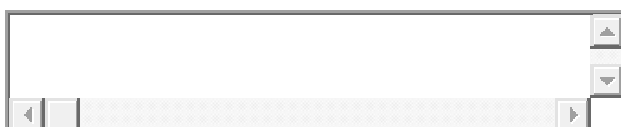
10. Are there other types of human-made hazards that threaten your municipality?

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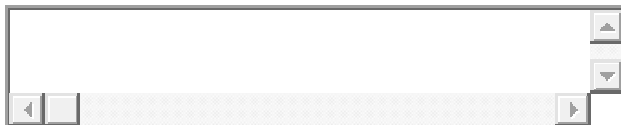
11. Identify any specific studies or reports that describe human-made conditions in your municipality?

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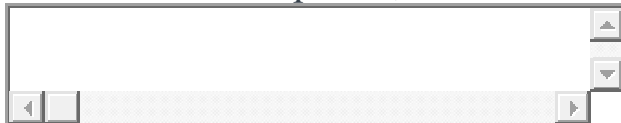
12. What has your municipality done to address human-made hazard vulnerable areas?

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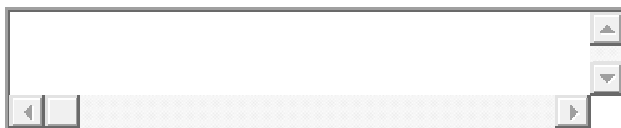
13. What actions should be taken to address these problem areas?

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14. Please comment on the inclusion of Invasive Species in the HMP Update. Have invasive species challenged your municipality, what have you done to address invasive species, and what actions will you take in the future?

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15. Other comments or remarks:

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**MONTGOMERY COUNTY
BOARD OF COMMISSIONERS**

VALERIE A. ARKOOSH, MD, MPH, CHAIR
KENNETH E. LAWRENCE, JR., VICE CHAIR
JOSEPH C. GALE, COMMISSIONER



**MONTGOMERY COUNTY
PLANNING COMMISSION**

MONTGOMERY COUNTY COURTHOUSE • PO Box 311
NORRISTOWN, PA 19404-0311
610-278-3722
FAX: 610-278-3941 • TDD: 610-631-1211
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SCOTT FRANCE, AICP
EXECUTIVE DIRECTOR

HAZARD MITIGATION SURVEY

Montgomery County Residents,

The County is updating its hazard mitigation plan. Please help us plan for responding to future disasters by completing this survey (will take approximately 15 minutes).

Hazard Mitigation is any action taken to reduce the loss of life and property by lessening the impact of disasters. This update focuses on the following types of disasters: (A) Flooding/Severe Precipitation Events, (B) Heat Events, (C) Disease Outbreaks, (D) Civil Disturbance, (E) Cyber Security and (F) Invasive Species.

This survey is designed to gather information from around Montgomery County to help us better coordinate activities and reduce the risk of injury or property damage. All responses are anonymous. These questions are for information-gathering only and results will be shared among Montgomery County departments for planning purposes only. If data is presented to the public, it will only be aggregate data. For instance, it would appear in a format, such as, 75% of survey respondents listed flooding/storm damage as the core hazard in their region of the County.

We would like to thank you in advance for your cooperation and participation.

Please contact Ellis Foley at efoley@montcopa.org if you have any questions or concerns regarding the questionnaire.

1. I am a (choose one):

- | | |
|--|---|
| <input type="checkbox"/> Full-time resident of Montgomery County | <input type="checkbox"/> Full-time resident of the region |
| <input type="checkbox"/> Part-time resident of Montgomery County | <input type="checkbox"/> Visitor |

2. I am a (check all that apply):

- | | |
|---|-------------------------------------|
| <input type="checkbox"/> A local business owner | <input type="checkbox"/> A student |
| <input type="checkbox"/> Self-employed | <input type="checkbox"/> Retired |
| <input type="checkbox"/> A manager | <input type="checkbox"/> Unemployed |
| <input type="checkbox"/> An employee | |
| <input type="checkbox"/> Other (please specify) _____ | |

3. Are you familiar with the phrase Hazard Mitigation?

- | | |
|------------------------------|-----------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No |
|------------------------------|-----------------------------|

4. Which of the following are you most affected or threatened by?

- | | |
|---|--|
| <input type="checkbox"/> Flooding/severe weather events | <input type="checkbox"/> Cyber security |
| <input type="checkbox"/> Heat events | <input type="checkbox"/> Disease outbreaks |
| <input type="checkbox"/> Civil disturbance | <input type="checkbox"/> Invasive species |
| <input type="checkbox"/> Other (please specify) _____ | |

5. Select the one hazard you are most concerned about in the next 1 to 5 years:

☐ Flooding/severe weather events

☐ Cyber security

☐ Heat events

☐ Disease outbreaks

☐ Civil disturbance

☐ Invasive species

☐ Other (*please specify*) _____

6. Please rank (1-7) the following hazards based on how you believe our governments should prioritize them to allocate limited resources:

_____ Flooding/severe weather events

_____ Cyber security

_____ Heat events

_____ Disease outbreaks

_____ Civil disturbance

_____ Invasive species

_____ Other

7. Would you like to receive updates on Montgomery County's planning process to reduce impacts from hazards?

☐ Yes

☐ No

If yes, please provide contact information:

Email: _____ Telephone: _____

Flooding/Severe Precipitation Events

8. In the last 10 years were you evacuated from your home as a result of a disaster (e.g. flooding)?

☐ Yes

☐ No

Please clarify the disaster and provide an address or nearby intersection:

9. Did you go to a shelter?

☐ Yes

☐ No

Please provide name, address, or nearby intersection of the shelter:

10. If you've experienced flooding at home, do you have flood insurance?

☐ Yes

☐ No

11. Do you or did you have problems getting homeowners/renters insurance due to risks from natural hazards?

☐ Yes

☐ No

12. Where in your community have you noticed repeated disruption or damage due to flooding/ severe weather?
Please enter a location and a description of the damage:

Extreme Heat

13. Do you have access to air conditioning (A/C) in your living environment?

☐ Yes

☐ No

14. Has someone in your family experience heat stress, exhaustion, stroke or rash in your living environment?

☐ Yes

☐ No

15. Did you go to a cooling shelter or a space with A/C?

☐ Yes

☐ No

Please provide name, address, or nearby intersection of the cooling shelter or business with A/C:

16. With limited resources, which method should our governments utilize to mitigate heat impacts?

☐ Access to A/C units and installation for low-income residents

☐ Enhanced tree planting and other native vegetation in public space

☐ Other (please specify) _____

17. Is your workplace located outdoors?

☐ Yes

☐ No

18. Is your workplace directly affected by the temperature of the outdoor environment?

☐ Yes

☐ No

19. Have you experience heat stress, exhaustion, stroke or rash at your workplace?

☐ Yes

☐ No

If yes, what is your occupation?

Disease Outbreaks

20. In the past 5 years has your family experienced a decreased in income due to the impact of infectious disease (such as flu) or pandemic?

☐ Yes

☐ No

21. In the past 5 years has your family experienced a reduction in working hours due to the impact of infectious disease (such as flu) or pandemic?

☐ Yes

☐ No

22. In the past 5 years has your family experienced layoffs or had to resign from their job due to the impact of infectious disease (such as flu) or pandemic?

☐ Yes

☐ No

23. In the past 5 years has your family experienced a loss of health insurance/benefits due to the impact of infectious disease (such as flu) or pandemic?

☐ Yes

☐ No

24. Has your family experienced exposure to COVID-19 or a diagnosis of COVID-19?

☐ Yes

☐ No

25. During the COVID outbreak did someone in your family die from COVID-19?

☐ Yes

☐ No

26. Have members of your family or do members of your family plan to take the COVID-19 vaccines?

☐ Yes

☐ No

27. Aside from COVID-19, select the disease you are most concerned about in the next 1 to 5 years:

☐ Diabetes

☐ West Nile virus or other mosquito-borne illnesses

☐ Asthma

☐ Lyme disease or other tick-borne illnesses

☐ Influenza or Covid-19

☐ Viral hepatitis

☐ Other (please specify) _____

Civil Disturbance

28. In general, how satisfied are you with the provision of police services relating to civil disturbance in your community?

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Dissatisfied
- ☐ Very Dissatisfied

29. In your opinion, how equipped are the local police to address local civil disturbance issues?

- ☐ A great deal
- ☐ A lot
- ☐ A moderate amount
- ☐ A little
- ☐ None at all

30. With limited resources, which method should our governments utilize to mitigate negative outcomes from civil disturbance?

- ☐ Streamline and advertise mass gathering permits and/or emergency service notification requirements.
- ☐ Develop a list of “safe spaces” for protesting (*i.e. access to restrooms and drink water facilities, emergency service, nearby low-speed/low-risk traffic conditions*).
- ☐ Other (*please specify*) _____

Cyber Security

31. How concerned are you about your personal data security?

- ☐ Very concerned
- ☐ Somewhat concerned
- ☐ Not so concerned
- ☐ Not at all concerned

32. Please specify which private cyber issues represents your chief concern:

☐ Medical records

☐ Credit/financial information

☐ Purchasing habits/visited sites

☐ Other (*please specify*) _____

33. Has your business/employer expressed concern about network security?

☐ Yes

☐ No

34. During the past 5 years have you or your business/employers have any privacy breach incidents or complaints?

☐ Yes

☐ No

35. Please expand upon any cyber security concerns and comment on how local governments may boost cyber security measures?

Invasive Species

36. Has your property, your business or your employment/employer been affected by invasive species either native or non-native? For example, Golden Bamboo, Wisteria, Spotted Lanternfly, or Emerald Ash Borer.

☐ Yes

☐ No

If yes, please identify or describe species:

37. How satisfied were you with your communities handling of the recent spotted lanternfly outbreak?

☐ Very satisfied

☐ Somewhat satisfied

☐ Neither satisfied nor dissatisfied

☐ Somewhat dissatisfied

☐ Very dissatisfied

38. With limited resources, which method should our governments utilize to mitigate negative outcomes from invasive species?

- ☐ Stricter regulations
- ☐ Early detection
- ☐ Public awareness
- ☐ Surveillance, control, and eradication
- ☐ Other (*please specify*) _____

39. Is there anything else you'd like us to know about you or your community's experiences with hazards and how you hope these hazards are addressed in the future?



VISTA PREVIA DE LA ENCUESTA EN LÍNEA: <https://www.surveymonkey.com/r/S6F25YQ>

Cuestionario de mitigación de riesgos para residentes

Residentes del condado de Montgomery:

El Condado ha reunido un equipo para actualizar nuestro plan de mitigación de riesgos que trata los peligros que afectan a nuestras municipalidades. Ayúdenos a planificar las acciones contra futuros desastres completando esta encuesta sobre riesgos (les tomará aproximadamente 15 minutos).

La Mitigación de riesgos es cualquier acción que se tome para reducir la pérdida de vidas y propiedades disminuyendo el impacto de los desastres. Estos desastres pueden incluir inundaciones, tormentas severas, olas de calor, brotes de enfermedades u otros. Podrán notar que, según las preguntas formuladas, nuestro enfoque principal para esta información actualizada estará en las (A) Inundaciones/Eventos de lluvia intensa, (B) Eventos de calor, (C) Brotes de enfermedades, (D) Disturbios civiles, (E) Seguridad cibernética y (F) Especies invasoras.

Esta encuesta está diseñada para recopilar información de todo el condado de Montgomery para ayudarnos a coordinar mejor las actividades y reducir el riesgo de lesiones o daños a la propiedad. Estas preguntas son solo para recopilar información, y se compartirán entre los Departamentos del condado de Montgomery solo con fines de planificación. Es decir, si los datos se presentan al público, solo serán los resultados totales. Por ejemplo, se presentarían en un formato como este: el 75 % de los encuestados mencionaron los daños por inundaciones/tormentas como el peligro principal en su región del condado.

Queremos agradecerles de antemano su cooperación y participación.

Si tienen alguna pregunta o preocupación sobre el cuestionario, comuníquense con Ellis Foley a efoley@montcopa.org.

1. Soy _____:

- ☐ residente de tiempo completo del condado de Montgomery
- ☐ residente de tiempo parcial del condado de Montgomery
- ☐ residente de tiempo completo de la región
- ☐ visitante

2. Soy _____:

- ☐ un propietario de una empresa local
- ☐ un trabajador autónomo
- ☐ un administrador
- ☐ un empleado
- ☐ jubilado

- ☐ desempleado
- ☐ Otro (especifique)

3. ¿Está familiarizado con la frase “mitigación de riesgos”?

- ☐ Sí
- ☐ No

4. ¿Cuál de estos riesgos lo afecta o lo amenaza más?

- ☐ Inundaciones/Eventos climáticos severos
- ☐ Eventos de calor
- ☐ Disturbios civiles
- ☐ Seguridad cibernética
- ☐ Brotes de enfermedades
- ☐ Especies invasoras
- ☐ Otro (especifique)

5. Seleccione los que más le preocupan para los próximos 1 a 5 años.

- ☐ Inundaciones/Eventos climáticos severos
- ☐ Eventos de calor
- ☐ Disturbios civiles
- ☐ Seguridad cibernética
- ☐ Brotes de enfermedades
- ☐ Especies invasoras
- ☐ Otro (especifique)

Título de la pregunta

6. Con recursos limitados, ¿qué riesgos deberían priorizar nuestros gobiernos para reducir el impacto? 0

- ☐ Inundaciones/Eventos climáticos severos
- ☐ Eventos de calor
- ☐ Disturbios civiles
- ☐ Seguridad cibernética
- ☐ Brotes de enfermedades
- ☐ Especies invasoras

☐ Otro (especifique)

7. ¿Le gustaría recibir información actualizada sobre el proceso de planificación del condado de Montgomery para reducir los impactos de los riesgos?

- ☒ Sí
☐ No

8. Si está de acuerdo en recibir información actualizada, escriba su dirección de correo electrónico:
Dirección de correo electrónico:

9. En los últimos 10 años, ¿lo evacuaron de su casa como resultado de un desastre (por ejemplo, una inundación)?

- ☐ Sí
☐ No

10. Escriba una dirección o una intersección cercana:

11. ¿Fue a un refugio?

- ☐ Sí
☐ No

12. Escriba el nombre, la dirección o la intersección cercana del refugio:

13. Si ha tenido inundaciones en su casa, ¿tiene seguro contra inundaciones?

- ☐ Sí
☐ No

14. ¿Tiene o tuvo problemas para obtener un seguro para propietarios/inquilinos debido a los riesgos derivados de peligros naturales?

- ☐ Sí
☐ No

15. ¿Dónde ha notado repetidamente perjuicios o daños debido a inundaciones/clima severo?
Escriba una dirección/intersección y una descripción del daño en el cuadro de comentarios.

16. ¿Tiene acceso a aire acondicionado (A/C) en su entorno?

- ☐ Sí
- ☐ No

17. ¿Alguien de su familia ha tenido estrés por calor, agotamiento, derrame cerebral o sarpullido en su entorno?

- ☐ Sí
- ☐ No

18. ¿Fue a un refugio de enfriamiento o espacio con aire acondicionado?

- ☐ Sí
- ☐ No

19. Escriba el nombre, la dirección o la intersección cercana del refugio de enfriamiento o negocio con A/C:

20. Con recursos limitados, ¿qué método deberían usar nuestros gobiernos para mitigar los impactos del calor?

- ☐ Evaluación de unidades de aire acondicionado e instalación para residentes de ingresos bajos
- ☐ Plantación de árboles y otra vegetación en el espacio público
- ☐ Otro (especifique)

21. ¿Está situado su lugar de trabajo al aire libre?

- ☐ Sí
- ☐ No

22. ¿Se ve afectado directamente su lugar de trabajo por la temperatura del ambiente exterior?

- ☐ Sí
- ☐ No

23. ¿Ha tenido estrés por calor, agotamiento, derrame cerebral o sarpullido en su lugar de trabajo?

- ☐ Sí
- ☐ No

24. Si la respuesta es “Sí”, ¿cuál es su ocupación?:

25. En general, ¿cuál es su grado de satisfacción con la prestación de servicios policiales relacionados con disturbios civiles en su comunidad?

- ☐ Muy satisfecho
- ☐ Satisfecho
- ☐ Ni satisfecho ni insatisfecho
- ☐ Insatisfecho
- ☐ Muy insatisfecho

26. En su opinión, ¿qué tan equipada está la policía local para tratar los problemas de disturbios civiles locales?

- ☐ Mucho
- ☐ Bastante
- ☐ Moderadamente
- ☐ Poco
- ☐ Nada en absoluto

27. Con recursos limitados, ¿qué método debería usar nuestros gobiernos para mitigar los resultados negativos de las concentraciones masivas espontáneas?

- ☐ Agilizar y anunciar permisos de concentraciones masivas o requisitos de notificación de servicios de emergencia
- ☐ Desarrollar una lista de “espacios seguros” para protestar (es decir, acceso a baños e instalaciones de agua potable, servicios de emergencia, condiciones de tráfico cercanas de baja velocidad/bajo riesgo)
- ☐ Otros (especifique)

28. ¿Qué tan preocupado está por la seguridad de sus datos personales?

- ☐ Muy preocupado
- ☐ Algo preocupado
- ☐ No muy preocupado

☐ Para nada preocupado

29. Especifique qué amenazas de seguridad cibernética en su información personal son su principal preocupación:

- ☐ Expediente médico
- ☐ Información crediticia/financiera
- ☐ Hábitos de compra/lugares visitados
- ☐ Otro (especifique)

30. ¿Ha expresado preocupación su empresa/empleador por la seguridad de la red?

- ☐ Sí
- ☐ No

31. Durante los últimos 5 años, ¿ha tenido su empresa/empleador incidentes o quejas por vulneración de privacidad?

- ☐ Sí
- ☐ No

32. Amplíe cualquier preocupación sobre seguridad cibernética, y comente cómo los gobiernos locales pueden impulsar medidas de seguridad cibernética.

33. En los últimos 5 años, ¿ha tenido su familia una disminución en los ingresos debido al impacto de una enfermedad infecciosa (como la gripe) o una pandemia?

- ☐ Sí
- ☐ No

34. En los últimos 5 años, ¿ha tenido su familia una reducción en las horas de trabajo debido al impacto de una enfermedad infecciosa (como la gripe) o una pandemia?

- ☐ Sí
- ☐ No

35. En los últimos 5 años, ¿ha habido algún despido en su familia o alguno ha tenido que renunciar a su trabajo debido al impacto de una enfermedad infecciosa (como la gripe) o una pandemia?

- ☐ Sí
- ☐ No

36. En los últimos 5 años, ¿ha tenido su familia una pérdida de seguro/beneficios médicos debido al impacto de una enfermedad infecciosa (como la gripe) o una pandemia?

- ☐ Sí
☐ No

37. ¿Ha tenido su familia exposición al COVID-19 o un diagnóstico de COVID-19?

- ☐ Sí
☐ No

38. Durante el brote de Covid-19, ¿alguien de su familia murió de COVID-19?

- ☐ Sí
☐ No

39. ¿Se han vacunado o planean vacunarse sus familiares contra el COVID-19?

- ☐ Sí
☐ No

40. Seleccione las enfermedades o condiciones médicas que más le preocupan para los próximos 1 a 5 años:

- ☐ Diabetes
☐ Asma
☐ Virus del Nilo Occidental u otras enfermedades transmitidas por mosquitos
☐ Enfermedad de Lyme u otras enfermedades transmitidas por garrapatas
☐ Influenza
☐ Hepatitis viral
☐ Otra (especifique)

41. ¿Se han visto su propiedad, negocio o empleo/empleador afectados por especies invasoras?

42. Si la respuesta es “Sí”, identifique la especie: 0

43. ¿Qué tan satisfecho estuvo con el manejo que se hizo en sus comunidades del reciente brote de mosca linterna con manchas?

- ☐ Muy satisfecho
- ☐ Algo satisfecho
- ☐ Ni satisfecho ni insatisfecho
- ☐ Algo insatisfecho
- ☐ Muy insatisfecho

44. Con recursos limitados, ¿qué método deberían usar nuestros gobiernos para mitigar los resultados negativos de las especies invasoras?

- ☐ Reglamentaciones más estrictas
- ☐ Conciencia pública
- ☐ Detección precoz
- ☐ Vigilancia, control y erradicación

Otro (especifique)



HAZARD MITIGATION QUESTIONNAIRE FOR MONTGOMERY COUNTY RESIDENTS

Report of Results
November 2021



METHOD



The questionnaire was available online for **three months** and advertised using

- social media (Facebook, Twitter, etc.)
- flyers sent via direct mail to all municipal offices
- promotional material displayed at county events (including 4-H Fair and National Night Out)

Respondents were able to complete the **online survey in English or Spanish**, however only responses were received for the English copy.



In addition to the online surveys, Montgomery County Planning Commission placed questionnaires (English only) at **six library locations** for a two-month period:

- Norristown Public Library
- Perkiomen Valley Library
- Upper Moreland Free Library
- Lansdale Public Library
- Upper Perkiomen Valley Library
- Ardmore Library



MCPC

GENERAL SURVEY RESULTS



294
Total number of questionnaire respondents



97.62%
Of respondents were residents



79.38%
Of respondents were familiar with the term "hazard mitigation"

Select Hazards Ranked

- 1 Flooding/Severe Weather Events
- 2 Disease Outbreaks
- 3 Cyber Security
- 4 Civil Disturbance
- 5 Heat Events
- 6 Invasive Species

Additional Hazards Of Concern:

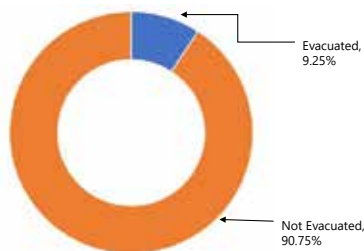
Climate Change	Traffic/Transportation Accidents
Utility Disruptions	Heavy Winds/Tornadoes
Mental Health Care	Sinkholes
Gun Violence	Tree Falls
Systematic Racism	Over-policing/Penal System



MCPC

RESULTS: Flooding/Severe Precipitation Events

Percentage of respondents evacuated from their homes because of a disaster:



Disasters cited include:

- flooding
- sewer back-ups associated with flooding damage
- power outages due to rain and winter storms



Zero

Respondents who reported to an emergency shelter after a disaster event. Instead respondents stayed with family, friends or neighbors.



15.61%

Of respondents have flooding insurance

60.00%

Had trouble attaining insurance due to their risk from natural hazards



MCPC

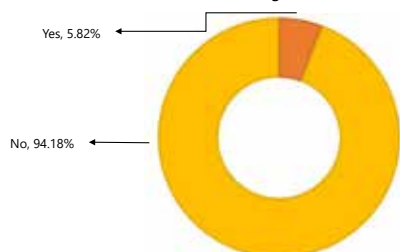
RESULTS: Heat Events



98.63%

Of respondents have access to air-conditioning in their living environment

Percentage of respondents that have experienced heat stress, exhaustion, stroke or rash in their living environment:



42.96%

Of respondents went to a cooling shelter or space with air-conditioning



6.06 %

Of respondents have workplaces located directly outdoors



15.27%

Of respondents have workplaces that are affected by outdoor temperatures



3.10%

Of respondents have experienced heat stress, exhaustion, stroke or rash at work

Careers of those that have experienced heat stress at work:

Librarians	Auto Technicians
Landscapers/Gardeners	Nurses
Teachers	Pharmacists/Pharmacy Specialist
Sports Referee	Lifeguard
Federal/Local Gov. Employees (at home-office)	Construction, Numerous Positions
Computer Programmers	Corporate/Product Marketers



MCPC

RESULTS: Disease Outbreaks

Respondents were asked a some of questions regarding the Coronavirus (COVID-19) pandemic or other infectious diseases that have occurred over the last five years.



31%

of respondents or members of their family have experienced a decrease in income



38%

of respondents or members of their family have experienced a reduction in work hours



20%

of respondents or members of their family have experienced layoffs or had to resign from their job



3%

of respondents or members of their family have experienced a loss of health insurance/benefits



40%

of respondents or members of their family have been exposed or had a diagnosis of Covid-19



7%

of respondents or members have had someone in their family die from Covid-19



95%

of respondents or members of their family have received the Covid-19 vaccine or plan to take the vaccine

Respondents identified the following disease/conditions of most concerned in the next one to five years:

Influenza or Covid-19 (175)
Diabetes (33)
Lyme Disease or Other Tick-Borne Illnesses (31)
West Nile Virus or Mosquito-Borne Illnesses (12)
Cancers (9)
Asthma (6)
High Cholesterol and Associate Heart Disease (4)



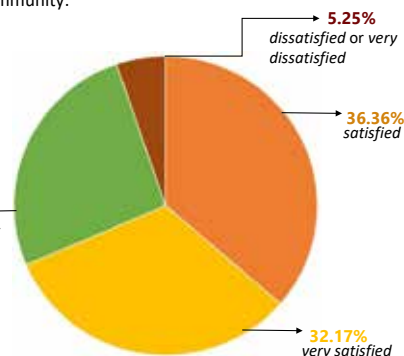
MCPC

RESULTS: Civil Disturbance

Civil disturbance hazards encompass a set of hazards emanating from a wide range of possible events that cause civil disorder, confusion, strife, and economic hardship. Civil disturbance hazards include the following:

- Famine
- Economic collapse and recession
- Misinformation
- Public unrest, mass hysteria and rioting
- Strike and labor dispute

How satisfied were respondents with the provision of police services related to civil disturbance in their community:



Respondents were asked how equipped local police were to address local civil disturbances issues:



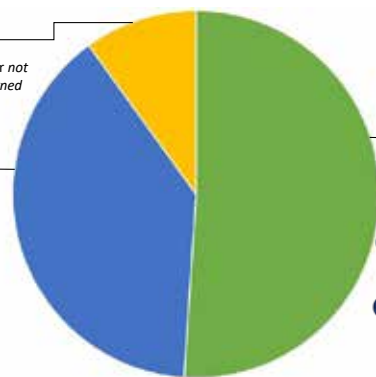
MCPC

RESULTS: Cyber Security

Respondents were asked how concerned they were about personal data security:

9.95%
not so concerned or not at all concerned

38.97%
very concerned



Issue of primary concern to respondents:

- Credit/financial information (264)
- Purchasing habits/visited sites (30)
- Medical records (22)
- Infrastructure/utility disruptions (4)
- Criminal history (1)
- Ransomware (1)
- Voting security (1)



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RESULTS: Invasive Species

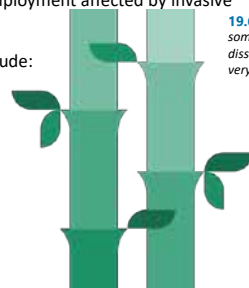


75.82%

Of respondents, have had their property, business or employment affected by invasive species.

Species identified include:

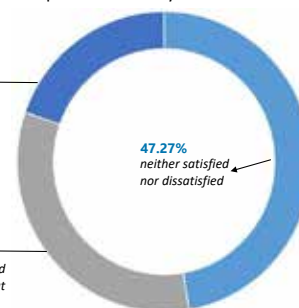
- 1 Spotted lanternfly (94)
- 1 Emerald ash borer (41)
- 1 Bamboo (7)
- 1 Wisteria (6)
- 1 Tree of heaven (4)
- 1 Japanese's beetle (4)
- 1 Stink bug (4)
- 1 Wild garlic (4)



19.64%
somewhat dissatisfied or very dissatisfied

33.09%
very satisfied or somewhat satisfied

Respondents were asked how satisfied they were with the local governments handling of the recent spotted lanternfly outbreak:



Respondents ranked methods to be utilized to mitigate negative outcomes from invasive species:

- 1 Surveillance, Control & Eradication (192)
- 2 Public Awareness (192)
- 3 Early Detection (95)
- 4 Stricter Regulations (95)



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**MONTGOMERY COUNTY
PLANNING COMMISSION**

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SCOTT FRANCE, AICP
EXECUTIVE DIRECTOR

**HAZARD MITIGATION QUESTIONNAIRE FOR MONTGOMERY COUNTY RESIDENTS
Report of Results, November 2021**

Purpose

The purpose of the voluntary questionnaire was to better understand resident's concerns and vulnerabilities to natural and man-made hazards and the resulting disasters. In the past, planners have had difficulty attracting substantial public involvement at public meetings. Disseminating the questionnaires prior to public meetings enabled the Planning Commission to identify public opinions as well as began to advertise for future public events. Hosting questionnaires in numerous formats was essential to the Planning Commission to elevate equity in community participation and stimulate increased participation among resident's that may be more at risk to certain hazards.

Executive Summary

The 2023 Hazard Mitigation Plan (HMP) is the fourth iteration of the Plan, which aims to anticipate and accurately understand communities' exposure to hazards. The Plan Update is a collaborative project undertaken by Montgomery County's Planning Commission and Department of Public Safety with critical input from a Planning Team consisting of local emergency staff, planning staff and a diverse set of stakeholders. The current HMP update is the first time a public questionnaire has been applied to gather input from the residents on experienced and perceived hazards. Since the HMP evaluates over twenty hazards, the questionnaire only targets recently experienced disasters that could be at the forefront of public attention to maximize responses.

Respondents had a very high interest in flooding/precipitation risks and associated power outages or traffic incidents. Numerous residents noted that climate change risk was their highest concern because it would exasperate current natural hazards in their communities. Numerous residents were bothered that new developments are not held to higher stormwater management or native vegetation requirements in order rectify current flooding and heat hazards in their communities. A key take away was that residents hoped that municipalities could partner with utilities to modernize infrastructure and reduce the risk of failure during hazard events.

Generally, residents agreed that information on stormwater management practices and invasive species management was readily available and used by individuals. However, municipalities were not prioritizing maintenance or removal. The perceived lack of targeted interest in maintenance/vegetation management was agitating to many residents; many even commented that deferred maintenance of public infrastructure was directly enhancing their risk of flooding events as well as decreasing their property values.

Understandably, influenza was considered the top health concern in the near future, followed by diabetes and tick-borne illnesses. Many residents cited the high cost of health care as the primary area of concern in regard to illness and were particularly troubled by cost related to treatable or chronic



conditions such as diabetes, heart diseases and cancers. Fairly consistently, residents expressed the need for affordable mental health treatment and trauma-informed services to be expanded throughout the county.

There were mixed opinions related to the topic of civil disturbance, which encompasses a wide range of events that cause civil disorder, confusion, strife, and economic hardship. However, it was clear that residents recognize the right of fellow citizens to protest or peacefully assembly. But highlighted that law enforcement needed enhanced resources and training to mitigate the potential negative impacts of these events (due select few people) without violent or discriminatory means oppressed upon the events attendees. Additionally, many residents were concerned about cyber security. However, a consensus arose that mitigation and action on this topic would need to come from the federal or state government.

Methodology

The was questionnaire available online for three months and advertised using social media (such as Facebook and Twitter), direct mailing of flyers to all municipal offices and promotional material displayed at county events (including 4-H Fair and National Night Out). Respondents were able to complete the online survey in English or Spanish, however only responses were received for the English copy.

In addition to the online surveys, Montgomery County Planning Commission placed questionnaires (English only) at six library locations for a two-month period:

- Norristown Public Library
- Perkiomen Valley Library
- Upper Moreland Free Library
- Lansdale Public Library
- Upper Perkiomen Valley Library
- Ardmore Library

An effort was made to find a host facility in the Pottstown region; however, due to COVID-19 requirements and construction activities, it was not possible.

Overall, 278 responses were generated by the online questionnaire and 16 responses arrived via the paper questionnaires.

Survey Results

General

This report explores two hundred and ninety-four (294) responses to a questionnaire with the option to take the survey online via Survey Monkey in English or Spanish or in-person at five libraries geographically distributed across Montgomery County PA. Most questionnaires, 97.62%, were completed by full-time residents of Montgomery County. The remaining were submitted by visitors to the county including but not limited to employees of the region or business-owners. Over 25.00% of respondents were retired, 2.05% were unemployed, and 4.44% were local business owners.

When asked whether they were familiar with the phrase “hazard mitigation”, 79.38% responded yes. There was a consensus that not only were respondents most affected and threatened by flooding/severe weather events but also this hazard was their topmost concern in the next one to five

years. Respondents were asked to rank hazards based on how they believe the government should prioritize them to allocate resources and the following ranking emerged:

1. Flooding/severe weather events
2. Disease outbreaks
3. Cyber security
4. Civil disturbance
5. Heat events
6. Invasive species

The questionnaire only identified the previously mentioned six hazards for ranking. Other hazards of concern identified by respondents are as followed:

- Climate Change (4)
- Systematic Racism (4)
- Power Outages (4)
- Traffic/Transportation Accidents (4)
- Heavy Winds/Tornadoes (2)
- Sinkholes (2)
- Aggressive/Over-policing (2)
- Tree Falls (1)
- Prison Overcrowding/Penal System (1)

Flooding/Severe Precipitation Events

Over the last 10 years, 9.25% of respondents were evacuated from their home because of a disaster. Disasters cited include flooding, sewer back-ups associated with flooding damage and power outages due to rain and winter storms. None of the respondents reported to an emergency shelter after these evacuations and instead stayed with family, friends or neighbors.

15.61% of those surveyed possess flooding insurance and 9.41% (or 60% of those with insurance) had trouble attaining homeowners/renters' insurance due to their risk from natural hazards.

Core areas respondents have noticed repeated disruption or damage due to flooding/severe weather include:

Flooding

Municipality	Approximate Location	
Whitemarsh Township	Fairway Rd. & Hillside Rd. Joshua Rd. & Germantown Pike (2)	
Upper Hanover Township	East Buck Road Fry Road	
Montgomery Township	Brookwood Road	
Borough of East Greenville	Main Street & Water Street	
Lower Pottsgrove Township	North Keim Street & Buchert Road Potter Drive & Overlook Drive	
Bridgeport Borough	East 4th Street Front Street	River Road West Front Street & Mill Street
West Norriton Township	Port Indian Lane	

Norristown Borough	Elmwood Park Zoo Area Schuylkill Avenue Dekalb Street East Washington Street	East Lafayette Street East Main Street Water Street
Hatfield Borough	Broad Street	
Ambler Borough	Church Street Tennis Avenue	
Abington Township	Easton Road Keswick Avenue Grovania Avenue	
Towamencin Township	Kriebel Rd. & Bustard Rd.	
Upper Dublin Township	Loch Alsh Field – Loch Alsh Avenue and Fort Washington Avenue Fort Washington Interchange	
Lower Frederick Township	Main Street & Park Ave. Spring Mount Rd. & Gravel Pike	
Springfield Township	Norfolk Road & Larchwood Road	
Schwenksville Borough	Meadow Park Schwenksville Wastewater Treatment Plant Main Street & Centennial Street Main Street & Park Avenue	Centennial Street & 2 nd Street Game Farm Rd & Smith Rd East Park Avenue between Route 29 (Main Street/Gravel Pike) and Pennypacker Road
Whitpain Township	Walton Road Dundee Drive Valley Road	Skippack Road (Between Penllyn Blue Bell Pike & Butler Pike)
Skippack Township	Stump Hall Road	
Upper Moreland Township	South York Road & Mill Road	
Upper Merion Township	Upper Merion Area Middle School Upper Merion Community Center Roberts Elementary School Martin's Dam Club Bob White Park - 485 Falcon Rd Wayne, PA Walker Field – 520 Old Fort Road Sweetbriar Park Near Hansen Road/Beidler Road McKaig Nature Center Trinity Lane Btw Balligomingo Rd. & Holstein Rd. Covered Bridge Road Abrams Rd. Btw West Beidler Rd. & Hamlet Drive Croton Rd. Btw Sharon Drive & Alderbrook Drive Croton Rd Btw County Boundary & Kathwood Drive Penn Circle & Old Forge Lane Springdell Rd. & Jasper Rd. 1 st Avenue Near American Avenue	Hamlet Mews – Hamlet Drive Jonas Road Bridge Brownlie Road Bridge Keebler Bridge Balligomingo Rd. Sweetbriar Road River Rd. South Gulph Road Beidler Rd./Abrams Rd./Route 23 Caley Road Suellen Drive Garrison Way Brookwood Road Lafayette Road Longview Road Lantern Road West Valley Forge Road General Washington Road Hansen Road Cul-de-sac Crossfield Rd Btw Thomas Drive and Prince Frederick Street Including Upper Merion High School Complex

	North Gulph Road, particularly near the Intersections Of 76, 276 and 422 Firethorn Rd & Henderson Rd. Jasper Rd. and Bernard Drive Near Crow Creek Crooked Lane Near Gulph Mills Golf Club King Of Prussia Road & Croton Road Arden Road & South Gulph Road Caley Road & Regimental Road Beidler Road Btw Susan Drive and Abrams Mill Road	George Drive & Jasper Road N Warner Rd. & N Gulph Rd. Bill Smith Boulevard Keebler Road & Allendale Road Garrison Way Riverview Road
Lower Providence Township	Eagle Stream Apartment Complex Pawlings Road & Gertrude Avenue Pawlings Road & Eagleville Road Level Road & Arcola Road Pinetown Rd. & Egypt Rd. Egypt Road & Ridge Pike Germantown Pike Bridge Over Skippack Creek	Brimfield Road Catfish Lane Miami Avenue Park Avenue Van Buren Avenue & Adams Avenue Clearfield Avenue & Woodlyn Avenue
Pottstown Borough	Montgomery County Community College, 101 College Drive, Pottstown, PA 19464	
Upper Providence Township	2 nd Avenue Lower Perkiomen Valley Park Yerkes Road	
Limerick Township	Lewis Road Btw County Club & Benner Rd.	
Perkiomen Township	East Park Avenue between Route 29 (Main Street/Gravel Pike) and Pennypacker Road	
Upper Gwynedd Township	Sumneytown Pike Near West Point Pike/Church Road	
Plymouth Township	Launfall Road & West Germantown Pike	

Power Outages

Municipality	Approximate Location
Abington Township	Rockwell Road Edge Hill Avenue
Montgomery Township	Woodbrook Development, Doylestown Rd. & Meadow Glen Rd.
Whitpain Township	Clearview Rd Btw Township Line Rd. and Swede Rd. Yost Rd. Btw North Wales Rd. and Route 202
Upper Merion Township	Valley Forge Acres Firethorn Rd & Henderson Rd. General Washington Road
Lower Pottsgrove Township	North Keim Street & Buchert Road

Heat Events

Almost all, 98.63% of respondents, have access to air-conditioning in their living environment. It is important to note that perceptions of heat risk expressed in these surveys will not include those that live in higher risk environment across Montgomery County. Nonetheless, 5.82% of respondents have experienced heat stress, exhaustion, stroke or rash in their living environment. Less than half,

approximately 42.96%, of those experiencing heat stress, etc. went to a cooling shelter or space with air-conditioning. Respondents identified the following as shelter, which have been visited during heat events:

- Abington High Schools (Abington Townships and Rockledge Borough)
- Glenside Library or Abington Library (Cheltenham Township and Abington Township)
- King of Prussia Mall (Upper Merion Township)

While only 6.06% of respondents have workplaces located directly outdoors, 15.27% of respondents have workplaces that are affected by outdoor temperatures. All in all, 3.10% of respondents have experienced heat stress, exhaustion, stroke or rash at work. The career of those experiencing heat-related health stresses include:

Librarians	Auto Technicians
Landscapers/Gardeners	Nurses
Teachers	Pharmacists/Pharmacy Specialist
Sports Referee	Lifeguard
Federal/Local Gov. Employees (at home-office)	Construction, Numerous Positions
Computer Programmers	Corporate/Product Marketers

The questionnaire identified two potential methods that local governments could use to mitigate heat impacts and invited respondents to specify other solutions/methods. The responses are as follows:

- Tree planting and other vegetation in public space (142)
- Assess to air-conditioning units and installation for low-income residents (101)
- Enhance vegetation requirements for large developments (4)
- Preserve open space and critical habitats (2)
- Upgrade electric grid to reduce power outages and interruptions (2)
- Provide air-conditioning in all public space including transportation infrastructure (2)
- Establish government run cooling centers (2)
- Enhance new development and renovation standards to require effective energy and environmental standards including improved ventilation, insulation, etc. (1)

Disease Outbreaks

Respondents were asked a handful of questions regarding the Coronavirus (COVID-19) pandemic or other infectious diseases that have occurred over the last five years. Responses were as follows:

- 30.77% of respondents or members of their family have experienced a decrease in income
- 38.43% of respondents or members of their family have experienced a reduction in work hours
- 20.43% of respondents or members of their family have experienced layoffs or had to resign from their job
- 3.55% of respondents or members of their family have experienced a loss of health insurance/benefits
- 39.51% of respondents or members of their family have been exposed or had a diagnosis of Covid-19
- 6.62% of respondents have had someone in their family die from Covid-19
- 95.44% of respondents or members of their family have taken the COVID-19 vaccine or plan to take the vaccines

Respondents identified the following disease or conditions that are of most concerned in the next one to five years:

- Diabetes (33)
- Cancers (9)
- Asthma (6)
- West Nile Virus or Other Mosquito-Borne Illnesses (12)
- Lyme Disease or Other Tick-borne Illnesses (31)
- Influenza Or COVID-19 (175)
- High Cholesterol and Associated Heart Disease (4)
- Viral Hepatitis (2)
- Varicella-Zoster Virus (1)
- Sexually Transmitted Diseases (1)

Importantly, many respondents noted that the unaffordability of and lack of access to medical care was a primary concern.

Civil Disturbance

When respondents were asked how satisfied they were with the provision of police services related to civil disturbance in their community, most respondents, 36.36%, answered *satisfied*. 32.17% of respondents answered *very satisfied*, while 26.22% identified themselves as *neither satisfied nor dissatisfied*. 5.25% of respondents were *dissatisfied* or *very dissatisfied* with the provision of police services related to civil disturbances.

Respondents were asked how equipped local police were to address local civil disturbances issues. A majority, 37.05%, said *a moderate amount*. 15.11% of respondents answered *a little* or *none*. Whereas 47.85% answered *a great deal* or *a lot*.

The questionnaire identified two potential methods that local governments could utilize to mitigate negative outcomes from spontaneous mass gathering and invited respondents to specify other solutions/methods. The responses are as follows:

- Streamline and advertise mass gathering permits/emergency service notification reqmts. (75)
- Develop a list of “safe spaces” for protesting (i.e., access to restrooms and drinking water facilities, emergency service, nearby low-speed/low-risk traffic conditions) (151)
- Demilitarize local police forces and support training on non-violent intervention/crowd control/de-escalation methods, anti-bias training (7)
- Increase police presence and target violent criminals (8)
- Improve access to mental health services, emergency trauma care and other community aid (3)
- Support efforts to control misinformation particularly of any extremist viewpoints (1)
- Update laws relating to firearms (1)
- Install video surveillance cameras in high-crime areas (1)
- Expand career firefighter and other emergencies service positions instead of relying on exhausted emergency volunteers (1)

Cyber Security

When respondents were asked how concerned they were about personal data security, most respondents, 51.03%, answered *somewhat concerned*. 38.97% of respondents answered *very concerned*, while 9.95% were *not so concerned* or *not at all concerned*.



The questionnaire asked respondents to specify which issue represents their primary concern. The responses are as follows:

- Medical records (22)
- Credit/financial information (264)
- Purchasing habits/visited sites (30)
- Criminal History (1)
- Ransomware (1)
- Infrastructure/Utility Disruption (4)
- Voting Security (1)

The questionnaire asked respondents to expand upon any cyber security concerns, and comments on how local governments may boost cyber security measures. Core responses are as follows:

- Local governments could provide monthly tips/news on how to avoid becoming a victim to scams/phishing (5)
- Development a recommended action plan for individuals in the case of a cyber-incident (2)
- Update cyber security laws and better regulate (2)
- Create a hotline for cyber incidents/attacks (1)
- Assess the vulnerability of utilities to cyber-attacks (2)

Invasive Species

The majority, 75.82% of respondents, have had their property, business or employment affected by invasive species. Species identified include:

spotted lanternfly (94)	emerald ash borer (41)	bamboo (7)
asian tiger mosquito (1)	wisteria (6)	tree of heaven (4)
amur cork tree (1)	stink bugs (4)	japanese beetle (4)
japanese knotweed (1)	wild garlic (4)	gypsy moth (1)
poison ivy (2)	white snakeroot (1)	mile-a-minute vine (1)
hemlock woolly adelgid (1)	english ivy (3)	norway maple (1)
kudzu (2)	japanese stiltgrass (4)	lesser celandine (2)

When respondents were asked how satisfied they were with the local government's handling of the recent spotted lanternfly outbreak, most respondents, 47.27% answered *neither satisfied nor dissatisfied*. 33.09% of respondents answered *very satisfied* or *somewhat satisfied*, while 19.64% were *somewhat dissatisfied* or *very dissatisfied*.

The questionnaire asked respondents which methods should be used to mitigate negative outcomes from invasive species. The responses are as follows:

- Stricter regulations (47)
- Public awareness (98)
- Early detection (95)
- Surveillance, control, and eradication (192)

Appendix A. Open-Ended Responses

Below are a handful of educational responses to the final open-ended question. In some cases, responses have been consolidated if numerous comments address the same hazards: *Is there anything else you'd like us to know about you or your community's experiences with hazards and how you hope these hazards are addressed in the future?*

Flooding

- Storm water management is a real issue. Partner with local universities (like Villanova, who has renowned experts in stormwater management and could use this as a project with students) to address this.
- Educate homebuyers on flooding and require real estate owners to disclosure whether homes have experienced past flooding.
- Flooding is not restricted to the floodplain, residents who do not even live creeks/streams/rivers due to a number of reasons including rapid building development and lack of storm drains.
- Explore areas where existing infrastructure is being effect by or is contributing to flooding. Encourage changes to the sewer system and power grid that will make them more resilient to flooding/extreme rainfall events.
- Overbuilding and new construction in areas already struggling with may need to be curtailed.
- During a flood, the county should close the Schuylkill River Trail in the affected area. With emergency vehicles and dumpsters, trash trucks etc. using the SRT to access our homes, it would be safer if the trail was closed to recreational bikers, skaters, and walkers until it is safe. Possibly 1 to 2 weeks, depending on the amount of devastation incurred.
- Maintenance of BMPs needs to be a top priority; plans need to be enforced.

Trees/Vegetation

- There should be regulation around which 'heritage/legacy' trees in our township can be cut down, education for the public, and financial help for those with shade trees on their property. I understand the Main Line funds tree care, which is why many of their streets are tree lined. This decreases heat problems, shelters us from storms, and increases property values, among several other added benefits.
- There should be more open/green space and native plants...the increased construction & paving, etc. is enhancing the damage caused by big storms/flooding.

Utility Disruptions

- Resources for vulnerable people during power outages.
- Engage with electrical providers to modernize infrastructure in order to mitigate impacts from storms.

Transportation Accidents

- Add stoplights to intersections with multiple accidents reported.
- Explore visibility at intersections and identify overgrowth of vegetation hampering visibility.

Environmental Contamination

- Chemicals and crude oil traveling through the county is a concern. We need to better understand the impact of a chemical spill on the community.
- Industrial hazards from landscaping businesses or other hazards. In the King of Prussia area, my smoke detectors are constantly going off due to the fumes coming off the mulch piles.
- Very polluting gas burning landscape machines such as mowers and leaf blowers should be transitioning to all electric. And all forms of electricity should be rapidly transitioning to clean renewables.



Climate Change/Carbon Emission

- Because of global warming and climate change, Montgomery County should take a closer look at their carbon footprint. I hope we can reduce this footprint and mitigate the effects on the population of MontCo.
- Flooding: with climate change and all the new construction in the area, floodwater mitigation is going to become critical. It is of utmost importance that this issue is addressed now, before the situation gets worse.

Extreme Temperature

- Highly paved areas are creating 'heat islands' that intensify storms that then impact other communities. Improving native tree coverage is an inexpensive and long-term way to control flooding, manage heat emergencies, combat invasive plant infestations, reduce wind, and reduce impacts of heat islands on local climate and improve community aesthetics.
- Locations of where to go during a heat event are not published adequately.

Civil Disturbance

- Continued training for our law enforcement is important so that the police can continue to handle what comes next. The better equipped our local governmental services are to handle the risks and hazards that we know of as well as those we don't, the better our community will be to both residents and businesses alike.

Wind Damage/Tornado

- The frequency and severity of hurricanes and tornados locally has increased dramatically. Municipalities should put resources towards vetting contractors who can build in-house tornado-proof closets and provide public info along with streamlined building permitting for residents to protect themselves.

Others

- Residents would benefit from an educational seminar on what insurance to have to protect assets against various hazards. I.e., how to obtain flood insurance, what covers tornado damage (and living somewhere else if necessary), and property damage from a mob or mass gathering.
- It's imperative to have racism expunged from our institutions and policies. Mitigation is investing in Diversity, Inclusion and Equity. Anyone getting a dime from local resources should have a DEI action plan and local DEI expert / consultant. We need funding and attention to roll something like that out. Best DEI practices in local government / policing will have life / death, mental health, physical health impact for generations. Please include and recognize systematic racism and its solutions in your hazard mitigation plan.
- Siren warning to alert of severe weather or any type of emergency. if we lose power, or it's the middle of the night (sleeping) there is no access to the news.
- Mental health services need to be improved.

Website for Public Outreach – TEXT:

<https://www.montcopa.org/3850/Hazard-Mitigation-Planning>

A [draft update](#) of the current plan for the next five-year cycle, which will begin in 2023, was compiled over the course of 2022 with information provided by municipalities, county departments, and state agencies. A multi-disciplined steering committee comprised of county, municipal, and community representatives, advised the process.

Updating and adopting the HMP is essential because a current plan is required by state and federal agencies in order for communities in Montgomery County to be eligible for certain types of pre- and post-disaster mitigation funding.

- [Draft Plan Update](#)
- [Comment on the Draft Plan Update](#)

Public Participation

Participation and feedback from the general public and other stakeholders (businesses, nonprofits, schools, etc.) is a vital part of the hazard mitigation planning process. Several public meetings took place to review significant sections of the draft plan as they were completed. Current and past opportunities for education and public input are listed below:

NEW!

Comment on the Plan

Now that the [draft plan update](#) is complete, Montco invites community leaders and the public to review and comment on the document before it is submitted to the PA Emergency Management Agency (PEMA) to start the approval process. The [draft plan update](#) is available on this web page and at local libraries.

Comments will be accepted through **February 17, 2023** and can be submitted [online](#) or mailed to:

Drew Shaw, Environmental Planning Manager

Montgomery County Planning Commission

Courthouse, PO Box 311

Norristown, PA 19404-0311

November 17, 2022 Public Webinar

This public webinar provided a progress report on the hazard mitigation plan update and opportunities for public input on the mitigation strategy goals and actions. [Hazard Mitigation Plan Update - Goals and Actions - Public Webinar Presentation](#)

April 25 and April 26 Public Webinar

This public webinar, offered on two dates, focused on the results of a risk assessment matrix completed by local emergency response personnel. Participants had an opportunity to submit comments. [More Information](#)

If you would like to get in touch with the project team, please contact [Drew Shaw](#) 610-278-3733 for more information.

HAZARD MITIGATION PLAN, 2023 UPDATE



HAVE YOUR SAY...

**We want to know which
natural and man-made
hazards most affect you!**

**Please take 5-10 minutes to complete a short survey
before the close of 2021.**



ACCESS THE SURVEY

You can take our on-line survey at
<https://www.surveymonkey.com/r/S6F25YQ>
and click the survey link.

Or scan
this code:



Printed copies will be
accepted, mail to:
Ellis Foley
One Montgomery Plaza, Suite 201
425 Swede Street
Norristown, PA 19401



COMING SOON Public Meeting Dates

The County will be holding three public meetings between now and 2023 to gather input on specific sections of the Hazard Mitigation Plan. Check our website for times.

**MONTGOMERY COUNTY
BOARD OF COMMISSIONERS**

VALERIE A. ARKOOSH, MD, MPH, CHAIR
KENNETH E. LAWRENCE JR., VICE CHAIR



**MONTGOMERY COUNTY
PLANNING COMMISSION**

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NORRISTOWN, PA 19404-0311
610-278-3722
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WWW.MONTCOPA.ORG

July 22, 2021

Hello,


The Montgomery County is in the process of updating the County-wide Hazard Mitigation Plan (HMP). The Plan identifies and evaluates risks and vulnerabilities associated with human-made and natural hazards and the resulting disasters. This HMP update we would like to expand our public outreach and participation and as a result we are hoping for your help!


If you feel comfortable, please post the attached flyers around your office or any municipal owned property that you believe will generate interest. Additionally, if you have any upcoming newsletters, we would hope you can include our flyers as well. We appreciate your assistance in getting all voices in County heard.

Thank you,

Ellis Foley, AICP

LEED Green Assoc.
Environmental Planner II
Montgomery County Planning Commission
Email: efoley@montcopa.org
Tele: 610-278-3729
Pronouns: she/her/hers


Montgomery County Planning Commission



**Invitation to Review and Comment on
 Montco's Draft Hazard Mitigation Plan Update**






The proposed draft update to the *Montgomery County Hazard Mitigation Plan* is available for public review and comment. The update, scheduled to be completed in 2023, will continue to reduce the county's vulnerability to weather-related, geologic, human-caused, technological, and other natural hazards that could threaten the county. This plan update, required by FEMA, is being prepared to meet state and federal public safety requirements.

The draft was compiled over the past year with information provided by municipalities, county departments, and state agencies. A steering committee, comprised of county, municipal, and community representatives, advised the process. Several public meetings took place to review significant sections of the draft plan update as they were completed. Now that the proposed draft update is complete, Montco invites community leaders and the public to review and comment on the document before it is submitted to the PA Emergency Management Agency (PEMA) to start the approval process.

The proposed draft update and online comment form are available at www.montcopa.org/MontcoHazardMitigationPlan. The plan is also available at local libraries. Comments will be accepted through **February 17, 2023** and can be submitted online or mailed to:

Drew Shaw, Environmental Planning Manager
 Montgomery County Planning Commission
 PO Box 311
 Norristown, PA 19404-0311

Contact: [Drew Shaw](mailto:Drew.Shaw@montcopa.org), Environmental Planning Manager

[Montgomery County Planning Commission](http://www.montcopa.org)
 Contact: [Rita McKelvey](mailto:Rita.McKelvey@montcopa.org) 610-278-3753

Hazard Mitigation Plan Update Planning Group AGENDA

AGENDA
August 25, 2021
10:00 – 11:00

1. Welcome & Introductions (10 – 15 Minutes)

2. Hazard Mitigation Defined (5 – 10 Minutes)

What is Hazard Mitigation?
What is a Hazard Mitigation Plan?

3. 2021 – 2023 Update Process (10 – 15 Minutes)

- a) Organize
- b) Assess
- c) Strategize
- d) Adopt & Implement

4. Participation & Community Engagement (5 Minutes)

Planned Outreach
Process Requirements

5. Schedule & Next Steps (5 Minutes)

SAVE THE DATES

Planning Team Meetings (Required):

January 25, 2022 1:00 – 2:00 PM
May 10, 2022 1:00 – 2:00 PM
August 23, 2022 1:00 – 2:00 PM
November 15, 2023 1:00 – 2:00 PM

Public Meetings (Optional):

October 27, 2021 7:00 – 8:30 PM
March 16, 2022 7:00 – 8:30 PM
November, 2023 TBD

MONTGOMERY COUNTY

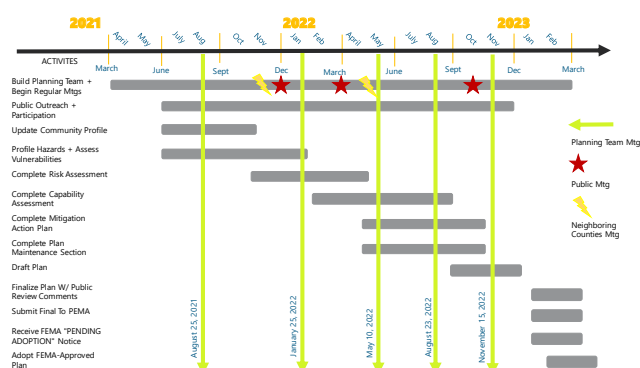
HAZARD MITIGATION PLAN UPDATE

Planning Team Meeting 2:
Tuesday, January 25, 2022 -1:00 PM



AGENDA

- | 1 | 2 | 3 | 4 |
|-------------------|-------------------------------------|--|-------------------|
| WELCOME | HAZARD PRIORITIZATION MATRIX | ALL HAZARDS REVIEW (As Time Allows) | NEXT STEPS |
| Status | Purpose & Instructions | New In 2023 | Homework Review |
| Website Materials | Definitions | Previously Profiled Hazards | |
| HMP Worksheet | Past Results | | |
| Results | Example | | |



Website Materials

Public Meeting PPT, December 2021
To Be Added Soon:
Summary Of Citizen Survey Result



HMP Worksheet

PART 1

How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community?
NC = No Change
I = Increase
D = Decrease

(NC, I, D)

Drought (6, 0, 1)
Earthquake (6, 0, 1)
Extreme Temperature (3, 3, 1)
Flood, Flash Flood, Ice Jam (0, 6, 0)
Hailstorm (5, 1, 1)
Hurricane, Tropical, Non-wester (1, 6, 0)
Invasive Species (2, 4, 1)
Landslide (5, 1, 1)
Lightning Strike (6, 0, 1)
Radon Exposure (6, 0, 1)
Subsidence, Sinkhole (2, 4, 1)

Tornado, Windstorm (2, 4, 1)
Wildfire (5, 1, 1)
Winter Storm (3, 2, 2)
Building & Structure Collapse (6, 0, 1)
Civil Disturbance (4, 3, 0)
Cyber Terrorism (4, 3, 0)
Dam Failure (6, 0, 1)
Gas & Liquid Pipeline (6, 0, 1)
Hazard Materials Release (6, 0, 1)
Levee Failure (6, 0, 1)

PART 2

Other Hazards: Do any of these hazards, not previously profiled in the County's hazard mitigation plan, have the potential to affect your municipality significantly?

(0) Disorientation
(0) Drowning
(1) Mass Food/Animal Feed Contamination
(3) War & Criminal Activity

Nuclear Incident (6, 0, 1)
Opioid Accident Response (4, 3, 0)
Terrorism (5, 1, 1)
Transportation Accident (6, 0, 1)
Urban Fire & Explosion (6, 0, 1)
Utility Disruption (2, 4, 1)
Pandemic and Infectious Disease (0, 7, 0)



2

HAZARD PRIORITIZATION MATRIX

Purpose & Instructions

Definitions

Past Results

Example



HAZARD PRIORITIZATION MATRIX

Hazard	Probability	Impact	Spatial Extent	Warning Time	Duration	RF
1. Wildfire (Urban, Suburban, Rural)	4	4	3	4	4	21
2. Flood (Urban, Suburban, Rural)	4	4	3	4	4	21
3. Earthquake (Urban, Suburban, Rural)	4	4	3	4	4	21
4. Hurricane (Urban, Suburban, Rural)	4	4	3	4	4	21
5. Tornado (Urban, Suburban, Rural)	4	4	3	4	4	21
6. Ice Storm (Urban, Suburban, Rural)	4	4	3	4	4	21
7. Drought (Urban, Suburban, Rural)	4	4	3	4	4	21
8. Air Pollution (Urban, Suburban, Rural)	4	4	3	4	4	21
9. Noise (Urban, Suburban, Rural)	4	4	3	4	4	21
10. Radiation (Urban, Suburban, Rural)	4	4	3	4	4	21

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

Purpose: To determine the Risk Factor (RF) for each hazard.

Instructions: Use the criteria in the Summary of Risk Factor (RF) Approach to assign a value (1-4) in each risk assessment category for each hazard. Then calculate the risk factor, by multiplying the value assigned to each risk assessment category by the weighting factor for each category agreed upon by the HMPT. The sum of all five categories equals the final RF value.

Prioritization Category	Prioritization Score
High	2.5 - 3.0
Medium	1.9 - 2.4
Low	0 - 1.8

DEFINITIONS

Probability: What is the likelihood of a hazard event occurring in a given year?

Level (Weight Value)	Criteria
Unlikely (1)	Less Than 1% Annual Probability
Possible (2)	Between 1% & 49.9% Annual Probability
Likely (3)	Between 50% & 90% Annual Probability
Highly Likely (4)	Greater Than 90% Annual Probability

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?

Level (Weight Value)	Criteria
Minor (1)	Very Few Injuries, If Any, Only Minor Property Damage & Minimal Disruption On Quality Of Life. Temporary Shutdown Of Critical Facilities.
Limited (2)	Minor Injuries Only. More Than 10% Of Property In Affected Area Damaged Or Destroyed. Complete Shutdown Of Critical Facilities For More Than One Day.
Critical (3)	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.
Catastrophic (4)	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.

DEFINITIONS

Spatial Extent: How large of an area could be impacted by a hazard event? Are impacts localized or regional?

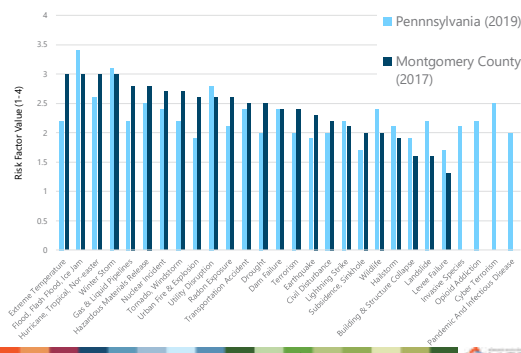
Level (Weight Value)	Criteria
Negligible (1)	Less Than 1% Of Area Affected
Small (2)	Between 1% & 10.9% Of Area Affected
Moderate (3)	Between 11% & 25% Of Area Affected
Large (4)	Greater Than 25% Of Area Affected

Warning Time: Is there usually some lead time associated with the hazard event? Have warning measures been implemented?

Level (Weight Value)	Criteria
More Than 24 Hrs (1)	Self-Defined
12 To 24 Hrs (2)	Self-Defined
6 To 12 Hrs (3)	Levels of warning time and criteria that define them may be adjusted based on hazard addressed.
Less Than 6 Hrs (4)	Self-Defined

Duration: How long does the hazard event usually last?

Level (Weight Value)	Criteria
Less Than 6 Hrs (1)	Self-Defined
Less Than 24 Hrs (2)	Self-Defined
Less Than 1 Week (3)	Levels of warning time and criteria that define them may be adjusted based on hazards addressed.
More Than 1 Week (4)	Self-Defined



URBAN FIRE & EXPLOSION EXAMPLE:

An urban fire involves a structure or property within an urban or developed area. For hazard mitigation purposes, major urban fires involving large buildings and/or multiple properties are of primary concern. The effects of a major urban fire include minor to significant property damage, loss of life, and residential or business displacement. Explosions are extremely rapid releases of energy that usually generate high temperatures and often lead to fires. The risk of severe explosions can be reduced through careful management of flammable and explosive hazardous materials. (FEMA, 1997).

Urban fires and explosions often begin as a result of other hazards—particularly storms, lightning strikes, drought, transportation accidents, hazardous materials releases, criminal activity (arson), and terrorism.



PA HIRA RANKING (2019)

1.9

MONTCO HIRA RANKING (2017)

2.6

Example: URBAN FIRE & EXPLOSION

Probability **Impact** **Spatial Extent** **Warning Time** **Duration**

Less Than 1% Annual Probability 3 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. 1 Less Than 1% Of Area Affected 4 Less Than 6 Hrs 1 Less Than 6 Hrs

RF Value = [(1 x .30) + (3 x .30) + (1 x .20) + (4 x .10) + (1 x .10)] = [(.30) + (.90) + (.20) + (.40) + (.10)] = **1.9**

3

ALL HAZARDS REVIEW

New In 2023

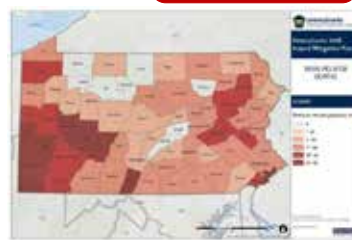
Previously Profiled Hazards



PROPOSED ADDITION

Opioid addiction occurs when an individual becomes physically dependent on opioids, which include opiates and narcotics. Opioids are a synthetic substance found in certain prescription pain medications: morphine, codeine, methadone, oxycodone, hydrocodone, fentanyl, and hydromorphone, and street drugs like heroin. These drugs can be highly addictive, which often lead to misuse and overdosing.

Nationally, Pennsylvania is among four of the hardest hit states from opioid-related deaths, along with West Virginia, Ohio, and New Hampshire. In Pennsylvania, opioid overdoses have become the leading cause of accidental death, surpassing automobile accidents (CDC, 2017). Pennsylvania has seen a steady rise in opioid related deaths over the last several years, with drug-related death rates increasing 102 percent between 2014 and 2017.

PA HIRA RANKING (2019)
2.2MONTCO HIRA RANKING (2017)

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PROPOSED ADDITION

Gun violence is a leading cause of premature death in the U.S. Guns kill almost 30,000 people and cause 60,000 injuries each year. Gun related deaths attributed to suicide and homicide in Montgomery County is detailed in the chart above. Between 2017 and 2018, white males accounted for over 75% of all gun related deaths. Over 75% of gun related deaths were classified as a suicide with an average age of 48.2 years and 54.6 years respectively. Data provided by Montgomery County Coroner's office.

DEATHS BY FIREARMS IN MONTGOMERY COUNTY

Demographic	2017		2018	
	Suicide	Homicide	Suicide	Homicide
Number of Deaths	49	9	22	12
Male	36	9	21	9
Female	7	0	1	0
Age Range	18-94	18-92	22-91	20-91

BURDEN OF GUN VIOLENCE

- Gun violence affects people of all ages and races in the U.S. but has a disproportionate impact on young adults, males and racial/ethnic minorities.
- Guns are a weapon of choice for mass homicides and suicide.
- Gun violence cost the U.S. \$229 billion, or an average of \$700 per gun in America.

War & Criminal Activity:
GUN VIOLENCE

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NEW

An invasive species is a species that is not indigenous to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. These species can be any type of organism: plant, fish, invertebrate, mammal, bird, disease, or pathogen. Infestations may not necessarily impact human health but can create a nuisance or agricultural hardships by destroying crops, defoliating populations of native plant and tree species, or interfering with ecological systems (Governor's Invasive Species Council of Pennsylvania, 2009).

Most new introductions of invasive species occur because of human activity. Since the first outbreak in 1862 (Canada Thistle, Johnson Grass, and Marijuana), there have been 26 acts and quarantines enacted to prevent the spread of invasive species.

The probability of future occurrence for invasive species threats is on the rise because of the growing volume of transported goods, increasing technology, efficiency and speed of transportation and expanding international trade agreements, as well as more favorable climatic conditions.

1960-2010 Invasive Species in Pennsylvania

Year	Species	Year	Species
1960	Spotted Lanternfly	2000	Asian Longhorn Beetle
1961	Spotted Lanternfly	2001	Asian Longhorn Beetle
1962	Spotted Lanternfly	2002	Asian Longhorn Beetle
1963	Spotted Lanternfly	2003	Asian Longhorn Beetle
1964	Spotted Lanternfly	2004	Asian Longhorn Beetle
1965	Spotted Lanternfly	2005	Asian Longhorn Beetle
1966	Spotted Lanternfly	2006	Asian Longhorn Beetle
1967	Spotted Lanternfly	2007	Asian Longhorn Beetle
1968	Spotted Lanternfly	2008	Asian Longhorn Beetle
1969	Spotted Lanternfly	2009	Asian Longhorn Beetle
1970	Spotted Lanternfly	2010	Asian Longhorn Beetle

PA HIRA RANKING (2019)
2.1MONTCO HIRA RANKING (2017)

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PANDEMIC AND
INFECTIOUS DISEASE

A pandemic occurs when infection from a new strain of a certain disease, to which most humans have no immunity, substantially exceeds the number of expected cases over a given period of time. Such a disease may or may not be transferable between humans and animals. (Martin & Martin-Granel, 2006).

Since Winter 2019/2020 the Covid-19 pandemic has been in existence and has contributed to 1,461 deaths countywide. Recently cases have increased and are extremely high. Prior to the Covid-19 outbreaks, core disease of concern with pandemic and infectious potential in PA included: Zika Virus, West Nile virus, and influenza.

PA HIRA RANKING (2019)
2.0MONTCO HIRA RANKING (2017)

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Civil disturbance hazards encompass a set of hazards emanating from a **wide range of possible events that cause civil disorder, confusion, strife, and economic hardship**. Civil disturbance hazards include the following:

- Famine; involving a widespread scarcity of food leading to malnutrition and increased mortality
- Economic Collapse, Recession
- Misinformation; erroneous information spread unintentionally
- Public Unrest, Mass Hysteria
- Riot; group acts of violence against property and individuals
- Strike, Labor Dispute

The scale and scope of civil disturbance events varies widely. However, government facilities, landmarks, prisons, and universities are common sites where crowds and mobs may gather. Over the past 265 years, Pennsylvania has had about dozen civil disorders take place which were notable enough to be recorded in the state's history with the most recent being after the 2018 Super Bowl Eagles victory.

From 2012 to 2017, the Commonwealth experienced an average of 74 civil disturbance events each year. The location of civil disturbance events is unpredictable, yet spatial distribution patterns of riots in the past suggest that cities, universities, sporting events, and where large crowds gather are probable areas for a civil disturbance event to ensue.

Table 1.1.1 Civil Disturbance Events in Pennsylvania

Year	Event	Location	Year	Event	Location
1793	Shays' Rebellion	Shays' Rebellion	1938	Shays' Rebellion	Shays' Rebellion
1812	Shays' Rebellion	Shays' Rebellion	1939	Shays' Rebellion	Shays' Rebellion
1862	Shays' Rebellion	Shays' Rebellion	1940	Shays' Rebellion	Shays' Rebellion
1901	Shays' Rebellion	Shays' Rebellion	1941	Shays' Rebellion	Shays' Rebellion
1918	Shays' Rebellion	Shays' Rebellion	1942	Shays' Rebellion	Shays' Rebellion
1920	Shays' Rebellion	Shays' Rebellion	1943	Shays' Rebellion	Shays' Rebellion
1921	Shays' Rebellion	Shays' Rebellion	1944	Shays' Rebellion	Shays' Rebellion
1922	Shays' Rebellion	Shays' Rebellion	1945	Shays' Rebellion	Shays' Rebellion
1923	Shays' Rebellion	Shays' Rebellion	1946	Shays' Rebellion	Shays' Rebellion
1924	Shays' Rebellion	Shays' Rebellion	1947	Shays' Rebellion	Shays' Rebellion
1925	Shays' Rebellion	Shays' Rebellion	1948	Shays' Rebellion	Shays' Rebellion
1926	Shays' Rebellion	Shays' Rebellion	1949	Shays' Rebellion	Shays' Rebellion
1927	Shays' Rebellion	Shays' Rebellion	1950	Shays' Rebellion	Shays' Rebellion
1928	Shays' Rebellion	Shays' Rebellion	1951	Shays' Rebellion	Shays' Rebellion
1929	Shays' Rebellion	Shays' Rebellion	1952	Shays' Rebellion	Shays' Rebellion
1930	Shays' Rebellion	Shays' Rebellion	1953	Shays' Rebellion	Shays' Rebellion
1931	Shays' Rebellion	Shays' Rebellion	1954	Shays' Rebellion	Shays' Rebellion
1932	Shays' Rebellion	Shays' Rebellion	1955	Shays' Rebellion	Shays' Rebellion
1933	Shays' Rebellion	Shays' Rebellion	1956	Shays' Rebellion	Shays' Rebellion
1934	Shays' Rebellion	Shays' Rebellion	1957	Shays' Rebellion	Shays' Rebellion
1935	Shays' Rebellion	Shays' Rebellion	1958	Shays' Rebellion	Shays' Rebellion
1936	Shays' Rebellion	Shays' Rebellion	1959	Shays' Rebellion	Shays' Rebellion
1937	Shays' Rebellion	Shays' Rebellion	1960	Shays' Rebellion	Shays' Rebellion
1938	Shays' Rebellion	Shays' Rebellion	1961	Shays' Rebellion	Shays' Rebellion
1939	Shays' Rebellion	Shays' Rebellion	1962	Shays' Rebellion	Shays' Rebellion
1940	Shays' Rebellion	Shays' Rebellion	1963	Shays' Rebellion	Shays' Rebellion
1941	Shays' Rebellion	Shays' Rebellion	1964	Shays' Rebellion	Shays' Rebellion
1942	Shays' Rebellion	Shays' Rebellion	1965	Shays' Rebellion	Shays' Rebellion
1943	Shays' Rebellion	Shays' Rebellion	1966	Shays' Rebellion	Shays' Rebellion
1944	Shays' Rebellion	Shays' Rebellion	1967	Shays' Rebellion	Shays' Rebellion
1945	Shays' Rebellion	Shays' Rebellion	1968	Shays' Rebellion	Shays' Rebellion
1946	Shays' Rebellion	Shays' Rebellion	1969	Shays' Rebellion	Shays' Rebellion
1947	Shays' Rebellion	Shays' Rebellion	1970	Shays' Rebellion	Shays' Rebellion
1948	Shays' Rebellion	Shays' Rebellion	1971	Shays' Rebellion	Shays' Rebellion
1949	Shays' Rebellion	Shays' Rebellion	1972	Shays' Rebellion	Shays' Rebellion
1950	Shays' Rebellion	Shays' Rebellion	1973	Shays' Rebellion	Shays' Rebellion
1951	Shays' Rebellion	Shays' Rebellion	1974	Shays' Rebellion	Shays' Rebellion
1952	Shays' Rebellion	Shays' Rebellion	1975	Shays' Rebellion	Shays' Rebellion
1953	Shays' Rebellion	Shays' Rebellion	1976	Shays' Rebellion	Shays' Rebellion
1954	Shays' Rebellion	Shays' Rebellion	1977	Shays' Rebellion	Shays' Rebellion
1955	Shays' Rebellion	Shays' Rebellion	1978	Shays' Rebellion	Shays' Rebellion
1956	Shays' Rebellion	Shays' Rebellion	1979	Shays' Rebellion	Shays' Rebellion
1957	Shays' Rebellion	Shays' Rebellion	1980	Shays' Rebellion	Shays' Rebellion
1958	Shays' Rebellion	Shays' Rebellion	1981	Shays' Rebellion	Shays' Rebellion
1959	Shays' Rebellion	Shays' Rebellion	1982	Shays' Rebellion	Shays' Rebellion
1960	Shays' Rebellion	Shays' Rebellion	1983	Shays' Rebellion	Shays' Rebellion
1961	Shays' Rebellion	Shays' Rebellion	1984	Shays' Rebellion	Shays' Rebellion
1962	Shays' Rebellion	Shays' Rebellion	1985	Shays' Rebellion	Shays' Rebellion
1963	Shays' Rebellion	Shays' Rebellion	1986	Shays' Rebellion	Shays' Rebellion
1964	Shays' Rebellion	Shays' Rebellion	1987	Shays' Rebellion	Shays' Rebellion
1965	Shays' Rebellion	Shays' Rebellion	1988	Shays' Rebellion	Shays' Rebellion
1966	Shays' Rebellion	Shays' Rebellion	1989	Shays' Rebellion	Shays' Rebellion
1967	Shays' Rebellion	Shays' Rebellion	1990	Shays' Rebellion	Shays' Rebellion
1968	Shays' Rebellion	Shays' Rebellion	1991	Shays' Rebellion	Shays' Rebellion
1969	Shays' Rebellion	Shays' Rebellion	1992	Shays' Rebellion	Shays' Rebellion
1970	Shays' Rebellion	Shays' Rebellion	1993	Shays' Rebellion	Shays' Rebellion
1971	Shays' Rebellion	Shays' Rebellion	1994	Shays' Rebellion	Shays' Rebellion
1972	Shays' Rebellion	Shays' Rebellion	1995	Shays' Rebellion	Shays' Rebellion
1973	Shays' Rebellion	Shays' Rebellion	1996	Shays' Rebellion	Shays' Rebellion
1974	Shays' Rebellion	Shays' Rebellion	1997	Shays' Rebellion	Shays' Rebellion
1975	Shays' Rebellion	Shays' Rebellion	1998	Shays' Rebellion	Shays' Rebellion
1976	Shays' Rebellion	Shays' Rebellion	1999	Shays' Rebellion	Shays' Rebellion
1977	Shays' Rebellion	Shays' Rebellion	2000	Shays' Rebellion	Shays' Rebellion
1978	Shays' Rebellion	Shays' Rebellion	2001	Shays' Rebellion	Shays' Rebellion
1979	Shays' Rebellion	Shays' Rebellion	2002	Shays' Rebellion	Shays' Rebellion
1980	Shays' Rebellion	Shays' Rebellion	2003	Shays' Rebellion	Shays' Rebellion
1981	Shays' Rebellion	Shays' Rebellion	2004	Shays' Rebellion	Shays' Rebellion
1982	Shays' Rebellion	Shays' Rebellion	2005	Shays' Rebellion	Shays' Rebellion
1983	Shays' Rebellion	Shays' Rebellion	2006	Shays' Rebellion	Shays' Rebellion
1984	Shays' Rebellion	Shays' Rebellion	2007	Shays' Rebellion	Shays' Rebellion
1985	Shays' Rebellion	Shays' Rebellion	2008	Shays' Rebellion	Shays' Rebellion
1986	Shays' Rebellion	Shays' Rebellion	2009	Shays' Rebellion	Shays' Rebellion
1987	Shays' Rebellion	Shays' Rebellion	2010	Shays' Rebellion	Shays' Rebellion
1988	Shays' Rebellion	Shays' Rebellion	2011	Shays' Rebellion	Shays' Rebellion
1989	Shays' Rebellion	Shays' Rebellion	2012	Shays' Rebellion	Shays' Rebellion
1990	Shays' Rebellion	Shays' Rebellion	2013	Shays' Rebellion	Shays' Rebellion
1991	Shays' Rebellion	Shays' Rebellion	2014	Shays' Rebellion	Shays' Rebellion
1992	Shays' Rebellion	Shays' Rebellion	2015	Shays' Rebellion	Shays' Rebellion
1993	Shays' Rebellion	Shays' Rebellion	2016	Shays' Rebellion	Shays' Rebellion
1994	Shays' Rebellion	Shays' Rebellion	2017	Shays' Rebellion	Shays' Rebellion
1995	Shays' Rebellion	Shays' Rebellion	2018	Shays' Rebellion	Shays' Rebellion
1996	Shays' Rebellion	Shays' Rebellion	2019	Shays' Rebellion	Shays' Rebellion
1997	Shays' Rebellion	Shays' Rebellion	2020	Shays' Rebellion	Shays' Rebellion
1998	Shays' Rebellion	Shays' Rebellion	2021	Shays' Rebellion	Shays' Rebellion
1999	Shays' Rebellion	Shays' Rebellion	2022	Shays' Rebellion	Shays' Rebellion
2000	Shays' Rebellion	Shays' Rebellion	2023	Shays' Rebellion	Shays' Rebellion

PA HIRA RANKING (2019)
2.0MONTCO HIRA RANKING (2017)
2.2

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CYBER TERRORISM

Cyber-terrorism is a broad term that refers to acts associated with the convergence of terrorism and cyberspace. Generally, cyber-terrorism involves unlawful attacks or threats against computers, networks, and the information stored therein to intimidate or coerce a government or its people to achieve political or social objectives (Denning, 2000). These acts can range from taking control of a host website, to using networked resources to directly cause destruction and harm. The Pennsylvania Department of Homeland Security defines the following types and methods of cyber-attacks: Botnet, card skimming, denial-of-service attack, malicious code, pharming, phishing, spam, spear phishing, spoofing, spyware, trojan horse, virus, and worm.

Cyber-terrorism can cause severe disruptions to transportation, public safety, and utility services, all of which are critical infrastructure that are highly dependent on information technology. All state agencies, as well as individuals, businesses, and other institutions in the Commonwealth, are potential targets for cyber-terrorism. Potential threats include identity theft, loss of sensitive information, disruption of services, and other malicious activity.

Table 4.3.18-2 Past occurrences of cyber attacks, 2012-2018 (PENNA-HC, 2018)

INCIDENT	YEAR	LOCATION
Cyber threat	2016	York
International cyber attack	2017	Statewide
Cyber attack	2017	Northampton, Bethlehem, City
Cyber Incident	2018	Statewide

PA HIRA RANKING (2019)
2.5
MONTICO HIRA RANKING (2017)
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TRANSPORTATION ACCIDENT

Transportation accidents can result from any form of air, rail, water, or road travel. These incidents are **collectively the costliest** of all hazards in the Commonwealth in terms of lives lost, injuries, and economic losses. The sheer amount of roadway coupled with the high volume of traffic creates the potential for serious accidents along the Commonwealth's roads and bridges.

It is unlikely that small accidents would significantly impact the larger community. However, certain accidents could have secondary regional impacts such as a hazardous materials release or disruption in critical supply/access routes, especially if vital transportation corridors or junctions are present. (Research and Innovative Technology Administration, 2009). Traffic congestion in certain circumstances can also be hazardous. Traffic congestion is a condition that occurs when traffic demand approaches or exceeds the available capacity of the road network. This hazard should be carefully evaluated during emergency planning since it is a key factor in timely disaster or hazard response, especially in areas with high population density. (Federal Highway Administration, 2009).



GAS & LIQUID PIPELINES

Pipeline systems are defined by federal regulations as all parts of a pipeline facility through which a hazardous liquid or gas moves, including piping, valves, pumps or compressors, metering and delivery stations, and storage and breakout tanks. Although pipelines are typically located underground, they may also be located aboveground when dictated by operational considerations (such as connections to pump and compressor stations) or environmental conditions (such as geological characteristics) (FEMA, 2015).

Pipeline failures are low-probability, potentially high-consequence events. Although gas and liquid pipeline failures are infrequent, the hazardous and inflammable materials released by these events can pose a significant threat to public safety and the built and natural environment. Impacts to life and property can result from inhalation or ingestion of toxins, exposure to a fire or explosion, or exposure to contaminated soils or drinking water (FEMA, 2015). Explosions associated with pipeline failures, for example, can cause severe injury to nearby residents and destroy homes and other property.



PA HIRA RANKING (2019)
2.2
MONTICO HIRA RANKING (2017)
2.8

HAZARDOUS MATERIALS RELEASE

PREVIOUSLY TITLED ENVIRONMENTAL HAZARD

Hazardous materials can include toxic chemicals, infectious substances, biohazardous waste, and any materials that are explosive, corrosive, flammable, or radioactive. Hazardous material releases can occur wherever hazardous materials are manufactured, used, stored, or transported. Such releases can occur along transportation routes or at fixed-site facilities. Hazardous material releases can contaminate air, water, and soils possibly resulting in death and/or injuries. Dispersion can take place rapidly when transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Releases can affect nearby populations and contaminate critical or sensitive environmental areas. Additionally, as of 2016, Montgomery County had 146 industrial facilities monitored through EPA's Toxic Release Inventory (TRI) database.

PA HIRA RANKING (2019)
2.5
MONTICO HIRA RANKING (2017)
2.8

EXTREME TEMPERATURE

Extreme cold temperatures drop well below what is considered normal for an area during the winter months and often accompany winter storm events. Combined with increases in wind speed, such temperatures in Pennsylvania can be life threatening to those exposed for extended periods of time. Extreme heat can be described as temperatures that hover 10°F or more above the average high temperature for a region during the summer months. Extreme heat is responsible for more deaths in Pennsylvania than all other natural disasters combined.

According to the National Climatic Data Center there have been 85 extreme temperature episodes in Pennsylvania between 2000 and 2017. 50 of these events have been a result of extreme cold/wind chill, resulting in 4 deaths, and 35 have been extreme heat episodes, resulting in 90 deaths and 103 injuries.

With changing climate and annual average temperatures increasing, extreme temperatures are projected to increase more than average and the number of days above 90°F will rise while heat waves will intensify.



PA HIRA RANKING (2019)
2.2
MONTICO HIRA RANKING (2017)
3.0

UTILITY DISRUPTION

Utility interruption hazards are hazards that impair the functioning of important utilities in the energy, telecommunications, public works, and information network sectors. Utility interruption hazards include the following:

- Geomagnetic Storms
- Fuel or Resource Shortage
- Electromagnetic Pulse
- Information Technology Failure
- Ancillary Support Equipment
- Public Works Failure
- Telecommunications System Failure
- Transmission Facility or Linear Utility Accident

Utility interruptions occur throughout the Commonwealth but usually are small-scale, localized incidents. Utility interruptions are possible anywhere there is utility service. Widespread utility interruption events usually occur approximately once every five years, usually as a secondary effect of an extreme weather event.

Table 4.3.19-1 Electrically Interconnected events reported to Pennsylvania Public Utilities Commission in 2016

UTILITY NAME	OUTAGE DATE	AFFECTED CUSTOMERS	CAUSE
Allegheny	2/24/2016	13,118	Storm and high winds
APCO	2/24/2016	32,174	Storm and high winds
APCO	2/24/2016	38,124	Storm and high winds
APCO	2/24/2016	46,024	Storm and high winds
APCO	2/24/2016	56,024	Storm and high winds
APCO	2/24/2016	66,024	Storm and high winds
APCO	2/24/2016	76,024	Storm and high winds
APCO	2/24/2016	86,024	Storm and high winds
APCO	2/24/2016	96,024	Storm and high winds
APCO	2/24/2016	106,024	Storm and high winds
APCO	2/24/2016	116,024	Storm and high winds
APCO	2/24/2016	126,024	Storm and high winds
APCO	2/24/2016	136,024	Storm and high winds
APCO	2/24/2016	146,024	Storm and high winds
APCO	2/24/2016	156,024	Storm and high winds
APCO	2/24/2016	166,024	Storm and high winds
APCO	2/24/2016	176,024	Storm and high winds
APCO	2/24/2016	186,024	Storm and high winds
APCO	2/24/2016	196,024	Storm and high winds
APCO	2/24/2016	206,024	Storm and high winds
APCO	2/24/2016	216,024	Storm and high winds
APCO	2/24/2016	226,024	Storm and high winds
APCO	2/24/2016	236,024	Storm and high winds
APCO	2/24/2016	246,024	Storm and high winds
APCO	2/24/2016	256,024	Storm and high winds
APCO	2/24/2016	266,024	Storm and high winds
APCO	2/24/2016	276,024	Storm and high winds
APCO	2/24/2016	286,024	Storm and high winds
APCO	2/24/2016	296,024	Storm and high winds
APCO	2/24/2016	306,024	Storm and high winds
APCO	2/24/2016	316,024	Storm and high winds
APCO	2/24/2016	326,024	Storm and high winds
APCO	2/24/2016	336,024	Storm and high winds
APCO	2/24/2016	346,024	Storm and high winds
APCO	2/24/2016	356,024	Storm and high winds
APCO	2/24/2016	366,024	Storm and high winds
APCO	2/24/2016	376,024	Storm and high winds
APCO	2/24/2016	386,024	Storm and high winds
APCO	2/24/2016	396,024	Storm and high winds
APCO	2/24/2016	406,024	Storm and high winds
APCO	2/24/2016	416,024	Storm and high winds
APCO	2/24/2016	426,024	Storm and high winds
APCO	2/24/2016	436,024	Storm and high winds
APCO	2/24/2016	446,024	Storm and high winds
APCO	2/24/2016	456,024	Storm and high winds
APCO	2/24/2016	466,024	Storm and high winds
APCO	2/24/2016	476,024	Storm and high winds
APCO	2/24/2016	486,024	Storm and high winds
APCO	2/24/2016	496,024	Storm and high winds
APCO	2/24/2016	506,024	Storm and high winds
APCO	2/24/2016	516,024	Storm and high winds
APCO	2/24/2016	526,024	Storm and high winds
APCO	2/24/2016	536,024	Storm and high winds
APCO	2/24/2016	546,024	Storm and high winds
APCO	2/24/2016	556,024	Storm and high winds
APCO	2/24/2016	566,024	Storm and high winds
APCO	2/24/2016	576,024	Storm and high winds
APCO	2/24/2016	586,024	Storm and high winds
APCO	2/24/2016	596,024	Storm and high winds
APCO	2/24/2016	606,024	Storm and high winds
APCO	2/24/2016	616,024	Storm and high winds
APCO	2/24/2016	626,024	Storm and high winds
APCO	2/24/2016	636,024	Storm and high winds
APCO	2/24/2016	646,024	Storm and high winds
APCO	2/24/2016	656,024	Storm and high winds
APCO	2/24/2016	666,024	Storm and high winds
APCO	2/24/2016	676,024	Storm and high winds
APCO	2/24/2016	686,024	Storm and high winds
APCO	2/24/2016	696,024	Storm and high winds
APCO	2/24/2016	706,024	Storm and high winds
APCO	2/24/2016	716,024	Storm and high winds
APCO	2/24/2016	726,024	Storm and high winds
APCO	2/24/2016	736,024	Storm and high winds
APCO	2/24/2016	746,024	Storm and high winds
APCO	2/24/2016	756,024	Storm and high winds
APCO	2/24/2016	766,024	Storm and high winds
APCO	2/24/2016	776,024	Storm and high winds
APCO	2/24/2016	786,024	Storm and high winds
APCO	2/24/2016	796,024	Storm and high winds
APCO	2/24/2016	806,024	Storm and high winds
APCO	2/24/2016	816,024	Storm and high winds
APCO	2/24/2016	826,024	Storm and high winds
APCO	2/24/2016	836,024	Storm and high winds
APCO	2/24/2016	846,024	Storm and high winds
APCO	2/24/2016	856,024	Storm and high winds
APCO	2/24/2016	866,024	Storm and high winds
APCO	2/24/2016	876,024	Storm and high winds
APCO	2/24/2016	886,024	Storm and high winds
APCO	2/24/2016	896,024	Storm and high winds
APCO	2/24/2016	906,024	Storm and high winds
APCO	2/24/2016	916,024	Storm and high winds
APCO	2/24/2016	926,024	Storm and high winds
APCO	2/24/2016	936,024	Storm and high winds
APCO	2/24/2016	946,024	Storm and high winds
APCO	2/24/2016	956,024	Storm and high winds
APCO	2/24/2016	966,024	Storm and high winds
APCO	2/24/2016	976,024	Storm and high winds
APCO	2/24/2016	986,024	Storm and high winds
APCO	2/24/2016	996,024	Storm and high winds
APCO	2/24/2016	1,006,024	Storm and high winds

PA HIRA RANKING (2019)
2.8
MONTICO HIRA RANKING (2017)
2.6

FLOOD, FLASH FLOOD, ICE JAM

Flooding is the temporary condition of partial or complete inundation on normally dry land and it is the most frequent and costly of all hazards in Pennsylvania. Flooding events are generally the result of excessive precipitation. General flooding is typically experienced when precipitation occurs over a given river basin for an extended period of time. Flash flooding is usually a result of heavy localized precipitation falling in a short time period over a given location, often along mountain streams and in urban areas where much of the ground is covered by impervious surfaces.

The severity of a flood event is dependent upon a combination of stream and river basin topography and physiography, hydrology, precipitation and weather patterns, present soil moisture conditions, the degree of vegetative clearing as well as the presence of impervious surfaces in and around flood-prone areas (NOAA, 2009). Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly. All forms of flooding can damage infrastructure (USACE, 2007).

PA HIRA RANKING (2019)

3.4

MONTCO HIRA RANKING (2017)

3.0



HURRICANE, TROPICAL, NOR-EASTER

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 of 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). 13 Presidential Disaster Declarations, 4 Presidential Emergency Declarations, and two additional Gubernatorial Declarations have been made since 1955 due to coastal storm events in Pennsylvania.

PA HIRA RANKING (2019)

2.6

MONTCO HIRA RANKING (2017)

3.0



WINTER STORM

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. A winter storm can range from a moderate snowfall or ice event over a period of a few hours to blizzard conditions with wind-driven snow that lasts for several days. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility and disrupt transportation. They begin as low-pressure systems that move through Pennsylvania usually following the jet stream.

Due to their regular occurrence, these storms are considered hazards only when they result in damage to specific structures or cause disruption to traffic, communications, electric power, or other utilities. The snowfall season is November through April, with the greatest monthly snowfalls occurring in March as moisture supply begins to increase with rising temperatures.

The Commonwealth of Pennsylvania has a long history of severe winter weather. Six of the 59 Presidential Disaster and Emergency Declarations issued in Pennsylvania have been in response to winter storms.

PA HIRA RANKING (2019)

3.1

MONTCO HIRA RANKING (2017)

3.0



TORNADO, WINDSTORM

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes or tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of high wind velocities and wind-blown debris.

According to the National Weather Service, tornado wind speeds can range between 30 to more than 300 miles per hour. They are more likely to occur during the spring and early summer months of March through June and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small, short-lived tornadoes can inflict tremendous damage. Destruction ranges from minor to catastrophic depending on the intensity, size, and duration of the storm. Structures made of light materials such as mobile homes are most susceptible to damage. Waterspouts are weak tornadoes that form over warm water and are relatively uncommon in Pennsylvania.

PA HIRA RANKING (2019)

2.2

MONTCO HIRA RANKING (2017)

2.7



SUBSIDENCE, SINKHOLE

Subsidence is a natural geologic process that commonly occurs in areas with underlying limestone bedrock and other rock types that are soluble in water. Water passing through naturally occurring fractures dissolves these materials leaving underground voids. Eventually, overburden on top of the voids causes a collapse which can damage structures with low strain tolerances. This collapse can take place slowly over time or quickly in a single event. Karst topography describes a landscape that contains characteristic structures such as sinkholes, linear depressions, and caves. In addition to natural processes, human activity such as water, natural gas, and oil extraction can cause subsidence and sinkhole formations. (FEMA, 1997).

There are two common causes of subsidence in Pennsylvania: 1) dissolution of carbonate rock such as limestone or dolomite and 2) mining activity. DCMR provides an online inventory of sinkholes listing 3,619 sinkholes that have been identified across Pennsylvania.

PA HIRA RANKING (2019)

1.7

MONTCO HIRA RANKING (2017)

2.0



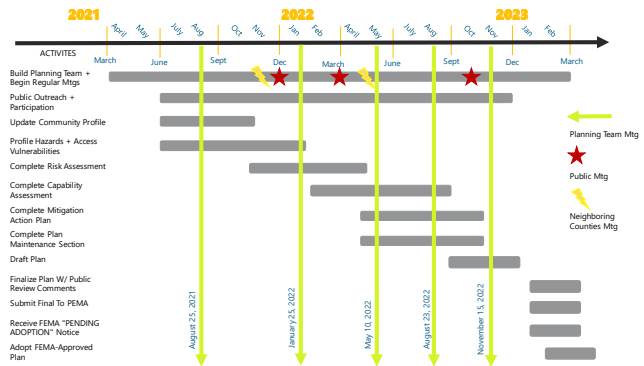
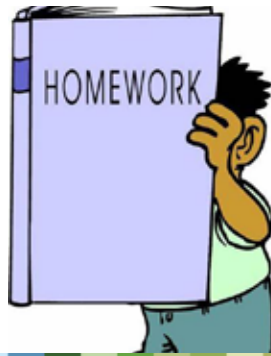
4

NEXT STEPS

Homework Review

HOMEWORK REVIEW

Individual Hazard Prioritization Matrix
Due Date: February 15th
Response To Complied Matrix
Due Date: March 1st



THANK YOU

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NUCLEAR INCIDENT

Nuclear incidents generally refer to events involving the release of significant levels of radioactivity or exposure of workers or the public to radiation (FEMA, 1997). The primary concern following such an incident or accident is the extent of radiation, inhalation, and ingestion of radioactive isotopes which can cause acute health effects (e.g. death, burns, severe impairment), chronic health effects (e.g. cancer), and psychological effects. (FEMA, 1997).

Most of these generating stations are concentrated in the eastern portion of the state. Nuclear incidents rarely occur, but the incident at Three Mile Island is the worst fixed-nuclear facility accident in U.S. history. The resulting contamination and state of the reactor core led to the development of a fourteen-year cleanup and scientific effort with a minimum cost estimate of nearly \$1 billion. Despite the severity of the damage, no injuries due to radiation exposure occurred.



PA HIRA RANKING (2019)
2.4

MONTCO HIRA RANKING (2017)
2.7



BUILDING & STRUCTURE COLLAPSE

Buildings and other engineered structures, including bridges, may collapse if their structural integrity is compromised, especially due to effects from other natural or human-made hazards. Older buildings or structures, structures that are not built to standard codes, or structures that have been weakened are more susceptible to be affected by these hazards. Most buildings constructed after 1961 in the Commonwealth were built under modern building codes as adopted in the Pennsylvania Uniform Construction Code.

Bridges serve to connect both large and small roadways and communities throughout the Commonwealth. Whether they span another roadway or a body of water, bridges are a crucial part of every transportation system. However, many of Pennsylvania's bridge structures are aging and in great need of repair.

Hazard events such as fires, winter storms, and tropical storms could create conditions that would cause buildings or structures to collapse.



PA HIRA RANKING (2019)
1.9

MONTCO HIRA RANKING (2017)
1.6

TERRORISM

Terrorism is use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyberattacks (computer-based); and the use of chemical, biological, nuclear and radiological weapons (FEMA, 2009). Increasingly, cyberattacks have become a more pressing concern for governments across America.

There are many important considerations in evaluating terrorism hazards, such as the existence of facilities, landmarks, or other buildings of international, national, or regional importance. Military and civilian government facilities, international airports, large cities, and high-profile landmarks are considering high-risk targets, according FEMA. Other targets can include large public gatherings, water and food supplies, utilities, and corporate centers.

PA HIRA Ranking and Hazard Potential of County Assets, 2014 and 2017	2014	2017	2014	2017	2014	2017	2017
Domestic Threat	0	0	0	0	0	0	0
Biotech Threat	0	0	0	0	0	0	0
Border Threat	29	150	261	209	152	112	35
Cyber Attacks	0	0	0	0	0	0	0
Explosive Threats	0	0	0	0	0	0	0
Gasoline	0	0	0	0	0	0	0
School Bomb Threat	0	41	37	46	39	24	6
Suspicious Terrorism	0	1	0	0	0	1	0
Terrorism Threat	1	6	0	0	0	0	0
Terrorism Activity - 2014	38	237	330	294	330	182	46

PA HIRA RANKING (2019)
2.0

MONTCO HIRA RANKING (2017)
2.4



In addition to flooding and severe winds, hail is another potential damaging product of severe thunderstorms. Hailstorms occur when ice crystals form within a low pressure front due to the rapid rise of warm air into the upper atmosphere and the subsequent cooling of the air mass. Frozen droplets gradually accumulate on the ice crystals until, having developed sufficient weight, they fall as precipitation in the form of balls or irregularly shaped masses of ice greater than 0.75 inches in diameter (FEMA, 1997).

Damage to crops and vehicles are typically the most significant impacts of hailstorms. Areas in eastern and central Pennsylvania typically experience less than 2 hailstorms per year while areas in western Pennsylvania experience 2-3 annually.

Hailstorm events are expected to continue to occur annually, primarily between April and August, throughout Pennsylvania with the southeast and west portions of the state experiencing a higher number of hailstorm events compared to other areas

HAILSTORM



PA HIRA RANKING (2019)

2.1

MONTICO HIRA RANKING (2017)

1.9

A levee is a human-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water to provide protection from temporary flooding (Interagency Levee Policy Review Committee, 2006). Levee failures or breaches occur when a levee fails to contain the floodwaters for which it is designed to control, or floodwaters exceed the height of the constructed levee.

In the event of a levee failure, flood waters will ultimately inundate the protected area landward of the levee. There is no comprehensive list of levee failures in Pennsylvania, and historically few, if any, have been reported. The probability of future occurrence can be reduced through proper design, construction, and maintenance measures. The age of the levee can increase the potential for failures if it is not maintained. Levee failure is also influenced by the frequency and severity of flood events.



PA HIRA RANKING (2019)

1.7

MONTICO HIRA RANKING (2017)

1.3

LEVEE FAILURE

Lightning is a discharge of electrical energy resulting from the build-up of positive and negative charges within a thunderstorm. The flash or "bolt" of light usually occurs within clouds or between clouds and the ground. A bolt of lightning can reach temperatures approaching 50,000°F. On average, 89 people are killed each year by lightning strikes in the United States. Within Pennsylvania, the annual average number of thunder and lightning events in a given area can expect ranges between 40-70 events per year (FEMA, 1997).

Eastern and southeastern Pennsylvania are at greater risk for death, injury, or damage to lightning than central and north-central sections of the Commonwealth due to higher population density. There were 657 lightning events in the 57 counties across Pennsylvania between 1950 and 2018 resulting in 30 deaths and 2,257 injuries. Northampton and Bucks Counties reported the most events with 63 and 62 events.

LIGHTNING STRIKE



PA HIRA RANKING (2019)

2.2

MONTICO HIRA RANKING (2017)

2.1

A landslide is the downward and outward movement of slope-forming soil, rock, and vegetation reacting to the force of gravity. Landslides may be triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes, and changes in groundwater levels. Mudflows, mudslides, rockfalls, rockslides, and rock topples are all forms of a landslide. Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, developed hillsides, and areas recently burned by forest and brush fires (Delano & Wilsusen, 2001).

Pennsylvania has a long history of landslide activity. This has resulted from a combination of the state's humid temperate climate, locally steep and rugged topography, and great diversity in the erosion and weathering characteristics of near-surface sedimentary rocks. Human activity and extreme precipitation events can also cause landslides.



PA HIRA RANKING (2019)

2.2

MONTICO HIRA RANKING (2017)

1.6

LANDSLIDE

An earthquake is the motion or trembling of the ground produced by sudden displacement of rock usually within the upper 10-20 miles of the Earth's crust. Earthquakes result from crustal strain, volcanism, landslides, or the collapse of underground caverns. Earthquakes can affect hundreds of thousands of square miles, cause damage to property measured in the tens of billions of dollars, result in loss of life and injury to hundreds of thousands of persons, and disrupt the social and economic functioning of the affected area. Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking which is dependent upon amplitude and duration of the earthquake (FEMA, 1997).

Earthquake hazards are highest in the southeastern and far northwestern regions of the Commonwealth and the strongest earthquakes with epicenters within the state have occurred in an area near Lancaster. About 35 earthquakes have caused light damage in Pennsylvania since the beginning of the Colonial period with about half having epicenters outside the state.

EARTHQUAKE



PA HIRA RANKING (2019)

1.9

MONTICO HIRA RANKING (2017)

2.3

A dam is a barrier across flowing water that obstructs, directs, or slows down water flow. Dams provide benefits such as flood protection, power generation, drinking water, irrigation, and recreation. Failure of these structures results in an uncontrolled release of impounded water. Failures are relatively rare, but immense damage and loss of life is possible in downstream communities when such events occur. Aging infrastructure, hydrologic, hydraulic and geologic characteristics, population growth, and design and maintenance practices should be considered when assessing dam failure hazards. Dam failure most often occurs during or after a massive rainfall, flooding, or spring thaws, sometimes with little to no warning. Catastrophic failures are characterized by the sudden, rapid, and uncontrolled release of impounded water or any other fluid or semi-fluid from a dammed impoundment or water body. Pennsylvania uses three categories to classify dam hazards: High, Significant, and Low (FEMA, April 2004). Dam failures may or may not leave enough time for evacuation of people and property, depending on their abruptness.

Approximately 20 of the 28 dams located in Pennsylvania are regulated by DEP have approved Emergency Action Plans. These plans are also reviewed and approved by FEMA.



PA HIRA RANKING (2019)

2.4

MONTICO HIRA RANKING (2017)

2.4

DAM FAILURE

RADON EXPOSURE

Radon is a cancer-causing natural radioactive gas that you can't see, smell, or taste. It is a large component of the natural radiation that humans are exposed to and can pose a serious threat to public health when it accumulates in poorly ventilated residential and occupation settings. According to the EPA, radon is estimated to cause about 21,000 lung cancer deaths per year, second only to smoking as the leading cause of lung cancer (EPA 402-R-03-003: EPA Assessment, 2003). An estimated 40% of the homes in Pennsylvania are believed to have elevated radon levels (Pennsylvania Department of Environmental Protection, 2009).

Radon exposure is inevitable given present soil, geologic, and geomorphic factors across Pennsylvania. Development in areas where previous radon levels have been significantly high will continue to be more susceptible to exposure. However, new incidents of concentrated exposure may occur with future development or deterioration of older structures. Exposure can be limited with proper testing for both past and future development and appropriate mitigation measures.



PA HIRA RANKING (2019)
2.1
MONTICO HIRA RANKING (2017)
2.6

DROUGHT

Drought is a natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought. This hazard is of particular concern in Pennsylvania due to the presence of farms as well as water-dependent industries and recreation areas across the Commonwealth. A prolonged drought could severely impact these sectors of the local economy, as well as residents who depend on wells for drinking water and other personal uses. (National Drought Mitigation Center, 2006).

The worst drought event on record in Pennsylvania occurred in 1963. Drought emergency status led to widespread water use restrictions, and reservoirs dipped to record low levels. Although severe droughts have occurred in the 20th century, a more long-term look at past droughts, when climate conditions appear to have been similar to today, indicates that 20th century droughts do not represent the possible range of drought variability.



PA HIRA RANKING (2019)
2.0
MONTICO HIRA RANKING (2017)
2.5

WILDFIRE

A wildfire is a raging, uncontrolled fire that spreads rapidly through vegetative fuels, exposing and possibly consuming structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. Wildfires can occur at any time of the year, but mostly occur during long, dry hot spells in the spring months of March, April and May. Any small fire in a wooded area, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness, negligence, and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion.

Wildfires in Pennsylvania can occur in fields, grass, brush, and forests. 98% of wildfires in Pennsylvania are a direct result of people, often caused by debris burns (PA DCNR, 1999). It is estimated that five to ten thousand wildfires occur annual in Pennsylvania with northeastern Pennsylvania being the most at risk for loss of life and/or property due to the number of homes at risk for wildfires.



PA HIRA RANKING (2019)
2.4
MONTICO HIRA RANKING (2017)
2.0

Capability Assessment

44 CFR Requirement

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



Purpose/Intent

Performing the capability assessment is important to formulate a viable mitigation strategy later in the planning process.

A capability assessment has three components:

- An inventory of a jurisdiction's existing planning and regulatory tools,
- An analysis of its capacity to use them effectively,
- A review and summary of how the mitigation plan will be integrated into other planning mechanisms

Process

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



Also:

- It also highlights the measures in place that merit continued support and enhancement through future mitigation efforts
- The capability assessment helps to ensure that proposed mitigation actions are practical, considering the local ability to implement them

1. Capability Assessment Survey

Municipality	Comprehensive Plan	Capital Improvement Plan	Economic Development Plan	Continuity of Operations Plan	Open Space Management Plan	Natural Resources Conservation Plan	Transportation Plan	Historic Preservation Plan	Farmland Preservation Plan	Evacuation Plan	Disaster Recovery Plan	Emergency Operations Plan	Subdivision and Land Development Ordinance	Zoning Ordinance	Building Code	Fire Code
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)
Alameda	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)	Yes (2015)

- Planning and Regulatory Capability (NFIP Compliance, Act 167 Plans for example)
- Administrative and Technical Capability (Staff and expertise)
- Financial Capability (Capital improvement programming, fees, grants)
- Education and Outreach (Education programs and certifications)

2. Information Analysis

- Create an inventory of existing documents, programs and regulatory tools.
- Describe how each identified program relates to hazard mitigation.
- Identify any existing gaps, weaknesses or conflicts within the planning area.

This will help guide the mitigation strategy process and permit possible future improvement in County/municipal capabilities.

Products: A Capability Inventory

- Table of planning tools:
 - Comprehensive plan
 - Building code
 - Floodplain ordinance – NFIP participation
 - Subdivision and land development ordinance
 - Zoning ordinance
 - Historic preservation plan and/or ordinance



Particular Focus on NFIP

The description should include the following:

- Framework for managing the NFIP
- Permitting process
- How residents are assisted with mapping
- Compliance and enforcement mechanisms (i.e. is PA Model Floodplain Management Ordinance used or is a more restrictive ordinance used)
- Community Rating System (CRS) participation
- Information on any sanctioned or suspended jurisdictions

Products: Current Documents

- Descriptions of all of the planning mechanisms and local capabilities currently in place
- Identify how each one aids hazard mitigation efforts
- Summarize existing limitations to hazard mitigation capabilities:
 - Planning and Regulatory
 - Administrative and Technical
 - Financial Capability
 - Education and Outreach

Product: Self-Assessment Capability Matrix

- Record the results from Section 5 of the Capability Assessment Survey completed by each jurisdiction
- To be included in Section 5.2.5 – Self-Assessment (in the appendix)



3. Determine Participation in the National Flood Insurance Program

- Describe each jurisdiction's participation in the NFIP
- Identify how the participation aids hazard mitigation efforts
- Discuss efforts to encourage non-participants to participate
- Note who uses the PA Model Floodplain Ordinance
- Note any communities with more restrictive ordinances
 - Freeboard
 - Hazardous materials
 - Critical facilities



Identify historic structures in the floodplain

- Which have obtained and maintained flood insurance through the NFIP
- Which have not obtained and maintained flood insurance through the NFIP



Product: Local Compliance Checklist

- Municipal framework for managing the NFIP
- Permitting process
- Resident assistance with mapping
- Compliance and enforcement mechanisms
- Community Rating System (CRS) participation
- Information on any sanctioned or suspended jurisdictions

4. Integration with Existing Planning Mechanisms

- How is the HMP has or will be integrated into local plans and programs?
 - Determine how the existing plan has been integrated into planning mechanisms over the past 5 years
- How existing mechanisms have been incorporated into the HMP
 - Determine how this update will be integrated into planning efforts (Comprehensive Plans, etc.)

Product: Integration Efforts Summary

- A summary of efforts to integrate the HMP into existing mechanisms
- Incorporation of local plans and programs into the HMP

Homework!

- Review all charts to identify missing or incorrect data
 - *Based on your understanding/area of expertise*

April 25 and 26, 2022 Public Meeting Attendance

Meeting Date	First Name	Last Name	Municipality	Municipality
Monday, April 25,	Camille	Blanche	Royersford Borough	
Monday, April 25,	Lisa	Brown	Lower Gwynedd Township	
Monday, April 25,	Ian	Costello	Abington Township	
Monday, April 25,	Diana	Maher	West Norriton Township	
Monday, April 25,	WAYNE	STEVENS	Pennsburg Borough	PENNSBURG BORO
Tuesday, April 26,	Jamie	Anderson	Narberth Borough	
Tuesday, April 26,	Patricia	Boldosser	Cheltenham Township	
Tuesday, April 26,	Charles	Faulkner	Collegeville Borough	
Tuesday, April 26,	Chloe	Mohr	Other	
Tuesday, April 26,	Paul	Racette	Upper Dublin Township	
Tuesday, April 26,	Christopher	Schwartz	Plymouth Township	
Tuesday, April 26,	Amy	Smith	Other	
Tuesday, April 26,	Kathy	Costello	Collegeville Borough	Collegeville Borough
Tuesday, April 26,	Kyle	Dermer	Hatboro Borough	Hatboro Borough
Tuesday, April 26,	Matt	Reinhardt	Horsham Township	Horsham Township
Tuesday, April 26,	Matt	Markland	Limerick Township	Limerick Township
Tuesday, April 26,	Shaun	Semmeles	Limerick Township	Limerick Township
Tuesday, April 26,	Mike	Mrozinski	Lower Providence Townsh	Lower Providence Township
Tuesday, April 26,	Marybeth	Cody	Marlborough Township	Marlborough Township
Tuesday, April 26,	Timothy	Konetchy	Other	MCPC
Tuesday, April 26,	Carolyn	McCreary	Montgomery Township	Montgomery Township
Tuesday, April 26,	Michael	Matusheski	Plymouth Township	Plymouth Township
Tuesday, April 26,	Michael	Taylor	Springfield Township	Springfield Township
Tuesday, April 26,	Conor	McCann	Upper Gwynedd Township	Upper Gwynedd
Tuesday, April 26,	Sharon	Bastone	Upper Hanover Township	Upper Hanover

MUNICIPALITY	WORKSHEETS/SURVEYS/FORMS*					MEETINGS											
	Planning and Regulatory Documents	NFIP Compliance	Watershed and Stormwater Mgt.	Public Comment Period Input	Planning Team Meetings			Public Meetings					Provided public comment or attended Public Mtg 4-Feb-23	SEPA Counties Meetings			
					Meeting 1 Aug-21	Meeting 2 Jan-22	Meeting 4 Nov-22	7-Dec-21	8-Dec-21	25-Apr-22	26-Apr-22	17-Nov-22		3-Nov-22	4-Feb-23		
Abington	✓	✓	✓	✓	✓	✓					✓	✓			✓		
Ambler	✓	✓	✓	✓									✓				
Bridgeport	✓	✓	✓	✓								✓					
Bryn Athyn			✓	✓													
Cheltenham	✓	✓	✓	✓				✓				✓					
Collegeville	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓					
Conshohocken		✓	✓	✓		✓			✓				✓				
Douglas	✓	✓	✓	✓										✓			
East Greenville	✓	✓	✓	✓		✓									✓		
East Norriton	✓	✓	✓	✓		✓		✓	✓				✓		✓		
Franconia		✓	✓	✓													
Green Lane	✓	✓	✓	✓											✓		
Hatboro	✓	✓	✓	✓							✓	✓					
Hatfield B.		✓	✓	✓											✓		
Hatfield T.		✓	✓	✓													
Horsham	✓	✓	✓	✓		✓					✓	✓			✓		
Jenkintown	✓	✓	✓	✓													
Lansdale	✓	✓	✓	✓				✓							✓		
Limerick	✓	✓	✓	✓	✓	✓		✓			✓	✓			✓		
Lower Frederick	✓	✓	✓	✓		✓		✓	✓				✓				
Lower Gwynedd		✓	✓	✓							✓	✓					
Lower Merion	✓	✓	✓	✓		✓		✓	✓						✓		
Lower Moreland		✓	✓	✓													
Lower Pottsgrove	✓	✓	✓	✓													
Lower Providence	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓					
Lower Salford	✓	✓	✓	✓											✓		
Marlborough	✓	✓	✓	✓				✓			✓	✓					
Montgomery	✓	✓	✓	✓		✓		✓	✓		✓	✓			✓		
Narberth	✓	✓	✓	✓					✓			✓	✓				
New Hanover	✓	✓	✓	✓	✓	✓		✓	✓								
Norristown	✓	✓	✓	✓	✓	✓		✓		✓		✓			✓		
North Wales	✓	✓	✓	✓											✓		
Pennsburg	✓	✓	✓	✓							✓	✓			✓		
Perkiomen	✓	✓	✓	✓							✓						
Plymouth	✓	✓	✓	✓				✓			✓	✓					
Pottstown	✓	✓	✓	✓				✓									
Red Hill	✓	✓	✓	✓		✓									✓		
Rockledge	✓	✓	✓	✓													
Royersford	✓	✓	✓	✓													
Salford		✓	✓	✓											✓		
Saiford			✓	✓													
Schwenksville	✓	✓	✓	✓	✓	✓									✓		
Skippack	✓	✓	✓	✓											✓		
Souderton	✓	✓	✓	✓						✓			✓				
Springfield	✓	✓	✓	✓							✓	✓	✓		✓		
Telford	✓	✓	✓	✓													
Towamencin	✓	✓	✓	✓											✓		

MUNICIPALITY	WORKSHEETS/SURVEYS/FORMS				MEETINGS										SEPA Counties		
	Planning and Regulatory Documents	NFIP Compliance	Watershed and Stormwater Mgt.	Public Comment Period Input	Planning Team Meetings			Public Meetings						Provided public comment or attended Public Mtg	Meetings		
					Meeting 1 Aug-21	Meeting 2 Jan-22	Meeting 4 Nov-22	7-Dec-21	8-Dec-21	25-Apr-22	26-Apr-22	17-Nov-22					
Trappe	✓	✓	✓	✓													
Upper Dublin	✓	✓		✓									✓				
Upper Frederick	✓	✓		✓													
Upper Gwynedd	✓	✓		✓	✓			✓							✓		
Upper Hanover	✓	✓		✓											✓		
Upper Merion	✓	✓		✓	✓									✓			
Upper Moreland	✓	✓		✓										✓			
Upper Pottsgrove	✓	✓		✓			✓							✓			
Upper Providence	✓	✓		✓				✓							✓		
Upper Salford	✓	✓		✓													
W Conshohocken	✓	✓		✓			✓							✓			
West Norriton	✓	✓	✓	✓				✓							✓		
West Pottsgrove	✓	✓															
Whitemarsh	✓	✓		✓	✓								✓				
Whitpain	✓	✓	✓	✓					✓								
Worcester	✓	✓		✓													
Bucks County																✓	✓
Chester County																✓	✓
Delaware County																✓	✓
Montgomery County																✓	✓
Philadelphia County																✓	✓

* Municipal participation during data collection was accomplished via phone and email communication directly between the municipality and MCPC.

Appendix D – Emergency Declarations

Emergency Declarations Involving Montgomery County

Declaration Date	Incident Period	Type of Disaster	Affected Areas	Action
10-Sep-21	Aug 31, 2021 - Sep 5, 2021	Pennsylvania Remnants of Hurricane Ida - 4618-DR-PA. Six additional related amendments	Bucks, Chester, Delaware, Montgomery, Philadelphia, and York Counties	Presidential
30-Mar-20	Jan 20, 2020 and continuing	Pennsylvania Covid-19 Pandemic - DR-4506-PA	All PA Counties	Presidential
13-Mar-20	Jan 20, 2020 and continuing	Pennsylvania Covid-19 - EM-3441-PA	All PA Counties	Presidential

Appendix E – Critical Facilities

Medical Facilities in Montgomery County						
Facility	Number	Prefix	Road	Suffix	Postal Address	Ownership Municipality
General Hospitals						
Abington Memorial Hospital	1200		Old York	Rd	Abington	nonprofit Abington
Einstein Medical Center- Elkins Park	60		Township Line	Rd	Elkins Park	profit Cheltenham
Holy Redeemer Hospital and Medical Center	1648		Huntingdon	Pk	Meadowbrook	nonprofit Abington
Main Line Hospitals - Bryn Mawr	130 S		Bryn Mawr	Ave	Bryn Mawr	nonprofit Lower Merion
Main Line Hospitals - Lankenau	100		Lancaster	Ave	Wynewood	nonprofit Lower Merion
Mercy Suburban Hospital	2701		DeKalb	Pk	Norristown	nonprofit East Norriton
Montgomery Hospital	1301		Powell	St	Norristown	nonprofit Norristown
Lansdale Hospital	100		Medical	Dr	Lansdale	profit Hatfield Township
Pottstown Memorial Medical Center	1600 E		High	St	Pottstown	profit Pottstown
Specialty Hospitals						
Eagleview Hospital	100		Eagleview	Rd	Eagleview	nonprofit Lower Providence
Horsham Clinic	722 E		Butler	Pk	Amble	profit Horsham
Montgomery County Emergency Service Inc.	50		Beech	Dr	Norristown	nonprofit West Norriton
Norristown State Hospital	1001		Sterigere	St	Norristown	state Norristown
Brook Glen Behavior Hospital- Northwestern Institute	7170		Lafayette	Ave	Fort Washington	profit Whitemarsh
Valley Forge Medical Center and Hospital	1033 W		Germanstown	Pk	Norristown	profit East Norriton
Montgomery County Ambulatory Surgery Centers						
Abington Surgical Center	2710		Blair Mill	Rd	Willow Grove	profit Upper Moreland
Delaware Valley Laser Surgery Institute	2		Bala	Pz	Bala Cynwyd	profit Lower Merion
Endoscopic Associates	1235		Old York	Rd	Abington	profit Abington
Foundation Surgery Ctr. at Fort Washington	467		Pennsylvania	Ave	Fort Washington	profit Upper Dublin
Hillmont Endoscopy Center	1811		Bethlehem	Pk	Flourtown	profit Springfield
Holy Redeemer Ambulatory Surgery Center	821		Huntingdon	Pk	Huntingdon Valley	profit Abington
Surgery Center at Limerick	420		Linfied Trappe	Rd	Limerick	profit Limerick
Kremer Laser Eye Center	601 S		Henderson	Rd	King of Prussia	profit Upper Merion
Main Line Surgery Center	10		Presidential	Blvd	Bala Cynwyd	profit Lower Merion
Wills Eye Surgery Center - Plymouth	625		Ridge	Pk	Conshohocken	profit Plymouth
Physician's Care Surgical Hospital	454		Enterprise	Drive	Royersford	profit Limerick

Montgomery County Nursing Home Facilities, 2017

Map #	Long-Term Care Facility	Street Number	Prefix	Street Name	Suffix	Post Office	Municipality	Type of Ownership	Number of Beds
1	Ambler Extended Care Center	32 S		Bethlehem	Pk	Ambler	Ambler	1	100
3	Aristacare at Meadow Spring	845		Germantown	Pk	Plymouth Meeting	Plymouth	2	153
4	Artman Luthern Home	250 N		Bethlehem	Pk	Ambler	Ambler	1	61
5	Beaumont at Bryn Mawr	601 N		Ithan	Ave	Bryn Mawr	Lower Merion	1	44
7	Brookside Healthcare and Rehab. Facility	2630		Woodland	Rd	Roslyn	Abington	2	120
8	Chestnut Hill Lodge Health and Rehab Center	8833		Stenton	Ave	Wyndmoor	Springfield	2	181
10	Dock Terrace	275		Dock	Dr	Lansdale	Towamencin	1	72
11	Dresher Hill Health and Rehabilitation Center	1390		Camp Hill	Rd	Fort Washington	Upper Dublin	2	118
12	Edgehill Nursing and Rehabilitation Center	146		Edgehill	Rd	Glenside	Abington	1	60
13	Elkins Crest Health and Rehabilitation Center	265 E		Township Line	Rd	Elkins Park	Cheltenham	2	150
14	Elm Terrace Gardens	660 N		Broad	St	Lansdale	Lansdale	1	72
15	Fairview Care Center of Papermill Road	850		Papermill	Rd	Glenside	Springfield	2	129
17	Foulkeways at Gwynedd	1120		Meetinghouse	Rd	Gwynedd	Lower Gwynedd	1	52
9	Fox Subacute at Clara Burke	251		Stenton	Ave	Plymouth Meeting	Whitemarsh	2	60
18	Frederick Mennonite Community	2849		Big	Rd	Frederick	Upper Frederick	1	61
19	Garden Spring Center	1113 N		Easton	Rd	Willow Grove		2	173
21	Gwynedd Estates	301		Norristown	Rd	Ambler	Lower Gwynedd	1	40
22	Gwynedd Square Center for Nursing and Conval. Care	773		Sumneytown	Pk	Lansdale	Upper Gwynedd	3	181
23	Harston Hall	350		Haws	Ln	Flourtown	Springfield	2	120
24	Health Center at the Hill in Whitemarsh	4000		Fox Hound	Dr	Lafayette Hills	Whitemarsh	1	60
25	Hillcrest Center	1245		Church	Rd	Wyncote	Cheltenham	2	180
26	Holy Redeemer Hospital Transitional Care Unit	1648		Huntingdon	Pk	Meadowbrook	Abington	1	21
27	Hopkins Center	8100		Washington	Ln	Wyncote	Cheltenham	2	107
28	Ivy Hill Rehabilitation and Nursing Center	1401		Ivy Hill	Rd	Wynmoor	Springfield	2	145
29	Lankenau Hospital Transitional Care Center	100		Lancaster	Ave	Wynnewood	Lower Merion	1	22
30	Luther Woods Convalescent	313 W		County Line	Rd	Harboro	Horsham	3	140
31	Madlyn and Leonard Abramson Center for Jewish Life	1425		Horsham	Rd	North Wales	Horsham	1	324
32	Manorcare Health Service of Pottstown	724 N		Charlotte	St	Pottstown	Pottstown	2	150
33	Manorcare Health Services of Huntingdon Valley	3430		Huntingdon	Pk	Huntingdon Valley	Lower Moreland	2	125
34	Manorcare Health Services of King of Prussia	600 W		Valley Forge	Rd	King of Prussia	Upper Merion	2	170
35	Manorcare Health Services of Lansdale	640		Bethlehem	Pk	Montgomeryville	Montgomery	2	155
37	Masonic Home of Pennsylvania	801		Ridge	Pk	Lafayette Hill	Whitemarsh	1	160
38	Meadowood	3205		Skipack	Pk	Worcester	Worcester	1	59
39	Meadows at Shannondell	6000		Shannondell	Dr	Audubon	Lower Providence	2	60
2	Meadowview Rehab and Nursing Center	9209		Ridge	Pk	Philadelphia	Whitemarsh	2	244
48	Norriton Square Nursing and Rehab Center	1700		Pine	St	Norristown	Norristown	2	99
42	Parkhouse Geriatric and Rehabilitation Center	1600		Black Rock	Rd	Royersford	Upper Providence	5	467
43	Pennsburg Manor	530		Macoby	St	Pennsburg	Pennsburg	3	120
44	Peter Becker Community	800		Maple	Ave	Harleysville	Franconia	1	72
45	Phoebe Wyncote	208		Fernbrook	Ave	Wyncote	Cheltenham	1	58
46	Pottstown Memorial Med. Center Transitional Care Unit	1600 E		High	St	Pottstown	Pottstown	1	8
47	Regina Community Nursing Center	550 E		Foranice	St	Norristown	Norristown	1	121
49	Rydal Park of Philadelphia Presbyterian Homes Inc.	1515		Fairway		Rydal	Abington	1	114
50	Saint Joseph's Villa	110 W		Wissahickon	Ave	Flourtown	Springfield	4	106
51	Saint Mary's Manor, Lansdale	701		Lansdale	Ave	Lansdale	Lansdale	4	120
52	Sanatoga Center	225		Evergreen	Rd	Pottstown	Lower Pottsgrove	2	130
53	Saunders House	100		Lancaster	Ave	Wynnewood	Lower Merion	1	180

Montgomery County Nursing Home Facilities, 2017

Map #	Long-Term Care Facility	Street Number	Prefix	Street Name	Suffix	Post Office	Municipality	Type of Ownership	Number of Beds
54	Silver Stream Center	905		Penllyn	Pk	Spring House	Lower Gwynedd	2	120
55	Souderton Mennonite Homes	207 W		Summit	St	Souderton	Franconia	1	71
57	St. Joseph's Manor	1616		Huntingdon	Pk	Meadowbrook	Abington	1	296
58	Suburban Woods Health and Rehabilitation Center	2751		DeKalb	Pk	Norristown	East Norriton	2	120
59	Towne Manor East	2004		Old Arch	Rd	Norristown	East Norriton	1	120
60	Towne Manor West	205 E		Johnson	Hy	Norristown	East Norriton	1	119
61	Waverly Heights	1400		Waverly	Rd	Gladwynne	Lower Merion	1	49
62	White Billet Subacute Center	412 S		York	Rd	Hatboro	Hatboro	2	37
63	Willow Ridge Center	3485		Davisville	Rd	Hatboro	Upper Moreland	2	92
6	Willowbrook at Brittany Pointe Estates	1001		Valley Forge	Rd	Lansdale	Upper Gwynedd	1	92
16	Willowbrook at Fort Washington Estates	735		Susquehanna	Rd	Fort Washington	Upper Dublin	1	40
41	Willowbrook at Normandy Farms Estates	8000		Twin Silos	Dr	Blue Bell	Whitpain	1	73
56	Willowbrook at Spring House Estates	728		Norristown	Rd	Lower Gwynedd	Lower Gwynedd	1	96
40	Wyndmoor Hills Health Care	8601		Stenton	Ave	Wyndmoor	Springfield	2	77
	County Total								7066

Source: PA Department of Health, 2017.

- 1 Nonprofit corporation
- 2 For-profit corporation
- 3 For-profit partnership
- 4 Church owned and operate
- 5 County owned

Municipal Buildings

Municipality	Location	Police Station
Abington Township	1176 Old York Rd, Abington	Yes
Ambler Borough	122 East Butler Ave, Ambler	Yes
Bridgeport Borough	63 W. Fourt St, Bridgeport	Yes
Bryn Athyn Borough	2835 Buck Road, Bryn Athyn	Yes
Cheltenham Township	8230 Old York Rd, Elkins Park	Yes
Collegeville Borough	491 E Main St, Collegeville	Yes
Conshohocken Borough	400 Fayette St., Conshohocken	Yes
Douglass Township	1320 E Philadelphia Ave, Gilbertsville	Yes
East Greenville Borough	206 Main Street, East Greenville	Yes
East Norriton Township	2501 Stanbridge Street, Norritown	Yes
Franconia Township	671 Allentown Rd, Franconia	Yes
Green Lane Borough	Main Street, Green Lane	No
Hatboro Borough	414 S York Rd, Hatboro	Yes
Hatfield Borough	401 S Main Street, Hatfield	Yes
Horsham Township	1950 School Road, Hatfield	Yes
Jenkintown Borough	1025 Horsham Road, Horsham	Yes
Lansdale Borough	700 Summit Ave, Jenkintown	Yes
Limerick Township	One Vine St, Lansdale	Yes
Lower Frederick Township	646 West Ridge Pike, Limerick	Yes
Lower Gwynedd Township	53 Spring Mount Road, Spring Mount	Yes
Lower Merion Township	1130 N. Bethlehem Pike, Spring House	Yes
Lower Moreland Township	75 East Lancaster Ave, Ardmore	Yes
Lower Pottsgrove Township	640 Red Lion Rd, Huntingdon Valley	Yes
Lower Providence Township	2199 Buchert Rd, Pottstown	Yes
Lower Salford Township	100 Parklane Dr, Eagleville	Yes
Marlborough Township	379 Main St, Harleysville	Yes
Montgomery Township	6040 Upper Ridge Rd, Green Lane	Yes
Narberth Borough	1001 Stump Rd, Montgomeryville	Yes
New Hanover Township	100 Conway Ave, Narberth	Yes
Norristown	2943 North Charlotte St, Gilbertsville	Yes
North Wales Borough	235 East Airy St, Norristown	Yes
	300 School St, North Wales	Yes

Municipality	Location	Police Station
Pennsburg Borough	76 West Sixth St, Pennsburg	Yes
Perkiomen Township	1 Trappe Rd, Collegeville	No
Plymouth Township	700 Belvoir Rd, Plymouth Meeting	Yes
Pottstown Borough	100 East High St, Pottstown	Yes
Red Hill Borough	56 W. 4th St, Red Hill	No
Rockledge Borough	121 Huntingdon Pike, Rockledge	Yes
Royersford Borough	300 Main St, Royersford	Yes
Salford Township	139 Ridge Rd, Tylersport	No
Schwenksville Borough	140 Main St, Schwenksville	Yes
Skippack Township	1246 Bridge Rd, Skippack	No
Souderton Borough	31 W Summit St, Souderton	Yes
Springfield Township	1510 Paper Mill Rd, Wyndmoor	Yes
Telford Borough	122 Penn Ave, Telford	Yes
Towamencin Township	1090 Troxel Rd, Kulpsville	Yes
Trappe Borough	525 West Main St, Trappe	No
Upper Dublin Township	801 Loch Alsh Ave, Fort Washington	Yes
Upper Frederick Township	Big Road, Obelisk	No
Upper Gwynedd Township	Parkside Place, West Point	Yes
Upper Hanover Township	1704 Pittsburg Rd, East Greenville	No
Upper Merion Township	175 West Valley Forge Rd, King of Prussia	Yes
Upper Moreland Township	117 Park Ave, Willow Grove	Yes
Upper Pottsgrove Township	1409 Farmington Ave, Pottstown	Yes
Upper Providence Township	1286 Black Rock Rd, Oaks	Yes
Upper Salford Township	Salford Station Rd, Salfordville	No
West Conshohocken Borough	112 Ford St, West Conshohocken	Yes
West Norriton Township	1630 West Marshall St, Norristown	Yes
West Pottsgrove Township	980 Grosstown Rd, Stowe	Yes
Whitemarsh Township	616 Germantown Pike, Lafayette Hills	Yes
Whitpain Township	960 Wentz Rd, Blue Bell	Yes
Worcester Township	1721 Valley Forge Rd, Worcester	No

Public Safety

Municipality	Number of Officers		Location of Police Station
	Full-Time	Part-Time	
Abington Township	92	0	1166 Old York Road, Abington, PA
Ambler Borough	13	0	122 E. Butler Ave., Ambler, PA
Bridgeport Borough	7	7	95 W. 4th St., Bridgeport, PA
Bryn Athyn Borough	5	1	2835 Buck Road, Bryn Athyn, PA
Cheltenham Township	68	0	8230 Old York Road, Elkins Park, PA
Collegeville Borough	8	0	491 Main St., Collegeville, PA
Conshohocken Borough	21	2	400 Fayette St., Conshohocken, PA
Douglass Township	12	1	1320 E. Philadelphia Ave., Gilbertsville, PA
East Norriton Township	29	0	2501 Stanbridge St., Norristown, PA
Franconia Township	11	2	671 Allentown Road, Franconia, PA
Hatboro Borough	14	0	120 E. Montgomery Ave., Hatboro, PA
Hatfield Township	28	0	2000 School Road, Hatfield, PA
Horsham Township	40	0	1025 Horsham Road, Horsham, PA
Jenkintown Borough	11	4	700 Summit Ave., Jenkintown, PA
Lansdale Borough	24	4	35 Vine St., Lansdale, PA
Limerick Township	27	0	646 W. Ridge Pike, Limerick, PA
Lower Frederick Township	3	0	53 Spring Mount Road, Zieglersville, PA
Lower Gwynedd Township	18	1	1130 N. Bethlehem Pike, Spring House, PA
Lower Merion Township	136	0	71 E. Lancaster Ave, Ardmore, PA 19003
Lower Moreland Township	22	0	640 Red Lion Road, Huntingdon Valley, PA
Lower Pottsgrove Township	20	0	2199 Buchert Road, Pottstown, PA
Lower Providence Township	31	1	100 Parklane Drive, Eagleville, PA
Lower Salford Township	21	0	474 Main Street, Harleysville, PA 19438
Marlborough Township	3	3	6040 Upper Ridge Road, Green Lane, PA
Montgomery Township	36	0	1001 Stump Road, Montgomeryville, PA
Narberth Borough	5	0	100 Conway Ave, Narberth, PA
New Hanover Township	10	2	2943 N. Charlotte St., Gilbertsville, PA
Norristown Borough	65	0	235 E. Airy Street, Norristown, PA
North Wales Borough	4	3	300 School Street, North Wales, PA
Plymouth Township	46	0	700 Belvoir Rd., Plymouth Meeting PA
Pottstown Borough	46	0	100 E. High Street, Pottstown, PA
Rockledge Borough	4	8	1 Park Ave., Rockledge, PA
Royersford Borough	7	4	300 Main Street, Royersford, PA
Souderton Borough	6	5	31 W. Summit Street, Souderton, PA
Springfield Township	28	0	1510 Paper Mill Road, Wyndmoor, PA
Telford Borough	6	3	100 Penn Ave., Telford, PA
Towamencin Township	23	0	1655 Sumneytown Pike, Kulpville, PA
Upper Dublin Township	40	0	801 Loch Alsh Ave., Fort Washington, PA
Upper Gwynedd Township	20	0	Parkside Place, West Point, PA
Upper Merion Township	65	0	175 W. Valley Forge Road, King of Prussia, PA
Upper Moreland Township	34	0	117 Park Ave., Willow Grove, PA
Upper Perkiomen Police			88 W. 6th St., Pennsburg, PA
Upper Pottsgrove Township	9	3	1420 Heather Place, Pottstown, PA
Upper Providence Township	29	0	1286 Black Rock Road, Oaks, PA
West Conshohocken Borough	12	4	1001 New DeHaven St., West Conshohocken, PA
West Norriton Township	27	0	1630 Marshall Street, Jeffersonville, PA
West Pottsgrove Township	8	3	980 Grosstown Road, Stowe, PA
Whitemarsh Township	36	0	616 Germantown Pike, Lafayette Hill, PA
Whitpain Township	30	0	960 Wentz Road, Blue Bell, PA
Pennsylvania State Police (King of Prussia)			251 Flinthill Rd, King of Prussia, PA 19406
Pennsylvania State Police (Skiippack)	-	-	2047 Bridge Road, Schwenksville, PA
TOTALS	1260	61	

Colleges and Universities

Name	Number	Prefix	Road	Suffix	Postal Address	Municipality	Enrollment
Arcadia University	450	S	Easton Road	Rd	Glenside	Cheltenham	3850
Biblical Theological Seminary*	200	N	Main	St	Hatfield	Hatfield T	337
Bryn Athyn College of the New Church			College	Dr	Bryn Athyn	Bryn Athyn	302
Bryn Mawr College	101	N	Merion	Ave	Bryn Mawr	Lower Merion	1709
Calvary Baptist Theological Seminary	1380		Valley Forge	Rd	Lansdale	Towamencin	106
DeSales University-Lansdale Campus	815		Sumneytown	Pk	Lansdale	Lansdale	150
Devry's University	1140		Virginia	Dr	Fort Washington	Upper Dublin	900
Eastern Baptist Theological Seminary (Palmer)	588	N	Gulph	Rd	King of Prussia	Upper Merion	252
Gatz College	7605		Old York	Rd	Melrose Park	Cheltenham	1002
Gwynedd-Mercy College	1325		Sumneytown	Pk	Gwynedd Valley	Lower Gwynedd	2700
Harcum College	750		Montgomery	Ave	Bryn Mawr	Lower Merion	1516
Haverford College	370		Lancaster	Ave	Haverford	Lower Merion	1290
Manor College	700		Fox Chase	Rd	Jenkintown	Abington	858
Montgomery County Community College-Main	340		DeKalb Pike	Pk	Blue Bell	Whitpain	12742
Montgomery County Community College-West	101		College	Dr	Pottstown	Pottstown	**
Pennsylvania College of Optometry	8380		Old York	Rd	Elkins Park	Cheltenham	1007
Pennsylvania State University-Abington Campus	1600		1600 Woodland Road	Rd	Abington	Abington	4000
Reconstructionist Rabbinical College	1299		Church	Rd	Wyncote	Cheltenham	72
Rosemont College	1400		Montgomery	Ave	Rosemont	Lower Merion	900
Saint Charles Borromeo Theological Seminary	1000	E	Wynnewood	Rd	Wynnewood	Lower Merion	167
Temple University-Ambler Campus	580		Meetinghouse	Rd	Ambler	Upper Dublin	3000
Temple University-Fort Washington Campus	401		Commerce	Dr	Fort Washington	Upper Dublin	
University of Phoenix	1170		Devon	Dr	Wayne	Upper Merion	
Ursinus College	610	E	Main	St	Collegeville	Collegeville	1556
Westminster Theological Seminary	2960	W	Church	Rd	Glenside	Cheltenham	613

*Proposed relocation of the Seminary in 2018

** part of Blue Bell Campus Enrollment

Private Schools

School Name	Address	Municipality	Enrollment
Abington Friends School	575 Washington Ln Jenkintown PA 19046	Abington	537
Academy of the New Ch Boys	2815 Benade Circle Bryn Athyn PA 19009	Bryn Athyn	113
Academy of the New Ch Girls	2815 Huntington Pk Bryn Athyn PA 19009	Bryn Athyn	97
Ancillae Assumpta Academy	2025 Church Rd Wyncote PA 19095	Cheltenham	595
Baldwin School	701 W. Montgomery Ave Bryn Mawr PA 19010	Lower Merion	571
Beth Shalom Goldman Nur & Kdg	8231 Old York Road Elkins Park PA 19027	Cheltenham	4
Beth Tikvah Bnai Jeshurun	1001 Paper Mill Rd Erdenheim PA 19038	Springfield	0
Bethel Christian Academy	2901 W. Cheltenham Avenue Wyncote PA 19095	Cheltenham	30
Bishop McDevitt High School	125 Royal Ave Wyncote PA 19095	Cheltenham	434
Blessed Teresa of Calcutta Education Center	256 Swamp Pike Schwenksville PA 19473	Limerick	290
Bryn Athyn Church School	600 Tomlinson Road Bryn Athyn PA 19009	Bryn Athyn	261
Calvary Baptist School	1380 S. Valley Forge Road Lansdale PA 19446	Towamencin	370
Cheder Chabad Philadelphia	276 South Bryn Mawr Avenue Bryn Mawr PA 19010	Lower Merion	73
Christopher Dock Men HS	1000 Forty Foot Rd Lansdale PA 19446	Towamencin	790
Conshohocken Catholic School	130 West 5th Ave. Conshohocken PA 19428	Conshohocken	0
Corpus Christi School	920 Sumneytown Pike Lansdale PA 19446	Upper Gwynedd	477
Coventry Christian Schools Inc	699 North Pleasantview Road Pottstown PA 19464	Lower Pottsgrove	239
Family Worship Center Kingergarten	1000 Troxel Road Lansdale PA 19446	Towamencin	21
Friends Central School	1101 City Ave Wynnwood PA 19096	Lower Merion	779
Friendship House	1333 Cow Path Road Hatfield PA 19440	Hatfield	0
Gan Chabad of the Main Line	625 Montgomery Avenue Merion Station PA 19066	Lower Merion	0
Germantown Academy	340 Morris Road Fort Washington PA 19034	Whitemarsh	1128
Good Shepherd Catholic Regional School	835 North Hills Ave Ardsley PA 19038	Abington	162
Grace Christian School	320 N 3rd St Telford PA 18969	Souderton	68
Gwynedd Friends	Rt 202 and Sumneytown Pike Gwynedd PA 19436	Lower Gwynedd	11
Gwynedd Mercy Acad El Division	816 Norristown Rd P.O. Box 241 Springhouse PA 19477	Lower Gwynedd	411
Gwynedd Mercy High School	1345 Sumneytown Pk Gwynedd Valley PA 19437	Lower Gwynedd	376
Haverford School	450 Lancaster Ave Haverford PA 19041	Lower Merion	978
Hill School **	717 East High St. Pottstown PA 19464	Pottstown	502
Holy Cross Regional Catholic School	701 Locust Street Collegeville PA 19426	Collegeville	560
Holy Rosary Regional Catholic School	3040 Walton Rd Plymouth Meeting PA 19462	Plymouth	298
Huntingdon Valley Christ Academy	1845 Byberry Road Huntingdon Valley PA 19006	Upper Moreland	171
I S Kosloff Torah Academy High School for Girls	50 Montgomery Avenue Bala Cynwyd PA 19004	Lower Merion	77
Indian Creek Mennonite School	Box 637 Harleysville Pike Telford PA 18969	Franconia	0
Indian Valley Kindergarten	423 N Main St Souderton PA 18964	Souderton	9
Jack M. Barrack Hebrew Academy	272 South Bryn Mawr Avenue Bryn Mawr PA 19010	Lower Merion	380
Kids in the Village Early Learning Center	3050 West Germantown Pike Eagleville PA 19403	Lower Providence	7
La Salle College High School	8605 Cheltenham Ave Wyndmoor PA 19038	Springfield	1109
Lansdale Catholic High School	700 Lansdale Ave. Lansdale PA 19446	Lansdale	703
Life Changing Christian Academy	518 Ryers Avenue Cheltenham PA 19012	Cheltenham	0
Main Line Reform Temple	410 Montgomery Ave Wynnwood PA 19096	Lower Merion	22
Mary Mother of the Redeemer School	1321 Upper State Road North Wales PA 19454	Montgomery	591
Mater Dei Catholic School	493 E. Main Street Lansdale PA 19446	Lansdale	415
Meadowbrook School	1641 Hampton Road Meadowbrook PA 19046	Abington	119
Merion Mercy Academy	511 Montgomery Ave Merion Station PA 19066	Lower Merion	552
Mesivta High School of Greater Philadelphia	314 Levering Mill Road Bala Cynwyd PA 19004	Lower Merion	29
Miquon School	2025 Harts Lane Conshohocken PA 19428	Whitemarsh	152
Mother Teresa Regional Catholic School	405 Allendale Road King of Prussia PA 19046	Upper Merion	205
Mount Saint Joseph Academy	120 W Wissahickon Ave Flourtown PA 19031	Springfield	530
New Life Academy	585 Freeman School Rd Schwenksville PA 19473	Lower Salford	0
Open Door Christian Academy	1260 Fort Washington Ave Fort Washington PA 19034	Upper Dublin	107
Our Lady of Mercy Regional Catholic School	29 Conwell Dr Maple Glen PA 19002		425
Penn Christian Academy	50 W Germantown Pike East Norriton PA 19401	East Norriton	127
Perkiomen School **	200 Seminary Street Pennsburg PA 18073	Pennsburg	340
Philadelphia Montgomery Christian Academy	35 Hillcrest Ave Erdenheim PA 19038	Springfield	253
Plymouth Meeting Friends School	2150 Butler Pike Plymouth Meeting PA 19462	Plymouth	127
Pope John Paul II High School	181 Rittenhouse Road Royersford PA 19468	Upper Providence	869
Presentation BVM School	105 Old Soldiers Road Cheltenham PA 19012	Cheltenham	209
Quaker School At Horsham	250 Meetinghouse Road Horsham PA 19044	Horsham	52
Queen of Angels Regional Catholic School	401 N. Easton Road Willow Grove PA 19090	Upper Moreland	229
Red Hill Christian School	208 E 5th St Red Hill PA 18076	Red Hill	12
Regina Angelorum Academy	105 Argyle Road Ardmore PA 19003	Lower Merion	95
Regina Coeli Academy	1525 Marian Road Abington PA 19001	Abington	83

Private Schools

School Name	Address	Municipality	Enrollment
Rosemont School of Holy Child	1344 Montgomery Ave Rosemont PA 19010	Lower Merion	252
Saint Miriam Academy	654 Bethlehem Pike Flourtown PA 19031	Whitemarsh	0
Salford Mennonite Kindergarten	480 Groffs Mill Rd Harleysville PA 19438	Lower Salford	9
Shipley School	814 Yarrow St Bryn Mawr PA 19010	Lower Merion	838
St Albert the Great School	214 Welsh Rd Huntingdon Valley PA 19006 *	Lower Moreland	493
St Aloysius	220 N. Hanover St. Pottstown PA 19464	Pottstown	195
St Basil Academy	711 Fox Chase Rd Jenkintown PA 19046	Abington	251
St Francis of Assisi School	601-A Buttonwood St Norristown PA 19401	Norristown	190
St Gabriels Hall	1350 Pawlings Road Audubon PA 19407	Lower Providence	142
St Genevieve School	1237 Bethlehem Pike Flourtown PA 19031	Springfield	267
St Helena School	1499 DeKalb Pike Blue Bell PA 19422	Whitpain	510
St Hilary of Poitiers School	920 Susquehanna Rd Rydal PA 19046	Abington	234
St Joseph The Protector School	2336 Fairhill Ave Glenside PA 19038	Abington	361
St Katherine Day Sch -Lower/Jr	930 Bowman Ave Wynnewood PA 19096	Lower Merion	47
St Margaret School	227 N Narberth Ave Narberth PA 19072	Narberth	255
St Mary School	40 Spring Mount Rd Schwenksville PA 19473	Lower Frederick	231
St Philip Neri School	3015 Chestnut St Lafayette Hill PA 19444	Whitemarsh	473
Stowe Lighthouse Christ Acad	527 Glasgow Street Stowe PA 19464	West Pottsgrove	0
theVillage School	452 South Roberts Rd Rosemont PA 19010	Lower Merion	44
Tiferet Bet Israel	1920 Skippack Pike Blue Bell PA 19422	Whitpain	0
Torah Academy of Greater Philadelphia	742 Argyle Road Wynnewood PA 19096	Lower Merion	301
Trinity Christian Academy	4055 Davisville Rd Hatboro PA 19040-2929	Upper Moreland	0
Valley Christian School	2364 Huntingdon Pike Huntingdon Valley PA 19006	Lower Moreland	108
Valley Forge Baptist Academy	616 S Trappe Rd Collegeville PA 19426	Upper Providence	176
Villanova Acad Honor Studies	1860 Montgomery Ave Villanova PA 19085	Lower Merion	105
Visitation BVM School	190 North Trooper Road Norristown PA 19403	West Norriton	567
Waldron Mercy Academy	513 Montgomery Ave Merion Station PA 19066	Lower Merion	467
West Hill School	1455 West Hill Road Rosemont PA 19010	Lower Merion	0
Wyndcroft School	1395 Wilson Street Pottstown PA 19464	Pottstown	213
Yeshiva Lab School	612 Montgomery Avenue Narberth PA 19072	Narberth	17
Zipporah S Abramson Ctr. for Early Childhood Ed.	239 Welsh Road Maple Glen PA 19002	Upper Dublin	7

Source: PA Department of Education reflecting enrollment for the 2015- 2016 school year

* moved to Keim Street in Lower Pottsgrove Township August 2017

** boarding schools

Montgomery County Public Elementary Schools

School District	Elementary School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment
Abington	Copper Beech	825	N	Easton	Rd	Glenside	Abington	1089
	Highland	1301		Edgehill	Rd	Abington	Abington	517
	McKinley	370		Cedar	Rd	Elkins Park	Abington	726
	Overlook	1750		Edgehill	Rd	Abington	Abington	527
	Roslyn	2565		Susquehanna	Rd	Roslyn	Abington	512
	Rydal	1160		Huntingdon	Pk	Huntingdon Valley	Abington	592
	Willow Hill	1700		Coolidge	Ave	Willow Grove	Abington	404
	Gilbertsville	36		Congo	Rd	Gilbertsville	Douglas	815
	New Hanover-Upper Frederick	2547		Big	Rd	Frederick	New Hanover	788
Cheltenham Township								
	Elkins Park	8149		New Second	St	Elkins Park	Cheltenham	720
	Glenside	400		Harrison	Ave	Glenside	Cheltenham	485
	Myers	7609		Montgomery	Ave	Elkins Park	Cheltenham	369
	Wyncote	333		Rices Mill	Rd	Wyncote	Cheltenham	398
Colonial								
	Colonial	230		Flourtown	Rd	Plymouth Meeting	Plymouth	720
	Conshohocken	301		Harry	St	Conshohocken	Conshohocken	183
	Plymouth	542		Plymouth	Rd	Plymouth Meeting	Plymouth	544
	Ridge Park	200		Karrs	Ln	Conshohocken	Plymouth	454
Hatboro-Horsham	Whitemarsh	4120		4120 Joshua Road	Rd	Lafayette Hill	Whitemarsh	406
	Blair Mill	109		Bender	Rd	Hatboro	Horsham	464
	Crooked Billet	70		Meadowbrook	Ave	Hatboro	Hatboro	286
	Hallowell	200		Maple	Ave	Horsham	Horsham	307
Jenkintown	Pennypack	130		Spring	Ave	Hatboro	Hatboro	269
	Simmons	411		411 Babylon Road	Rd	Horsham	Horsham	691
	Jenkintown			West & Highland	Ave	Jenkintown	Jenkintown	323
Lower Merion	Belmont Hills	200		200 School Street	St	Bala Cynwyd	Lower Merion	485
	Cynwyd	101	W	Levering	Rd	Bala Cynwyd	Lower Merion	549
	Gladwyne	230	W	Righter's Mill	Rd	Gladwyne	Lower Merion	729
	Merion	549	S	Bowman	Ave	Merion Station	Lower Merion	610
	Penn Valley	301		Righter's Mill	Rd	Narberth	Lower Merion	686
Lower Moreland Township	Penn Wynne	250		Haverford	Rd	Wynnewood	Lower Merion	739
	Murray Avenue	2551		Murray	Ave	Huntingdon Valley	Lower Moreland	567
	Pine Road	3737		Pine	Rd	Huntingdon Valley	Lower Moreland	938
Methacton	Arrowhead	232		Level	Rd	Eagleville	Lower Providence	278

Montgomery County Public High Schools

School District	High School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	2016 Enrollment
	North Montco Technical Career Center	1265		Sumneytown	Pk	Lansdale	Towamencin	970
	Western Montgomery Career and Technology Center	77		Graterford	Rd	Limerick	Limerick	536

Montgomery County Public Elementary Schools

School District	Elementary School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment
	Franconia	366		Harleysville	Pk	Souderton	Franconia	477
	Lower Salford	250		Maple	Ave	Harleysville	Lower Salford	399
	Oak Ridge	465		Moyer	Rd	Harleysville	Lower Salford	511
	Salford Hills	2721		Barndt	Rd	Harleysville	Upper Salford	294
	Vernfield	960		Long	Rd	Telford	Franconia	351
	West Broad Street	342	W	Broad	St	Souderton	Franconia	529
Spring-Ford								
	Brooke	339	N	Lewis	Rd	Royersford	Limerick	412
	Evans	125		Sunset	Rd	Limerick	Limerick	622
	Limerick	81		Limerick Center	Rd	Royersford	Limerick	359
	Oaks			Oaks School	Dr	Oaks	Upper Providence	541
	Royersford	450		Spring	St	Royersford	Upper Providence	428
	Spring Ford 5-6 Center	833	S	Lewis	Rd	Royersford	Upper Providence	1249
	Upper Providence	833	S	Lewis	Rd	Royersford	Upper Providence	536
Springfield Township								
	Springfield Township Elementary Enfield	1118		1118 Church Road	Rd	Oreland	Springfield	352
	Springfield Township Elementary Erdenheit	500		500 Haws Lane	Ln	Flourtown	Springfield	714
Upper Dublin								
	Maple Glen	1581		Fort Washington	Ave	Maple Glen	Upper Dublin	416
	Fort Washington	1010		Fort Washington	Ave	Fort Washington	Upper Dublin	476
	Jarrettown	1520		Limekiln	Pk	Dresher	Upper Dublin	459
	Thomas Fitzwater	12		12 School Lane	Ln	Willow Grove	Upper Dublin	436
Upper Merion								
	Bridgeport	900		Bush	St	Bridgeport	Bridgeport	376
	Caley	725		Caley	Rd	King of Prussia	Upper Merion	474
	Candlebrook	310		Prince Frederick		King of Prussia	Upper Merion	401
	Roberts	889		Croton	Rd	Wayne	Upper Merion	348
Upper Moreland Township								
	Upper Moreland Primary School	3980		3980 Orangemans Road	Rd	Hatboro	Upper Moreland	696
Upper Perkiomen								
	Marlborough	1450		1450 Gravel Pike	Pk	Green Lane	Upper Hanover	653
Wissahickon								
	Blue Bell	801		Symphony	Ln	Blue Bell	Whitpain	419
	Lower Gwynedd	571		Houston	Rd	Ambler	Lower Gwynedd	483
	Mattison	131		Rosemary	Ave	Ambler	Ambler	171
	Shady Grove	351		West Skippack	Pk	Ambler	Whitpain	491
	Stony Creek	1721		Yost	Rd	Blue Bell	Whitpain	367

Montgomery County Public Middle Schools/ Junior High Schools

School District	Middle/Junior High School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment
Abington	Abington Junior High School	2056		Susquehanna	Rd	Abington	Abington	1,733
Boyetown	Boyetown Area Junior High East	2020		Big Road		Gilbertsville	New Hanover	864
Cheltenham Township	Cedarbrook Middle School	300		Longfellow	Ave	Wyncote	Cheltenham	696
Colonial	Colonial Middle School	716		Belvoir	Rd	Plymouth Meeting	Plymouth	1,026
Hatboro-Horsham	Keith Valley Middle School	227		Meetinghouse	Rd	Horsham	Horsham	1,220
Lower Merion	Bala Cynwyd Middle School	510		Bryn Mawr	Ave	Bala Cynwyd	Lower Merion	817
	Welsh Valley Middle School	325		Tower	Ln	Narberth	Lower Merion	801
Lower Moreland	Murray Avenue	2551		Murray	Ave	Huntingdon Valley	Lower Moreland	804
Methacton	Arcola Intermediate School	4001		Eagleville	Rd	Eagleville	Lower Providence	1,254
Norristown Area	East Norriton Middle School	330		Roland	Dr	Norristown	East Norriton	910
	Elsentower Middle School	1601		Markley	St	Norristown	Norristown	566
	Roosevelt Alternative School	1161		Markley	St	Norristown	Norristown	91
	Stewart Middle School	1315	W	Marshall	St	Norristown	Norristown	473
North Penn	Pennbrook Middle School	1201	E	Walnut	St	North Wales	Upper Gwynedd	839
	Penndale Middle School	400		Penn	St	Lansdale	Lansdale	1,348
	Pennfield Middle School	726		Forty Foot	Rd	Hatfield	Hatfield	779
Perkiomen Valley	Perkiomen Valley Middle School East	100		Kagey	Rd	Collegeville	Perkiomen	759
	Perkiomen Valley Middle School West	220		Big	Rd	Zieglerville	Upper Frederick	644
Pottsgrove	Pottsgrove Middle School	1351	N	Hanover	St	Pottstown	Upper Pottsgrove	734
Pottstown	Pottstown Middle School	600	N	Franklin		Pottstown	Pottstown	617
Souderton Area	Indian Crest Middle School	139		Harleysville	Pk	Souderton	Franconia	807
	Indian Valley Middle School	130		Maple	Ave	Harleysville	Lower Salford	773
Spring-Ford	Spring-Ford 8th Grade Center	700		Washington	St	Royersford	Royersford	574
	Spring-Ford 9th Grade Center	400	S	Lewis	Rd	Royersford	Upper Providence	603
	Spring-Ford 7th Grade Center	833	S	Lewis	Rd	Royersford	Upper Providence	633
Upper Dublin	Sandy Run Middle School	520		Twining	Rd	Dresher	Upper Dublin	1,010

Montgomery County Public Middle Schools/ Junior High Schools

School District	Middle/Junior High School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment
Upper Merion	Upper Merion Middle School	450		450 Keebler Road	Rd	King of Prussia	Upper Merion	1,143
Upper Moreland	Upper Moreland Middle School	3980		Orangemans	Rd	Hatboro	Upper Moreland	706
Upper Perkiomen	Upper Perkiomen Middle School	510		Jefferson		East Greenville	East Greenville	708
Wissahickon	Wissahickon Middle School	500		Houston	Rd	Ambler	Lower Gwynedd	1,082

Montgomery County Public High Schools

School District	High School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment
Abington	Abington Senior High School	900		Highland	Ave	Abington	Abington	1984
Cheltenham	Cheltenham High School	500		Rices Mill	Rd	Wyncote	Cheltenham	1712
Colonial	Plymouth-Whitemarsh Senior High School	201 E		Germanstown	Pk	Plymouth Meeting	Whitemarsh	1573
Hatboro-Horsham	Hatboro-Horsham Senior High School	899		Horsham	Rd	Horsham	Horsham	1905
Jenkintown	Jenkintown High School			West & Highland	Ave	Jenkintown	Jenkintown	189
Lower Merion	Harriton Senior High School	600 N		Ithan	Ave	Rosemont	Lower Merion	884
	Lower Merion High School	315 E		Montgomery	Ave	Ardmore	Lower Merion	1584
Lower Moreland	Lower Moreland High School	555		Red Lion	Rd	Huntingdon Valley	Lower Moreland	662
Methacton	Methacton High School	1005		Kriebel Mill	Rd	Eagleville	Worcester	1761
Norristown Area	Norristown Area High School	1900		Eagle	Dr	Norristown	West Norriton	1964
North Penn	North Penn Senior High School	1340		Valley Forge	Rd	Lansdale	Towamencin	3424
Perkiomen Valley	Perkiomen Valley High School	509		Gravel	Pk	Collegeville	Perkiomen	1417
Pottsgrove	Pottsgrove Senior High School	1345		Kauffman	Rd	Pottstown	Lower Pottsgrove	1010
Pottstown	Pottstown Senior High School	750 N		Washington	St	Pottstown	Pottstown	849
Souderton Area	Souderton Area School District	625		625 Lower Road	Rd	Souderton	Franconia	1583
Spring-Ford	Spring-Ford Senior High School	350 S		Lewis	Rd	Royersford	Limerick	1395
Springfield Township	Springfield Township High School	1801 E		Paper Mill	Rd	Erdenheim	Springfield	869
Upper Dublin	Upper Dublin High School	800		800 Loch Alsh Avenue	Ave	Fort Washington	Upper Dublin	1597
Upper Merion	Upper Merion High School	435		Crossfield	Rd	King of Prussia	Upper Merion	1129
Upper Moreland	Upper Moreland High School	3000		Terwood	Rd	Willow Grove	Upper Moreland	1090
Upper Perkiomen	Upper Perkiomen High School	2		2 Walt Road	Rd	Pennsburg	Red Hill	1086
Wissahickon	Wissahickon High School	521		Houston	Rd	Ambler	Lower Gwynedd	1493
Vocational	Central Montgomery Technical High School	821		Plymouth	Rd	Plymouth Meeting	Plymouth	629
	Eastern Center for Arts and Technology	3075		Terwood	Rd	Willow Grove	Upper Moreland	134

Montgomery County Public High Schools

School District	High School	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment
	North Montco Technical Career Center	1265		Sumneytown	Pk	Lansdale	Towamencin	263
	Western Montgomery Career and Technology Center	77		Graterford	Rd	Limerick	Limerick	117

Private Elementary Schools

Name	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment	Notes
Abington Friends School	575		Washington	Ln	Jenkintown	Abington	634	
Academy of the New Church	2815		Huntingdon	Pk	Huntingdon Valley	Bryn Athyn		Grades 6 through 12
Ancillae Assumpta Academy	2025		Church	Rd	Wyncote	Cheltenham	474	
Armenian Sisters Academy	440		Upper Gulph	Rd	Radnor	Upper Merion	163	
Baldwin School	701	W	Montgomery	Ave	Bryn Mawr	Upper Merion	612	PK-12
Blessed Teresa of Calcutta Elementary School	256		Swamp	Pk	Schwenksville	Limerick	270	PK-8
Calvary Baptist Christian School	1380	S	Valley Forge	Rd	Lansdale	Towamencin	308	PK-12
Centre Square Montessori School	1775		Skippack	Ave	Blue Bell	Whitpain	125	
Conshohocken Catholic Elementary School	205		Fayette	St	Conshohocken	Conshohocken	201	Will Close 6/12
Corpus Christi School	920		Sumneytown	Pk	Lansdale	Upper Gwynedd	527	Adding Students through merger
Coventry Christian- Lower School	962	E	Schuylkill	Rd	Pottstown	Lower Pottsgrove	290	
Epiphany of Our Lord School	3040		Walton	Rd	Plymouth Meeting	Whitpain	212	Adding Students through merger
French International School of Philadelphia	150	N	Highland	Ave	Bala Cynwyd	Lower Merion	268	
Friends Central School	1101		City	Ave	Fort Washington	Whitemarsh	459	PK-6
German Town Academy	340		Morris	Rd	Ardsley	Abington	240	K-8
Gladwyne Montessori School	920		Youngsford	Rd	Gladwyne	Souderton	461	
Good Shepperd Regional Elementary School	835		North Hills	Rd	Spring House	Lower Gwynedd	470	
Grace Christian School	320	N	Third	St	Telford	Lower Merion	451	
Gwynedd Mercy Academy Elementary Division	816		Norristown	Rd	Haverford	Upper Merion	72	
Haverford School	450		Lancaster	Ave	Huntingdon Valley	Jenkintown	207	Will Close 6/12
Huntingdon Valley Christian Academy	1845		Byberry	Rd	Jenkintown	Franconia	17	
Immaculate Conception School	606		West	Ave	Souderton	Lower Merion	27	
Indian Creek Mennonite School	423		Main	St	Bala Cynwyd	Montgomery	785	
Main Line Academy	124		Bryn Mawr	Ave	Meadowbrook	Abington	151	
Mary Mother of the Redeemer Elem. School	1321		Upper State	Rd	Conshohocken	Whitemarsh	149	
Meadowbrook School	1641		Hampton	Rd	King of Prussia	Upper Merion	209	PK-8
Miquon School	2025		Harts	Ln	Schwenksville	Lower Merion	55	6 through 12
Mother of Divine Providence School	405		Allendale	Rd	Fort Washington	Upper Dublin	221	PK-8
New Life Youth and Family	585		Freemans School	Rd	Abington	Abington	251	Will Close 6/12, PK-8
Open Door Christian Academy	1260		Fort Washington	Ave	Abington	Abington	86	
Our Lady Help of Christians Elem. School	1525		Elkins	Ave	Abington	Abington	176	Will Close 6/12
Our Lady of Confidence School	314	N	Easton	Rd	Norristown	East Norriton	246	PK-8
Our Lady of Victory Elementary School	351	E	Johnson	Hwy	East Norriton	East Norriton	617	PK-8
Penn Christian Academy	50	W	German town	Pk	Souderton	Franconia	298	PK-8
Penn View Christian School	420		Godshall	Rd	East Greenville	Springfield	137	PK-6
Perkiomen School	200		Seminary	Dr	Erdenheim	Plymouth	145	K-6
Philadelphia Montgomery Christian Academy	35		Hillcrest	Ave	Plymouth Meeting	Cheltenham	295	K-8
Plymouth Meeting Friends School	2150		Butler	Pk	Cheltenham	Horsham	69	k-9
Presentation BVM School	105		Old Soldiers	Rd	Horsham	Lower Merion	484	k-8
Quaker School at Horsham	250		Meetinghouse	Rd	Wynnewood	Red Hill	141	
Perelman Jewish Day School	49		Haverford Road	Rd	Red Hill	Lower Merion	311	PK-8
Red Hill Christian School	501		Graber	Pl	Rosemont	Lower Merion	387	
Rosemont School of the Holy Child	1344		Montgomery	Ave	Bryn Mawr	Royersford	200	Will Close 6/12
Shipley School	814		Yarrow	St	Royersford	Royersford	200	Will Close 6/12
Sacred Heart Elementary School			Lewis and Washington	St				

Private Elementary Schools

Name	Number	Prefix	Road Name	Suffix	Postal Address	Municipality	Enrollment	Notes
St. Albert the Great School	214		Welsh	Rd	Huntingdon Valley	Lower Moreland	537	PK-8
St. Aloysius School	220	N	Hanover	St	Pottstown	Pottstown	163	PK-8
St. Alphonsus School	29		Conwell	Dr	Maple Glen	Upper Dublin	421	Adding Students through merger
St. Anthony- St. Joseph Elementary School	260		Forest	Ave	Ambler	Ambler	196	Will Close 6/12
St. Catherine of Siena School	317		Witmer	Rd	Horsham	Horsham	295	Will Close 6/12
St. David School	401	N	Easton	Rd	Willow Grove	Upper Moreland	315	Adding Students through merger
St. Eleanor	701		Locust	St	Collegeville	Collegeville	482	Adding Students through merger
St. Francis of Assisi School	601		Buttwood	St	Norristown	Norristown	189	
St. Genevieve School	1237		Bethlehem	Pk	Flourtown	Springfield	259	K-8
St. Helena School	1499		DeKalb	Pk	Blue Bell	Whitpain	452	PK-8
St. Hilary of Poitiers School	920		Susquehanna	Rd	Rydal	Abington	202	K-8
St. Katherine Day School	930		Bowman	Ave	Wynnewood	Lower Merion	94	
St. Luke Evangelist School	2336		Fairhill	Ave	Glenside	Abington	331	Adding Students through merger
St. Margaret School	227	N	Narberth	Ave	Narberth	Narberth	281	
St. Marie Goretti School	2980		Cowpath	Rd	Hatfield	Hatfield	204	Will Close 6/12
St. Mary School	40		Spring Mount	Rd	Schwenksville	Lower Frederick	581	
St. Philp Neri School, East Greenville	26	E	6th	St	East Greenville	East Greenville	135	Will Close 6/12
St. Philp Neri School, Lafayette Hill	3015		Chestnut	St	Lafayette Hill	Whitemarsh	450	PK-8
St. Rose of Lima School	425	S	Pennsylvania	Ave	North Wales	North Wales	183	Will Close 6/12
St. Stanislaus School	493	E	Main	St	Lansdale	Lansdale	356	Adding Students through merger
St. Teresa of Avila School	2550	S	Parkview	Dr	Norristown	West Norriton	202	PK-8
St. Titus School	3000		Keenwood	Rd	Norristown	East Norriton	185	Will Close 6/12
Torah Academy	742		Argyle	Ave	Wynnewood	Lower Merion	318	
Twin Spring Farm Education Center	1632	E	Butler	Pk	Ambler	Upper Dublin	203	
Valley Christian School	2364		Huntingdon	Pk	Huntingdon Valley	Lower Moreland	112	
Valley Forge Baptist Temple Academy	616	S	Trappe	Rd	Trappe	Upper Providence	92	
Villanova Academy Honor Studies	1860		Montgomery	Ave	Villanova	Lower Merion	106	
Visitation BVM School	190	N	Trooper	Rd	Norristown	West Norriton	681	PK-8
Waldron Mercy Academy	513		Montgomery	Ave	Merion Station	Lower Merion	445	K-8
Wyncote Academy	7920		Washington	Ln	Wyncote	Cheltenham	474	K-8
Wyndcroft School	1395		Wilson	St	Pottstown	Pottstown	240	k-8

Fire Companies

Name	Station_ID	Address	City
Abington Fire Co.	100	1920 Horace Ave	Abington
Barren Hill Fire Co.	29	647 Germantown Pike	Lafayette Hill
Belmont Hills Fire Co.	22	4 S Washington Ave	Bala Cynwyd
Black Rock Volunteer Fire Co - Mont Clare	99B	216 Bridge St	Mont Clare
Black Rock Volunteer Fire Co - Oaks	99A	260 Green Tree Rd	Phoenixville
Bridgeport Fire Co.	31	72 W 4Th St	Bridgeport
Bryn Athyn Fire Co.	11	2815 Buck Rd	Athyn
Bryn Mawr Fire Co.	23	901 W Lancaster Ave	Bryn Mawr
Centre Square Fire Co. Main Station	33	1298 Skippack Pike	Blue Bell
Cheltenham Fire Co.	4	413 Ryers Ave	Cheltenham
Collegeville Fire Co.	34	29 E 5Th Ave	Collegeville
Colmar Fire Co.	12	2700 Walnut St	Colmar
Conshohocken Fire Co. #2	35	819 Fayette St	Conshohocken
East Greenville Fire Co.	38	401 Washington St	East Greenville
Edge Hill Fire Co.	400	2843 Limekiln Pike	Glenside
Elkins Park Fire Co.	3	7818 Montgomery Ave	Elkins Park
Enterprise Fire Co.	95	36 Byberry Ave	Hatboro
Fairmount Fire Co.	14	100 Vine St	Lansdale
Montgomery Township Main Station	18A	325 Stump Rd	North Wales
Montgomery Township Sub-Station	18B	441 Doylestown Pike	Montgomeryville
Flourtown Fire Co.	6	1526 Bethlehem Pike	Flourtown
Fort Washington Fire Co. Main Station	88A	1245 Fort Washington Ave	Fort Washington
Fort Washington Fire Co. Sub-Station	88B	3315 Susquehanna Rd	Dresher
George Clay Fire Co.	39	426 Ford St	Conshohocken
Gilbertsville Fire Co.	67	1456 E Philadelphia Ave	Gilbertsville
Gladwyne Fire Co.	24	1044 Black Rock Rd	Gladwyne
Glenside Fire Co.	1	210 W Glenside Ave	Glenside
Goodwill Fire Co.	32	304 Bush St	Bridgeport
Green Lane Fire Co.	42	214 Main St	Green Lane
Harleysville Fire Co.	89	274 Kulp Rd	Harleysville
Harmonville Fire Co. Main Station	44A	2100 Butler Pike	Plymouth Meeting
Harmonville Fire Co. Sub-Station	44B	904 Germantown Pike	Plymouth Meeting
Hatfield Fire Co. Main Station	17A	75 N Market St	Hatfield
Hatfield Fire Co. Sub-Station	17B	380 Fairgrounds Rd	Hatfield
Horsham Fire Co. Main Station	15A	315 Meetinghouse Rd	Horsham
Horsham Fire Co. Sub-Station	15B	1015 Horsham Rd	Horsham
Huntingdon Valley Fire Co.	8	636 Red Lion Rd	Huntingdon Valley
Independent Fire Co.	16	609 Greenwood Ave	Jenkintown
Jefferson Fire Co.	46	85 School Ln	Eagleville
King Of Prussia Fire Co. Main Station	47A	170 Allendale Rd	King of Prussia
King Of Prussia Fire Co. Sub-Station	47B	300 W Beidler Rd	King of Prussia
Lamott Fire Co.	2	7600 Penrose Ave	Elkins Park
Limerick Fire Co.	51A	390 W Ridge Pike	Limerick
Linfield Fire Co.	51B	1077 Main St	Linfield

Fire Companies

Lower Frederick Fire Co.	52	137 Spring Mount Rd	Schwenksville
Lower Providence Fire Co. Main Station	53A	3151 Ridge Pike	Eagleville
Lower Providence Fire Co. Sub-Station	53B	24 Lark Ln	Audobon
Mckinley Fire Co.	200	893 Jenkintown Rd	Elkins Park
Merion Of Ardmore Fire Co.	25	35 Greenfield Ave	Ardmore
Narberth Fire Co.	26	100 Conway Ave	Narberth
New Hanover Fire Co.	37A	2154 Swamp Pike	Gilbertsville
Norristown Fire Dept. - Fairmount Engine Co #2	27D	401 W Main St	Norristown
Norristown Fire Dept. - Hancock Fire Co.	27E	820 W Airy St	Norristown
Norristown Fire Dept. - Mont. Hose Fire Co.	27B	201 W Freedley St	Norristown
Norristown Fire Dept. - Norristown Hose Co.	27A	627 Dekalb St	Norristown
Norriton Fire Engine Co. Main Station	61A	2830 Swede Rd	Norristown
Norriton Fire Engine Co. Sub-Station	61B	656 W Germantown Pike	Norristown
North Penn Fire Co. Main Station	62A	141 S Main St	North Wales
North Penn Fire Co. Sub-Station	62B	1120 Meetinghouse Rd	
Ogontz Fire Co.	5	8215 Old York Rd	Elkins Park
Oreland Fire Co.	700	1500 Bruce Rd	Oreland
Penn Wynne Fire Co.	21	1442 Manoa Rd	Wynnewood
Pennsburg Fire Co.	65	501 Penn St	Pennsburg
Perkiomen Township Fire Co.	66	485 Gravel Pike	Collegeville
Pioneer Fire Co.	96	700 Greenwood Ave	Jenkintown
Plymouth Fire Co.	43	1321 Colwell Ln	Conshohocken
Pottstown Fire Dept. - Empire Hook & Ladder	69C	76 N Franklin St	Pottstown
Pottstown Fire Dept. - Goodwill Fire Co.	69A	714 High St	Pottstown
Pottstown Fire Dept. - North End Fire Co.	69D	301 Prospect St	Pottstown
Pottstown Fire Dept. - Phillies Fire Co.	69B	240 Chestnut St	Pottstown
Red Hill Fire Co.	71	71 E 4Th St	Red Hill
Ringing Hill Fire Co.	59	815 White Pine Ln	Pottstown
Rockledge Fire Co.	9	505 Huntingdon Pike	Rockledge
Roslyn Fire Co.	500	1128 Bradfield Rd	Abington
Royersford Fire Dept. - Friendship Fire Co	98B	269 Green St	Royersford
Royersford Fire Dept. - Humane Fire Co	98A	301 Walnut St	Royersford
Sanatoga Fire Co.	58	2222 E High St	Pottstown
New Hanover Fire Co. Sub-Station	37B	513 Schultz Rd	Perkiomenville
Skippack Fire Co.	86	1230 Bridge Rd	Schwenksville
Souderton Fire Co.	74	260 N 2Nd St	Souderton
Spring Mill Fire Co.	45	1210 E Hector St	Conshohocken
Swedeland Fire Co.	48	609 A St	King of Prussia
Swedesburg Fire Co.	49	310 Jefferson St	Bridgeport
Telford Fire Co.	75	400 W Broad St	Telford
Towamencin Fire Co. Main Station	76A	1590 Bustard Rd	Harleysville
Towamencin Fire Co. Sub-Station	76B	1260 Snyder Rd	Lansdale
Trappe Fire Co.	77	20 W 5Th Ave	Trappe
Tylersport Fire Co.	72	125 Ridge Rd	Tylersport
Union Fire Association Of Cynwyd	28	149 Montgomery Ave	Bala Cynwyd

Fire Companies

Upper Frederick Fire Co.	87	2837 Little Rd	Perkiomenville
Upper Gwynedd Fire Co.	80	660 Garfield Ave	West Point
Upper Pottsgrove Fire Co.	79	1409 Farmington Ave	Pottstown
Upper Providence Twp Fire Rescue	93	1286 Black Rock Rd	Phoenixville
Upper Salford Fire Co.	78	782 Old Skippack Rd	Salfordville
Washington Fire Co.	36	36 W Elm St	Conshohocken
Weldon Fire Co.	300	412 Easton Rd	Glenside
West End Fire Co.	57	112 Rice St	Stowe
Willow Grove Fire Co. Main Station	10A	227 Davisville Rd	Willow Grove
Willow Grove Fire Co. Sub-Station	10B	4355 Davisville Rd	Hatboro
Wissahickon Fire Co. Main Station	7A	245 E Race St	Ambler
Wissahickon Fire Co. Sub-Station	7B	1130 N Bethlehem Pike	Springhouse
Worcester Fire Co.	83	1725 Valley Forge Rd	Worcester
Wynmoor Hose Co.	82	1101 Willow Grove Ave	Wyndmoor

Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision-maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	
Risk Assessment	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	
	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document?	

Worksheet 7.2

Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	

Appendix G

Mitigation Actions Prioritization Worksheet

Scoring: For each consideration, indicate a plus (+) for favorable, and a negative (-) for less favorable.

Goal 1: Develop a better understanding of the potential disasters that could occur in Montgomery County

STAPLEE Criteria	S (Social)		T (Technical)		A (Administrative)			P (Political)			L (Legal)			E (Economic)			E (Environmental)						
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance / Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	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 Sites	Consistent with Community Environmental Goals	Consistent With Federal Laws
Considerations → for Alternative Actions																							
1a-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1a-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-7	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-8	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
1b-9	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+

Goal 2: Ensure that the public understands potential hazards and is aware of which actions to be taken to minimize their risks.

STAPLEE Criteria Considerations for Alternative Actions	S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)			E (Economic)				E (Environmental)				
	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance / Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	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 Sites	Consistent with Community Environmental Goals	Consistent With Federal Laws
2a-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-7	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2a-8	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2b-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2b-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2b-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2b-4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+
2b-5	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	0	+	+

Goal 3: Significantly reduce the risk of loss of life, injuries, economic costs, and destruction of natural and cultural resources that result from all hazards.																							
STAPLEE Criteria		S (Social)		T (Technical)		A (Administrative)		P (Political)		L (Legal)			E (Economic)			E (Environmental)							
Considerations for Alternative Actions	Community Acceptance	Effect on Segment of Population	Technical Feasibility	Long-term Solution	Secondary Impacts	Staffing	Funding Allocated	Maintenance / Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge	Benefit of Action	Cost of Action	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Waste Sites Effect on HAZMAT	Consistent with Community Environmental Goals	Consistent With Federal Laws
3a-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3a-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3b-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3b-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3b-4	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3c-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3d-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3e-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3e-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3e-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3f-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3f-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3g-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3h-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3h-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3h-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3i-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3i-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3j-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3j-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3k-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3l-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3m-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3m-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3n-1	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3n-2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+
3n-3	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	+

Goal 4: Encourage and promote actions to minimize the impact of floods within the county.															
STAPLEE S	T	A	P	L	E	E	E	E	E	E	E	E	E	E	E
Criteria	(Technical)	(Administrative)	(Political)	(Legal)	(Economic)	(Environmental)	(Social)	(Health)	(Safety)	(Cultural)	(Aesthetics)	(Quality of Life)	(Equity)	(Efficiency)	(Sustainability)
Consider	Effect on	Funding All	Local Char	Public Supl	State Auth	Existing Lo	Potential L	Benefit of Ac	Cost of Ac	Contribute Outside Fu	Effect on I	Effect on C	Consistent	Consistent	Consistent
4a-1	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4a-2	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4a-3	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4a-4	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-1	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-2	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-3	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-4	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-5	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-6	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-7	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-8	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-9	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-10	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-11	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-12	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4b-13	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4c-1	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4c-2	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4c-3	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4d-1	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4d-2	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4e-1	+	-	+	+	+	+	+	+	+	+	0	0	+	+	+
4e-2	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4e-3	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+
4e-4	+	+	+	+	+	+	+	+	+	+	0	0	+	+	+

COUNTY COMMISSIONERS

On motion of _____, seconded by _____, it was unanimously adopted that:

WHEREAS, hazards including flooding, severe storms, and drought periodically threaten the safety of people and result in property damage in Montgomery County; and

WHEREAS, the vulnerability of the Montgomery County to some hazard events may be reduced through various mitigation measures; and

WHEREAS, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165, enacted under paragraph 104 of the Disaster Mitigation Act of 2000, provides new approaches to mitigation planning and requires local government to prepare and adopt mitigation plans as a condition for receiving certain federal disaster grants and loans and to amend these plans each five years; and

WHEREAS, the 2017 Montgomery County Hazard Mitigation Plan was prepared and adopted by Montgomery County and nearly all its municipalities; and

WHEREAS, a 5-year revision to the 2017 plan has been prepared by the County Planning Commission and Public Safety Department in accordance with appropriate federal guidelines established in accordance with the Stafford Act; and

WHEREAS, the public and each municipality in the county was given an opportunity to fully participate in the Plan Amendment process; and

WHEREAS, the Board of the Montgomery County Planning Commission has reviewed the proposed Hazard Mitigation plan and has found it to be in accordance with the current Board Policy;

NOW THEREFORE BE IT RESOLVED, that the Montgomery County Commissioners hereby approve the 2022 Montgomery County Hazard Mitigation Plan and the proper County officials are hereby authorized and directed to execute the same.

C: File
Controller
Purchasing
Finance
Planning

RESOLUTION OF
THE [governing body] of [municipality]
ADOPTING THE 2022 MONTGOMERY COUNTY HAZARD MITIGATION PLAN

WHEREAS, hazards including flooding periodically threaten the safety of people and result in property damage in [municipality]; and

WHEREAS, the vulnerability of the [municipality] to some hazard events may be reduced through various mitigation measures; and

WHEREAS, Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), 42 U.S.C. 5165, enacted under paragraph 104 of the Disaster Mitigation Act of 2000, provides new approaches to mitigation planning and requires local government to prepare and adopt mitigation plans as a condition for receiving certain federal disaster grants and loans and to amend these plans each five years; and

WHEREAS, a Montgomery County Hazard Mitigation Plan was prepared in 2017 and adopted by the county and [municipality]; and

WHEREAS, a revised hazard mitigation plan has been prepared by the Montgomery County Planning Commission and Public Safety Department in accordance with appropriate federal guidelines established in accordance with the Stafford Act; and

WHEREAS, the public and [municipality] in the county was given an opportunity to fully participate in the preparation of the 2022 Montgomery County Hazard Mitigation Plan preparation process; and

NOW THEREFORE BE IT RESOLVED, that the [governing body] of [municipality] hereby adopts the 2022 Montgomery County Hazard Mitigation Plan; and

BE IT FUTHER RESOLVED, the [municipal manager/ secretary] is directed to formally submit the a copy of this resolution to Montgomery County to be transmitted to Pennsylvania Emergency Management Agency (PEMA) and Federal Emergency Management Agency (FEMA) to enable the plan's final approval.

Municipal Contacts

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