



WASHINGTON COUNTY

2017 Multi-Jurisdictional
Hazard Mitigation Plan

2017
WASHINGTON COUNTY
HAZARD MITIGATION PLAN
UPDATE



PREPARED BY
JH CONSULTING, LLC OF WEST VIRGINIA
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1.0 INTRODUCTION

BACKGROUND

The *Washington County Multi-Jurisdictional Hazard Mitigation Plan of 2017* is an update of the previously updated plan in 2012. Mitigation planning regulations mandate jurisdictions to update the Hazard Mitigation Plan every five years from the date of FEMA approval; this is essential for determining the effectiveness of programs, reflecting changes in the land development or programs affecting mitigation priorities. By updating the plan, local communities can also determine the strengths and weaknesses of the plan and what elements may need to be changed.

PLAN AUTHORITY

In response to continuing large-scale federal outlays of disaster funds to states and communities, during the decade of the 1990's Congress passed the Disaster Mitigation Act of 2000 (DMA, 2K), which required counties to formulate a hazard mitigation plan in order to be eligible for mitigation funds made available by the Federal Emergency Management Agency (FEMA). Section 322 of the Robert T. Stafford Act requires that all states and local jurisdictions develop and submit Mitigation Plans designed to meet the criteria outlined in 44 CFR Parts 201 and 206.

PURPOSE

The purpose of the mitigation plan is to identify risks and vulnerabilities from hazards that affect Washington County to prevent or reduce the loss of life and injury and to limit future damage costs by developing methods to mitigate or eliminate damage from various hazards.

SCOPE

The *Washington County Hazard Mitigation Plan* follows a planning methodology that includes public involvement, a risk assessment for various identified hazards, an inventory of critical facilities and at-risk residential areas, a mitigation strategy for high-risk hazards, and a method to maintain and update the plan.

UPDATES TO THIS PLAN

Each section in the *Washington County Multi-Hazard Mitigation Plan of 2017* includes a brief description of how the section has been updated since 2012.



1.1 THE PLANNING PROCESS

§201.6(b) and
201.6(c)(1)

An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

- (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
- (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

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

This plan was developed in accordance with Part 201.6 of Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as enacted by Section 104 of the Disaster Mitigation Act of 2000. Several resources were used during the development of the plan, including the United States Department of Homeland Security (USDHS or DHS) / Federal Emergency Management Agency's (FEMA) *Local Mitigation Planning Handbook* (USDHS/FEMA, 2013), the governing regulations in the Code of Federal Regulations.

1.1.1 Plan Development Process of 2017

In May of 2017, the Washington County Commission awarded the update of the hazard mitigation plan to JH Consulting, the consultant. The Washington County Division of Emergency Services (WCDES) enlisted the services of JH Consulting, the consultant, to update the *Washington County Hazard Mitigation Plan*. WCDES formed a planning committee for the hazard mitigation plan update of 2017. The committee included representatives from each jurisdiction as well as various departments within the county; in some instances, committee members had participated in the last plan update as well.

The committee met five times during the planning process to review, discuss, and update pertinent information for the plan. The tasks committee members completed included the following.

- Risk assessment matrix
- Narratives about historical occurrences of hazards in their jurisdictions
- Updating the list of assets for their jurisdictions



- Completing an NFIP survey from FEMA
- Presenting new jurisdictional hazard mitigation projects
- Discussing existing plans and how they could integrate them into hazard mitigation
- Reviewing plan drafts
- Providing information on future development in the county

The following table lists each jurisdiction's or agency's representatives. By superscript, it indicates how the jurisdiction participated in the planning process. The superscripts correspond to the following numbers.

1. Attended at least one committee meeting.
2. Provided information to WCDES or the consultant directly via email or phone conversation.
3. Posted one or both of the online public surveys on their social media or website.
4. Completed one or all of the tasks outlined above.
5. Attended the public meeting.

TABLE 1.1.1.A COMMITTEE REPRESENTATIVES		
<i>Agency/City/Town</i>	<i>2011 Representative(s)</i>	<i>2017 Representative(s)</i>
Boonsboro, Town of ^{1,2,4}	Debra Smith	Megan Clark
Clear Spring, Town of ^{1,2,4}	Juanita Grimm	Juanita Grimm
Funkstown, Town of ^{1,2,4}	Brenda Haynes	Brenda Haynes
Hagerstown, City of ^{1,2,4} <i>Planning Office</i>	Kathleen Maher	Kathleen Maher
Hagerstown, City of ^{1,2,4} <i>Fire Department</i>	Kyd Dieterich	Mark Cleck
Hancock, Town of ^{1,2,4}	David Smith	David Smith
Keedysville, Town of ^{1,2,3,4}	Rick Bishop	Rick Bishop
Sharpsburg, Town of	N/A	Kimberly Fulk
Smithsburg, Town of ^{1,2,4}	Betsy Martin	Debra Smith
Washington County ^{1,2,3,4,5} <i>Department of Emergency Management</i>	Raphael Laroca Sam Anderson Verna Brown	Charlie Summers Tom Brown Joe Wesmiller
Washington County ¹ <i>Emergency Services</i>	N/A	David Hays
Washington County ^{1,2} <i>Engineering and Construction</i>	N/A	Blair Reynolds Rich Eichelberger
Washington County ^{1,2} <i>Environmental Management</i>	N/A	Julie Pippel
Washington County ^{1,2} <i>Planning and Zoning</i>	Stephen Goodrich	Stephen Goodrich
Washington County ^{1,2} <i>Public Works</i>	Robert Slocum	Scott Hobbs Jim Sterling
Washington County ¹ <i>Solid Waste</i>	Steve Zies	Dave Mason
Williamsport, Town of ^{1,2,4}	Donny Stotelmyer	Donny Stotelmyer



The committee convened for the first meeting at the end of July. The consultant reviewed the planning process, plan requirements, and tasks they would need to complete throughout the process with them. During the meeting, they discussed hazards existing in the previous plan and decided to consolidate some under one heading, and move others to a different section where they would be better categorized under cascading effects of natural or man-made hazards rather than hazards themselves. During this discussion, they included other cascading effects that occur as a result of a hazard in the plan. The consultant presented NCEI storm events data to the committee for background information on the number of hazards, deaths and injuries they caused, and the cost of the events from 2000-2017. This information was utilized to develop short, personal narratives about recent hazard occurrences in their area. After, the committee ranked the probability and severity of each new hazard on the list according to their perception. The results are shown in [Section 2.1.1 Risk](#).

At the second in-person meeting, the steering committee reviewed the goals, objectives and projects from the previous plan and decided to revise the goals and objectives to reflect a more manageable list. The committee determined that the goals should be more realistic, defined, and more clearly state the purpose. This way each jurisdiction could work towards the overall goals. During the meeting, each jurisdiction began to think about projects they could integrate into the plan. After the meeting, FEMA Region III along with AECOM presented new mapping tools in a public meeting; many of the committee members attended the meeting.

The third and fourth committee meetings were teleconferences. The first of these was minimally attended and a second opportunity was given for committee members to attend; a second meeting was scheduled. In it, the committee reviewed goals and objectives from the previous plan and offered examples of current mitigation projects they have been working on. During this meeting, the consultant also discussed the tasks the committee should be working on in preparation for the last in-person meeting.

During the fifth and final committee meeting, the third in-person meeting, attendees filled out the FEMA NFIP survey, reviewed goals and objectives, and completed a new projects worksheet. At this time the committee discussed the methods they would utilize to keep the plan current as well as other plans where this mitigation plan could be integrated. The committee members also had the opportunity to review a partial draft of the plan and comment on the content and layout.



The following table provides dates and a brief description of the agenda at each of the committee meetings. All documentation can be found in [Appendix 1: Meeting Documentation and Committee Involvement](#).

TABLE 1.1.1.B COMMITTEE MEETINGS			
<i>Meeting</i>	<i>Date</i>	<i>Type</i>	<i>Agenda</i>
Meeting 1	31 July, 2017	In person	<ul style="list-style-type: none"> • Overview of hazard mitigation definition and the planning process • Review of existing and proposed lists of hazards • Review, reorganize, and add cascading effects caused by hazards • Review of past hazard occurrences according to NCEI data <ul style="list-style-type: none"> ○ “Tell me a story” activity (personal description of past hazard occurrences in each jurisdiction) • Overview of probability and severity <ul style="list-style-type: none"> ○ Risk Assessment Matrix activity (ranking of hazards by each jurisdiction) • Presentation of community perceptions of hazards based on online public survey feedback • Distribution of asset inventories for jurisdictional review and update
Meeting 2	29 August 2017	In person	<ul style="list-style-type: none"> • Review of Risk Assessment Matrix results • Comparison of hazard perception results from committee vs. results from the public survey • Introduction to previous projects • Set manageable goals and objectives
Meeting 3	8 September 2017	Teleconference	<ul style="list-style-type: none"> • Review and approve new goals and objectives • Discuss new jurisdictional projects
Meeting 4	13 September 2017	Teleconference	<ul style="list-style-type: none"> • Review and approve new goals and objectives • Discuss new jurisdictional projects
Meeting 5	27 September 2017	In person	<ul style="list-style-type: none"> • Finalize goals and objectives • Complete NFIP survey • Review sample draft • Discuss plan integration • Discuss development trends • Present new projects for each jurisdiction • Agree upon plan maintenance procedures • Discuss public meeting possibilities

1.1.2 Engaging the Public and Other Stakeholders

The Washington County population had four opportunities to provide feedback and input for the hazard mitigation plan:

- two online public surveys,
- the draft comment period, and
- the in-person public meeting.



The committee distributed two online public surveys via social media after recognizing that social media is becoming more influential in the everyday lives of the population. The first survey focused on the various hazards that Washington County faces throughout the year; it gathered information on the population’s level of concern, measures they have taken to mitigate risk in their own homes, and general demographic information. The first survey was available to the public at the beginning of July, 2017; as of the draft delivery of this plan, the survey had received 221 responses. The second survey focused on gathering information about how willing the population would be to support various mitigation projects, grant opportunities, and tax incentives to reduce the risk to the county from hazards. This survey was available to the public at the beginning of August, 2017; as of the draft delivery of this plan, the survey had received 186 responses. The full data from both surveys is included in [Appendix 2: Public Surveys and Involvement](#).

After receiving the draft document, WCDES and various jurisdictions posted it on their websites and requested information from the public to be directed to the WCDES and invited them to participate in a traditional, in-person public meeting on December 20, 2017 to discuss the plan after the comment period was over.

The WCDES was in contact with various other partners within and surrounding Washington County borders. WCDES directly invited the stakeholders identified in the following table to provide input and comments on the draft plan. Any and all comments received from both the public and other stakeholders are included in [Appendix 2: Public Surveys and Involvement](#).

TABLE 1.1.2.A EXTERNAL STAKEHOLDER PARTICIPATION	
<i>Partner</i>	<i>Means of Participation</i>
Tri-County Council of Western Maryland	<ul style="list-style-type: none"> • Contacted WCDES’ consultant for information to include in its own planning efforts (i.e., the region’s 2018-2022 comprehensive economic development strategy)
Adams County (PA) Emergency Services	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment
Allegany County Department of Emergency Services	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment
Bedford County (PA) Emergency Management	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment
Berkeley County (WV) Office of Homeland Security & Emergency Management	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment
Franklin County (PA) Department of Emergency Services	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment
Frederick County Division of Emergency Management	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment
Fulton County (PA) Emergency Management Agency	<ul style="list-style-type: none"> • WCDES contacted county with a link to the draft mitigation plan, asking for comment



TABLE 1.1.2.A EXTERNAL STAKEHOLDER PARTICIPATION	
Partner	Means of Participation
Jefferson County (WV) Homeland Security & Emergency Management	<ul style="list-style-type: none"> WCDES contacted county with a link to the draft mitigation plan, asking for comment
Morgan County (WV) Office of Emergency Management	<ul style="list-style-type: none"> WCDES contacted county with a link to the draft mitigation plan, asking for comment

Additionally, FEMA Region III held a resiliency workshop during the update process and WCDES recognized the alignment of topics. The resiliency workshop provided information on newly-updated flood risk assessment tools. The county’s consultant utilized those tools for this project.

1.1.3 Research Conducted

The research conducted for the risk assessment phase of this update included data from federal, state, higher education, and mass media sources. The research aim was primarily to validate and describe the hazards included for consideration in this plan. Specific sources relative to individual hazards are listed in [Appendix 6 Citations](#).

The consultant reviewed a number of existing plans and reports to (a) identify any obvious inconsistencies between other development and mitigation efforts, (b) as baseline information for such sections as Analyzing Development Trends, and (c) to support discussions surrounding mitigation projects. Those documents included the following.

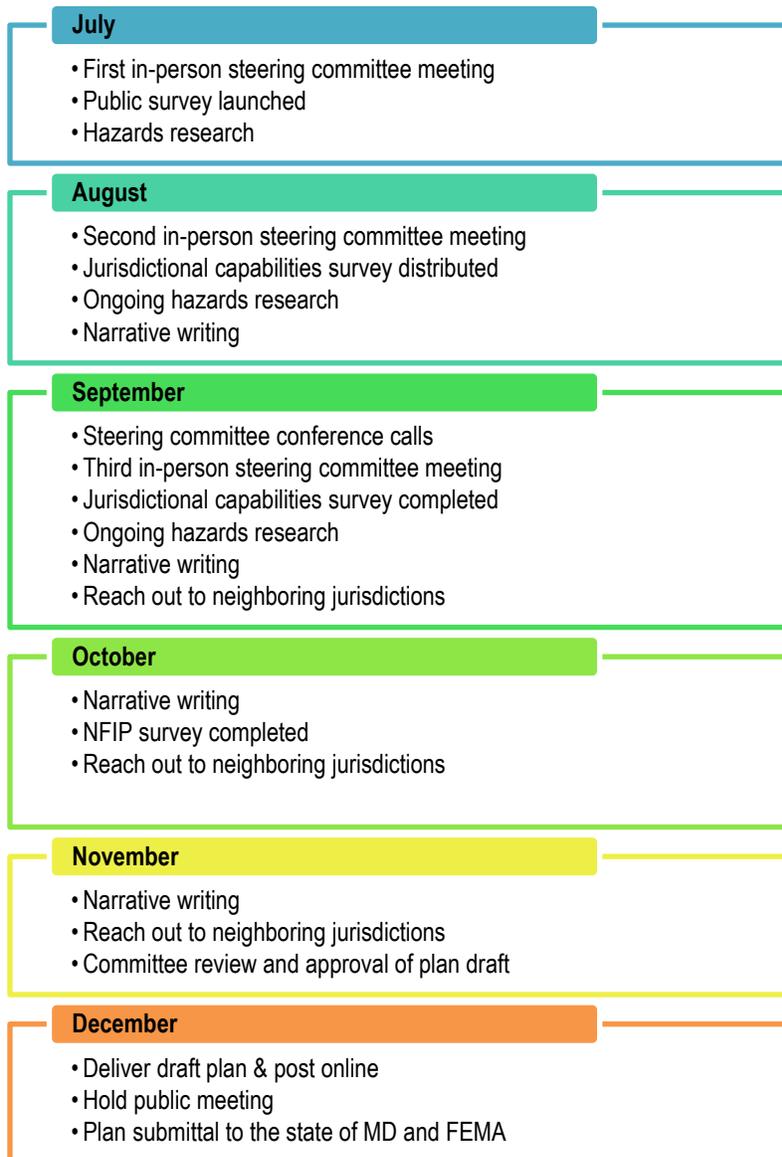
TABLE 1.1.3.A REFERENCED DOCUMENTS		
Document Type	Document Citation	How Incorporated Into Plan
Plan	Various Comprehensive Plans of jurisdictions in Washington County. See Appendix 6 Citations .	Used as reference for development trends, general information of the jurisdictions, and project ideas.
Study	Washington County. (2013). <i>Hazardous Materials Commodity Flow Study I-68 and I-70 Interchange</i> . Local Government. Hagerstown, MD	Referenced for information on hazardous materials in the county.
Report	USDHS FEMA. (1 January 2017). <i>Flood Risk Report Washington County Maryland</i> . Federal Government. Washington, D.C.	Used as technical information for new FEMA flood maps in the area.
Report	State of Maryland (1 December, 2015). <i>Heroin and Opioid Emergency Task Force</i> . State Government.	Used as reference for opioid research.
Technical Information	USDHS FEMA Region III. (July, 2015). <i>Plan Integration: Linking Local Planning Efforts</i> . Federal Government: Washington, D.C.	Used as guidance on incorporating local planning efforts/plans into the planning process.
Technical Information	USDHS FEMA. (June, 2016). <i>National Mitigation Framework</i> . Federal Government: Washington, DC	Used as general guidance on mitigation planning.
Technical Information	USDHS FEMA. (May, 2005). <i>Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning</i> . Federal Government: Washington, D.C.	Used as general guidance for incorporating historic property and cultural protection.



TABLE 1.1.3.A REFERENCED DOCUMENTS		
Document Type	Document Citation	How Incorporated Into Plan
Technical Information	USDHS FEMA. (March, 2013). <i>Local mitigation planning handbook</i> . Federal Government: Washington, D.C.	Used as general guidance on revised mitigation planning process
Technical Information	USDHS FEMA. (March, 2013). <i>Integrating Hazard Mitigation Into Local Planning</i> . Federal Government: Washington, D.C.	Used as general guidance on existing plan integration for hazard mitigation

1.1.4 Project Timeline

The Hazard Mitigation Plan update process took roughly six months to complete. The following graphic briefly describes the tasks that were completed each month.



1.1.5 Plan Development Process of 2012 Update

Washington County developed a Hazard Mitigation Planning Committee (HMPC), which was formed in June 2011. The committee was composed of representatives from various county and municipal agencies, including Emergency Management, Planning and Zoning and Public Works.

A data collection was conducted to ensure the most up-to-date information was utilized. Data collected included comprehensive plans including the new water resources elements and municipal growth elements, as well as zoning ordinances, development ordinances, and building codes and other relevant documents. Additional information was collected from public works, planning, emergency management, and GIS departments.

Three planning committee meetings were scheduled to coincide with key phases of the planning process.

- The kick-off meeting was held 9 June 2011. The HMPC reviewed the hazards identified in the *2005 Washington County Multi-Hazard Mitigation Plan* and the *2005 Maryland Hazard Analysis*; specific to Washington County. Additionally, 'new' hazard data tables were distributed for review. After the HMPC members reviewed the identified hazards, they were provided the opportunity to rank the identified hazards for the 2011 Plan update by filling out a Hazard Identification Ranking Sheet. The Capability Assessment Matrix obtained information on existing programs and policies in the county and municipal ordinances, specifically those that address natural hazards.
- The Mid-point Meeting, 31 August 2011, allowed the HMPC members to review the Hazard Identification and Ranking results. During this meeting, the HMPC members had the opportunity to review the critical facilities listing. Mitigation strategies were distributed to the HMPC members for review. The HMPC provided status updates for each mitigation action item as well as worked to identify and develop potential mitigation actions for implementation.
- The final meeting was held on 21 September 2011. The HMPC reviewed identified goals and objectives for countywide mitigation efforts. Several new goals and objectives were developed and included. The HMPC was asked to prioritize the mitigation actions. The county will implement the Plan and continue to perform periodic reviews and revisions to the plan through on-going Hazard Mitigation Planning Committee meetings. The committee will be entrusted with the



responsibility to meet annually to review the plan and also hold public meetings to solicit citizen input.

Each jurisdiction held a public meeting in 2012 for the plan update.



1.2 DESCRIPTION OF THE PLANNING AREA

2017 UPDATE

Old *Chapter 2: Washington County Profile*. The update to the description of the planning area section includes a reformatting, reorganization, and update of information to reflect changes in the past five years, redesign of maps, and the addition of relevant topics. Sections relating to future and planned development in the previous version were moved to [Section 1.4 Development Trends](#).

1.2.1 County Geography

Washington County is located in western Maryland between Allegany and Frederick Counties and is bounded on the north by the State of Pennsylvania and the south by the states of Virginia and West Virginia. Washington County was created in 1776 from Frederick County and was named for General George Washington. The county seat is located in Hagerstown; Washington County contains 458 square miles of territory and spreads across two physiographic provinces; the Ridge and Valley and the Blue Ridge. The county is also situated in the Potomac River Basin which drains into the Chesapeake Bay. Major streams in the county include Sideling Creek, which serves as the county's western boundary; Tonoloway Creek, Licking Creek, Little Conococheague Creek, Conococheague Creek, and Antietam Creek.

Steep slopes along the mountain ridges on the western and eastern fringes of the county ensure rapid runoff from rainfall and snowmelt, while the broad limestone valley in the center of the county contains sizeable karst areas, where land subsidence and groundwater pollution are major concerns. Flash flooding is also a potential problem, particularly in the Ridge and Valley and the Blue Ridge. The rock units that make up the county's surface contain large deposits of limestone, with sandstone ridges and some shale. The broad central valley is primarily limestone and shale of Cambrian and Ordovician age similar to the rock units found in the Great Valley in Pennsylvania, West Virginia and Virginia. The Blue Ridge is made up of complex pre-Cambrian age rocks, while the Ridge and Valley contains ridge forming sandstones along with shale and limestone primarily of Silurian Age. Slope failure, particularly in cut or fill areas where shale is overlain by sandstone, is not uncommon.

According to the Washington County Soil Survey, most of the soil associations in Washington County are related to the rock type of the parent material and the slope of the



land. The major soil groups formed on limestone units in the Great Valley consist of approximately 160,000 acres and make up the majority of land in the county. Major soil groups formed on shale, schist or sandstone on level to moderately sloping terrain consist of approximately 29,000 acres. Another 30,000 acres of land contain soils formed on colluvial materials at the foot of slopes along the western Ridge and Valley and the Blue Ridge. These soils have essentially formed on materials which have moved downslope over time. Another group of soils formed along major streams contain more than 6,500 acres that are classified as alluvial. These soils have been deposited by streams over time. Finally, approximately 30,000 acres of land in the Blue Ridge and the Ridge and Valley are classified as steep and stoney. When disturbed by road construction or other land development, soils on steep slopes, colluvial soils, and alluvial soils are more prone to downslope movement than other more stable soil types.

1.2.2 Jurisdictions

Washington County has eight towns and one city within its borders. The county seat is in the City of Hagerstown, the largest jurisdiction. The following is a brief description of each jurisdiction, according to the municipalities' websites, when available.

- Boonsboro:** Nestled at the foot of South Mountain, between Hagerstown and Frederick, lies a rural town at the crossroads of regional heritage tourism. Founded in 1792 by George and William Boone, cousins of Daniel Boone, Boonsboro forms a gateway to relevant colonial and Civil War heritage sites including the National Road, Washington Monument State Park, South Mountain and Antietam National Battlefield. The C&O Canal Towpath and Harpers Ferry Historical Park are only minutes away, and the proximity to the Appalachian Trail makes Boonsboro a welcome respite for hikers.
- Clear Spring:** Clear Spring was incorporated in 1836 and was named for a local spring that was so large it, at one time, turned a mill.
- Funkstown:** The plan for a village named "Jerusalem," bounded on three sides by the Antietam Creek, was unveiled by Jacob Funck in 1767. Early residents referred to it as 'Funck's Jerusalem Town' which became part of Washington County in 1776.

<i>Political Jurisdiction</i>	<i>Type</i>
Boonsboro	Town
Clear Spring	Town
Funkstown	Town
Hagerstown	City
Hancock	Town
Keedysville	Town
Smithsburg	Town
Sharpsburg	Town
Williamsport	Town
Washington	County



- **Hagerstown:** Hagerstown was founded in 1762 by Jonathan Hager, a gunsmith, fur trader, farmer and politician. After settling he quickly increased his wealth and expanded his land holdings acquiring over 10,000 acres which he used to layout plans for the town. It was originally named Elizabethtowne, in honor of his wife, but was later changed to Hagerstown in his honor. Hagerstown was situated at the crossroads of the “Warrior Trading Path,” the Eastern Native American North / South Trading Route, which is modern-day Route 11 and the First National Road, now Route 40. The town grew quickly and was a prized location for transportation of all kinds from covered wagon to nearby river navigation. The 19th Century marked the arrival of the railroad to the area in 1834. This, perhaps more than any other factor, spurred the growth of Hagerstown into the city we know today. The nickname “Hub City” comes from the way all the railroad lines running into to Hagerstown resembled the spokes of a wagon wheel on the map. The Western Maryland, the Baltimore and Ohio (B&O) and the Chesapeake and Ohio (C&O) all supplied these “spokes.” Railroading grew as an industry and was the main driver of the local economy well into the 20th Century. Although passenger service has ceased, freight still rolls through Hagerstown every day. Today, in keeping with its rich history the “Hub City” sits at the crossroads of two major interstates I-70 and I-81. It serves as a gateway to the Baltimore and the Washington, D.C. area as well as the “hub” of government, commerce, and recreation for the tristate area.
- **Hancock:** Located less than two hours from Baltimore and Washington D.C., we offer a slower paced existence where folks may enjoy our rich history, natural resources, arts and leisure activities, fine schools, and the community of locals who have chosen Hancock as their home. One of the oldest settlements in Western Maryland, Hancock derived its name from Edward Joseph Hancock, Jr., whose family operated the ferry at this northernmost point of the Potomac River. Edward Joseph Hancock, Jr. was considered a hero in the American Revolution who fought alongside General George Washington.
- **Keedysville:** Incorporated in 1872 and named for John J. Keedy.
- **Smithsburg:** The town of Smithsburg, Maryland is located in northeastern Washington County. Platted in 1814, the community's development was directly influenced by factors such as migration paths, the arrival of the railroad, and advances in agricultural technology. By 1923, much of the existing village had been erected. Aside from road improvements and the recent construction of



- suburban-type housing, Smithsburg retains its mid-19th- to early 20th-century architectural character. It is an excellent example of a community relatively untouched by modern, 20th-century architectural trends. Because Washington County has a rich collection of similar communities that appear much as they had at the turn of the century, Smithsburg's significance is important not only unto itself, but as an important contributing member to the greater architectural and cultural character of small towns in Washington County. Characterized by its rolling hills, open space, and fruit orchards, Smithsburg has grown to a community of approximately 3,000 citizens. The physical boundaries have grown to more than double its original size, making it the third largest municipality in Washington County.
- **Sharpsburg:** On September 17, 1862, The Battle of Antietam (also known as the bloodiest day of the Civil War,) brought devastation, heartache and 23,110 soldiers left dead, wounded, or missing. The sense of community shared by the people of Sharpsburg provided the strength to overcome the devastation and to rebuild the town. Presently the town looks very much as it did in the 1800s. Modern day conveniences have been added, but have been carefully planned out so as not to interfere with the historical nature of the town. Sharpsburg is nestled beside the Antietam Battlefield, with various attractions, such as the C&O Canal, Harper's Ferry, Washington Monument State Park, South Mountain, Crystal Grottoes Caverns, and many others just a short drive away.
 - **Williamsport:** The first non-Native Americans to record visits to the Williamsport area included Indian traders and included a young surveyor named George Washington. The first settler was Israel Friend in 1732. In 1749 a ferry operated by a man named Watkins provided crossing for people at the Potomac River (now River Bottom Park). In 1787 in the person of Brigadier General Otho Holland Williams, a Revolutionary War hero and compatriot of General George Washington As the young Nation expanded south and west, the need for better, faster means of transporting goods and people was critical. The solution was creating canals, locks and aqueducts to carry boats filled with goods and coal. The C&O Canal was built to make the Potomac a navigable path from Georgetown future North (Cumberland). The C&O Canal brought a "boom" of prosperity to Williamsport. The C&O Canal traffic and related industries slowly decreased due to the construction of the B&O Railroad although the Canal remained in use until the mid-1920s, the decline was hastened by damage caused by a series of disastrous floods in 1819, 1852, 1877



and 1889 which damaged bridges, aqueducts and sections of the canal itself. Williamsport’s location made it an inevitable crossroads to battlefields for both the Union and Confederate armies. Williamsport recovered after the end of the Civil War, with the arrival of the Western Maryland Railroad line boosting industrial development in the area.

- Washington County:** Established in 1776 and named for then-General George Washington, our county's history reflects the history of our nation. Among our many historical sites are a fort built in 1756 for use during the French and Indian War, a city founded by a German immigrant in 1762, a battlefield strewn with 23,000 dead and wounded soldiers in 1862, a highway, a canal, and later a railroad that helped to open up the frontier and further westward expansion. These treasures and many others secure Washington County's place of honor in American history. Our 458 square miles contain 3 National Parks, 7 State Parks, 14 County Parks, and numerous City and Town Parks. But perhaps our greatest treasures are 24 graceful stone arch bridges built between 1819 and 1863.

1.2.3 Climate

Although Washington County has some mountainous terrain and relatively high elevations (2,145 on Quirauk Mountain in the Blue Ridge, and 2,000 feet on Bear Pond Mountain in the Ridge and Valley), the climate is not much different from that of the central part of the State of Maryland with the exception that the county is somewhat drier on an annual basis. Precipitation averages 39.3 inches annually, while areas to the east and south

average between 40 and 44 inches of precipitation annually. This is in part due to the “rain shadow” effect of the Allegheny Plateau which draws off moisture from air masses which pass over Garrett and Allegany Counties as they travel from west to east.

Temperatures usually average a few

<i>Month</i>	<i>Precipitation</i>	<i>Minimum Temperature</i>	<i>Average Temperature</i>	<i>Maximum Temperature</i>
January	2.68 in.	23.3°F	30.8°F	38.3°F
February	2.55 in.	25.8°F	33.6°F	41.4°F
March	3.38 in.	32.3°F	41.5°F	50.7°F
April	3.56 in.	42.6°F	52.8°F	62.9°F
May	4.03 in.	51.8°F	62°F	72.2°F
June	3.88 in.	61.4°F	71.4°F	81.3°F
July	3.41 in.	65.5°F	75.3°F	85.2°F
August	3.14 in.	63.6°F	73.3°F	83°F
September	3.67 in.	56.2°F	65.7°F	75.3°F
October	2.88 in.	44.4°F	54.8°F	65.1°F
November	3.22 in.	36.3°F	44.9°F	53.5°F
December	2.89 in.	26.8°F	34°F	41.3°F
Average	39.29 in.	44.2°F	53.3°F	62.5°F

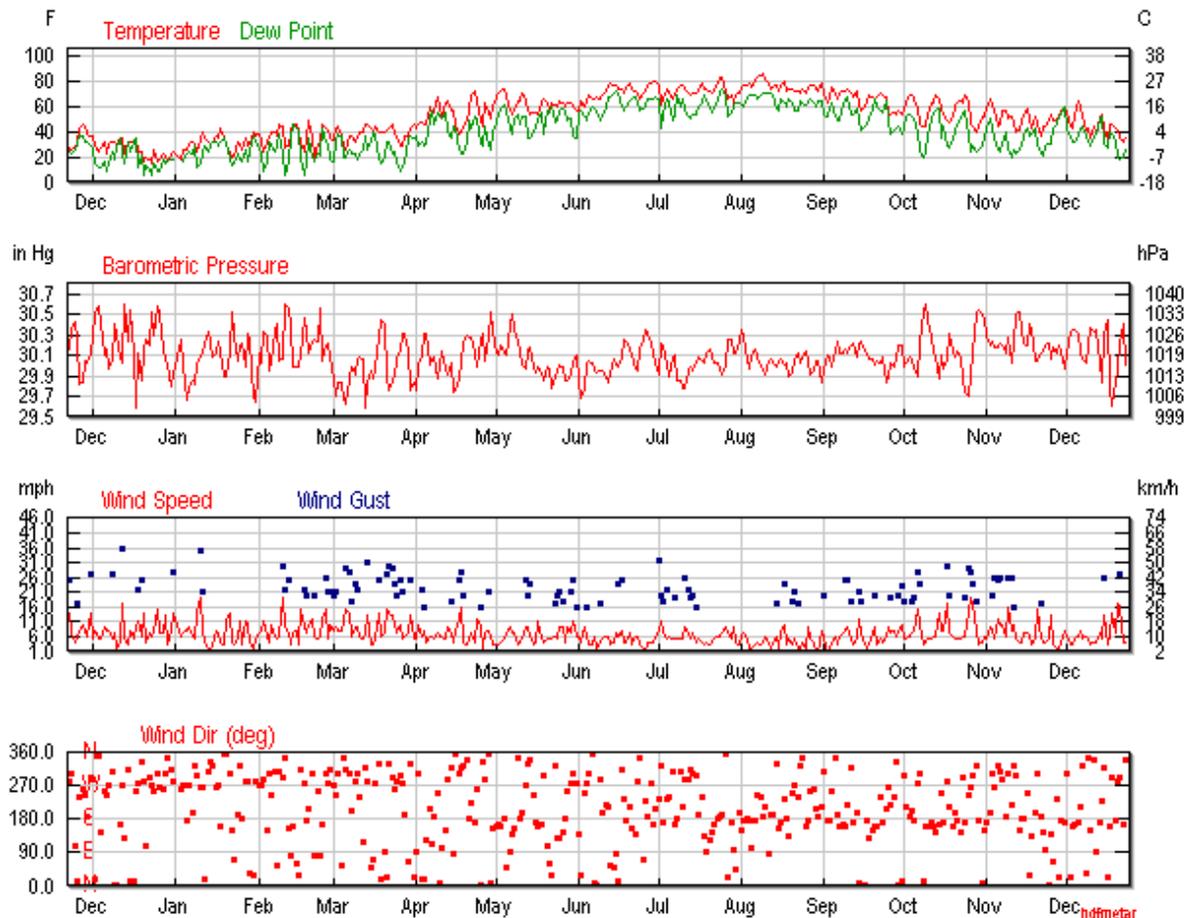
Source: NCEI



degrees cooler in Washington County than in the central and southern part of Maryland during the winter, but average a few degrees warmer during the day than the rest of the state during the summer season. This is partly due to the county's location between the Blue Ridge and the Allegheny Plateau where heat tends to build up between the higher ridges during daylight hours. At the Hagerstown Washington County Regional Airport weather station, monthly temperature averages range from 30 to 75°F throughout the year (NCEI, n.d.).

In addition, the county has to deal with dense fog conditions during many precipitation events when low hanging clouds hamper visibility. These events occur in the Blue Ridge and the Ridge and Valley areas. Temperature inversions, which are common in winter, also cause foggy conditions, particularly when warmer air contacts accumulated snow. Occasionally these fog events will last many hours and hamper transportation to a greater degree than snow or ice storms.

A synopsis of weather and climatic data for the Chewsville Weather Station just east of Hagerstown is shown below (Weather Underground, n.d.). Additional weather information appears in the hazard profiles.



1.2.4 County Demographics

The following table details the demographic information for the county and its municipalities. For population and housing trends in Washington County, refer to [Section 1.4 Development Trends](#).

TABLE 1.2.4.A WASHINGTON COUNTY CENSUS DATA										
Description	Washington County	Boonsboro	Clear Spring	Funkstown	Hagerstown	Hancock	Keedysville	Smithsburg	Sharpsburg	Williamsport
Population (2016 Estimate)	150,292	3,510	350	884	40,452	1,553	1,161	3,000	705	2,160
Median Age	40.4	41.9	32.3	44.2	33.8	35.9	40.8	33.7	40.9	46.5
Number of Companies	10,639	267	N/A	N/A	3,740	N/A	N/A	N/A	N/A	N/A
Education High School Graduate or Higher	86.70%	90.50%	85.70%	87.00%	83.00%	85.60%	96.90%	94.70%	87.6%	81.10%
Housing Units	61,111	1,487	185	390	18,348	863	418	1,063	376	1,117
Median Household Income	\$56,228	\$64,306	\$46,625	\$47,250	\$39,251	\$33,798	\$92,500	\$80,172	\$54,760	\$40,950
Foreign Born Population	7,504	80	9	11	2,751	21	51	56	4	30
Individuals Below Poverty Level	12.90%	6.90%	12.20%	7.90%	26.80%	14.40%	1.90%	10.50%	3.5%	18.50%
Veterans	12,058	286	23	64	2,892	123	81	186	87	191
<i>Race</i>										
White	124,955	3,257	364	819	2,8579	1,598	1,163	2,803	792	2,061
Black/African American	15,335	79	0	20	7,524	3	12	105	0	90
American Indian and Alaska Native	352	30	0	5	134	4	2	0	0	2
Asian	2,492	90	0	0	1,093	12	4	8	0	0
Hawaiian or Pacific Islander	59	0	0	0	25	0	0	0	0	0
Other	975	0	14	9	390	0	3	24	0	0
Two or More Races	5,102	0	0	10	2,465	32	1	70	19	65
Hispanic / Latino	6,020	9	18	26	2,431	4	46	109	6	19

Source: U.S. Census Bureau Community Facts

Population density is measured in persons per square mile. Because Washington County's boundaries are set and the population is increasing, population density is also increasing. The population density within the incorporated areas of Washington County is much higher than in the rural areas. Washington County has a land area of 457.78 square miles, which means that it has a density of 328, or on average, 328 people living in one



square mile. Generally, municipalities have a smaller land area and higher population, making the cities and towns denser. The population density within what are termed “rural areas” can vary significantly; for instance, subdivision or unincorporated communities may include clusters of residents and homes that result in very small, dense areas located sporadically throughout rural Washington County.

1.2.5 Economy

Since its initial settlement, Washington County has gone through several phases of economic development including a period of frontier settlement beginning before the French and Indian War; a period of rapid transportation development when the Bank Road (later U.S. Rt. 40), the Great Wagon Road (later U.S. Rt. 11), the C & O Canal, and the Baltimore and Ohio, Pennsylvania, and Western Maryland Railroads were built across the county, linking the east coast with the developing mid-western and southwestern states; a long period of agricultural development when much of the present day farmland was created; a

period of manufacturing development, and a resurgence of transportation and communication following the construction of the interstate highway system.

Today, Washington County has an economy that retains much of its past flavor while it attracts new industrial and commercial growth, particularly in the area near the junction of I-81 and I-70 near Hagerstown and around the airport. The Department of Business Development in Washington County lists 19 industrial and business parks in the county. The table above identifies the top 15 employers in the county for 2016.

TABLE 1.2.5.A TOP 15 EMPLOYERS IN WASHINGTON COUNTY	
Employer	Number of Employees
Washington County Public Schools	3,100
Meritus Medical Center	2,740
Citi	2,300
First Data	2,185
Washington County Government	1,352
Volvo Group	1,300
FedEx Ground	900
Hagerstown Community College	890
Bowman Group, LLC	745
Federal Government	567
Merkle Response Management Group	545
City of Hagerstown	500
Direct Mail Processors	500
City of Hagerstown	486
Brook Lane Health Services	485

Source: Washington County Department of Business Development

1.2.6 Transportation

Throughout its history, Washington County has served as a hub for both east-west and north-south transportation, with an early system of trails evolving into roads and



railroads that served both the westward expansion of the country into Ohio and the northwest, and through the Shenandoah Valley into Tennessee and the southwest.

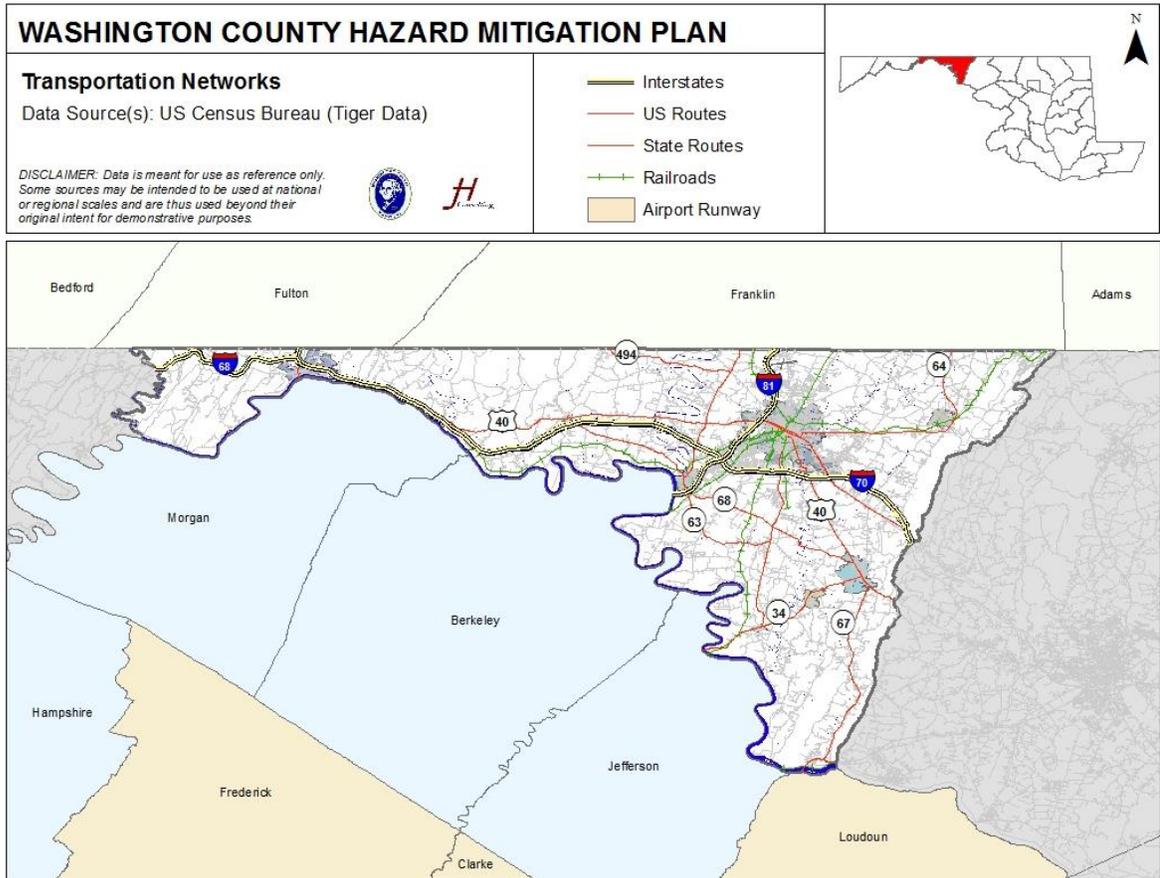
The transportation system in Washington County consists of an expansive network of roads and highways, railways, air traffic, and public transportation described below.

- **Roads:** With the completion of I-70 and I-81 during the 1960's, Washington County was poised as a crossroads for much of the commercial truck traffic moving from the Midwest and southwest to northeastern cities and ports. Following the North American Free Trade Agreement (NAFTA) agreement's approval, much of the truck traffic connecting Canada, the eastern U.S. and Mexico travels on I-81. Maintaining capacity on the interstates is critical for the long-term adequacy of city and county's transportation system. Heavy congestion on the interstates will make Hagerstown's thoroughfares and local roads attractive alternative routes for regional through traffic, specifically, Dual Highway, Eastern Boulevard, Northern Avenue, and much of U.S. Route 11. To avoid these problems, recommendations have been made for a number of transportation upgrades. These upgrades are included in the Washington County Capital Improvement Plan.
- **Rail:** During the same period rail traffic has become less of a factor in the county, although CSX, Winchester and Western, and Norfolk Southern still have east-west and north-south lines through the county.
- **Air:** Hagerstown Regional Airport (HGR) provides both public and private aviation services to the community. HGR hosts many businesses and services and continues to play an important role in the community.
- **Public Transit:** Greyhound Bus Lines includes scheduled service along Rt. 40 between Baltimore, Washington and Pittsburgh.

The Washington County Transit Department (WCT) operates all of the public transit in Washington County providing mass transportation that enhances the mobility of customers. The system runs eight, fixed urban routes that originate in Hagerstown and offers service to Funkstown, Halfway, Long Meadow, Maugansville, Robinwood, Smithsburg and Williamsport. In addition, WCT provides transportation for the elderly and persons with disabilities through a ride assist voucher program, which is funded by the Statewide Special Transportation Assistance Program (SSTAP) and ADA Complementary Paratransit Service for individuals with disabilities who cannot access fixed-route service. WCT also operates the Job Opportunity Access Program (JOBS) in cooperation with the Washington County



Department of Social Services (WCDSS). The urbanized fixed-route service carries the majority of the County's ridership. Total ridership averages over 470,000 passenger trips and all vehicles travel over 520,000 miles annually. Amtrak service runs along the Washington County border but there are no stops within the county; the closest stations are Harpers Ferry, WV, Martinsburg, WV and Cumberland on the Capitol Limited.



1.2.7 Medical Access

There are various options for getting medical attention in Washington County. Major hospitals and clinics include the Western MD Hospital Center, Meritus Health with several facilities in the area, Washington County Hospital, Hagerstown Surgical Clinic, and the VA Medical Center. There are also opportunities to access medical services around the county in West Virginia, and in counties surrounding Washington. Some of the surrounding facilities include WVU Healthcare in Martinsburg and Ranson, WV, the VA Medical Center in Martinsburg, the Frederick Memorial Hospital in Frederick MD, FMH Urbana, and Western MD Regional Medical Center in Cumberland.



1.2.8 Utilities

Utility service such as water, sewer, electricity, and gas are vital to a community. In Washington County, there are several providers. The following table outlines the various providers of utilities.

TABLE 1.2.8.A UTILITIES IN WASHINGTON COUNTY		
Utility Type	Name	Service Area
Water/Sewer	Washington County Water Quality	Antietam, Brooke Lane, Clear Spring, Conococheague, Sandy Hook, Smithsburg, and Winebrenner
	Hagerstown Water Division	Hagerstown Smithsburg
	Town of Hancock	Hancock
Electricity	Hagerstown Light	Hagerstown
	Potomac Edison (First Energy)	Washington County
Gas	Columbia Gas of Maryland, Inc.	Washington County
	Other propane providers	Washington County

1.2.9 Media

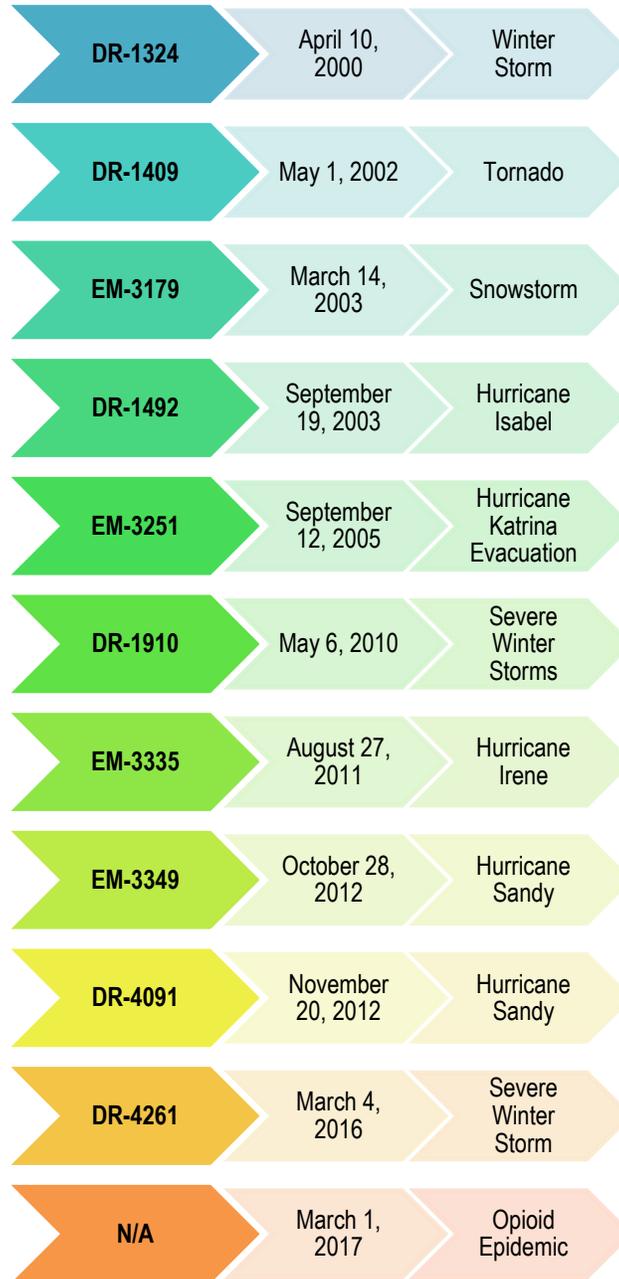
There are various media outlets in Washington County. These are outlined by type in the following table.

TABLE 1.2.9.A MEDIA IN WASHINGTON COUNTY		
Television	Print	Radio
In-county: WHAG (25 NBC) – Hagerstown WJAL (68 Independent) – Hagerstown WWPB (31 PBS) – Hagerstown Out of county: WFPT (62 PBS) – Frederick	The Herald Mail (Hagerstown) Atlantic Breezes (Statewide) Cumberland Times-News (Cumberland) Frederick News-Post (Frederick)	In-county: WARK 1490 AM– Hagerstown WAYZ 104.7 FM – Hagerstown WCRH 90.5 FM – Williamsport WGMS 89.1 FM – Hagerstown WICL 95.9 FM – Williamsport WJEJ 1420 AM – Hagerstown WZXH 91.7 FM – Hagerstown Out of county: WCBC 1270 AM – Cumberland WCMD 1230 AM – Cumberland WFMD 930 AM – Frederick WFRB 560 AM – Frostburg WFRB-FM 105.3 FM – Frostburg WFRE 99.9 FM Frederick WFWM 91.9 FM – Frostburg WLIC 97.1 FM – Frostburg WRQE 106.1 FM – Cumberland WTBO 1450 AM – Cumberland WWFD 820 AM – Frederick WWPN 101.1 FM – Westernport WYPF 88.1 FM – Frederick



1.2.10 Disaster Declarations

Since the year 2000, there have been six FEMA disaster declarations, four emergency declarations, and one public health emergency declaration in Washington County.



1.3 CAPABILITY ASSESSMENT

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

This section discusses the capabilities present with jurisdictions in Washington County that can support mitigation implementation. It contains an overview of National Flood Insurance Program (NFIP) compliance and participation as well as identifies the plans, ordinances, and planning bodies that can support the management of mitigation projects. Finally, it presents the results of a capability assessment survey administered by the county's consultant.

1.3.1 2017 Update

The 2012 version of the plan included the following information in two sections: *Chapter 3: Previous Hazard Mitigation Efforts* and *Appendix C: Capability Assessment*. The information has been consolidated under a broader "capability assessment heading" for ease of use. Additionally, the county's consultant updated information, where appropriate, based on jurisdictional input and availability of data (e.g., updating flood insurance policy and claims information). This section also now contains a jurisdictional self-assessment of capabilities supporting mitigation.

1.3.2 Capability Assessment Findings

Jurisdictional Capabilities

Washington County and its municipalities have various capabilities that can support mitigation efforts including comprehensive plans, building codes, subdivision and land use ordinances, zoning ordinances, a county-level water and sewerage plan, and floodplain regulations.

A multitude of planning commissions serves the jurisdictions in Washington County (see [Table 1.3.2.D](#) below). These commissions support general community planning within their designated jurisdictions. Miscellaneous powers and duties (Md. Land Use Code Ann. §2-105) include (but may not be limited to) the following.

- Promote planning
- Enter on any land and make examinations and surveys



- Accept and use gifts and public or private grants for the performance of the commission's functions (i.e., planning activities)
- Enact, adopt, amend, and execute a comprehensive plan
- Adopt zoning regulations to control street congestion; promote health, public safety, and general welfare; provide adequate light and air; promote the conservation of natural resources; prevent environmental pollution; properly manage growth and development; and promote or facilitate adequate transportation, water, sewerage, schools, recreation, parks, and other public facilities
- Recommend subdivision regulations to the legislative body
- Support the preservation of historic structures

Though the planning commissions do not coordinate hazard mitigation planning in Washington County directly, their responsibilities for coordinating community-level planning make them valuable resources for the creation of actionable mitigation strategies.

COMPREHENSIVE PLANS

Comprehensive plans promote sound land use and regional cooperation among local governments to address planning issues. These plans serve as the official policy guide for influencing the location, type, and extent of future development by establishing the basic decision-making and review processes on zoning matters, subdivision and land development, land uses, public facilities, and housing needs over time. The existing countywide comprehensive plan for Washington County was adopted in 2002. It includes some goals and objectives that promote mitigation activities. This plan is also in compliance with the Maryland Economic Growth, Resource Protection, and Planning Act of 1992. That Act requires each county to address visions that, in large part, promote hazard mitigation through land use regulation. These visions are designed to concentrate development in suitable areas having existing or planned water and sewer service, protect sensitive areas, including 100-year floodplains and steep slopes, and direct growth to existing population centers. (See [Section 1.4 Development Trends](#) for additional information.)

The comprehensive plan goals include measures designed to meet the above visions. These measures include the provision of adequate environmental safeguards to control and minimize development in floodplain areas and on steep slopes. The plan also calls for measures to control or eliminate environmental health hazards and calls for measures to provide adequate public safety services. The county zoning ordinance,



subdivision regulations, sediment and erosion control ordinance, stormwater management ordinance, floodplain regulations, and related municipal ordinances all address the regulatory measures to meet the above visions, goals, and objectives.

The Washington County Department of Planning & Zoning is currently updating the comprehensive plan (started in 2015). The updated plan will also contain sections on visions, goals, and objectives; economic development; transportation; land use and development standards; housing; environmental resources; agricultural resources; community facilities; and historical and cultural resources. In many ways, the 2040 comprehensive plan supports the same types of mitigation activities as noted above.

The nine other cities and towns in Washington County also maintain comprehensive plans. [Table 1.3.2.A](#) provides information relative to these documents.

TABLE 1.3.2.A COMPREHENSIVE PLANS		
<i>Jurisdiction</i>	<i>Current Plan Date</i>	<i>Description</i>
Boonsboro	2009	The latest Boonsboro comprehensive plan includes some goals. Under land use, one such goal is to ensure future development avoids environmentally sensitive areas. The plan also includes goals for maintaining safe and adequate water supply and continuing to protect the town's sensitive environmental resources. The plan also references the town's floodplain management ordinance that prohibits most development in the 100-year floodplain.
Clear Spring	1995	Clear Spring's plan identifies land use areas, including those in 100-year floodplains, particularly along Tom's Run. Goals listed in the plan include appropriate re-use of vacant areas in the town and leaving a legacy of clear air and water for future generations. Clear Spring's plan highlights the benefits of small-town life and expresses the town's desire to remain a small town.
Funkstown	2005	Funkstown's plan focuses on maintaining the town's sense of place. It includes goals and strategies that target mitigation. For instance, the town limits development on slopes greater than 25% and encourages a buffer strip along Antietam Creek.
Hagerstown	2018	The City of Hagerstown completed its comprehensive plan in April of 2018. The plan contains goals for environmental resources and sustainability, community facilities, urban design and historic preservation, housing and neighborhoods, downtown, transportation, water resources, economic development, and growth management and land use. The <i>vision Hagerstown 2035</i> document faces the challenges of vacancies, minimal investment, and declining property values in some areas of the city. As such, current planning offers unique opportunities to integrate resilient concepts into potential solutions to these challenges.
Hancock	2010	Hancock's most recent plan highlights property maintenance and protection, to include designated areas for environmental conservation, maintaining trees and plantings, restricting potential contaminating sources in the town's wellhead area, amending the town's stormwater management ordinance, and preserving sensitive environmental areas.
Keedysville	2009 (draft)	The Keedysville plan discusses promoting new development and redevelopment that incorporates environmental resources as site amenities. Such an action includes zoning and stormwater management elements. The town also seeks to create a town tree list for conservation and aesthetics. The plan also notes the importance of restricting development in floodplains.



TABLE 1.3.2.A COMPREHENSIVE PLANS		
<i>Jurisdiction</i>	<i>Current Plan Date</i>	<i>Description</i>
Sharpsburg	2016	Sharpsburg's 2016 plan lists, as goals, recognizing, respecting, and deriving maximum benefit from natural and environmental features; assuring the presence of public facilities and utility services to accommodate local needs; and achieving maximum compatibility between land uses and undeveloped land.
Smithsburg	2012	Smithsburg's plan includes numerous strategies that can support hazard mitigation. The plan states that the town values environmental preservation, and promulgates actions the protect wetlands, streams, floodplains, forested areas, and steep slopes from development. The plan also identifies the town's desire to be "formed by the natural landscape," and includes the use of pervious materials for paving in floodplains, the creation of a one-mile greenbelt around the town, etc.
Williamsport	2004	The comprehensive plan for Williamsport seeks to maintain the historic appeal of the town and to take advantage of locations along Route 68 and I-81 for economic development (i.e., "employment activities"). It also includes a goal for preserving land along the Conococheague Creek and the railroad right-of-way for open space and a trail.

BUILDING CODES

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. All jurisdictions in Washington County have adopted the *Maryland Building Performances Standards including the 2015 International Guideline Code (IBC), 2015 International Residential Code (IRC), and the 2015 International Energy Conservation Code (IECC)*. This code contains wind and snow loading requirements for new structures tailored to the climate of the county. The code also contains footer depth requirements related to the frost line and tie-down requirements for mobile homes.

SUBDIVISION AND LAND USE DEVELOPMENT ORDINANCES

Subdivision and land development ordinances (SALDOs) are intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Within these ordinances, guidelines 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. All nine jurisdictions in Washington County have adopted and enforced a subdivision and land development ordinance.

ZONING ORDINANCES



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 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. All nine jurisdictions in Washington County have zoning regulations.

WATER AND SEWER PLAN

The water and sewer plan shared many of the goals and objectives outlined in the comprehensive plans (particularly at the county level) noted above, including the concentration of development in areas having adequate water and sewer service and the elimination or treatment of hazardous pollutants. During the 2012 mitigation plan update, the committee reviewed the 2009 water and sewer plan to identify some of the problems experienced in the county and the corrective actions being taken. The Washington County Department of Water Quality pursues wastewater projects to address health and water quality issues in the county. These projects are included in the county's capital improvement plan and incorporated into the water and sewerage plan as they are developed. [Table 1.3.2.B](#) lists some of the county's water problems and their planned corrections.

TABLE 1.3.2.B WATER PROBLEMS AND PLANNED CORRECTIONS		
<i>Geographic Area</i>	<i>Nature of Problem</i>	<i>Planned Corrections</i>
Mt. Lena and San Mar	Inadequate individual supplies (cisterns). Small lot sizes afford no buffer zone between sewage disposal and water supplies. Contamination of groundwater.	Currently addressed as required on an individual case basis.
Leitersburg	Cisterns unsafe. Bacteria, unsafe wells.	Investigations of hookup to public lines in MD Route 64 or community wells. Problem continues but opposition to proposals.
Wilson-Shady Bower Conococheague	Wilson-Shady Bower corridor "possessed the poorest groundwater quality of any area" which was sampled by R.E. Wright & Associates in 1981. A high percentage of homes with bacterial contamination. Also high chlorides and nitrate-nitrogen.	Currently addressed as required on an individual case basis.
Rohrersville	Gasoline in shallow wells. Small lots and hand-dug wells. R.E. Wright & Associates noted nitrate-nitrogen and coliform contamination.	Currently addressed as required on an individual case basis.
Tilghmanton	Groundwater contamination. Some lots have an inadequate supply. R.E. Wright & Associates found no coliform but did find that nitrate-nitrogen concentrations approach the maximum contamination level in many of these wells.	Currently addressed as required on an individual case basis.
Antietam Drive	Inadequate fire flow. Flow tests in 1991 indicated only 800 gallons per minute available for fire protection. Area served by a dead-end water main, which is undesirable from hydraulic and reliability standpoint.	Looping system within pressure zone boundary.



TABLE 1.3.2.B WATER PROBLEMS AND PLANNED CORRECTIONS		
<i>Geographic Area</i>	<i>Nature of Problem</i>	<i>Planned Corrections</i>
Brownsville	Groundwater contamination.	Currently addressed as required on an individual case basis.
Gapland	Groundwater contamination.	Currently addressed as required on an individual case basis.
Ringgold	Groundwater contamination.	Currently addressed as required on an individual case basis.
Yarrowsburg	Groundwater contamination.	Currently addressed as required on an individual case basis.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) PARTICIPATION AND FLOODPLAIN MANAGEMENT ORDINANCES

Through the administration of floodplain ordinances, municipalities can ensure that all new construction or substantial improvements to existing structures located in the floodplain are flood-proofed, dry-proofed, or built above anticipated flood elevations. Floodplain ordinances may also prohibit development in certain areas altogether. The National Flood Insurance Program (NFIP) establishes minimum ordinance requirements which must be met for that community to participate in the program. However, a community is permitted and (in fact) encouraged to adopt standards which exceed NFIP requirements. All nine governmental jurisdictions within the county have floodplain regulations in place. One of the nine jurisdictions (Clear Spring) indicates that its regulations exceed the minimum standards set by the NFIP; the others meet the standards. Four jurisdictions (i.e., Boonsboro, Funkstown, Keedysville, and Williamsport) adopted the county ordinance. In August 2017, Washington County adopted a new floodplain ordinance to coincide with the adoption of the county’s new Flood Insurance Rate Maps (FIRMs) as part of the Federal Emergency Management Agency’s map modernization project. The 2017 FIRMs replaced the original maps from 1978 (with some intermittent, small updates).

During the 2017 update, the county’s consultant distributed an NFIP survey per FEMA Region III’s request. All respondents indicated making accessible copies of the FIRMs and most recent flood insurance studies available to residents in a variety of ways. Typically, these documents are on file at town halls. Some municipalities, such as Clear Spring, Funkstown, and Keedysville partner with the county for inspections, the provision of technical assistance, etc. Though all municipalities maintain compliance with the NFIP, the surveys revealed a variety of actual capabilities concerning managing the program. Washington County’s permits and inspections resources are vital to the management of the NFIP on a countywide basis. The surveys showed some variance in the number of



developable areas in floodplains. In some cases, such as Hagerstown, local officials receive minimal requests to erect buildings in floodplains; permits typically reference grading and other similar projects. Public outreach also varies. Some jurisdictions shared NFIP-related information via their websites (e.g., Washington County and Keedysville) and others have held public meetings (e.g., Clear Spring). Some focus on education when they receive specific requests (e.g., Hagerstown) and Washington County periodically sponsors seminars to insurance providers operating in the area. Finally, some jurisdictions noted minimal outreach to the public specifically on NFIP issues. [Appendix 1: Meeting Documentation and Committee Involvement](#) contains scanned copies of completed surveys.

[Table 1.3.2.C](#) outlines the NFIP report (FEMA, 2017) and details flood insurance policies within Washington County.

<i>Community Name</i>	<i>Total Premium</i>	<i>A-Zone (Buildings)</i>	<i>Policies</i>	<i>Total Coverage</i>	<i>Total Claims</i>	<i>Total Paid Since 1978</i>
Boonsboro	\$890.00	4	3	\$650,000.00	0	\$0.00
Clear Spring	\$1,120.00	0	3	\$875,000.00	1	\$0.00
Funkstown	\$10,433.00	0	6	\$1,342,500.00	6	\$15,139.68
Hagerstown	\$51,187.00	3	30	\$7,453,700.00	34	\$234,783.98
Hancock	\$47,475.00	0	13	\$3,167,300.00	27	\$516,751.86
Keedysville	\$3,266.00	1	2	\$425,000.00	1	\$0.00
Sharpsburg	\$3,271.00	0	3	\$811,200.00	9	\$106,431.11
Smithsburg	\$6,527.00	32	5	\$1,206,600.00	1	\$0.00
Unincorporated Areas of the County	\$192,849.00	968	227	\$51,573,200.00	280	\$2,611,986.16
Williamsport	\$11,115.00	1	10	\$1,672,300.00	45	\$723,075.20
TOTAL	\$328,133.00	1,009	302	\$69,176,800.00	404	\$4,208,167.99

[Table 1.3.2.D](#) summarizes the above discussion on a jurisdiction-by-jurisdiction basis. Data is taken from Questions 2, 3, 4, 5, 6, 7, 11, and 12 of the capability assessment survey issued by the county’s consultant.

<i>Jurisdiction</i>	<i>Jurisdictional Planning Commission</i>	<i>Comprehensive Plans</i>	<i>Building Codes*</i>	<i>Subdivision and Land Development Ordinance</i>	<i>Zoning Ordinance</i>	<i>Floodplain Ordinances (NFIP)</i>	<i>Capital Budget</i>	<i>Public Works Budget</i>
Washington County	YES	YES	YES	YES	YES	YES	N/A	N/A
Boonsboro, Town of	YES	YES	YES	YES	YES	YES	NO*	NO*
Clear Spring, Town of	YES	YES	YES	YES	YES	YES	NO	NO



TABLE 1.3.2.D CAPABILITIES FROM SURVEY

<i>Jurisdiction</i>	<i>Jurisdictional Planning Commission</i>	<i>Comprehensive Plans</i>	<i>Building Codes*</i>	<i>Subdivision and Land Development Ordinance</i>	<i>Zoning Ordinance</i>	<i>Floodplain Ordinances (NFIP)</i>	<i>Capital Budget</i>	<i>Public Works Budget</i>
Funkstown, Town of	YES	YES	YES	YES	YES	YES	NO*	NO*
Hagerstown, City of	YES	YES	YES	YES	YES	YES	NO*	NO*
Hancock, Town of	YES	YES	YES	YES	YES	YES	NO	YES†
Keedysville, Town of	YES	YES	YES	YES	YES	YES	NO*	NO*
Sharpsburg, Town of	YES	YES	YES	YES	YES	YES	NO	NO
Smithsburg, Town of	YES	YES	YES	YES	YES	YES	NO	NO
Williamsport, Town of	YES	YES	YES	YES	YES	YES	NO	NO*

† Answered “Yes, but it is limited or would be comprised of in-kind services.”

* Answered “No, but willing to include it in future budgets.”

The 2012 version of this plan contained a similar table listing municipal capabilities.

Table 1.3.2.D reflects the following notable changes.

- The 2012 version indicated that Clear Spring, Sharpsburg, and Williamsport did not have comprehensive plans in place. However, 2017 data yielded the existence of plans for each (though Clear Spring’s plan was dated 1995).
- The 2012 version noted “N/A” for Keedysville and Williamsport’s floodplain management ordinances. Both jurisdictions indicated having an ordinance in place during the 2017 update.

1.3.3 Capability Assessment Survey

Administrative and Technical Capability

Administrative capability is described by adequacy of departmental and personnel resources for the implementation of mitigation-related activities. Technical capability relates to adequacy of knowledge and technical expertise of local government employees or the ability to contract outside resources for this expertise to effectively execute mitigation activities. Common examples of skill sets and technical personnel for hazard mitigation include planners with knowledge of land development/management practices, engineers or professionals trained in construction practices related to buildings and/or infrastructure (e.g., building inspectors), planners or engineers with an understanding of natural and/or human caused hazards, emergency managers, floodplain managers, land surveyors, scientists



familiar with hazards in the community, staff with the education or expertise to assess community vulnerability to hazards, personnel skilled in geographic information systems, resource development staff or grant writers, and fiscal staff to handle complex grant application processes.

The Washington County Department of Planning and Washington County Division of Emergency Services (Emergency Management) provide technical assistance to municipalities. Other local organizations that could act as partners in mitigating natural and human-made hazards include the Community Foundation of Washington County, environmental advocacy groups, and watershed associations.

Table 1.3.3.A outlines the departments in Washington County and the municipalities, the number of personnel in each department, and the potential capabilities they have to implement hazard mitigation projects. Each jurisdiction provided their departments and number of personnel.

TABLE 1.3.3.A DEPARTMENTS AND PERSONNEL IN WASHINGTON COUNTY		
<i>Department</i>	<i>Number of Personnel</i>	<i>Capability</i>
<i>Washington County</i>		
Administration <ul style="list-style-type: none"> • Commissioners • Administrator • Department of Business Development • Project Liaison • Public Relations and Marketing • Attorney • Clerk • Ethics Commission • Sheriff's Office • State Attorney's Office • Treasurer's Office 	Not reported	<ul style="list-style-type: none"> • Mitigation project grant administration
Division of Construction	21	<ul style="list-style-type: none"> • The physical implementation of mitigation actions • Subject matter experts for construction projects
Division of Emergency Services <ul style="list-style-type: none"> • 911 Communication • Emergency Air Unit • Emergency Management • Special Operations • Fire and Rescue Services 	103	<ul style="list-style-type: none"> • Keeping plan current • Responding to disasters • Public education and awareness • Hazard monitoring • Provide technical assistance to municipalities
Division of Environmental Management <ul style="list-style-type: none"> • Solid Waste Department • Recycling • Department of Water Quality • Stormwater Management Program 	Solid Waste – 28 Water Quality – 79	<ul style="list-style-type: none"> • The physical implementation of mitigation actions • Subject matter experts for environmental projects • Hazard monitoring
Health and Human Services <ul style="list-style-type: none"> • Human Resources 	207	<ul style="list-style-type: none"> • Ensures sufficient personnel are available to complete mitigation projects



TABLE 1.3.3.A DEPARTMENTS AND PERSONNEL IN WASHINGTON COUNTY		
<i>Department</i>	<i>Number of Personnel</i>	<i>Capability</i>
• Fitness and Recreation		
Information Systems • Information Technology • GIS • Infrastructure and Operations • Software Support and Training • Wireless Communications	14	<ul style="list-style-type: none"> Partners in mitigation Development of mapping of hazards Implementation of new technologies that reduce impacts Hazard monitoring
Division of Plan Review and Permitting	27	<ul style="list-style-type: none"> Approval or denial of plans that have construction or development in safe or hazardous areas
Department of Planning and Zoning	21	<ul style="list-style-type: none"> Development of plans, rules, and regulations that allow or discourage certain projects Maintenance of plans and ordinances for development
Department of Public Relations and Marketing • Disability Advisory Committee	4	<ul style="list-style-type: none"> The inclusion of vulnerable populations in mitigation projects Public education and awareness
Division of Public Works • Hagerstown Regional Airport • Highway Department • Parks and Facilities Department • Transit Department	2 Highways – 94 Parks – 28 Transit – 51 Airport – 18 Golf Course – 17	<ul style="list-style-type: none"> The physical implementation of mitigation projects Hazard monitoring Public education and awareness
<i>Boonsboro</i>		
Administration	4	<ul style="list-style-type: none"> Mitigation project grant administration
Planning and zoning	1	<ul style="list-style-type: none"> Development of plans, rules, and regulations that allow or discourage certain projects Maintenance of plans and ordinances for development
Utilities	4	<ul style="list-style-type: none"> The physical implementation of mitigation projects Hazard monitoring
Public Works	5	<ul style="list-style-type: none"> The physical implementation of mitigation projects Hazard monitoring Public education and awareness
Police	6	<ul style="list-style-type: none"> Responding to disasters Public education and awareness Hazard monitoring Provide technical assistance to municipalities
<i>Clear Spring</i>		
Administration	1	<ul style="list-style-type: none"> Mitigation project grant administration
<i>Funkstown</i>		
Administration	3	<ul style="list-style-type: none"> Mitigation project grant administration
<i>Hancock</i>		
Administration	3	<ul style="list-style-type: none"> Mitigation project grant administration
Police	4 full time 2 part time	<ul style="list-style-type: none"> Responding to disasters Public education and awareness



TABLE 1.3.3.A DEPARTMENTS AND PERSONNEL IN WASHINGTON COUNTY		
<i>Department</i>	<i>Number of Personnel</i>	<i>Capability</i>
		<ul style="list-style-type: none"> • Hazard monitoring • Provide technical assistance to municipalities
Public Works	3 full time 1 part time	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Water/Waste water	1 full time 1 part time	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
<i>Hagerstown</i>		
Administration	4	<ul style="list-style-type: none"> • Mitigation project grant administration
Code Administration and Permitting	22	<ul style="list-style-type: none"> • Approval or denial of plans that have construction or development in safe or hazardous areas
Communications	1	<ul style="list-style-type: none"> • Partners in mitigation • Hazard monitoring • Notifications and warning of hazards
Community and Economic Development	13	<ul style="list-style-type: none"> • Partners in mitigation • Track population, economic, and development trends • Public education and awareness
Engineering	11	<ul style="list-style-type: none"> • Partners in mitigation • Design and build mitigation projects • Hazard monitoring
Finance	8	<ul style="list-style-type: none"> • Mitigation project grant administration • Tracking of mitigation project finances
Fire	69	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Human Resources	6	<ul style="list-style-type: none"> • Ensures sufficient personnel are available to complete mitigation projects
Parks and Recreation	42	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Police	123	<ul style="list-style-type: none"> • Responding to disasters • Public education and awareness • Hazard monitoring • Provide technical assistance to municipalities
Public Works	43	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Technology and Support Services	14	<ul style="list-style-type: none"> • Partners in mitigation • Development of mapping of hazards • Implementation of new technologies that



TABLE 1.3.3.A DEPARTMENTS AND PERSONNEL IN WASHINGTON COUNTY		
<i>Department</i>	<i>Number of Personnel</i>	<i>Capability</i>
		<ul style="list-style-type: none"> reduce impacts • Hazard monitoring
Utilities	127	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
<i>Keedysville</i>		
Administration	1	<ul style="list-style-type: none"> • Mitigation project grant administration
Planning and Zoning	5	<ul style="list-style-type: none"> • Development of plans, rules, and regulations that allow or discourage certain projects • Maintenance of plans and ordinances for development
<i>Sharpsburg</i>		
Administration	1	<ul style="list-style-type: none"> • Mitigation project grant administration
Historical Planning and Town Archives	1	<ul style="list-style-type: none"> • Partners in mitigation • Provide information on previous projects and hazards • Maintain plans for historical buildings
Planning and Zoning	8	<ul style="list-style-type: none"> • Development of plans, rules, and regulations that allow or discourage certain projects • Maintenance of plans and ordinances for development
Parks	1	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Streets	1	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Public Safety	1	<ul style="list-style-type: none"> • Responding to disasters • Public education and awareness • Hazard monitoring • Provide technical assistance to municipalities
<i>Smithsburg</i>		
Administration	4	<ul style="list-style-type: none"> • Mitigation project grant administration
Planning	1	<ul style="list-style-type: none"> • Development of plans, rules, and regulations that allow or discourage certain projects • Maintenance of plans and ordinances for development
Public Works	3	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness
Police	4	<ul style="list-style-type: none"> • Responding to disasters • Public education and awareness • Hazard monitoring



TABLE 1.3.3.A DEPARTMENTS AND PERSONNEL IN WASHINGTON COUNTY		
Department	Number of Personnel	Capability
		<ul style="list-style-type: none"> • Provide technical assistance to municipalities
<i>Williamsport</i>		
Administration	13	<ul style="list-style-type: none"> • Mitigation project grant administration
Public Works	4	<ul style="list-style-type: none"> • The physical implementation of mitigation projects • Hazard monitoring • Public education and awareness

State agencies agency which can provide technical assistance for mitigation activities include, but are not limited to:

- Governor’s Grants Office,
- Governor’s Office of Homeland Security,
- Maryland Department of the Environment,
- Maryland Department of Housing and Community Development,
- Maryland Economic Development Corporation,
- Maryland Emergency Management Agency,
- Maryland Environmental Service,

Federal agencies which can provide technical assistance for mitigation activities include, but are not limited to:

- Army Corps of Engineers,
- Department of Housing and Urban Development,
- Department of Agriculture,
- Economic Development Administration,
- Emergency Management Institute,
- Environmental Protection Agency,
- Federal Emergency Management Agency, and
- Small Business Administration.

Fiscal Capability

The decision and capacity to implement mitigation-related activities is often strongly dependent on the presence of local financial resources. While some mitigation actions are less costly than others, it is important that money is available locally to implement policies and projects. Financial resources are particularly important if communities are trying to take



advantage of state or federal mitigation grant funding opportunities that require local-match contributions. Only one entity (the county governmental unit) indicated having a paid grants specialist on its payroll.

State programs which may provide financial support for mitigation activities include, but are not limited to:

- 319 Nonpoint Source Program,
- Brownfields and Voluntary Cleanup Programs,
- State Revolving Loan Fund,
- Sewerage Facilities Supplemental Assistance Program, and
- Water Supply Program.

Federal programs which may provide financial support for mitigation activities include, but are not limited to:

- Community Development Block Grant (CDBG),
- Disaster Housing Program,
- Emergency Conservation Program,
- Emergency Management Performance Grants (EMPG),
- Emergency Watershed Protection Program,
- Hazard Mitigation Grant Program (HMGP),
- Flood Mitigation Assistance Program,
- Non-Insured Crop Disaster Assistance Program,
- Pre-Disaster Mitigation Program,
- Repetitive Flood Claims Program (RFC),
- Section 108 Loan Guarantee Programs,
- Severe Repetitive Loss (SRL) Program, and
- Weatherization Assistance Program.

Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to mitigate hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. In many cases, mitigation may not generate interest among local officials when compared with competing priorities. Therefore, the local political climate must



be considered when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions.

Self-Assessment

The capability assessment survey asked each local jurisdiction to conduct its own self-assessment of its capability to effectively implement hazard mitigation activities. As part of this process, the county’s consultant encouraged local government officials to consider the barriers to implementing proposed mitigation strategies in addition to the mechanisms that could enhance or further such strategies. In response to the survey questionnaire, local officials classified each of the capabilities as either “limited,” “moderate,” or “high.” Because this may be sensitive for local government officials, not every jurisdiction completed the self-assessment. [Table 1.3.3.B](#) summarizes the results of the self-assessment survey as a percentage of the nine responses received.

TABLE 1.3.3.B CAPABILITY SELF-ASSESSMENT			
<i>Capability</i>	<i>Limited</i>	<i>Moderate</i>	<i>High</i>
Planning & Regulatory	22%	33%	44%
Administrative & Technical	44%	33%	22%
Fiscal	56%	44%	0%
Political	22%	78%	0%

Responses: 9

As expected, communities rated their capabilities lower in the fiscal category and highest in the planning and regulatory capability. This self-assessment suggests areas where communities may want to consider mitigation projects. For example, community leaders may want to undertake education efforts to increase the political capabilities for pursuing mitigation. Community leaders may also wish to identify compatible areas in which hazard mitigation can be integrated into other planning efforts (e.g., comprehensive and water resources planning) potentially to take advantage of other funding streams.

The 2017 self-assessment added four questions to gauge community receptiveness to several types of mitigation strategies. [Table 1.3.3.C](#) details the results.



TABLE 1.3.3.C SELF-ASSESSMENT: PROJECT CONSIDERATIONS					
Sample Mitigation Strategy	Very Much Unwilling	Unwilling	Neutral	Willing	Very Willing
XYZ community guides development away from known hazard areas.	0	0	2	5	2
XYZ community restricts public investments or capital improvements within hazard areas.	0	1	5	2	1
XYZ community enforces local development standards (e.g., building codes, floodplain management ordinances, etc.) that go beyond minimum state or federal requirements.	0	2	4	3	0
XYZ community offers financial incentives (e.g., through property tax credits) to individuals and businesses that employ resilient construction techniques (e.g., voluntarily elevate structures, employ landscape designs that establish buffers, install green infrastructure elements, etc.).	0	0	6	3	0

1.3.4 Existing Limitations

As discussed above, communities in Washington County vary in their management of the NFIP. However, there is significant technical assistance available at the county and state levels to standardize and use more restrictive ordinances. (Four municipalities have already adopted the county’s ordinance, ensuring minimal standardization in the county.)

There are no communities in Washington County participating in the NFIP Community Rating System (CRS). However, most communities in the county have flood-prone areas. Participation in this program can provide premium reductions for properties located outside of special flood hazard areas (SFHA) of up to 10 percent and reductions for properties located in SFHA of up to 45 percent. These discounts can be obtained by undertaking public information, mapping and regulations, flood damage reduction and flood preparedness activities (FEMA, 2009). It should be noted, though, that there are administrative/management and on-going maintenance requirements for participation.

Cognizance of “hazard mitigation” at a conceptual level is somewhat of a challenge. In many instances, local officials and the general public associate buyouts with the term; thus, the planning process itself becomes one of outreach and education. Consideration of such projects as supporting auxiliary power at critical facilities is often minimal because wider perceptions of mitigation appear toward the end of the plan update period. Opportunities to integrate mitigation into other existing planning mechanisms may be missed for similar reasons or because of the difficulty of aligning traditional community planning with the more resource-focused emergency planning effort. FEMA Region III has expressed an



interest in developing a series of training for local officials to boost these capabilities in future update cycles.

Finally, limited funding is a critical barrier to the implementation of hazard mitigation activities. The county and its municipalities will need to rely on regional, state and federal partnerships for financial assistance.



1.4 DEVELOPMENT TRENDS

§201.6(c)(2)(ii)(C) [The plan should describe vulnerability in terms of] providing a general discussion of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

In general, the various jurisdictions in Washington County expect a population increase by the year 2030; this means that the county must prepare for new housing development and provide for economic development to sustain the growth. The city and towns in Washington County recognize the difficulties in expanding development within jurisdictional boundaries given the topographical and floodplain limitations, so some have resorted to annexing land to the jurisdiction to accommodate new growth. By doing this, they have identified areas of hazards (mainly flooding and land subsidence) and have decided to build away from them or leave them as open land for possible recreational use. This demonstrates the jurisdictions' understanding of the importance of considering hazardous areas for development and therefore implementing mitigation actions.

The following are a few examples of specific towns' struggles and plans for future development and hazard mitigation considerations.

- **Funkstown:** The Funkstown Comprehensive Plan outlines various programs in that include hazard mitigation. For example, the Legacy Program redirects state funds into dedicated conservation programs specifically designed to limit the adverse impacts of sprawl on agricultural lands and natural resources. The Brownfields Legislation creates a voluntary cleanup program through which an eligible developer supplies the state information about environmental conditions, including contamination of the site and proposed clean-up procedures.

There is an area along the Antietam Creek that is prone to flooding; the town has recognized the need to prohibit development along the floodplain and to encourage recreational areas and create trails and promote this as a tourist destination that would benefit both the residents and the tourists. The town has identified the need to work with the Washington County Planning Commission to achieve better land use controls in surrounding areas, particularly to the east of the town. The town predicts a slight population growth and increases in outside tourists that create economic growth that lies in activities related to its historical and residential character.



- **Smithsburg:** The Town of Smithsburg expects its population to grow from around 58,000 in 2010 to 73,000 by 2030. With this in mind, the town has considered the development of vacant land and constructing housing units, which leaves very little vacant land available for development, of which much of the area left is in the floodplain or is an area where environmental and topographical issues restrict the amount of development that could occur. The town has considered annexing land outside the town limits to the north. The State of Maryland recommends that the jurisdiction provide a certain amount of park and open space land per resident. In areas of undevelopable land, the town could consider meeting this recommendation and making use of the land.
- **Hagerstown:** In its latest comprehensive plan, Hagerstown outlines some challenges relating to population growth; the city identified the need to expand its corporate boundaries and provide these areas with public services, and to reuse and revitalize underdeveloped or underutilized industrial land. The city expects to see an increase in population and consequently in households in the next several years; the city projects growth by approximately 5,600 persons and around 2,100 households, necessitating the construction of additional housing and infrastructure.
- **Hancock:** The Town of Hancock developed various scenarios of population growth; in each one, the population increases by the year 2030, although it is not significant. Most of the town's undeveloped land is unsuitable for development due to steep slopes or floodplains, but there is one area where topographical issues could be overcome making up to 100 lots of land available. The town has considered a couple of different annexation areas that could be appropriate for economic development.
- **Boonsboro:** The town of Boonsboro expects its population to grow from 3,310 in 2007 to 5,339 by 2030; the expected population growth will occur in portions of the land that the town annexed in 2006 and are outlined in the town's comprehensive plan. Portions of the annexed land, mostly on the outer edges of the town are expected to serve as a transition area (agriculture, forest, or open space) between the town and the surrounding unincorporated area of Washington County. The Town of Boonsboro recognizes the need for increased water infrastructure due to the population growth and includes growth estimates from the Town of Keedysville, where they draw their source water. The Town of Boonsboro's Sensitive Areas Element of the comprehensive plan recognizes the need to protect streams, wetlands, floodplains, sensitive species habitat, and areas of steep slopes in and



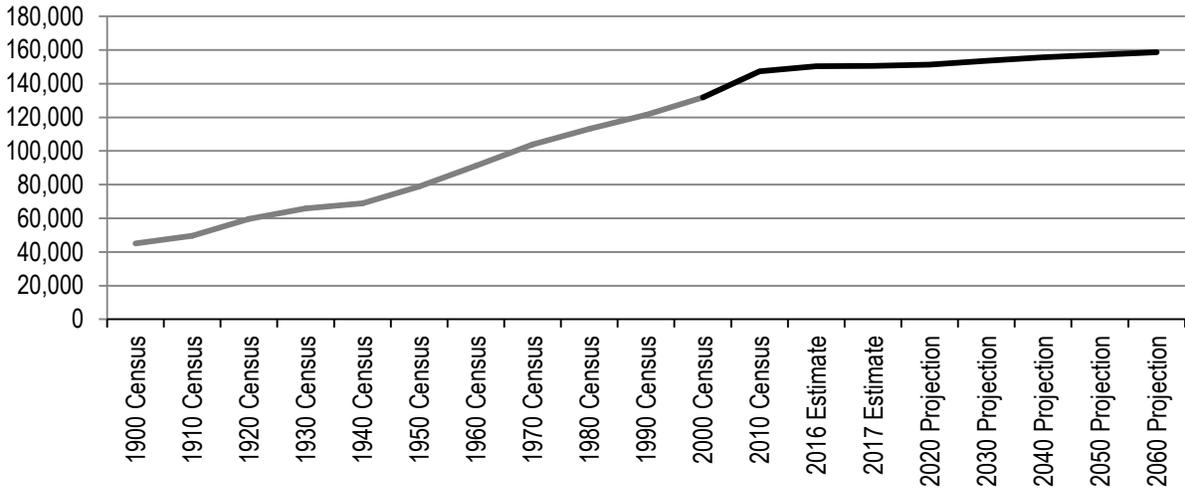
around the town. The protection mainly focuses on minimizing adverse impacts to these sensitive areas from development.

- **Sharpsburg:** The Land Use and Community Facilities Plan provides for the most appropriate locations of residential, commercial, recreational and other public and private activities and establishes desirable relationships between these activities to minimize conflicting land uses and provide safety and convenience for all Sharpsburg residents. It is important to note that Sharpsburg's Planning jurisdiction extends only to the Town's corporate limits. Logic requires that the plan encompass a somewhat larger area as patterns of use outside of town will impact the town proper. Most of the territory surrounding the Town to the North, South and West is recommended only for very limited use and is placed into an Agriculture and Conservation Category. While these areas are suggested primarily for agriculture or conservation, they should also provide for the enjoyment of open space and serve as recreational areas.
- **Washington County:** The Department of Water Quality actively pursues wastewater projects to address health and water quality issues in Washington County. As the projects are developed, they are included in the county's Capital Improvement Plan and incorporated into the Water and Sewerage Plan. While all the projects are important, some are directly relevant to hazard mitigation in relation to reducing nuisance flooding in some areas. One project is the Enhanced Nutrient Removal (ENR) upgrades to the Conococheague, Winebrenner, Antietam, and Smithsburg wastewater treatment plants. By upgrading Antietam and Smithsburg, additional flow capacity can be recognized for increasing the capacity in other facilities. (Washington County, 2009)

The U.S. Census keeps records of population throughout the years; every ten years they update the data through the census. Since 1900, the population in Washington County has grown significantly – by over 300% - with the most population growth between the 1940 and 1970 censuses. Over the years, the population in Washington County has grown steadily and is expected to continue this growth trend, but at a slower rate (ProximityOne, n.d.). The graph below shows the growth in Washington County since 1900 and projects population to 2060.

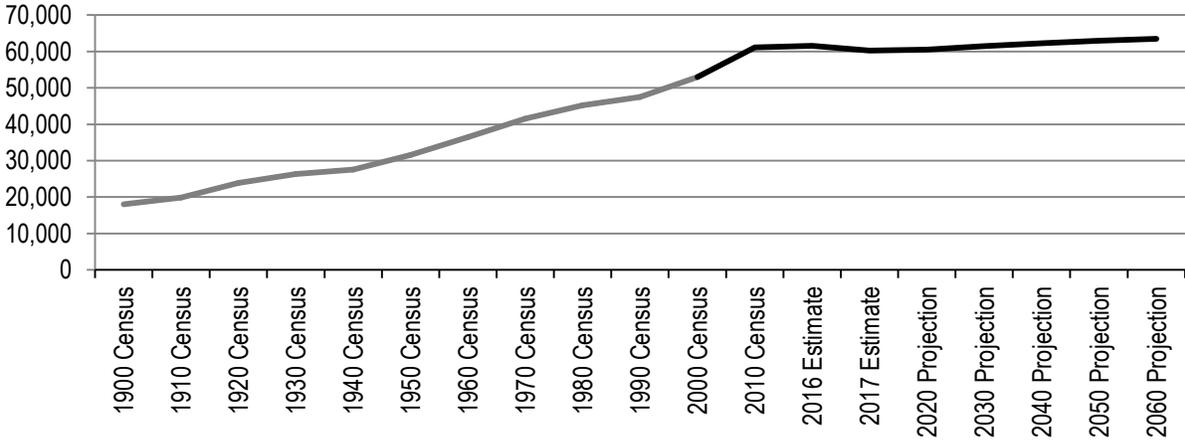


POPULATION GROWTH IN WASHINGTON COUNTY



Population growth means additional housing unit needs; data is available for accurate counts of housing units between 1990 and 2017. The average of population per housing unit for those years is approximately 2.5. This average was applied to the population from 1900 to 1980 as well as the population projections after 2017.

HOUSING UNITS IN WASHINGTON COUNTY



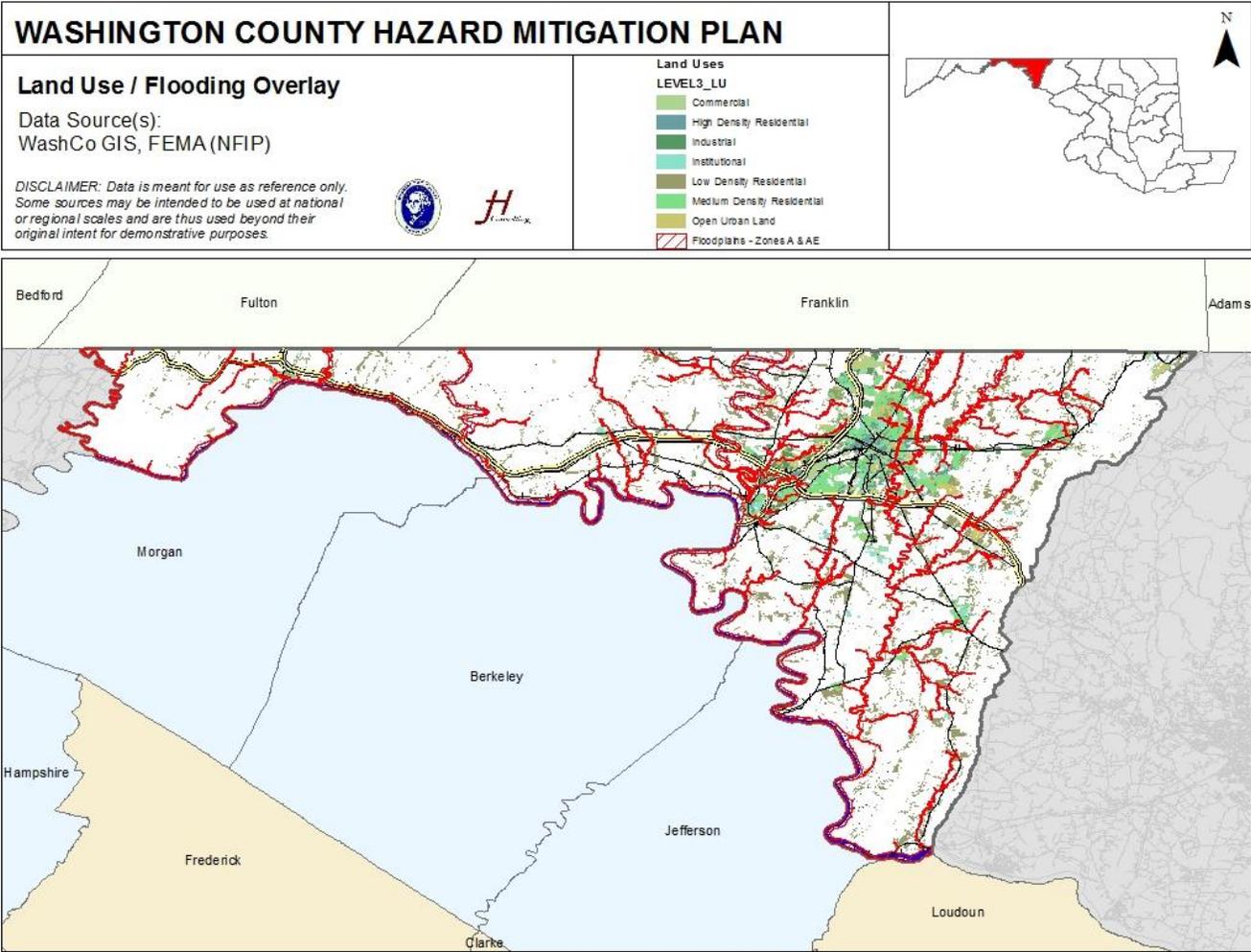
With the increase in population and, consequently, housing units, the need for water and sewer infrastructure extension also increases. Officials and planners should consider these trends when planning for future development.

The following pages show land uses, per zoning maps provided by Washington County GIS, with flood and land subsidence risk areas overlaid onto them. Each is shown at the county and municipal levels. As these areas develop (or re-develop), local officials may use these images to identify areas where education on resilient construction techniques could be beneficial.

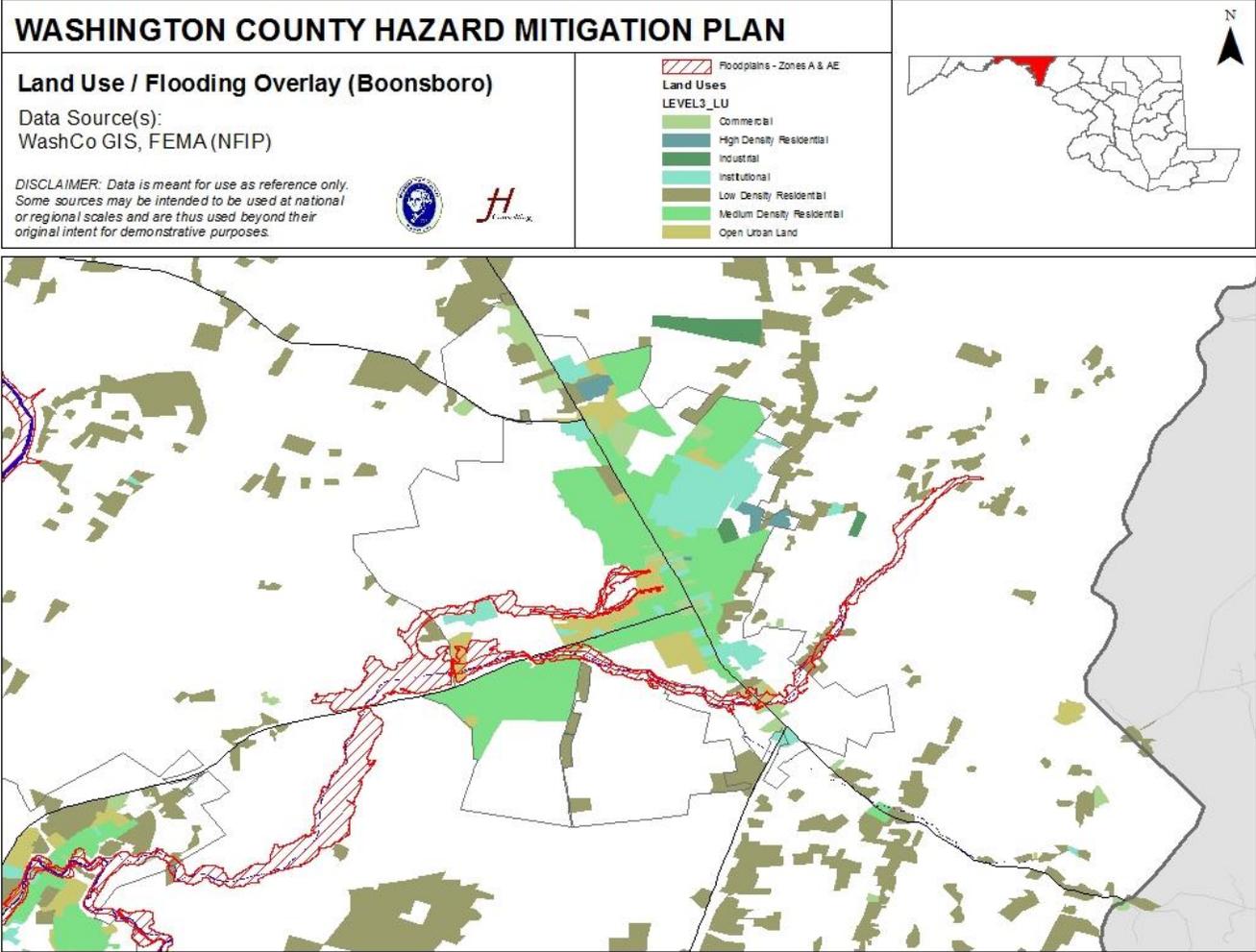


FLOOD OVERLAYS

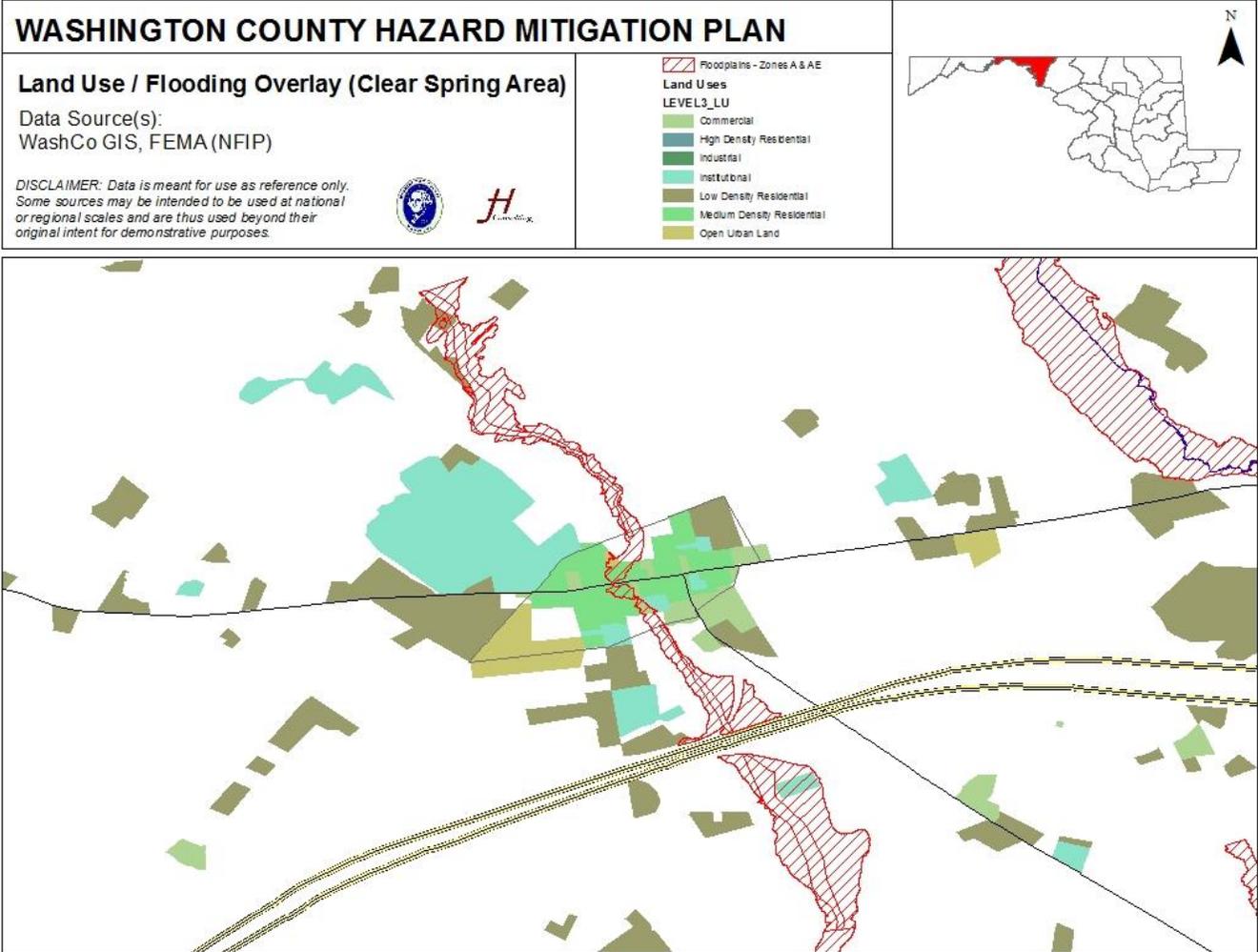
Washington County



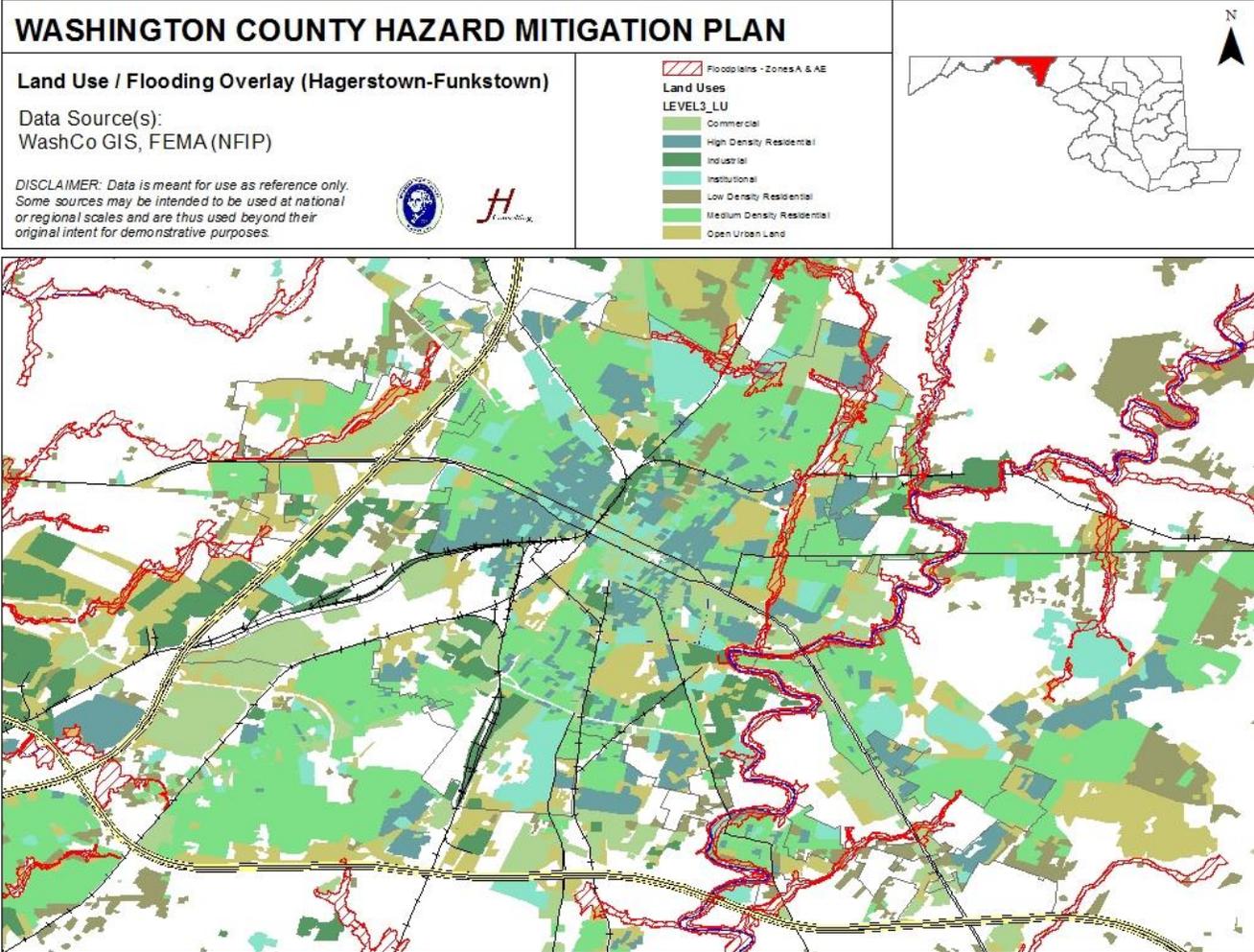
Boonsboro



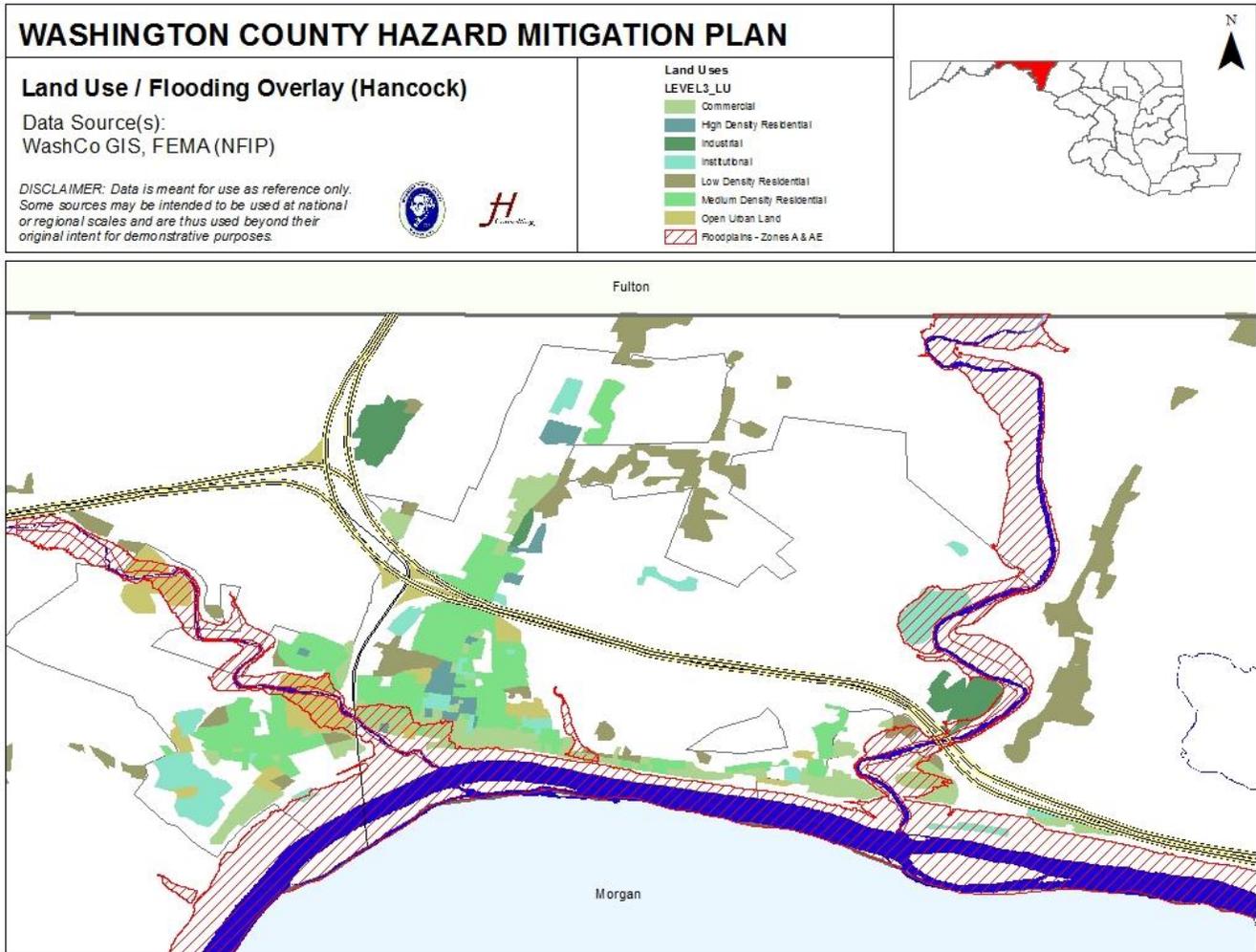
Clear Spring Area



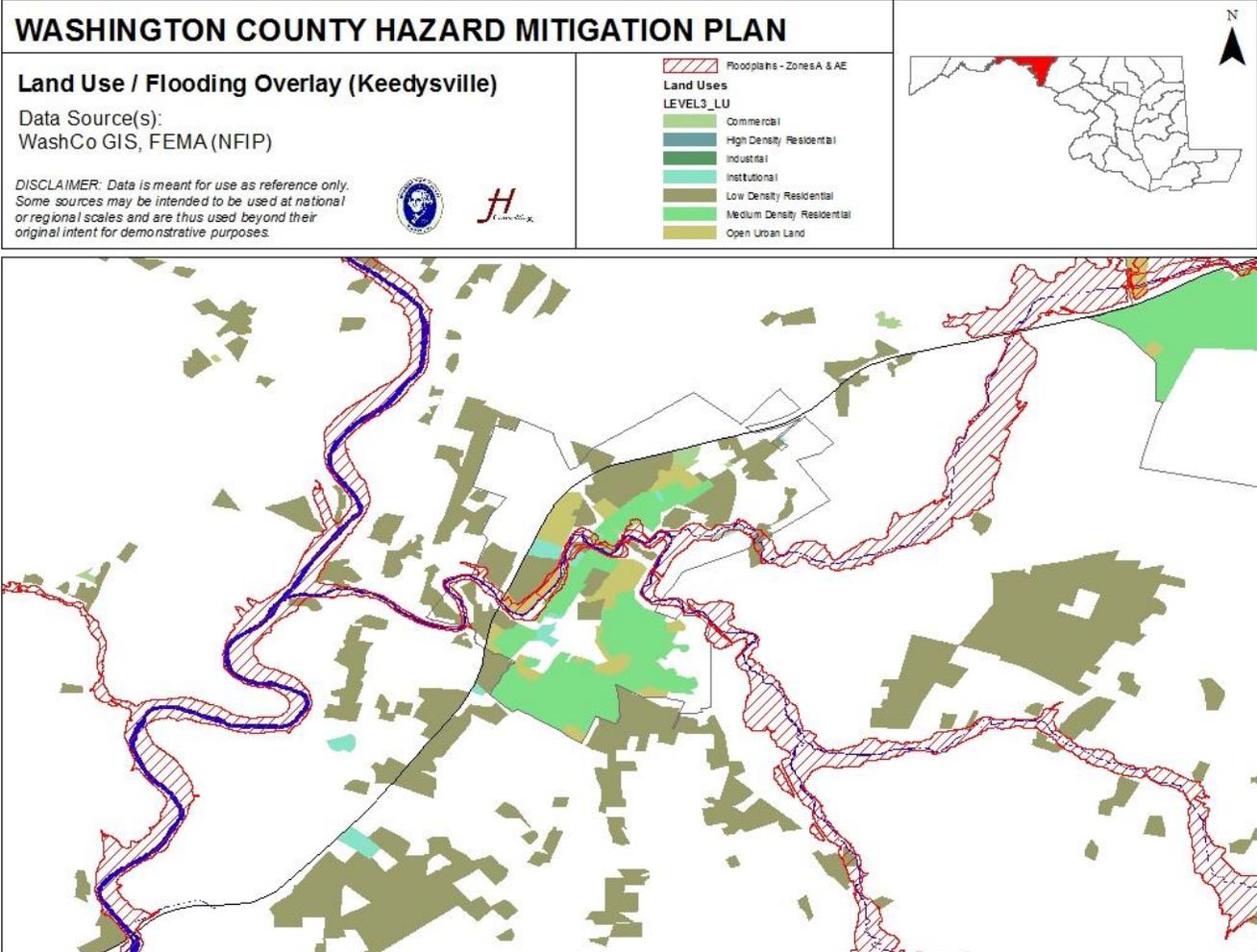
Hagerstown-Funkstown



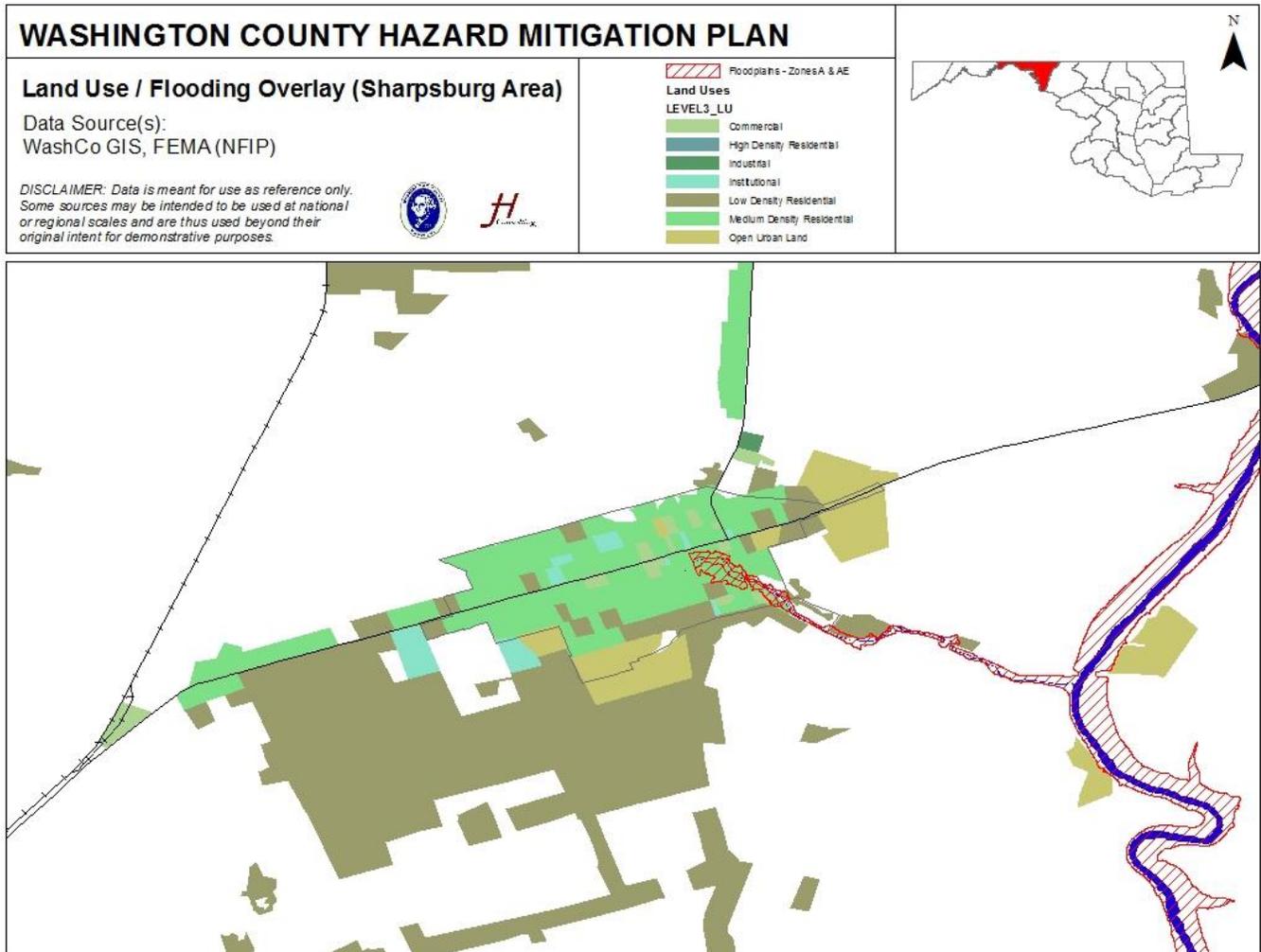
Hancock



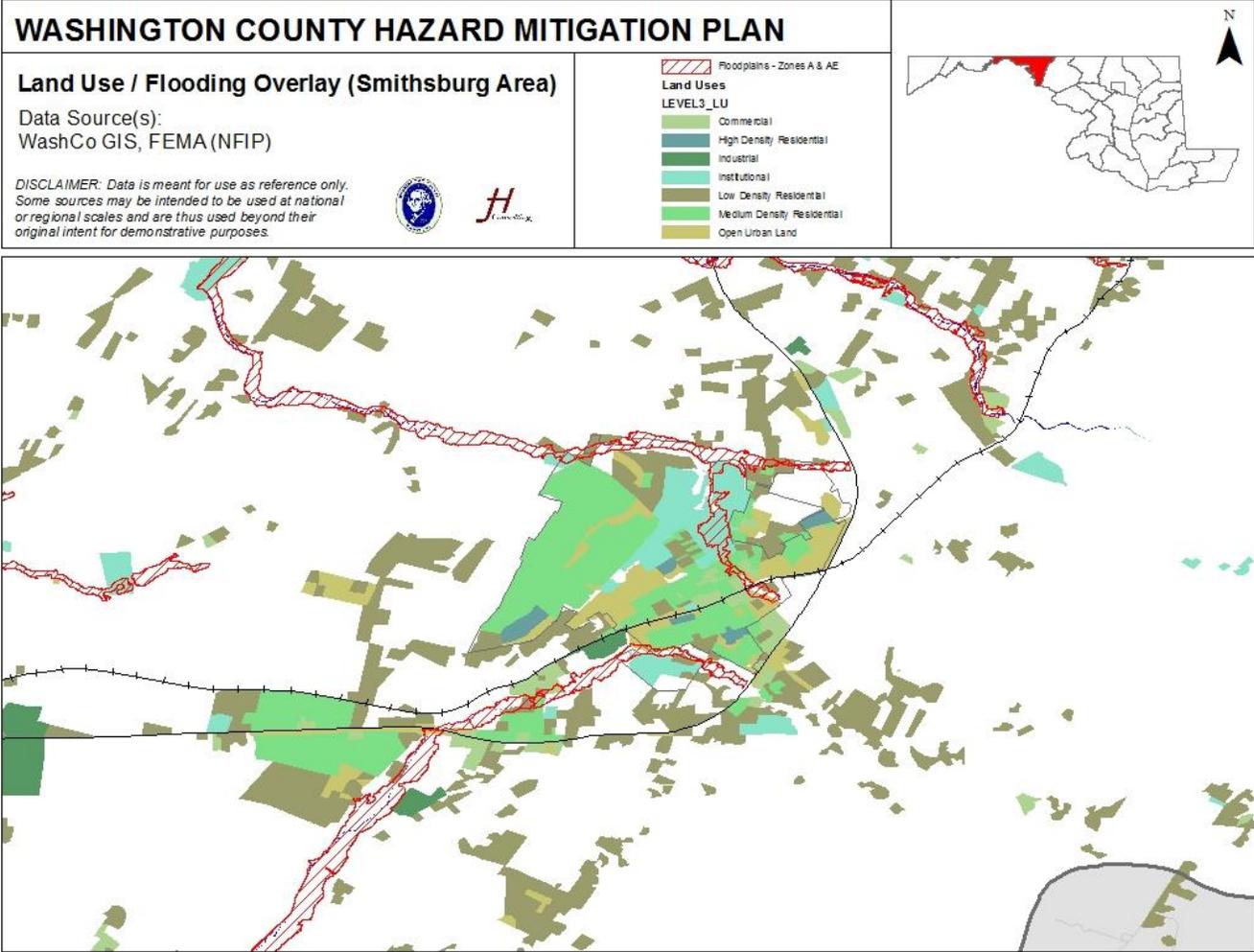
Keedysville



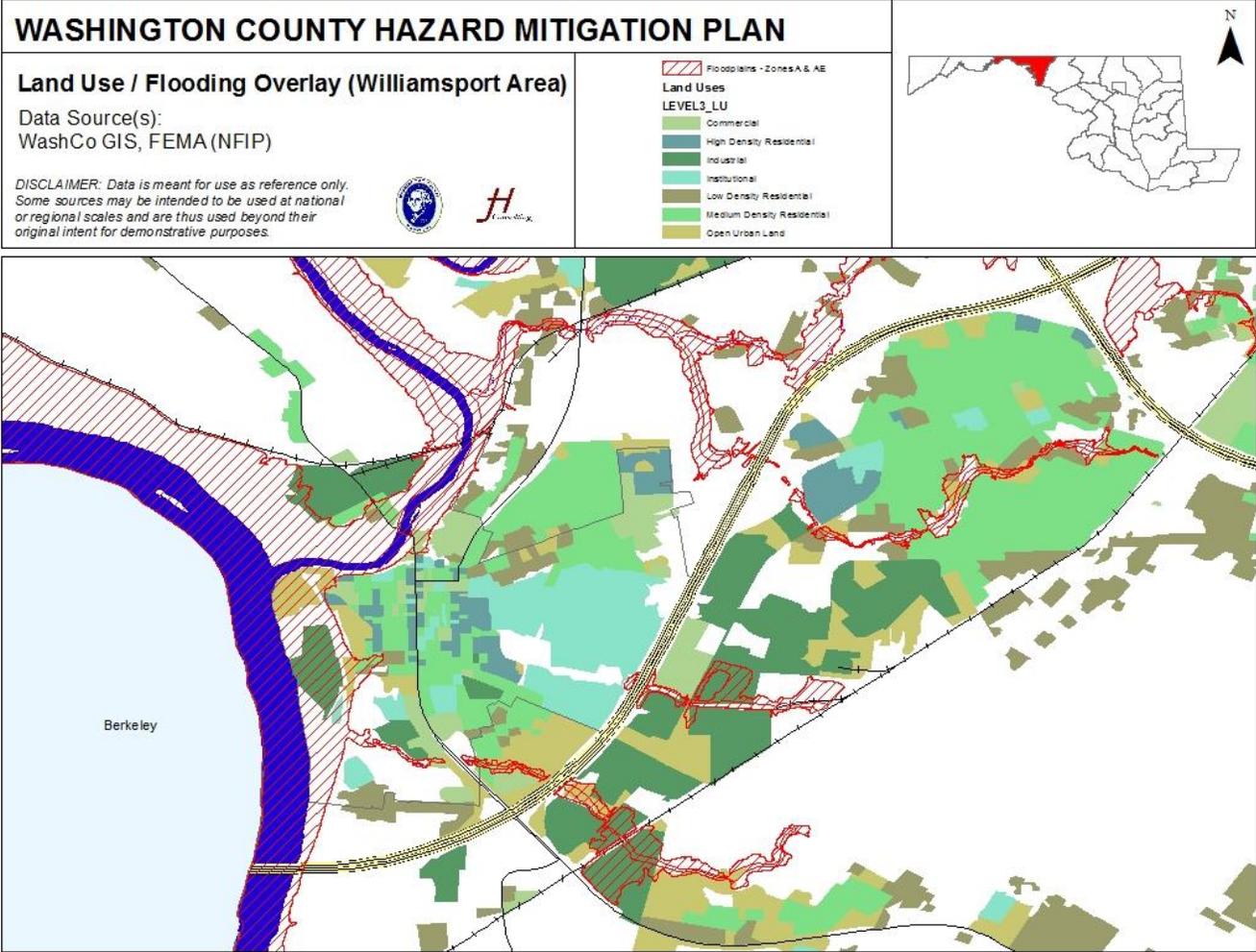
Sharpsburg Area



Smithsburg Area

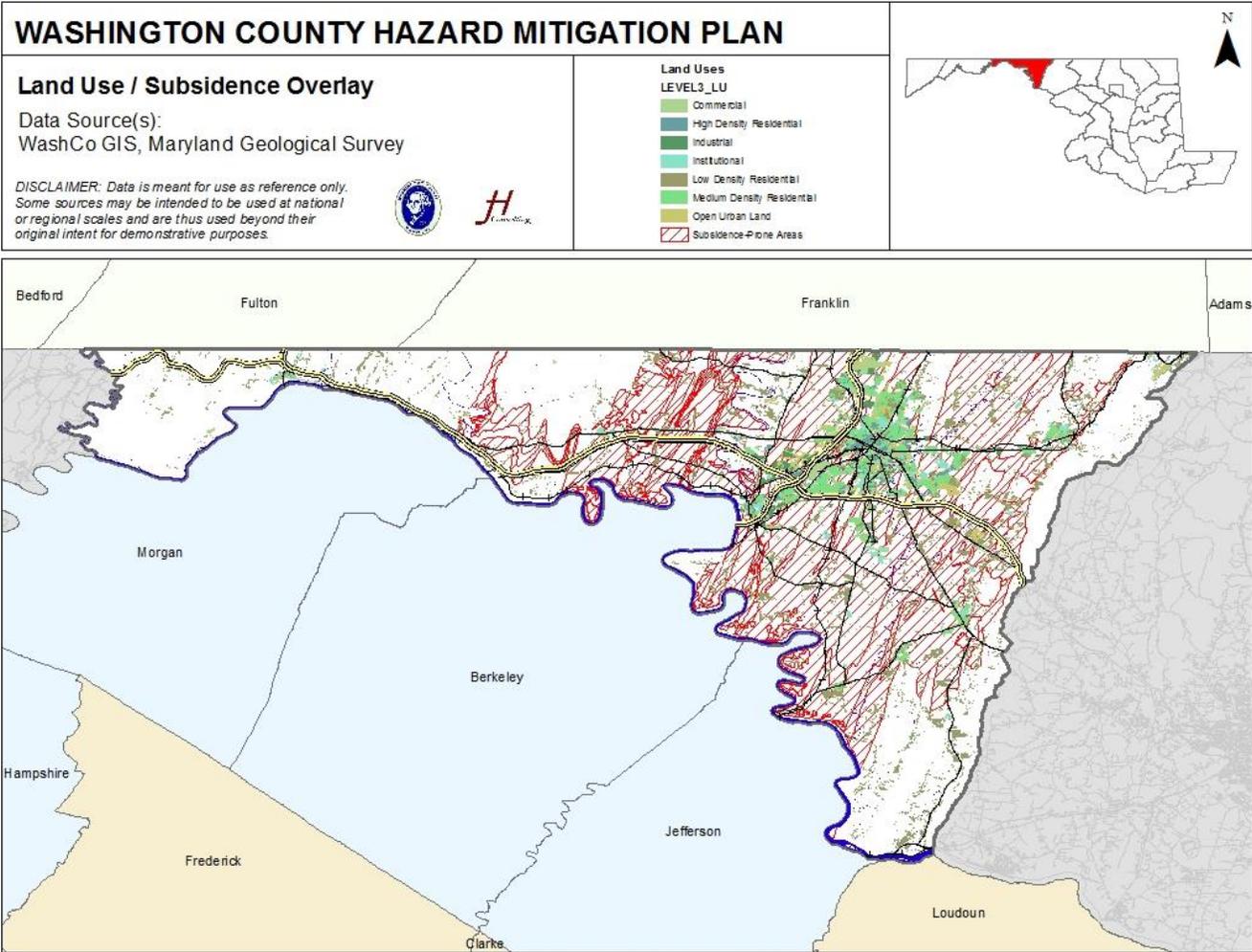


Williamsport Area

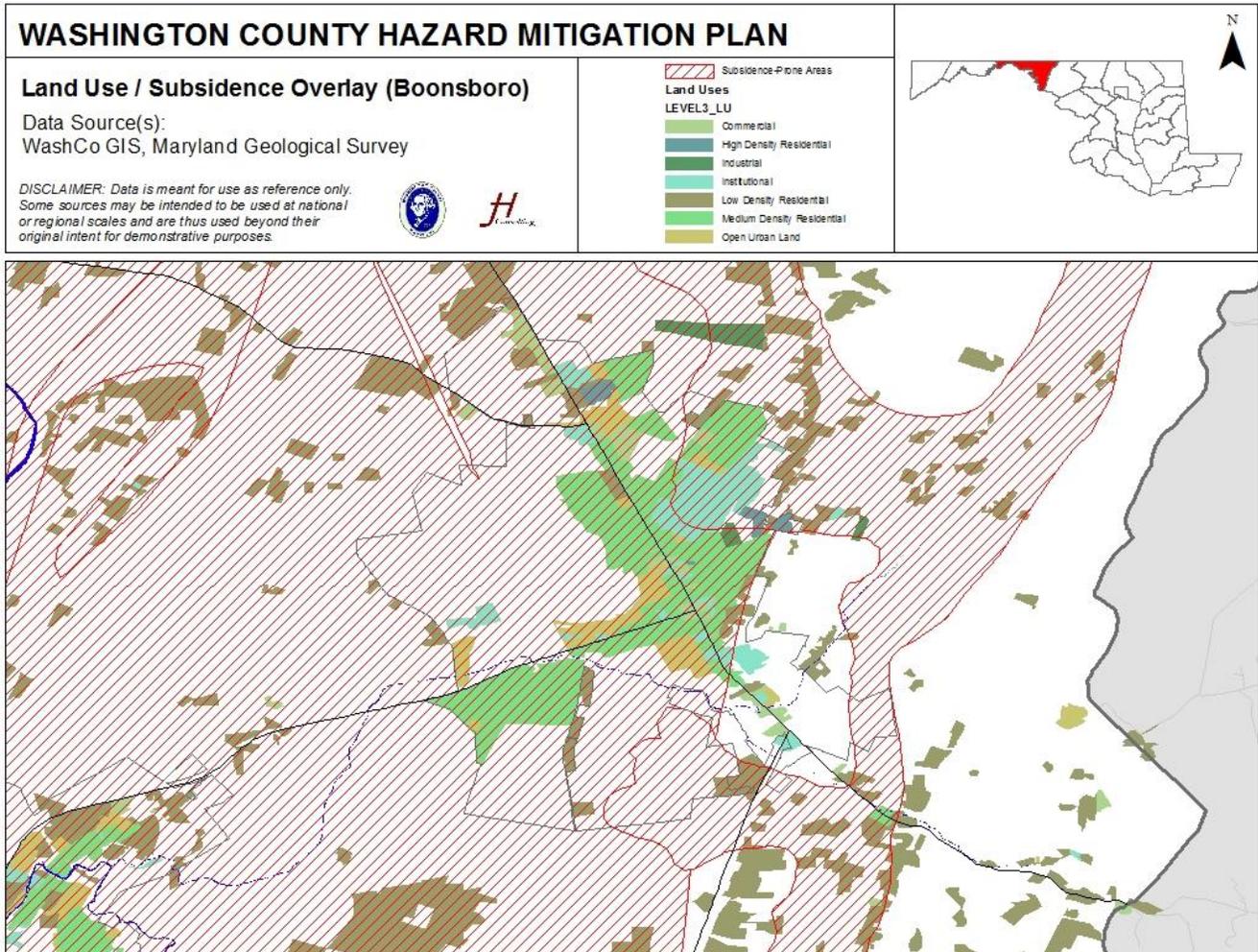


SUBSIDENCE OVERLAYS

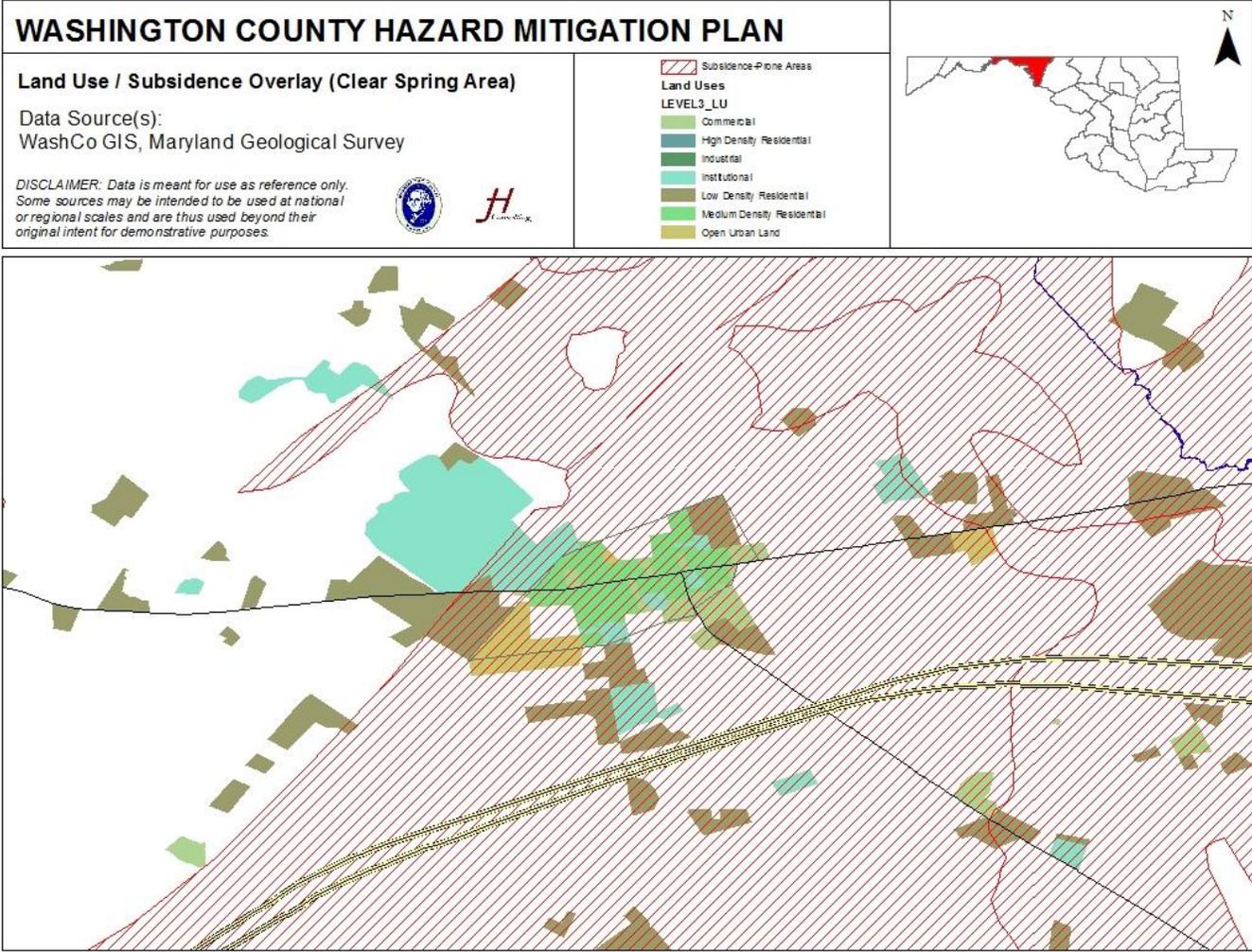
Washington County



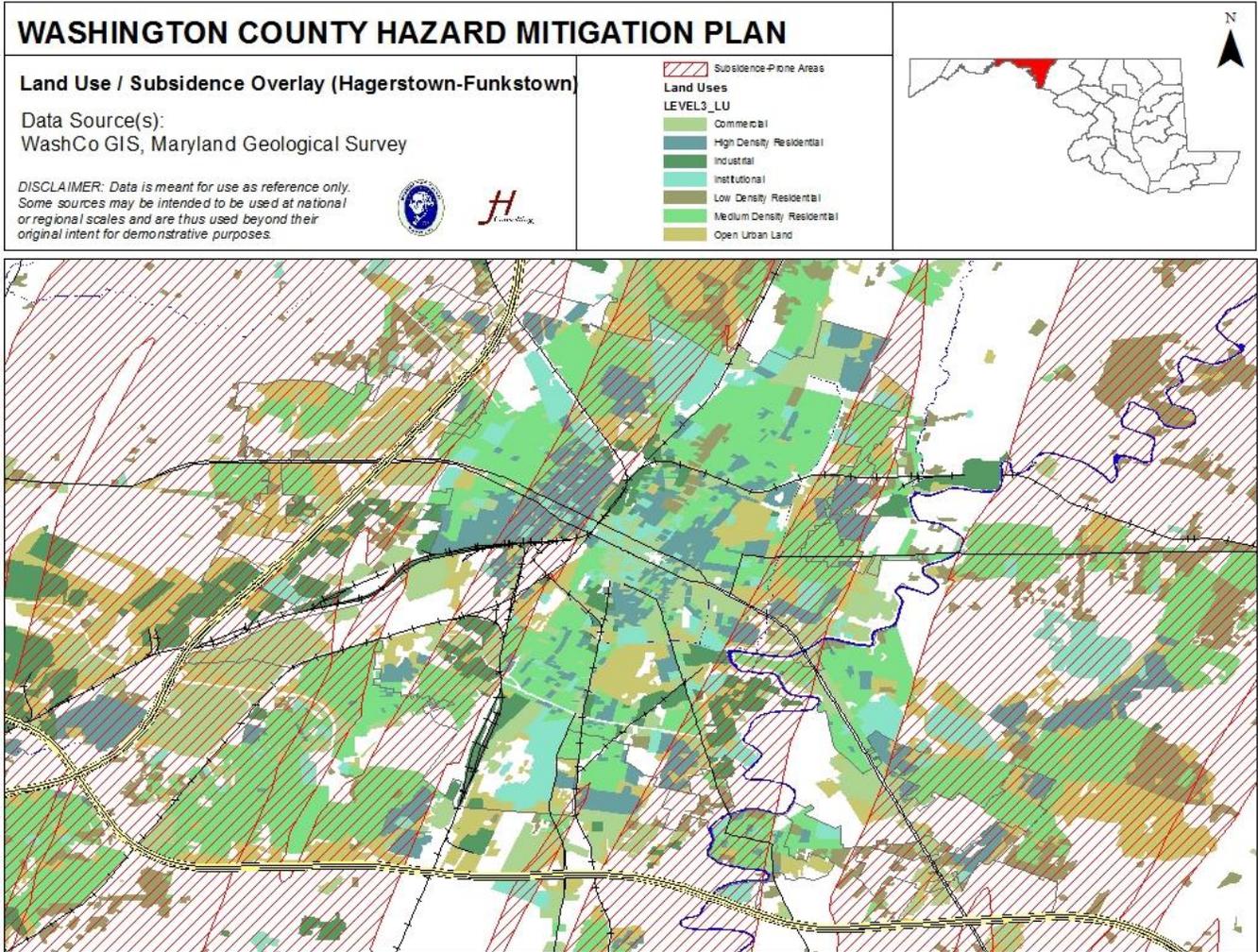
Boonsboro



Clear Spring Area

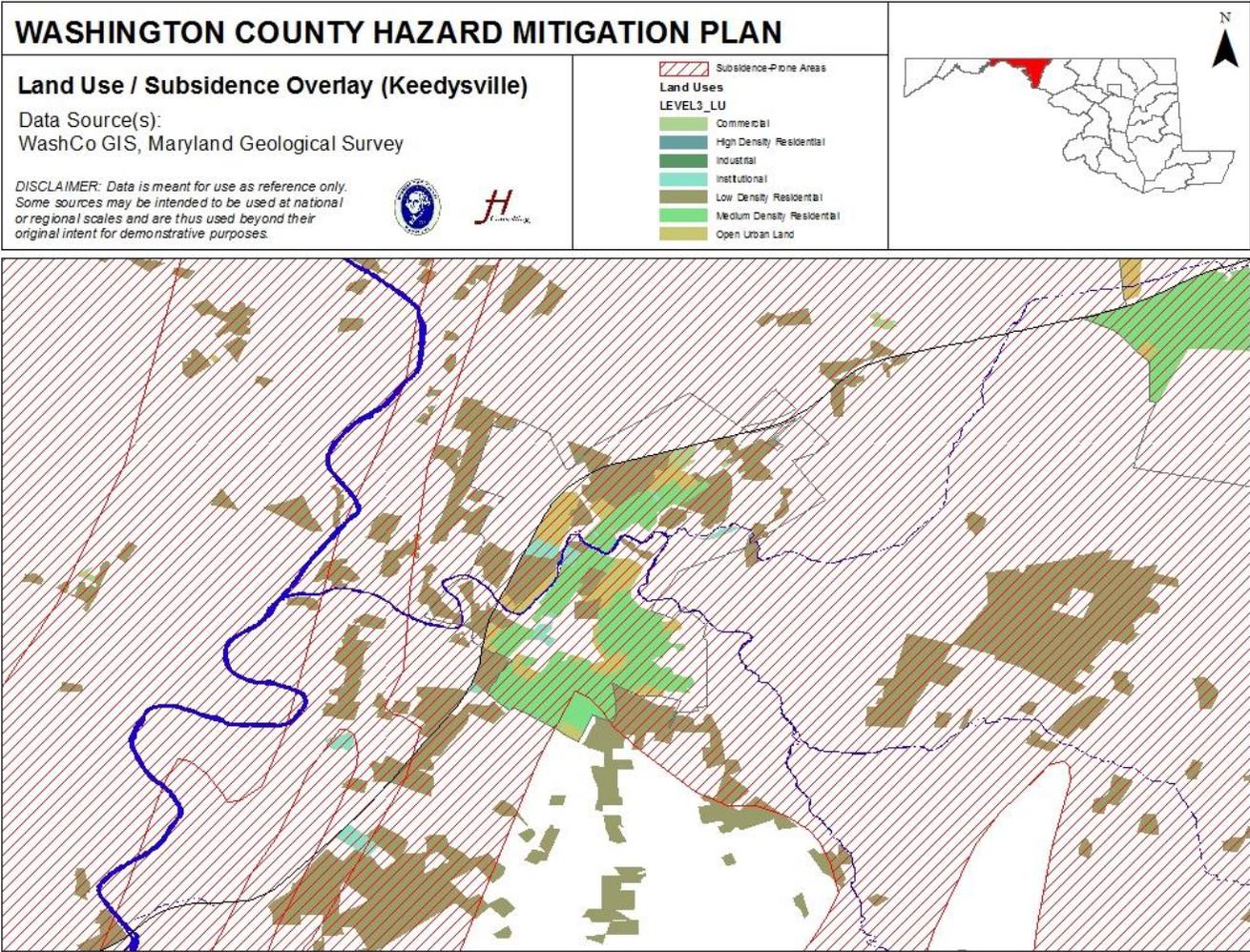


Hagerstown-Funkstown

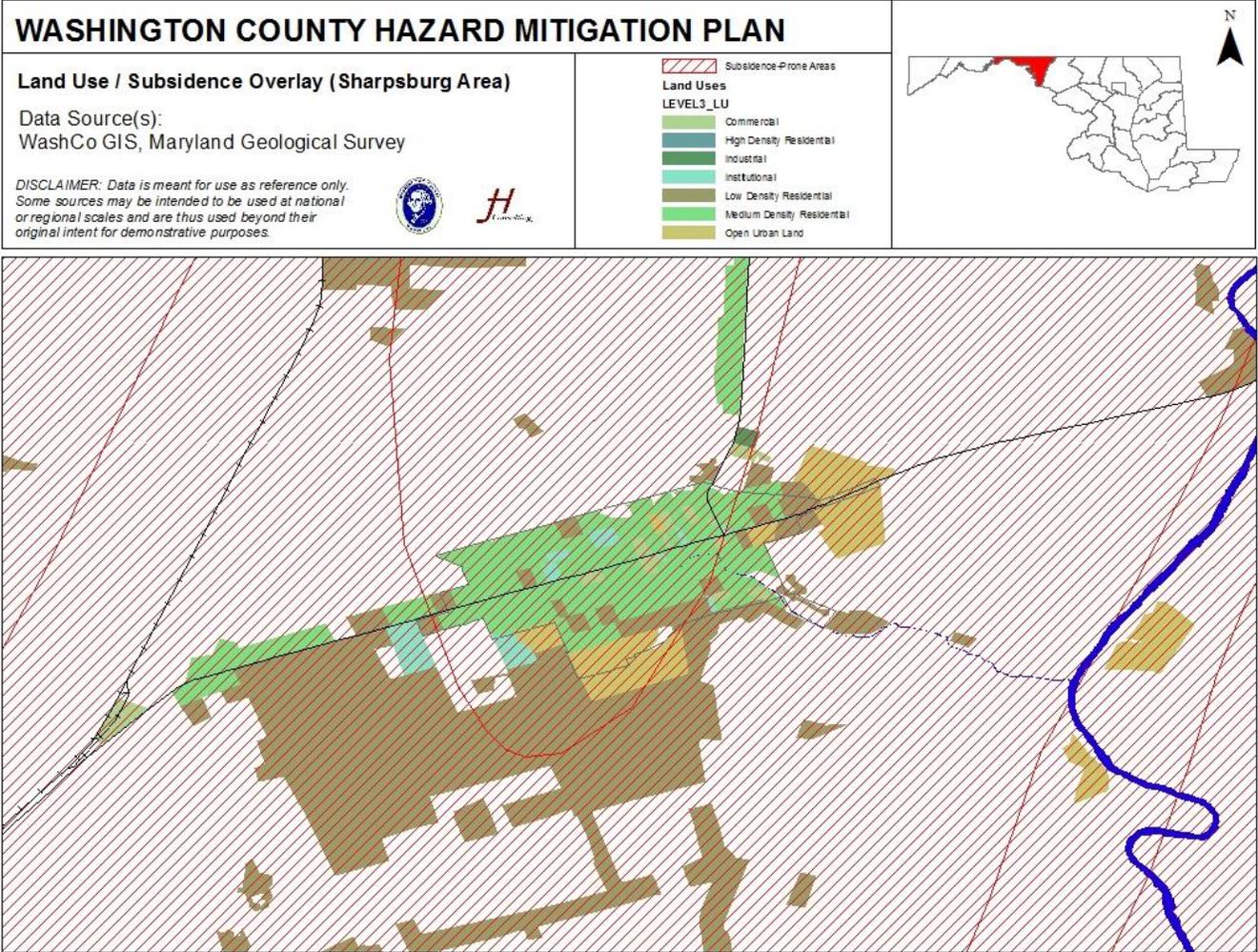


Hancock: The Town of Hancock did not include land subsidence risk areas.

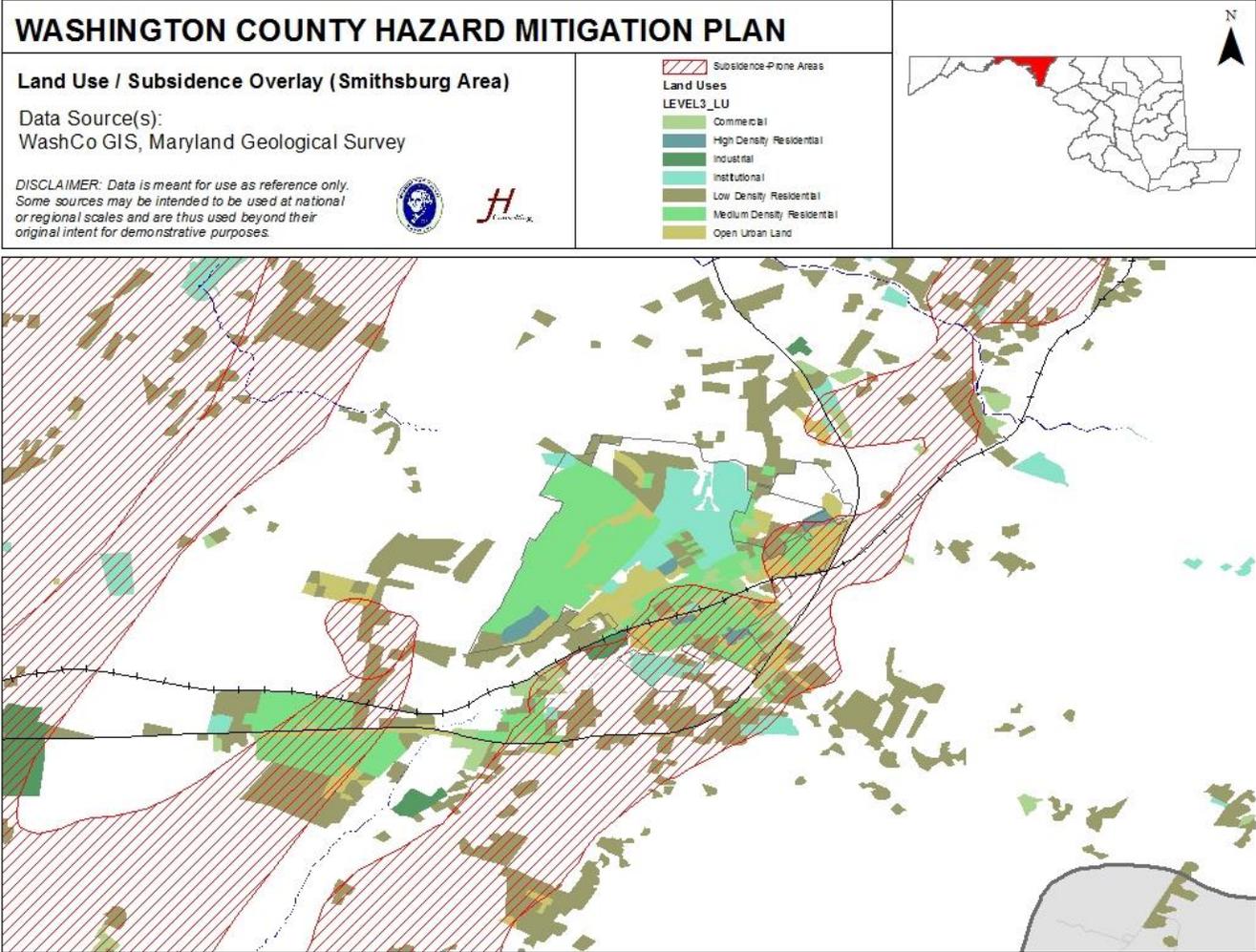
Keedysville



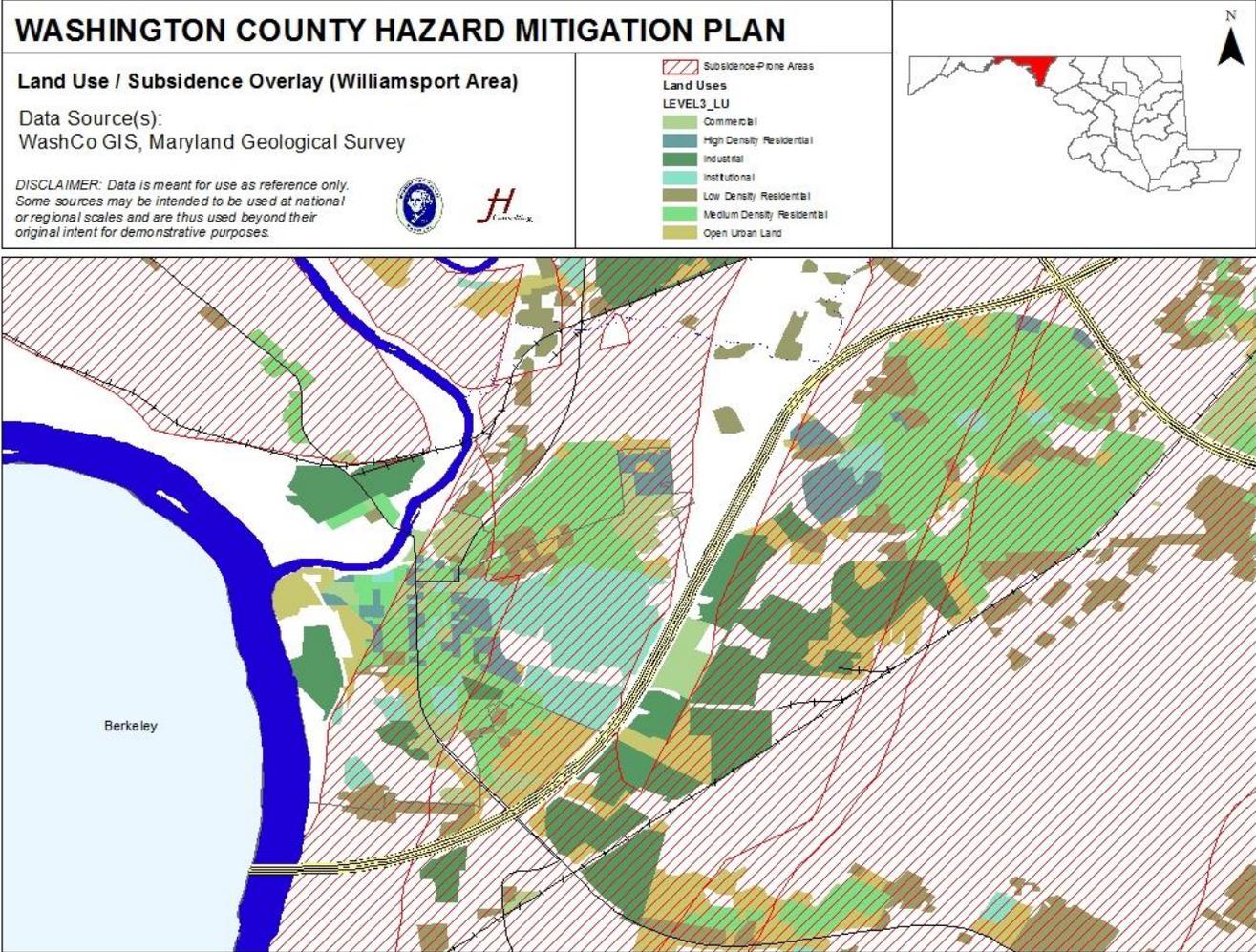
Sharpsburg Area



Smithsburg Area



Williamsport Area



The City of Hagerstown completed the update to their comprehensive plan in April of 2018. To determine the level of inclusion of hazard mitigation within this plan, a representative from the city completed a safe growth audit. Through it, the city can determine gaps and opportunities for improvement to reduce vulnerability in future development.

TABLE 1.4.A WORKSHEET 4.2 SAFE GROWTH AUDIT - VISION HAGERSTOWN 2035 COMPREHENSIVE PLAN		
<i>Comprehensive Plan</i>		
<u>Land Use</u>	Yes	No
1. Does the future land-use map clearly identify natural hazard areas? <i>Another map shows this. In the sensitive areas chapter there are maps of floodplains and slopes.</i>		X
2. Do the land-use policies discourage development or redevelopment within natural hazard areas? <i>Only in floodplains and steep slopes</i>	X	
3. Does the plan provide adequate space for expected future growth in areas located outside natural hazard areas?	X	
<u>Transportation</u>	Yes	No
1. Does the transportation plan limit access to hazard areas? <i>Depends on locations. In some instances, there may be crossings required over rivers or streams.</i>	X	
2. Is transportation policy used to guide growth to safe locations? <i>Don't use transportation to guide growth, they use land use to drive policies.</i>		X
3. Are movement systems designed to function under disaster conditions (i.e., evacuation)? <i>There are signs for evacuation routes, but the plan doesn't talk much about it.</i>	X	
<u>Environmental Management</u>	Yes	No
1. Are environmental systems that protect development from hazards identified and mapped? <i>The plan maps floodplains and steep slopes and development is discouraged, recommended setbacks for construction (MDE). Recommended forest conservation.</i>	X	
2. Do environmental policies maintain and restore protective ecosystems? <i>Forest conservation in land management code says to maintain or plan trees is encouraged. Don't know of any extreme sensitive areas in the county.</i>	X	
3. Do environmental policies provide incentives to development that is located outside protective ecosystems? <i>City provides incentives to encourage development in the downtown area, which is not an environmentally sensitive area.</i>	X	
<u>Public Safety</u>	Yes	No
1. Are the goals and policies of the comprehensive plan related to those of the mitigation plan? <i>A big part of the comprehensive plan is to focus growth where there already is infrastructure.</i>	X	
2. Is safety explicitly included in the plan's growth and development policies? <i>Yes, communities facilities chapter – fire, schools, EMS, etc.</i>	X	
3. Does the monitoring and implementation section of the plan cover safe growth areas? <i>Growth areas around the city are within the limits of annexation. Development codes discourage development in the floodplain.</i>	X	
<u>Zoning Ordinance</u>		
	Yes	No
1. Does the zoning ordinance conform to the comprehensive plan in terms of discouraging development or redevelopment within natural hazard areas? <i>Land management code includes floodplain ordinance, forest conservation ordinance, zoning, subdivision.</i>	X	
2. Does the ordinance contain natural hazard overlay zones that set conditions for land use within such zones?	X	



TABLE 1.4.A WORKSHEET 4.2 SAFE GROWTH AUDIT - VISION HAGERSTOWN 2035 COMPREHENSIVE PLAN		
No natural hazard zones – just flood plains.		
3. Do rezoning procedures recognize natural hazard areas as limits on zoning changes that allow greater intensity or density of land use?		X
<i>No – regulations according to floodplain.</i>		
4. Does the ordinance prohibit development within, or filling of, wetlands, floodways, and floodplains?	X	
<i>Does not necessarily prohibit, but needs MDE approval. Only happened a few times in 20 years.</i>		
Subdivision Regulations	Yes	No
1. Do the subdivision regulations restrict the subdivision of land within or adjacent to natural hazard areas?		X
<i>No, you can subdivide, but not build in floodplains.</i>		
2. Do the regulations provide for conservation subdivisions or cluster subdivisions in order to conserve environmental resources?	X	
<i>Encourages open space.</i>		
3. Do the regulations allow density transfers where hazard areas exist?		X
<i>Already allowed high density. Hard to plan for sewer capacity.</i>		
Capital Improvement Program and Infrastructure Policies	Yes	No
1. Does the capital improvement program limit expenditures on projects that would encourage development in areas vulnerable to hazards?		
<i>CIP is supposed to be compatible with the CP. Will be reviewing April. Works closely with engineering.</i>		
2. Do infrastructure policies limit extension of existing facilities and services that would encourage development in areas vulnerable to natural hazards?		X
3. Does the capital improvement program provide funding for hazard mitigation projects identifies in the mitigation plan?	X	
<i>Provides funding for Stormwater management retrofits.</i>		
Other	Yes	No
1. Do small area or corridor plans recognize the need to avoid or mitigation of natural hazards?		
2. Does the building code contain provisions to strengthen or elevate construction to withstand hazard forces?	X	
<i>Consistent with the state. Getting ready to review 2018 codes for local amendments. IBC with local amendments. Sometimes goes above and beyond, but typically based on screw sizes, etc.</i>		
3. Do economic development or redevelopment strategies include provisions for mitigation natural hazards?		X
<i>Incentives encourage development in the downtown or existing job center in the city.</i>		
4. Is there an adopted evacuation and shelter plan to deal with emergencies from natural hazards?		X
<i>Nothing beyond the hazmat plan.</i>		



2.0 RISK ASSESSMENT

§201.6(c)(2)(i) [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Section Overview

A risk assessment analyzes “the potential for damage, loss, or other impacts created by the interaction of hazards with community assets” (FEMA, 2013). The risk assessment section contains information on

- identified hazards that threaten the region in profiles,
- the vulnerability of the area as it relates to its assets,
- a list of community assets for Washington County, and
- an analysis of planned development.



2.1 RISK & VULNERABILITY

§201.6(c)(2)(i) [The risk assessment shall include a] description of the type...of all natural hazards that can affect the jurisdiction.

§201.6(c)(2)(i) [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

2.1.1 Risk

One of the components of the risk assessment is determining both the probability of a hazard occurring and the potential severity of that hazard event. This process helps identify which hazards pose the most significant risk to Washington County and its municipalities. The probability and severity of an event are largely based on historical research. The probability of an event happening is determined based on the number of events that have occurred within a certain timeframe. The timeframe is based on information available from different resources and varies depending on the data. Different sources provide data on the number of events throughout a period of years. This data is used to calculate probability.

The probability of occurrence is broken down into five categories as seen in the table to the right. The chance of occurrence of a hazard within a given year can be quantified based on historical data. This can be expressed in a numerical measure or as a percentage of 0-100 percent. It is calculated by adding the total occurrences of a specific hazard and dividing it by the years of data. For example, if there have been seven earthquakes in a county between 1950 and 2016 (66 years), the quantitative probability would be calculated by dividing seven events by 66 years. The result would be 0.10 or 10% chance of earthquake, roughly one every ten years. This percentage would indicate an 'improbable' probability of occurrence, based on the information presented in the table above. This formula for calculating probability will be used when appropriate (i.e. historical data is available).

TABLE 2.1.1.A. PROBABILITY		
Value	Description	Definition
1.1+ (101%)	Frequent	Will occur several times during a year
.76 – 1.0 (76 – 100%)	Probable	Likely to occur a few times in a year
.51 - .75 (51 – 75%)	Occasional	Likely to occur sometime during a year
.26 - .50 (26 – 50%)	Remote	Unlikely to occur in a year
0 - .25 (0 – 25%)	Improbable	So unlikely that it can be assumed it will not occur in a year



$$\frac{\text{Number of events}}{\text{Number of years}} = \text{Probability} \quad \text{OR} \quad \frac{7}{66} = .1015 \quad \text{OR} \quad 1 \text{ time every } 10 \text{ years}$$

Although some hazards have zero recorded occurrences, the risk may still exist. Since non-natural hazards generally do not depend on weather patterns to occur, they are not informed by this type of historical data. Non-natural and technological hazards are nearly impossible to assign a measurement of probability. In these cases, the probability will be analyzed in different ways that are appropriate to the hazard; the methods are detailed for in each profile.

The severity of an event is based on three main factors: 1) the historical deaths, injuries, and property/crop damage; 2) the extent of potential secondary and/or cascading impacts of the hazard and; 3) the potentially impacted geographic area as determined through risk mapping. Generally, the severity estimations will be less exact than probability estimations. The four classifications of severity are shown in the table above on the right.

<i>Description</i>	<i>Definition</i>
Catastrophic	Death or major structural loss
Critical	Severe injury, severe illness, or marginal structural damage
Marginal	Minor injury, minor illness, or structural damage
Negligible	Less than minor injury, illness or structural damage

The combination of hazard *probability* and hazard *severity* results are analyzed in a table known as the Risk Assessment Matrix, such as in the table shown below. This aides in determining if a mitigation measure should be considered for a hazard; if a hazard is calculated to be a medium, medium-high, or high risk, it is important to note the hazard and analyze possible mitigation strategies.

		PROBABILITY				
		<i>Frequent</i>	<i>Probable</i>	<i>Occasional</i>	<i>Remote</i>	<i>Improbable</i>
SEVERITY	<i>Catastrophic</i>	High	High	Medium High	Medium	Medium Low
	<i>Critical</i>	Medium High	Medium High	Medium	Medium Low	Low
	<i>Marginal</i>	Medium High	Medium	Medium Low	Low	Low
	<i>Negligible</i>	Medium	Medium Low	Medium Low	Low	Low

On occasion, the probability and severity of hazards depends on the perception of each person and their unique experiences and differs from data research and analysis. The



following table shows the perceptions of the committee members over the last three updates, 2005, 2012, and this update in 2017. The committee sometimes perceives a hazard as a higher or lower risk than before. The table notes the changes in hazard identification from the last update to this one in the *Notes* section.

TABLE 2.1.1.D COMMITTEE HAZARD RANKING 2005, 2012, 2017																
Hazards	2005					2012					2017					Notes
	High	Medium High	Medium	Medium Low	Low	High	Medium High	Medium	Medium Low	Low	High	Medium High	Medium	Medium Low	Low	
Drought			✓					✓						✓	Overall, the perception of drought risk has reduced.	
Extreme Temperatures				✓				✓						✓	In 2017, extreme cold was included	
Flood		✓					✓						✓		The flood concern has slightly decreased.	
Fire															Fire includes major fire, explosion, and wildfire. Concern for fires of all types has increased.	
Fire/Explosion				✓					✓							
Wildfire				✓					✓							
Hazmat	✓							✓					✓		The concern for hazmat incidents has not changed since the last update.	
Land Subsidence														✓	Land Subsidence includes karst, cave-ins, mudslides, landslides. The committee's level of concern remains low.	
Karst/Sinkhole				✓					✓							
Soil Movements					✓					✓						
Major Transportation Accident	✓							✓					✓		This hazard remains a medium risk concern to the committee	
Opioid Epidemic														✓	This hazard was not included in previous versions of this plan.	
Reportable Disease Epidemic				✓						✓				✓	Reportable disease epidemic concerns remain low.	
Severe Summer Weather													✓		The perception of this hazard has remained somewhat similar over the years. Severe Summer Weather includes tornadoes, lightning, hurricanes, thunderstorms, hail, and wind.	
Thunderstorm			✓					✓								
Tornado				✓					✓							
Coastal & Hurricane				✓					✓							
Severe Winter Weather														✓	During this update, the level of concern has decreased from previous years. Severe Winter Weather includes blizzards, ice storms, and heavy snow	
Winter Storm	✓					✓										
Groundwater Pollution		✓						✓							Not ranked in 2017, this hazard is considered a cascading event.	



2.1.2 Vulnerability

According to the Agency for Toxic Substances and Disease Registry (ATSDR), social vulnerability is, “the resilience of communities when confronted by external stresses on human health, stresses such as natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss” (ATSDR, 2014).

Disasters and incidents do not affect each person or group equally; there are many factors that are involved when determining the vulnerability of an individual, group or geographical area. Some of the categories of vulnerability to disasters that are not physical (i.e. type of structure or housing, location, etc.) include health, both public and individual, economic status, education level, language, race, among others. This section briefly describes each type of vulnerability and explains how a person, family, or group can be vulnerable to a disaster. It is important to note that even if a person or group is at risk of a hazard, they may or may not be vulnerable to it.

- **Health:** Understanding the overall health status of the community is important in determining the vulnerability of the population to any given hazard; emergencies and disaster situations can exacerbate existing medical conditions.
- **Age:** Typically, when age is a vulnerability, it is when the population is either very young, under the age of 5, or over 65. This segment of the population may not have the means to take care of themselves during a disaster and heavily rely on others to survive. In Washington County, 5.8% of the population is under the age of 5, and 16.6% are over the age of 65 (U.S. Census Bureau, 2016).
- **Economy or Income Disparity:** when a disaster strikes, having the ability and means to evacuate and get to a safe location, or recover from a disaster, can greatly reduce the impact of the event on the person or family. On occasion, residents cannot leave their homes for lack of resources (i.e., not having a car or available public transportation to leave, or the ability to pay for transportation, food, or lodging during or after the event). Although the majority of the population in Washington County does not struggle economically by U.S. poverty standards, still 12.9% of the population lives below the poverty line, most of who live in Hagerstown. In the past few years, from 2014 to 2016, the homeless population in Washington County has nearly doubled, with 456 in 2014, 461 in 2015 and 949 in 2016 (Maryland’s Interagency Council on Homelessness, 2016). The homeless population may be at greater risk due to their exposure to the elements and lack of economic resources.



- **Race or Ethnicity:** Mostly, vulnerability relating to race or ethnicity includes differences in cultures and languages that may prevent this population from receiving notifications from emergency personnel and understanding them in order to take necessary action. Nearly 17% of the population in Washington County is non-white. (US. Census, 2016)
- **Education and Literacy:** The majority of information regarding hazards and emergency procedures is delivered via written material (i.e. pamphlets, social media postings, tickers or scrolls on the television, etc.); if a percentage of the population is unable to read the information received, they become vulnerable to the hazards. Over 85% of the population in Washington County has achieved either a high school diploma or higher education.
- **Language:** As mentioned previously, race or ethnicity may involve speaking a different language from English. When warning messages are delivered in English, the population whose primary language is not English, may be at risk of not receiving the message as it was intended. On average in the county, 7% of people do not speak English as their first language in the home. The percentage is at around 10% in larger cities such as Hagerstown.

Vulnerable populations, populations of concern, or populations at risk are defined as those individuals or groups of people who are more exposed to the risks of the impacts of a hazard because of their age, gender, income, occupation, disability, physical or mental health, literacy, income, religion, education, or ethnicity.

Some groups face a number of stressors related to both climate and non-climate factors. For example, people living in impoverished urban or isolated rural areas, floodplains, coastlines, and other at-risk locations are more vulnerable not only to extreme weather and persistent climate change but also to social and economic stressors. Many of these stressors can occur simultaneously or consecutively. Over time, this “accumulation” of multiple, complex stressors is expected to become more evident as climate impacts interact with stressors associated with existing mental and physical health conditions and with other socioeconomic and demographic factors.

Taking all of these different types of populations into planning for hazard mitigation strategies is considered to be part of a “whole community approach”, a term the Federal Emergency Management Agency (FEMA) utilizes and encourages planners to include. The principles behind the whole community approach include understanding and meeting the



actual needs of the whole community, engaging and empowering all parts of the community, and strengthening what works well in communities on a daily basis (USDHS, 2011).

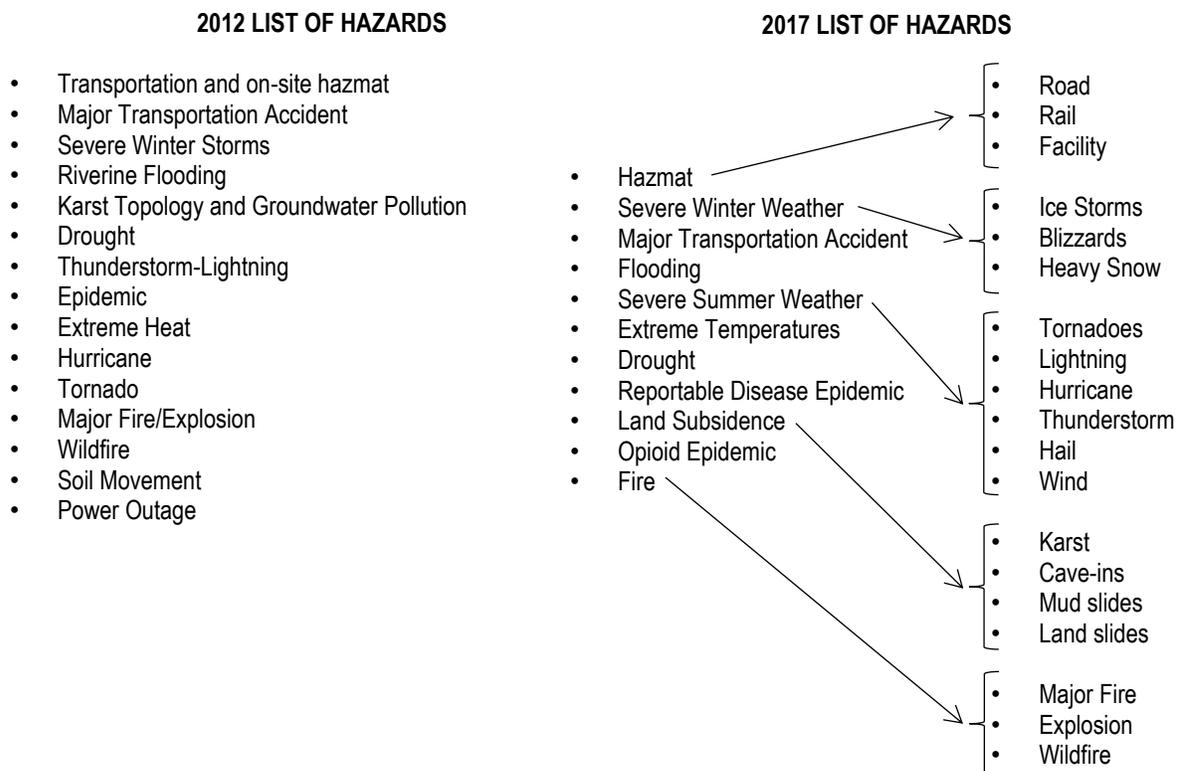
Each hazard profile goes further into detail explaining how the hazard could affect social vulnerability.



2.2 PROFILE HAZARDS

§201.6(c)(2)(i) [The risk assessment shall include a] description of the...location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Hazard identification and changes occurred during the first steering committee meeting. The consultant presented the list of hazards in the existing plan and suggested a reorganization and grouping of similar hazards. The committee approved the new list of hazards and the results are as follows.



The previous hazard mitigation plan included Power Outage and Groundwater Pollution as hazards; in this update, those elements were moved to [Section 2.3 Complicating Variables](#) and expanded upon due to the fact that these should not be considered stand-alone hazards but rather an effect of other hazards. In this update, the committee included the opioid epidemic profile because the Governor of Maryland declared a state of emergency. This plan acknowledges the difference between reportable disease and opioid epidemic as being two separate hazards. The opioid ‘epidemic’ is an epidemic in



name only, it does not meet the definition of true epidemic as established by the Center for Disease Control.

The following table contains a summary of all the hazards analyzed in this plan. This is a summary of the analysis conducted in the profile hazards. For detailed information, refer to each hazard profile. Data within the table includes the following information:

- **2012 Hazard List:** Identifies changes made from the previous hazard mitigation plan.
- **Period of Occurrence:** The typical time of the year events of this type can occur.
- **Warning Time:** The amount of time that passes from when the event is detected to when it occurs.
- **Number of Years:** Actual number of years data is available based on the 'record years'.
- **Number of Events:** The times an event has occurred within the timeframe of the 'number of years' according to the sources.
- **Probability:** The calculation of occurrence of a certain event based on number of years and number of events.
- **Severity:** Based on historical impacts, damages, injuries and deaths.
- **Risk:** Very low, low, medium, high, or very high based on the risk assessment matrix.
- **Loss Estimate:** Amount in dollars of damages to property or cost of repair.



TABLE 2.2.A. HAZARD SNAPSHOTS

Hazard	2012 Hazard List	Period of Occurrence	Warning Time	Number of Years	Number of Events	Probability	Severity	Risk	Loss Estimate
Drought	No change	At any time, typically in the summer months following a period of low precipitation	Weeks to months	20	5	0.25 REMOTE	NEGLIGIBLE	LOW	\$11.5 M
Extreme Temperatures	Previously Extreme Heat. For this update, extreme cold was also included.	At any time, typically during summer and winter months.	Days to weeks	21	26	0.80 PROBABLE	NEGLIGIBLE	MEDIUM LOW	N/A
Flood	No change, previously Riverine Flooding.	At any time, typically after periods of prolonged precipitation.	Days to hours	18	40	2.2 FREQUENT	CRITICAL	MEDIUM HIGH	
Fire	Includes Major Fire/Explosion and Wildfires from previous version.	At any time	Minutes	N/A	N/A	FREQUENT	CRITICAL	MEDIUM HIGH	N/A
Hazmat	Previously named Transportation and On-Site Hazmat	At any time	Hours to minutes	18	1,437	80 FREQUENT	MARGINAL	MEDIUM HIGH	\$260 per incident
Land Subsidence	Combined Soil Movement and Karst Topology. Now includes cave-ins, mud slides and land slides	At any time	Minimal	17	368	22 FREQUENT	MARGINAL	MEDIUM HIGH	N/A
Major Transportation Accident	No change	At any time	None	18	46	2.27 FREQUENT	CATASTROPHIC	HIGH	N/A



TABLE 2.2.A. HAZARD SNAPSHOTS

<i>Hazard</i>	<i>2012 Hazard List</i>	<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Number of Years</i>	<i>Number of Events</i>	<i>Probability</i>	<i>Severity</i>	<i>Risk</i>	<i>Loss Estimate</i>
Opioid Epidemic	New	At any time	N/A	N/A	N/A	FREQUENT	CATASTROPHIC	HIGH	N/A
Reportable Disease Epidemic	Change in name only to specify type of epidemic.	At any time	Days to weeks	11	12,098	1,099 FREQUENT	MARGINAL	MEDIUM HIGH	\$489 per person per year (worst case)
Severe Summer Weather	Combined Thunderstorm-Lightning, Hurricane, Tornado, and now includes hail, wind, and thunderstorms.	At any time, typically during summer months	Weeks to days	18	292	16.2 FREQUENT	CRITICAL	MEDIUM HIGH	\$15,250 per event (average)
Severe Winter Weather	No change	At any time, typically during winter months	Weeks to days	17	132	7.76 FREQUENT	MARGINAL	MEDIUM HIGH	Declared events average around \$800K



The following sections contain a profile of each hazard considered by this plan, which provides details on how the hazard impacts the area. Within each profile, research and historical data informs the hazard definition and its possible causes, the location and extent of the hazard, historical and potential losses and damages, the impact to various aspects of social vulnerability, and risk calculations. When appropriate, maps, tables and charts help in explaining information presented.



2.2.1 DROUGHT

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
Summer months or periods of low precipitation	Weeks / Months	LOW	MEDIUM-HIGH

2017 UPDATE

Previously Chapter 10, the drought profile was reformatted, reorganized, and updated to include more information under new categories such as probable causes, location and extent, and loss and damage and risk calculations; a drought risk map was also included. New occurrences of drought were updated with corresponding maps within the existing table. The Palmer Drought Severity Index table is shown to explain measurements of drought. The narrative was updated throughout the profile in appropriate locations.

HAZARD OVERVIEW

A drought is a deficiency of precipitation over a period of time resulting from a weather pattern that brings no moisture into an area. Droughts may be short term (a few weeks to a month) or long term (several months to several years). A long term drought may be interrupted by occasional precipitation without breaking the drought cycle. There are four different types of drought, which include the following.

- **Meteorological Drought:** A measure of departure from normal precipitation due to climatic differences. What is considered a drought in one location may not be in another location.
- **Agricultural Drought:** The amount of moisture in the soil no longer meets the needs of a particular crop.
- **Hydrological Drought:** Surface and subsurface water levels are below normal.
- **Socioeconomic Drought:** This occurs when physical water shortage begins to affect people.

The Palmer Drought Severity Index developed by W. C. Palmer in 1965, measures droughts by recording the departure of moisture from the norm. The index provides measurements of moisture

	< -4.0	Extreme drought
	-3.99 to -3.0	Severe drought
	-2.99 to -2.0	Moderate drought
	-1.99 to -1.0	Mild drought
	-0.99 to -0.5	Incipient drought
	-0.49 to 0.49	Near normal
	0.50 to 0.99	Incipient moist spell
	1.0 to 1.99	Moist spell
	2.0 to 2.99	Unusual moist spell
	3.0 to 3.99	Very moist spell
	> 4.0	Extreme moist spell



conditions so that comparisons can be made between locations and between time periods in the same location. The index is actually a hydrological index rather than a meteorological index since it is based on moisture availability (precipitation, outflow, and storage) over time. Washington County normally receives 36-40 inches of precipitation per year, the lowest in the state, partly because of the rain shadow effect of the Allegheny Plateau.

POSSIBLE CAUSES

Precipitation in the form of rain or snow falls in uneven patterns across the country. The amount of precipitation at a particular location varies from year to year, but over a period of years, the average amount is fairly constant. The amount of rain and snow also varies with the seasons. Even if the total amount of rainfall for a year is about average, rainfall shortages can occur during a period when moisture is critically needed for plant growth, such as in the early summer. When little or no rain falls, soils can dry out and plants can die. When rainfall is less than normal for several weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases. If dry weather persists and water-supply problems develop, the dry period can become a drought (USGS, 2016).

LOCATION & EXTENT

Washington County has experienced droughts that affected the entire region in the past. Generally, the extent of drought conditions would encompass an entire county, as well as neighboring counties and states. Droughts are widespread events that may extend to several states in varying degrees of severity.

A drought can vary in severity throughout the year; what starts out as a mild drought can reach severe or extreme drought status and then return to a mild drought. This process could take weeks or even months and the agricultural and socioeconomic effects could be felt months after the drought conditions are over.

Most municipalities in Washington County rely on surface water for their water supply; primarily from the Potomac River. Both the Bloomington Dam and Savage River Dam regulate the flow of the river; therefore this water supply will remain adequate during drought conditions for the next several decades. The communities using wells and springs, which have access to limestone or sandstone aquifers, normally have an adequate supply of water through periods of drought.



HISTORICAL OCCURRENCES

Beginning in 1930, the states in the Great Plains began a long term drought that lasted most of the decade of the 1930's and led to the abandonment of farms and ranches on a scale not seen in this country since that time. According to the Maryland Hazard Analysis, this same drought affected Maryland in 1930 and early 1931. During the 15 months from December 1929 through February 1931, rainfall was 21 inches below normal for much of the state. Other drought periods that have affected the state include 1953-56, 1968-71, 1980-83, and 1994-98.

Included herein are instances where drought conditions reached at least "severe drought"; there have been many more instances when drought conditions have prevailed for several months at a time, but never reached "severe" status.

TABLE 2.2.1.B. DROUGHT EVENTS	
<i>Date</i>	<i>Description</i>
July 1997	The weather in July proved to be the death knell for much of the crop yields, including corn, hay, alfalfa, and soybeans. Agricultural states of emergency were declared in many areas west of the Chesapeake Bay. Hardest-hit counties included Carroll, Frederick, Howard, Montgomery, and Washington. In Washington County, an estimated \$8.6 million in grain and silage corn, a 70 percent loss. Total of \$43.7 Million in crop damage. (Map not available).
November – December 1998	<p>The Maryland Science Center in Baltimore reported a monthly total of 1.11 inches in November and 1.34 in December. Other monthly rainfall totals from affected counties included 0.6 inches in Washington, 0.7 in Howard, 0.9 in Frederick, 1.0 in Charles, 1.1 in Carroll and Anne Arundel, and 1.2 in Montgomery and Prince Georges. Water levels and reserves were greatly affected by the persistent drought. The river stage at Williamsport, MD was at 1.4 feet for much of the month, low enough to see a Native American v-shaped fish weir from the I-81 bridge. Stream flows on all rivers within the Potomac and Shenandoah river basins averaged 85% below normal. A statewide ban on open burning remained in effect across the entire state through mid-month because of extreme fire danger. The ban remained in effect across Washington, Frederick, and Allegany Counties through the end of December. Total of \$20 Million in crop damage. The map shown here is from December 6, 1998.</p>



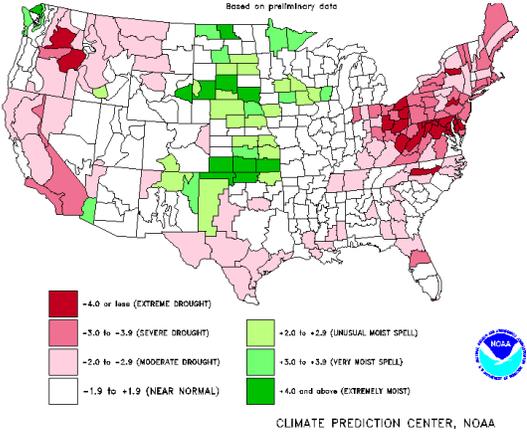
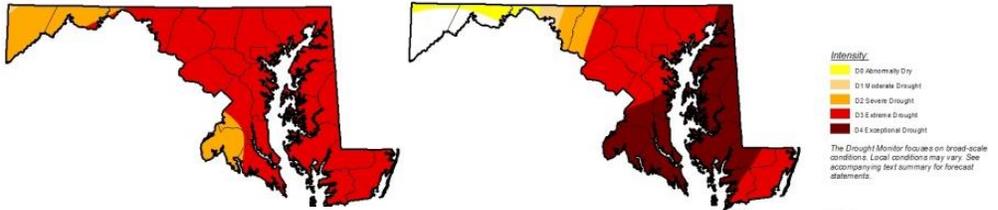
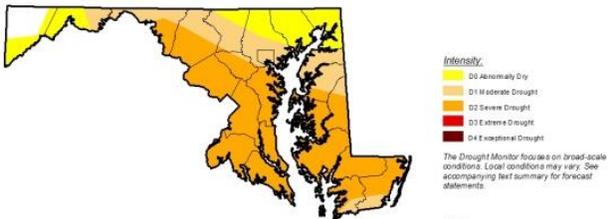
TABLE 2.2.1.B. DROUGHT EVENTS	
<i>Date</i>	<i>Description</i>
<p>May – October 1999</p>	<p>Corn stalks normally knee high were only two to six inches tall. Hay and pasture land wilted, soybean planting slowed or was halted, and watering holes and irrigation systems slowly dried up. By the last week of June, the Palmer Drought Index indicated North Central and Northeast Maryland were in a severe drought, and South Central and Western Maryland were in an extreme drought. June rainfall totals included Allegany County at 1.8 inches and Washington County at 2.8 inches. A popular swimming beach at Greenbriar State Park near Hagerstown remained closed because the water level remained well below the capacity of the 50 acre reservoir. Closing the beach for the summer led to \$120,000 in lost revenue. The lack of precipitation also continued to beat down crops and pastureland. Watering holes and irrigation sources continued to dry up, forcing many farmers to carry water to livestock. Washington County reported 80% of the county's crop land was under moderate to severe drought stress in July. In August, Washington County reported a corn crop loss of 60% and \$10 million in lost revenue. Total of \$30 Million in crop damage. The drought that affected much of the region since the summer of 1998 finally came to an end in October in Allegany and Washington Counties. At the beginning of the month, western Maryland was still in a moderate drought. From the first through the 11th, over two inches of much needed rain fell, bringing an end to the water shortage. The ban on open burning was finally lifted. The map shown is from July 17, 1999.</p> 
<p>March 2001 – November 2002</p>	<p>Groundwater levels in Maryland and Delaware were lower in most wells than during the droughts of the 1960s and 1999. Low groundwater and streamflow levels continued to reflect the long-term effects of hydrologic drought. Groundwater levels were below normal at the end of July at all of the 17 wells used for drought analysis in Maryland and Delaware, according to hydrologists at the U.S. Geological Survey (USGS). Ten of these wells set record low groundwater levels for July (USGS, 2002). The map pm the left is dated March 26, 2002 and the map on the left is dated August 20, 2002.</p> 
<p>June – October 2007</p>	<p>A portion of the Mid Atlantic hydrologic service area experienced severe agricultural drought conditions from July 24th through the end of the month. This area included Montgomery, Frederick and Washington Counties in central Maryland and south east across the southern Baltimore metro into Calvert County. The map shown is dated August 14, 2007.</p> 



TABLE 2.2.1.B. DROUGHT EVENTS	
Date	Description
June – November 2010	<p>September was dry with little rainfall and low water levels until the last day of the month. Record low September water levels were set in Carroll, Charles, and Wicomico Counties. Groundwater levels in Somerset and Washington Counties were in the lowest 10th percentile (USGS, 2010). The map shown is dated September 28, 2010.</p> 

Sources: 2011 Washington County Hazard Mitigation Plan & U.S. Drought Monitor

VULNERABILITY & IMPACTS

The following table describes the effects that drought can have on demographics, infrastructure and buildings, the environment, delivery of services, the environment, the economy, and the public confidence in governance.

TABLE 2.2.1.C DROUGHT CONSEQUENCE ANALYSIS	
Type of Impact	Description
Public /Responder Health and Safety	Droughts can affect home and land owners in a local, regional, or statewide context. Typically, drought events take a long time to develop and may be either short-term or long-term events. Impacts to the public during a drought take the form of crop damage/failures, water rationing and other water source impacts, and wildfires. First responders, such as fire and police, would be most concerned with the secondary impacts of drought, such as wildfires. As such, first responders would be called to incident area(s) to evacuate people from the fire area, close roads, create fire breaks, and attend to any injured. During a wildfire event, as with all disaster events, responders face the risk of personal injury while performing necessary job functions.
Continuity of Operations (incl. Delivery of services)	The impacts on continuity of operations due to drought will be very limited. Generally, buildings and infrastructure, which are essential to continuity of operations and delivery of services, are not impacted by drought.
Property, Facilities, And Infrastructure	Property and infrastructure is typically not vulnerable to drought. However, the water supply infrastructure may be impacted by drought during a long-term event.
Economic Condition	A major land drought event would draw upon state, county, and local resources. Some of the costs could be recouped through federal grant reimbursements, but local governments would still feel the fiscal impact of a major event.
Environment	Droughts impact the environment by causing wildfires, overloading water and wastewater treatment plants, creating dust storms, and disturbing wildlife and natural areas.

SOURCE: Maryland Hazard Mitigation Plan, 2016

LOSS & DAMAGES

Three of the last four USDA agriculture census years have been drought years. The USDA conducts a census of agriculture every five years and a survey annually. The table below shows commodity data for the last ten years; this includes two census years, each drought year, and survey years for the non-drought years. The information in the table



indicates the change in commodity production each year which provides an insight to the crop losses sustained due to droughts.

The table below identifies drought as either moderate or severe by color. The USDA surveys various commodities; corn and wheat are commodities that they survey annually, therefore these are representative crops for this calculation. According to the USDA 2012 Census data, which is the average used for all other years because data is unavailable, the dollar amount for each bushel per acre (units utilized) for corn is approximately \$135,000 and for wheat is approximately \$51,000.

The data on the production and value of corn and wheat is utilized to calculate the loss of crops during drought years. The average production of corn over the past ten years is of 125.4 bushels per acre with an average value of \$16.9 million. The average production of wheat is 66 bushels per acre with an average value of \$3.4 million. There are deviations from this average every year.

TABLE 2.2.1.D. DROUGHT LOSS ESTIMATE CALCULATION								
Year	Corn				Wheat			
	Yield	Δ Yield	Value	Gain or (Loss)	Yield	Δ Yield	Value	Gain or (Loss)
2007†	78.9	N/A	\$10.6 M	N/A	N/A	N/A	N/A	N/A
2008	128	+49.1	\$17.2 M	\$6.6 M	74.5	N/A	\$3.8 M	N/A
2009	150	+22	\$20.2 M	\$3 M	61	-13.5	\$3.1 M	(\$700 K)
2010	65	-85	\$8.7 M	(\$11.5 M)	57.4	-3.6	\$2.9 M	(\$200 K)
2011	101.1	+36.1	\$13.6 M	\$4.9 M	61.4	+4	\$3.1 M	\$200 K
2012†	124.4	+23.3	\$16.8 M	\$3.2 M	63.3	+1.9	\$3.2 M	\$100 K
2013	147.1	+22.7	\$19.8 M	\$3 M	68.5	+5.2	\$3.5 M	\$300 K
2014	164.6	+17.5	\$22.2 M	\$2.4 M	70.2	+1.7	\$3.5 M	\$0
2015	151.3	-13.3	\$20.4 M	(\$1.8 M)	67.3	-2.9	\$3.4 M	(\$100 K)
2016	143.1	-8.2	\$19.3 M	(\$1.1 M)	70.5	+3.2	\$3.6 M	\$200 K
Averages	125.4	+64.4	\$16.9 M	N/A	66	-4	\$3.4 M	N/A
Severe Drought	Moderate Drought	† USDA Census Year Yield = Bushels per acre				Sources: USDA & US Drought Monitor		

The data shows that 2010 has been the worst drought year in the last ten years and the most economic loss is \$11.5 million dollars for corn that year. The gross domestic product (GDP) for a county can be calculated by multiplying the median household income by the number of households in the county (BEA, n.d.). Washington County's GDP, according to data from the 2016 US Census Bureau, is \$3.1 billion. The loss of \$11.5 million due to drought pales in comparison to the total county GDP, making the loss a mere 0.37% of the total county GDP.



RISK CALCULATIONS

TABLE 2.2.1.E. DROUGHT RISK CALCULATION					
Probability			Severity		Risk
REMOTE			NEGLIGIBLE		LOW
Events	5	= 0.25	+	=	The remote probability of a drought event and its negligible severity makes this hazard a low risk to the county.
Years	20				
Between 1997 and 2017 there have been five events of severe drought conditions in Washington County.					
					The most severe loss recorded in the county was for \$11.5 M. This amount corresponds to only 0.37% of the total county's GDP, making the loss negligible.

There is a difference between the risk assessment for Washington County in this analysis and the state's analysis, which determined that the drought risk for Washington County is Medium High. The state bases its calculations on different criteria than that presented herein (State of Maryland, 2016, pg. 2-11). In addition, the committee perspectives from the last update in 2012 may have been different from the 2017 committee because the drought of 2010 was recent.

PREVIOUS MITIGATION EFFORTS

According to the 2009 *Washington County Water and Sewage Plan*, the county is in compliance with the Maryland Water Conservation Plumbing Fixtures Act (MWCPFA) and the Code of Maryland Regulation (COMAR) 09.20.01.02, which requires limits on water usage amount for fixtures such as urinals and water closets. The plan also details how the county and several municipalities conserve water. Hagerstown does not have a formal education program for its customers, but it utilizes an increasing block rate to encourage water conservation. The City of Hagerstown also has a continuing program for water line rehabilitation and leak protection; qualifying as a conservation effort. The Washington County Department of Water Quality utilizes the news media during low water emergencies to advise consumers of various bans in effect. The county also has a continuing program for water line rehabilitation and leak protection; qualifying as a conservation effort. The Boonsboro Utilities Commission adopted a low-flow plumbing fixture ordinance and has an active public information campaign on water conservation. Clear Spring, Funkstown, Hancock, Williamsport, and Smithsburg have all indicated that if water conservation in their municipalities is necessary, they have or would use media outlets to advise costumers on what to do.



2.2.2 EXTREME TEMPERATURES

Period of Occurrence	Warning Time	2017 Washington County Risk Assessment	2016 State of Maryland Risk Assessment
At any time, typically during the winter or summer months.	Days to weeks	MEDIUM LOW	NOT RANKED

2017 UPDATE

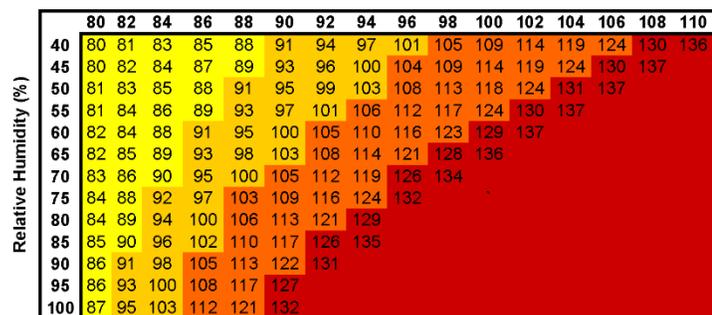
This hazard profile is reorganized and updated to include extreme cold. New maps, data, and graphics have been added, as well as updates to historical occurrences and inclusion of social vulnerability.

HAZARD OVERVIEW

Temperatures vary widely over the course of a year, but each season has average temperature ranges associated with them. Summer and winter have, generally, the highest and lowest range of temperatures, respectively. When the temperature is consistently greater than the normal in summer, meteorologists refer to it as a heat wave, which means, “temperatures of ten or more degrees above the average high temperature persist across the geographic region for several days or weeks” (Haddow, Bullock, & Coppola, 2014, p.51). These conditions can be a contributor to drought conditions when combined with a lack of rainfall. Excessive heat has a history of being deadly. In the United States “more than 1,500 die from exposure to excessive heat” (Haddow, Bullock, & Coppola, 2014, p.52). These conditions can also have serious impacts on crops, causing below average harvests. Repeated years of extreme temperatures can easily cause significant economic impacts on agricultural industries.

While there is no widely accepted definition of extremely cold temperatures, periods of colder than average conditions can cause an array of negative consequences depending on their duration (Haddow, Bullock, & Coppola, 2014, p.51). Extremely cold temperatures

NOAA's National Weather Service
Heat Index
Temperature (°F)

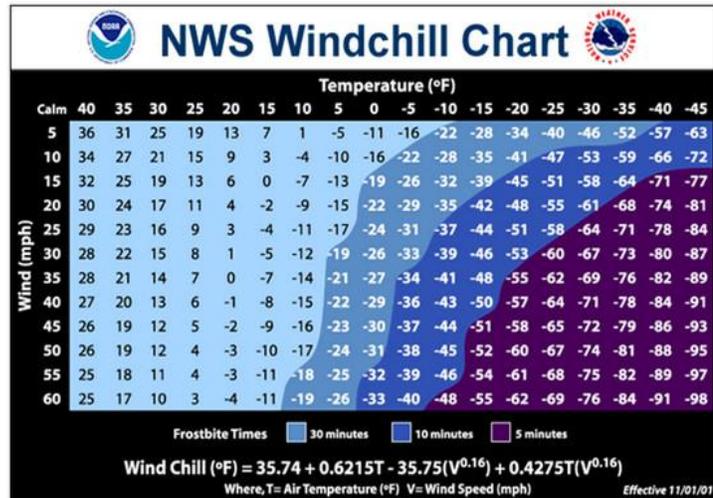


Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity
 Caution
 Extreme Caution
 Danger
 Extreme Danger

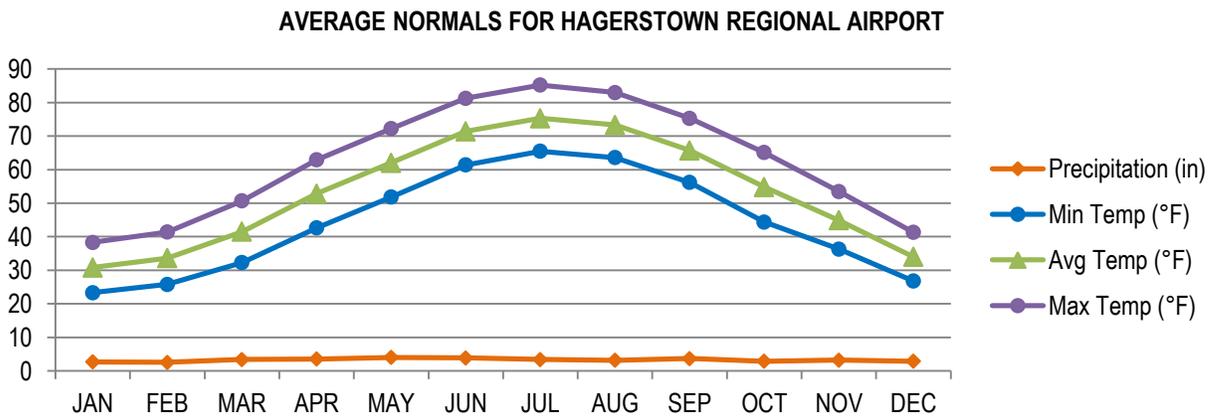


are immediately dangerous to both humans and livestock by causing frostbite and hypothermia, which can lead to permanent injury and death. The chart below shows how quickly frostbite can occur at different temperatures and wind speeds. In unprotected structures cold temperatures can freeze water pipes causing them to burst upon thawing, leading to significant damage. Cold snaps during typically warmer weather during the growing season can damage and destroy some crops, depending on their sensitivity to temperature.

To know what range of temperature is considered extreme for the region, it is necessary to know what the average temperatures are throughout any given year. The National Oceanic and Atmospheric Administration (NOAA), through its National



Environmental Satellite, Data, and Information Service, can generate reports of monthly “normal” at its different stations. The closest to the region is at the Hagerstown Regional Airport. The following graphic shows average ranges of temperature from 1981 to 2010. Every month has a high average, low average, and mean temperature in degrees Fahrenheit. Extreme temperatures would be those either 10 degrees above or below the average high or low temperatures.



Washington County usually has temperatures close to the 90's during summer months and a relative humidity in the 60-65% range due to its location west of the Blue



Ridge. During the summer months, daytime highs in the Great Valley can be slightly higher due to the heat trapped between the Ridge and Valley and the Blue Ridge. Typically, the county experiences 25-30 days of +90 degree temperatures. The highest temperature ever recorded in the state occurred in Keedysville in August, 1918 when the thermometer read 109 degrees. However, summer nighttime temperatures tend to be cooler than in central Maryland.

The National Centers for Environmental Information (NCEI) tracks four types of extreme temperatures.

- **Cold/Wind Chill:** Period of low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined advisory (typical value is -18° F or colder) conditions, on a widespread or localized basis. There can be situations where advisory criteria are not met, but the combination of seasonably cold temperatures and low wind chill values (roughly 15° F below normal) may result in a fatality.
- **Extreme Cold/Wind Chill:** A period of extremely low temperatures or wind chill temperatures reaching or exceeding locally/regionally defined warning criteria (typical value around -35° F or colder), on a widespread or localized basis. Normally these conditions should cause significant human and/or economic impact.
- **Heat:** A period of heat resulting from the combination of high temperatures (above normal) and relative humidity. A heat event occurs whenever heat index values meet or exceed locally/regionally established advisory thresholds or a directly-related fatality occurs due to the heat event.
- **Excessive Heat:** Excessive heat results from a combination of high temperatures (well above normal) and high humidity. An excessive heat event occurs when heat index values meet or exceed locally/regionally established excessive heat warning thresholds, on a widespread or localized basis (National Weather Service Instruction 10-1605, 2007).

POSSIBLE CAUSES

Weather patterns throughout the year naturally cause temperatures to rise and fall in the summer and winter months due to the inclination of the Earth towards the sun. However, the extreme temperatures that have been experienced in the last decade are attributable to climate change. See [Section 2.3 Complicating Variables](#).



LOCATION & EXTENT

Extreme temperatures are a region-wide hazard that can affect all geographic areas and jurisdictions of the county at once. Extreme temperatures have the potential to last several days or even weeks and typically have sufficient warning time (a matter of days) for preparation. As is the case with most weather related events, the municipalities in Washington County face similar temperatures during the summer and winter seasons.

HISTORICAL OCCURRENCES

The following table details the historical occurrences of heat and cold events in Washington County since 1995. Heat events are noted with pink and cold events with blue.

TABLE 2.2.2.A HISTORICAL EXTREME TEMPERATURE OCCURRANCES		
Type	Date	Description
Heat	July 14 to 16, 1995	The most life-threatening period of the heat wave occurred during the afternoon of the 15th, when temperatures ranged from 98 to 103 but heat indices were between 115 and 129. For the entire period, heat indices were at or above 90 at most locations. On the evening of the 15th, indices exceeded 100 until around 2 am, when outflow from a strong thunderstorm cooled and dried the surface, dropping temperatures and heat indices to the low to mid 70s.
Heat	July 21 to 31, 1995	The heat wave returned twice in late July, from the 21st through the 25th and again from the 29th through the 31st. However, temperatures were not as oppressive, ranging from 90 to 97 degrees. Daytime heat indices ranged from 105 to 115, but fell below 90 each night.
Heat	May 18 to 21, 1996	An early-season four-day heat wave, following a period of cool and generally cloudy weather, took its toll on outdoor enthusiasts who were unprepared for the dramatic temperature swing. Two persons suffered heat stroke in Washington Co (MDZ003), requiring hospitalization. Temperatures for the period averaged in the mid to upper 90s, yet less than a week earlier, fruit crops in western Maryland were threatened by subfreezing temperatures.
Heat	July 13 to 19, 1997	Daytime high temperatures averaged in the upper 90s for the 7 days, with the hottest days occurring on the 17th and 18th. Water usage bans were enforced in portions of southern Washington Co (MDZ003) from the 13th through the 17th.
Heat	August 16 to 17, 1997	Maximum temperatures were near or just above the century mark across most of northern and central Maryland east of the Allegheny Highlands both days. Heat index values ranged from 105 to 110 each day, but aside from several heat exhaustion cases, it appeared that at-risk residents remained in air conditioned locations.
Heat	July 20 to 23, 1998	The heat index equaled or exceeded 100 each afternoon. This heat wave was less tolerable than those in recent years since much of the summer had been cooler and less humid than normal.
Heat	July 4 to 7, 1999	High temperatures from the 4th included 101 degrees at Bryans Road, 100 degrees at Ridge, 99 degrees at Williamsport, Smithsburg, and Oxon Hill; and 98 degrees at Hagerstown, and Olney. On the 5th, temperatures soared to 101 degrees at Smithsburg, and 98 degrees at Gaithersburg, Rockville, Sharpsburg, and Hagerstown. Highs on the 6th included 100 degrees at Forest Glen and Hagerstown. The number of people treated for heat related illnesses included 2 in Washington County. Road surfaces and cars also fell victim to the heat. Interstate 70 in Western Maryland was littered with tractor-trailer tire caps as the heat caused the rubber to fly off the tire casings.



TABLE 2.2.2.A HISTORICAL EXTREME TEMPERATURE OCCURRANCES		
Type	Date	Description
Cold	January 21 to 22, 2000	During the morning of the 21st, northwest winds were blowing at 15 to 30 MPH. Temperatures across the region were in the teens. This resulted in wind chill readings from 10 to 25 degrees below zero between midnight and 10 AM. The winds also caused snow that had fallen in the past 24 hours to drift back onto roads, resulting in a difficult morning commute. High pressure built into the Mid-Atlantic region on January 21st. A combination of clear skies, calm winds, and a fresh snowpack led to extremely cold overnight temperatures. On the morning of the 22nd, the mercury dropped into the single digits above and below zero. Low temperatures included 9 degrees at Baltimore/Washington International Airport, 7 degrees at Damascus, 8 degrees in Mechanicsville, 9 degrees in Frederick, -1 degrees in Sharpsburg, 5 degrees in Hagerstown, and 2 degrees in Frostburg. The low temperature in downtown Baltimore only fell to 13 degrees because of its metropolitan location.
Cold	January 27 to 29, 2000	High pressure was centered directly over the Mid-Atlantic region on the 28th and 29th. The combination of clear skies, calm winds, and a snowpack led to unusually cold temperatures. On the morning of the 28th and 29th, the mercury dropped into the single digits above and below zero in many locations. Low temperatures on the 28th included 9 degrees at Baltimore/Washington International Airport, 11 degrees in Mechanicsville, 7 degrees in Frederick, -1 degree in Sharpsburg, 8 degrees in Hagerstown, and 4 degrees in Frostburg. The low temperature in downtown Baltimore only fell to 16 degrees because of its metropolitan location. On the 29th, low temperatures included 8 degrees at Baltimore/Washington International Airport, 6 degrees in Mechanicsville, 12 degrees in Frederick, -2 degrees in Sharpsburg, 4 degrees in Hagerstown, and 7 degrees in Frostburg. The low temperature in downtown Baltimore only fell to 20 degrees because of its metropolitan location.
Cold	December 22 to 23, 2000	After a cold front moved across the region during the afternoon of the 22nd, northwest winds picked up to 20 to 30 MPH. Temperatures dropped into the teens which created wind chills between -10 and -20 degrees. As the winds subsided during the early morning hours of the 23rd, temperatures ranged from the single digits above zero to the lower teens.
Cold	April 19, 2001	High pressure over the Mid-Atlantic region created calm winds and clear skies during the early morning hours of the 19th. These conditions in combination with a chilly air mass in place allowed temperatures to plummet into the mid-20s to lower 30s between 3 and 7 AM EDT. This resulted in a hard freeze which unfortunately was preceded by unseasonably warm weather which had caused many plants to bloom early. Homeowners and nurseries with outdoor vegetation reported losses.
Heat	June 12 to 13, 2001	High pressure in combination with southerly winds brought hot, hazy, and humid conditions to the Mid-Atlantic region between June 12th and 13th. High temperatures soared to around 90 degrees and heat indices reached near 100 degrees through the period.
Heat	June 27 to 30, 2001	High temperatures soared into the lower 90s and heat indices reached into the lower 100s through the period.
Heat	August 6 to 10, 2001	Afternoon temperatures soared into the 90s and dew points in the 60s pushed heat indices to between 98 and 112 degrees. In Hagerstown, the high temperature on the 7th and 9th was 96 degrees and on the 8th was 95 degrees.
Heat	July 2 to 4, 2002	Between July 2nd and 4th, high temperatures rose into the lower to middle 90s and dew points reached into the lower 70s. This resulted in heat index values reaching 100 to 110 degrees during the afternoon. In Washington County, a woman in her 60s was treated at a Hagerstown hospital for heat exhaustion. Her body temperature reached 105 degrees and she suffered from dementia. A 67 year-old man was overcome for a time by heat while changing a tire near Hancock. A firefighter was also treated for heat exhaustion on the 3rd after fighting a blaze in Hagerstown.



TABLE 2.2.2.A HISTORICAL EXTREME TEMPERATURE OCCURRANCES		
Type	Date	Description
Heat	July 28 to 29, 2002	The hottest days were the 28th and 29th of July when temperatures rose into the 90s and heat index values reached 100 to 110 degrees. Power companies reported record electricity use on the 29th.
Heat	August 1 to 5, 2002	Dew points in the upper 60s to mid-70s forced heat indexes to soar to between 98 and 110 degrees.
Heat	August 12 to 19, 2002	Temperatures soared well into the 90s during the afternoon each day and heat index values approached 100 degrees. In Washington County, three people were treated for serious heat related illnesses after participating in outdoor activities.
Heat	August 22, 2002	High temperatures rose into the mid-90s on the 22nd. With dew points in the lower to mid-70s, heat index values soared to near 105 degrees during the afternoon.
Heat	July 17 to 18, 2006	The heat index value climbed to around 105 degrees both afternoons.
Heat	August 1 to 3, 2006	Excessive heat conditions occurred on Tuesday, Wednesday, and Thursday, August 1-3, across much of Maryland. Afternoon heat index values ranged between 105 to as high as 115 degrees.
Heat	June 29, 2012	Plenty of moisture from the Gulf of Mexico caused high humidity during the 29th. Upper-level high pressure along with sunshine caused extremely hot conditions. The combination of the heat and humidity caused heat indices to be near or above 105 degrees. Heat indices were estimated to be between 105 and 109 degrees.
Heat	July 7, 2012	Upper-level high pressure built overhead while surface high pressure moved off the coast. A southerly flow combined with sunshine and subsidence for hot and humid conditions. Heat index values around 105 degrees were reported at Hagerstown.
Cold	January 7, 2014	An arctic front moved through the Mid-Atlantic and cold air moved into the region. Gusty winds and cold temperatures led to wind chill values below -20. High pressure settled across the area and led to cold conditions to continue for a few days. Wind chill values of -20 and below were measured at surrounding locations.
Heat	July 25, 2016	A southwesterly flow around high pressure over the Atlantic pumped in plenty of moisture while hot conditions persisted due to an upper-level ridge of high pressure. The heat and humidity caused dangerous heat indices. Heat indices were around 105 degrees at Hagerstown.
Heat	August 13, 2016	A southerly flow around high pressure ushered in unseasonably hot and humid conditions. Heat indices around 105 degrees were reported at Hagerstown.

Source: 2011 Washington County Hazard Mitigation Plan & NCEI

VULNERABILITY & IMPACTS

Though residents may think extreme temperatures are normal and become accustomed to them, there are still some effects that these can have on the population, infrastructure, delivery of services, and the economy. The following tables describe these effects.

TABLE 2.2.2.B EXTREME TEMPERATURES CONSEQUENCE ANALYSIS	
Type of Impact	Description
Public/Responder Health and Safety	According to the National Oceanic Atmospheric Administration, heat is the number one weather-related killer. The National Weather Service statistical data shows that heat causes more fatalities per year than floods, lightning, tornadoes and hurricanes combined. See Tables 2.2.2.C and 2.2.2.D below.
Continuity of Operations (incl. Delivery of services)	Excessive heat or extreme cold can cause cascading effects such as power outages that will hinder the ability to maintain various public services throughout the county as well as residential.



TABLE 2.2.2.B EXTREME TEMPERATURES CONSEQUENCE ANALYSIS	
Type of Impact	Description
Property, Facilities, And Infrastructure	Besides normal expansion and contraction of materials during heat and cold events, damage to property, facilities and infrastructure can be considered minimal (cracks, pipe bursts, etc.).
Economic Condition	The economy typically would not be affected unless cascading effects were to take place.
Environment	Heat and cold can affect flora and fauna in Washington County. Excessive heat or cold can kill certain types of vegetation and animals.

The tables below describe the risks to human health relating to extreme heat and cold temperatures. Every few degrees up or down can have a great impact on health.

TABLE 2.2.2.C HEAT RISKS	
Heat Index	Possible heat disorders for people in higher risk groups
130°F or higher	Heatstroke/sunstroke highly likely with continued exposure.
105-130°F	Sunstroke, heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.
90-105°F	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
80-90°F	Fatigue possible with prolonged exposure and/or physical activity.

TABLE 2.2.2.D COLD RISKS		
Stage	Core Temperature	Signs and Symptoms
Mild Hypothermia	99-97°F	Normal, shivering may begin.
	97-95°F	Cold sensation, goose bumps, unable to perform complex tasks with hands, shivering can be mild to severe, hands numb.
Moderate Hypothermia	95-93°F	Shivering, intense, muscles incoordination becomes apparent, movements slow and labored, stumbling pace, mild confusion, may appear alert. Use sobriety test, if unable to walk a 9 meter (30 foot) straight line, the person is hypothermic.
	93-90°F	Violent shivering persists, difficulty speaking, sluggish thinking, amnesia starts to appear, gross muscle movements sluggish, unable to use hands, stumbles frequently, difficulty speaking, signs of depression, withdrawn.
Severe Hypothermia	90-86°F	Shivering stops, exposed skin blue or puffy, muscle coordination very poor, inability to walk, confusion, incoherent/irrational behavior, but may be able to maintain posture and appearance of awareness
	86-82°F	Muscle rigidity, semiconscious, stupor, loss of awareness of others, pulse and respiration rate decrease, possible heart fibrillation.
	82-78°F	Unconscious, a heartbeat and respiration erratic, a pulse may not be obvious.
	78-75°F	Pulmonary edema, cardiac and respiratory failure, death. Death may occur before this temperature is reached.

Source: Canadian Centre for Occupational Health and Safety

LOSS & DAMAGES

This region of the country has become accustomed to fluctuations in temperature that range from extreme heat to extreme cold throughout the year. Destruction of property and injury are typically not associated with these types of events; the NCEI reports a loss of



\$0 for extreme temperature events, both heat and cold, since 2000. However, damages can be inflicted on properties if pipes freeze and burst.

PROBABILITY & SEVERITY CALCULATIONS

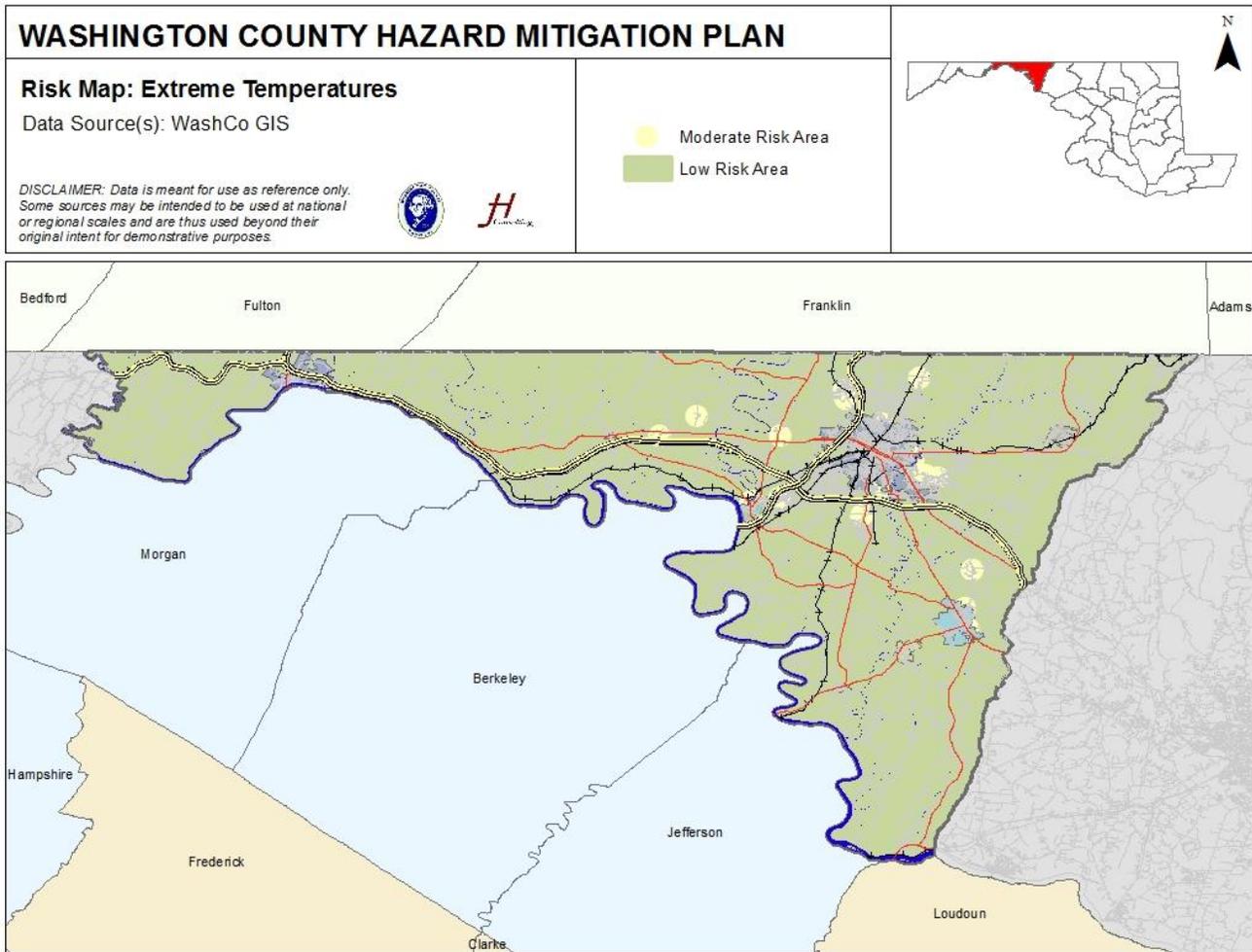
The following table calculates the risk of extreme temperatures in Washington County by comparing the probability and severity of events based on historical occurrences.

TABLE 2.2.2.E EXTREME TEMPERATURE RISK CALCULATION					
Probability		+	Severity	=	Risk
PROBABLE					NEGLIGIBLE
Events	26		Rarely do extreme cold or extreme heat events cause property damage. In some instances after long exposure, they may cause illness and death, but none have been recorded in the county.		This hazard is not one that should be of much concern to the county due to the medium low risk it poses.
Years	21				
The probability of an extreme cold or extreme heat event is high since there is about one recorded every year.					

RISK MAP

The map below depicts low and moderate risk areas, with the moderate areas corresponding to social vulnerability variables.





2.2.3 FLOOD

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time, typically after prolonged periods of precipitation.	Days to hours	MEDIUM HIGH	MEDIUM

2017 UPDATE

This profile, previously Chapter 8: Riverine Flooding has been expanded to include data such as NFIP participants and repetitive loss and severe repetitive loss property information. New maps are included as per the updated 2017 FEMA flood maps in Washington County.

HAZARD OVERVIEW

The FEMA definition for flooding is “a general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland or tidal waters or the rapid accumulation of runoff of surface waters from any source.” Floods can be caused by the passage of frontal storms, thunderstorms, hurricanes, snow melt or some combination of the above events. Between 1983 and 1997 Maryland averaged near \$10 million per year in flood damage.

Historically, the greatest flood events remain the 1936 floods on the Potomac River and the 1972 flood resulting from Hurricane Agnes.

There are two different types of flooding that are associated with rivers and streams: flash flooding and riverine flooding. Flash flooding occurs from the combination of rainfall intensity and duration.

Flooding is the most common, destructive, and deadliest natural disaster in the nation. Almost 90% of Presidential declarations involve flooding. Annual flood damage nationwide averages six billion dollars. In Maryland, flooding is a concern considering it is a coastal state with over 12 percent of its surface area in floodplains and has approximately 8,000 miles of tidal shoreline.

With the above factors in mind, Washington County is not only susceptible to widespread flooding along major streams and rivers, where the 100 year floodplain is located, but is also subject to flash flooding along smaller tributaries in the headwaters of steep sloped drainage basins. These are found in the western part of the county and along



the Blue Ridge on the county’s eastern flank. Since local climatic conditions can produce large amounts of precipitation at any time of the year, the potential for flooding is not limited to any particular season. However, historically, most major floods have occurred in the late winter or early spring when heavy snow accumulations are melted in conjunction with heavy rainfall, or in late summer or early fall during the hurricane season.

The National Flood Insurance Program (NFIP) is a governmental program administered through FEMA that, “aims to reduce impact on private and public structures... by providing affordable insurance to property owners and by encouraging communities to adopt and enforce floodplain management regulations” (FEMA). Each jurisdiction participating in the NFIP has a designated NFIP coordinator, sometimes referred to as the floodplain manager. This individual maintains the jurisdiction’s floodplain ordinance and ensures that development is compliant with that ordinance. Each local floodplain manager serves as the point of contact with FEMA regarding floodplain mapping. For more information on how each jurisdiction participates in the NFIP, refer to [Appendix 1: Meeting Documentation and Committee Involvement](#).

TABLE 2.2.3.A COMMUNITIES PARTICIPATING IN NFIP				
<i>Community</i>	<i>Initial FHBM Identified</i>	<i>Initial FIRM Identified</i>	<i>Current Effective Map Date</i>	<i>Regular</i>
Boonsboro	N/A	07/16/1980	07/15/2017	07/16/1980
Clear Spring	02/18/1977	02/18/1985	08/15/2017	04/17/1985
Funkstown	03/08/1974	01/01/1978	08/15/2017	02/01/1978
Hagerstown	05/10/1974	04/17/1978	08/15/2017	04/17/1978
Hancock	08/09/1974	02/17/1982	08/15/2017	02/17/1982
Keedysville	07/26/1974	01/02/1980	08/15/2017	01/02/1980
Sharpsburg	03/25/1977	01/02/1980	08/15/2017	01/02/1980
Smithsburg	01/17/1977	06/06/2001	08/15/2017	06/06/2001
Williamsport	02/15/1974	06/10/1977	08/15/2017	06/10/1977
Washington County	03/21/1975	05/01/1978	08/15/2017	05/01/1978

POSSIBLE CAUSES

Typically, the determining characteristics that can induce a flash flood include high rainfall intensity over a short duration. Flash floods can be further influenced by local topography, the ground’s capacity to hold water or soil moisture content. The sudden release of water can also cause flash floods, such as the breakup of an ice jam or dam.

LOCATION & EXTENT

In both the Blue Ridge and the western part of the county, steep slopes, and poor soil conditions along with the geologic structure of the Ridge and Valley, increase the chance for flash flooding to occur with any given amount of human caused activities such as



timbering and road building in this terrain can cause increased runoff which makes downstream areas more susceptible to damage from natural occurring events.

Of the nine municipalities in Washington County, Hancock and Williamsport are partially located within the floodplain of the Potomac River, while Hagerstown and Funkstown are partially located within the floodplain of Antietam Creek. Smithsburg and Boonsboro are partially located in the floodplain of smaller streams. All municipalities are also susceptible to flood damage from intense localized storms that produce rapid runoff. New urban development upslope of inadequate existing stormwater facilities in older urban areas also poses a runoff problem as these communities expand.

HISTORICAL OCCURRENCES

Since 1924 Washington County has been affected by a number of high water events, with several events surpassing the 100-year base flood recurrence interval in selected watersheds. One hundred year events have been recorded on the main stem of the Potomac and on Conococheague and Antietam Creeks since 1936. Examples of major floods since 1924 include the March 1936 snow melt event, which affected much of the central and northern Appalachians; the passage of Hurricane Hazel in the fall of 1954, which affected parts of the Potomac Basin; the passage of Hurricane Agnes in the summer of 1972, which caused widespread flooding throughout the northeast, and the flood of November, 1985 which resulted from excessive rainfall over a several day period and affected much of the Potomac Basin. More recently, flooding from snowmelt accompanied by heavy rain affected Washington County in January 1996. During the fall of that year Hurricane Fran caused more than \$1,000,000 worth of damage in the county.

The NCEI database records a total of 40 instances of floods in Washington County between 2000 and 2017 alone. For a full list of flooding events, refer to [Appendix 3: Detailed Lists of Hazard Events](#).

TABLE 2.2.3.B FLOOD EVENTS 2000-2017	
Event Type	Number of Events
Flash Flood	24
Flood	16
Total	40

May 12, 2008

A potent storm system crossed the region May 12th. Warm and moist air filtered in ahead of the system, bringing widespread showers and thunderstorms with heavy rain. Heavy rain began to overspread the region during the evening of the 11th and continued through the morning of the 12th. The pressure gradient with the low pressure system



produced strong gusty winds across lower southern Maryland during the late evening. With the ground already saturated dozens of trees and power lines fell across the region.

The tight pressure gradient and strong southeasterly flow, despite the quarter moon phase, allowed tidal departures of 2 feet or more along the Maryland Chesapeake Bay in lower southern Maryland. Several roads were closed and homes flooded due to the high tides. Several roads in the Hagerstown area were closed due to high water. Several basements were also flooded (NCEI).

VULNERABILITY & IMPACTS

TABLE 2.2.3.C FLOOD CONSEQUENCE ANALYSIS	
<i>Type of Impact</i>	<i>Description</i>
Public /Responder Health and Safety	One of the main concerns with health and floods is that many times floods cause power outages that can greatly affect people who are dependent on power to run life-sustaining machines. During a flood, people and first responders run the risk of sustaining injuries related to saving people and property as well as the possibility of drowning. In rare circumstances, floodwater can carry bacteria that can be harmful.
Continuity of Operations (incl. Delivery of services)	Floods often disrupt many services including power, sewer, water, communications, and road access. Lacking these, it is difficult to continue critical services to the community.
Property, Facilities, And Infrastructure	Damage to property, facilities, and infrastructure can range from minimal to total loss.
Economic Condition	The cost of recovery from floods can vary for everyone. Homeowners and businesses can claim insurance benefits if they have them, but may not be able to continue working due to devastation of the community or of their own property.
Environmental	Floods can cause erosion to the ground that can weaken the soil beneath.

LOSS & DAMAGES

Calculating all the costs associated with floods and flash floods is a difficult task and FEMA recognizes this hazard as the most frequent and most costly hazard in the U.S. According to the NCEI database, only one flood in the last 18 years, one in May of 2008 as described above, has had a cost associated with it and it was of \$20,000; this is largely inaccurate. For this reason, one way of calculating loss could be by reviewing National Flood Insurance (NFIP) claims. For example, in Washington County there have been 135 claims on properties due to flooding totaling over \$2 million; that's an average of \$16,000 per claim. These claims are broken out by community; the following tables detail the repetitive loss properties, the occupancy of the building, and total dollar losses.

Some properties are more vulnerable to floods than others. For those properties that have had claims, FEMA defines repetitive loss (RL) and severe repetitive loss (SRL) properties as follows:



A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. Currently there are over 122,000 RL properties nationwide.

A Severe Repetitive Loss (SRL) property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property. There are currently approximately 6,000 properties nationwide meeting the definition.

In Washington County there are a few properties that meet these criteria. Based on information provided by MEMA, the breakdown of RL and SRL properties is shown in the tables below. There are 49 repetitive loss properties and 1 severe repetitive loss property in Washington County. The table to the right breaks out these descriptions by city or town in which the properties are located. The table on the next page shows the overall counts for the entire county.

The HAZUS-MH program estimates that approximately 161 buildings would be at least moderately damaged by a 100-year flooding event, all within the “residential” occupancy category. An estimated 72 of those buildings would be

TABLE 2.2.3.D RL & SRL PROPERTIES		
Clear Spring	Single Family	1
	Total RL Properties	1
	Repetitive Losses	1
	Total Losses	\$85,000
Funkstown	Single Family	2
	Other, non-residential	1
	Total RL Properties	3
	Repetitive Losses	9
Hagerstown	Total Losses	\$232,300
	Single Family	4
	Other, non-residential	1
	Total RL Properties	5
Hancock	Repetitive Losses	13
	Total Losses	\$221,800
	Other, non-residential	3
	Total RL Properties	3
Sharpsburg	Repetitive Losses	6
	Total Losses	\$115,900
	Single Family	4
	Total RL Properties	4
Weaverton	Repetitive Losses	8
	Total Losses	\$81,600
	Single Family	1
	Total RL Properties	1
Williamsport	Repetitive Losses	3
	Total Losses	\$34,000
	Single Family	31
	Other, non-residential	1
	Other, residential	1
	Total RL/SRL Properties	33
Repetitive Losses	91	
Severe Repetitive Losses	4	
Total Losses	\$1,392,500	



Washington County	Total RL/SRL Properties	50
	Single Family	43
	Other, non-residential	6
	Other, residential	1
	Total Repetitive Losses	131
	Total Severe Repetitive Losses	4
	Total Losses	2,163,100

completely destroyed. Total building-related losses could stand at \$96.84 million with 0% of losses related to the business interruption of the region. Even though residential structures comprised the total estimated damage figure, residential occupancies accounted for 53.57% of the total loss HAZUS generated. The following tables summarize

the HAZUS data.

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Ct.	%	Ct.	%	Ct.	%	Ct.	%	Ct.	%	Ct.	%
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	0	0.00	23	14.29	7	4.35	59	36.65	72	44.72
Total (161)	0		0		23		7		59		72	

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Ct.	%	Ct.	%	Ct.	%	Ct.	%	Ct.	%	Ct.	%
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Manufactured Housing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	4	100.0
Masonry	0	0.00	0	0.00	4	12.50	0	0.00	13	40.63	15	46.88
Steel	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Wood	0	0.00	0	0.00	19	15.20	7	5.60	46	36.80	53	42.40

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss	Building	32.55	8.97	2.93	1.61	46.06
	Content	19.44	18.72	6.13	4.84	49.12
	Inventory	0.00	0.37	1.24	0.07	1.67
	Subtotal	51.99	28.05	10.29	6.51	96.84
Business Interruption	Income	0.00	0.08	0.00	0.01	0.09
	Relocation	0.01	0.01	0.00	0.00	0.02
	Rental Income	0.01	0.00	0.00	0.00	0.01
	Wage	0.01	0.08	0.00	0.04	0.14
	Subtotal	0.03	0.18	0.00	0.05	0.26
All	Total	52.02	28.23	10.29	6.57	97.10



PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.3.I FLOOD RISK CALCULATION					
Probability			Severity		Risk
FREQUENT			CRITICAL		MEDIUM HIGH
Events	40	+	Although the cost of flooding events may be high in the county, there has rarely been an instance of death from the flooding.	=	The risk of floods in Washington County is medium high.
Years	18				
The amount of floods per year, on average is about two. This makes the hazard a frequent occurrence in the county.					

COMMITTEE INPUT

The Washington County Hazard Mitigation Plan update committee took the time to describe some instances of flooding in their community. These are as follows.

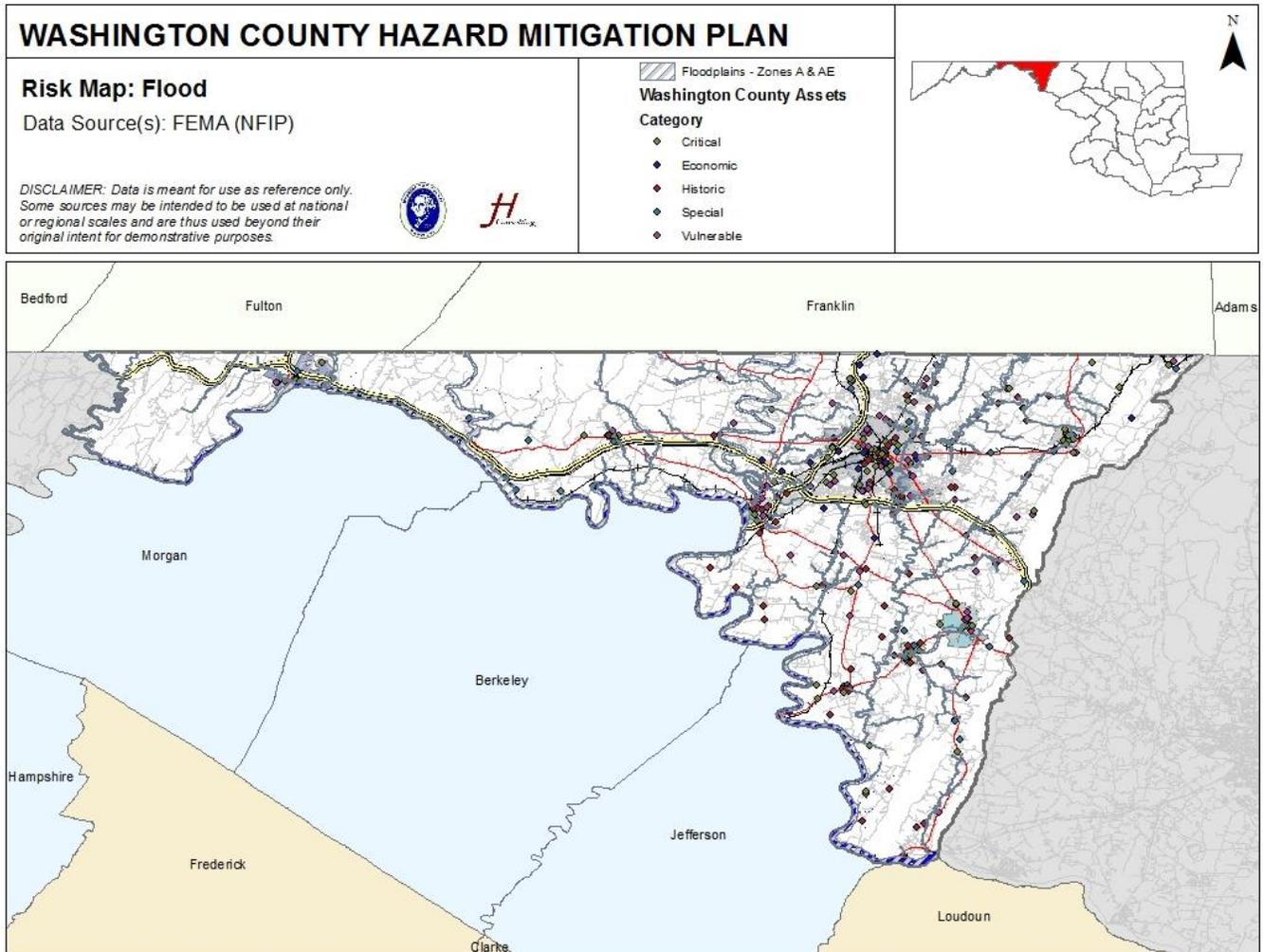
- **Clear Spring:** During and after heavy rainfall, flash flooding occurs at the center of town. This may have been a result of land development north and east of Clear Spring.
- **Clear Spring, 2014:** rain fell depositing 6” in two hours. Toms Run ran out of its bank and flooded downtown Clear Spring where many structures had been built over top of the stream.
- **Clear Spring, 2015:** Too much rain was received in a short period of time. Downtown flooded, firefighters had to wear life vests to rescue families. Storm left town in a total mess, people lost properties and personal belongings.
- **Keedysville, Little Antietam Creek:** 2012 or 2013: The creek is subject to brief periods of flooding. The last flooding occurred in the summer of 2012 or 2013. Basements of several buildings experienced water damage; no mitigation has been done.
- **Smithsburg:** Certain areas in Smithsburg are prone to flooding.

RISK MAP

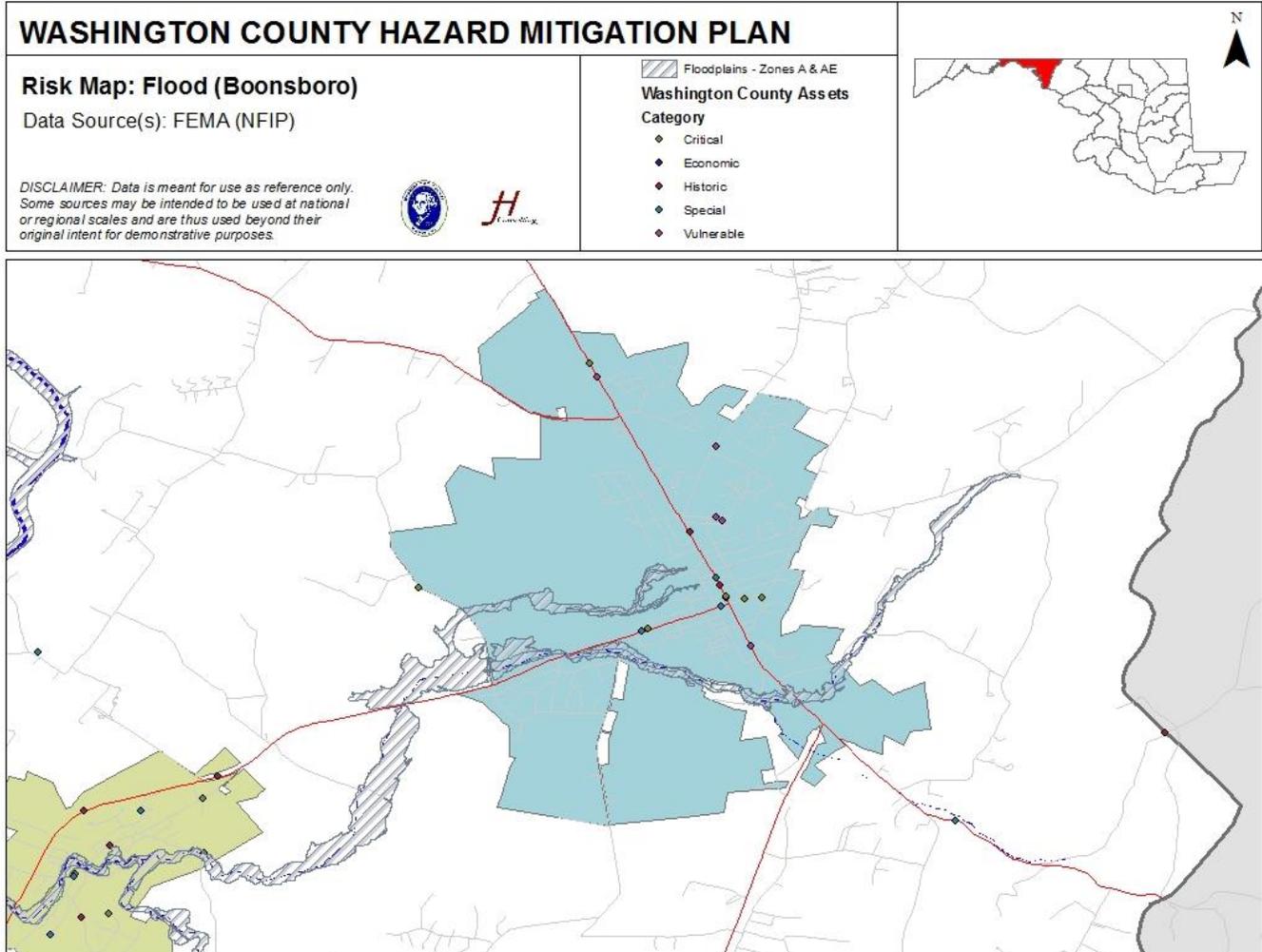
The risk maps below show flood risk areas with respect to Zones A and AE. This section includes a countywide map as well as municipal maps.



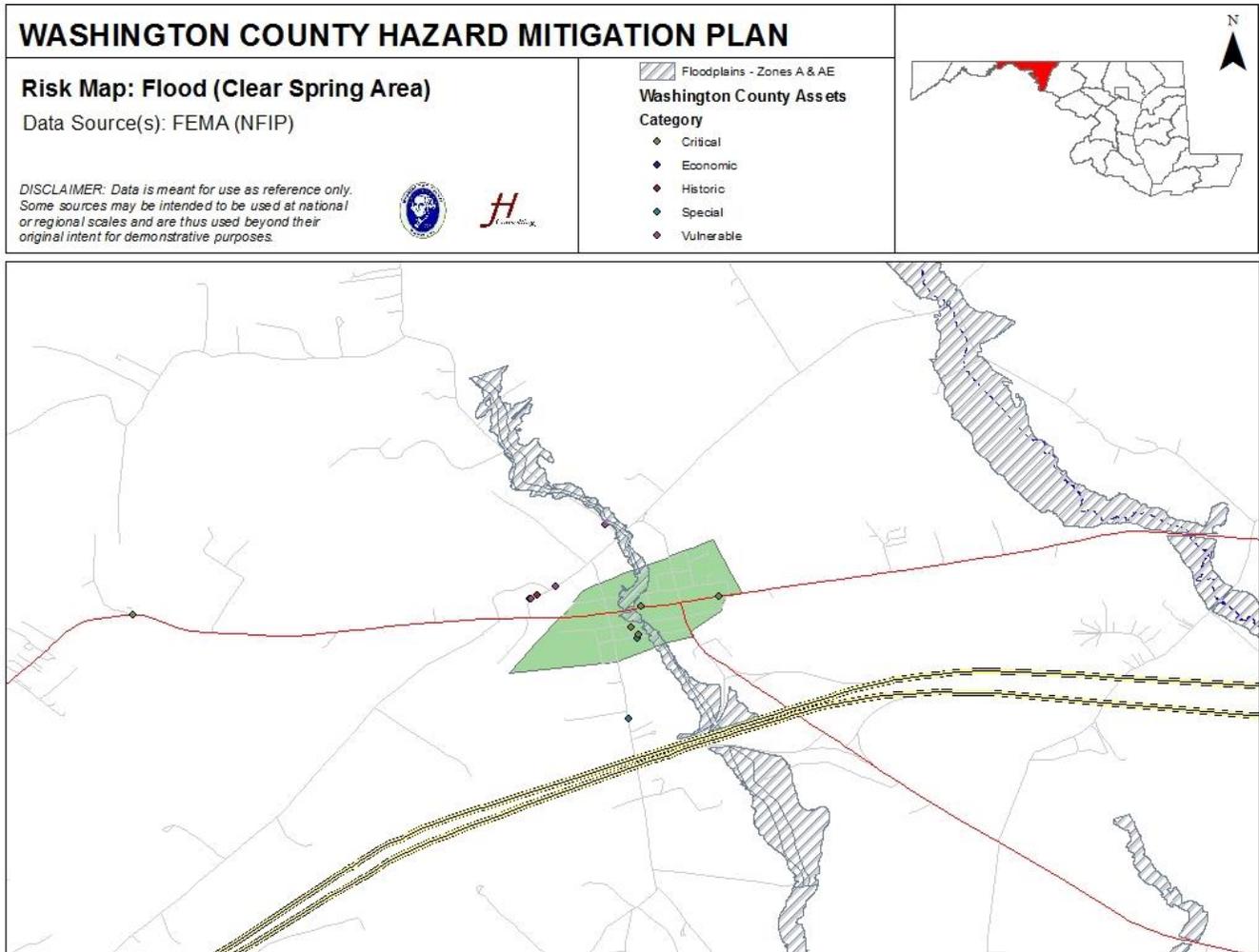
Washington County



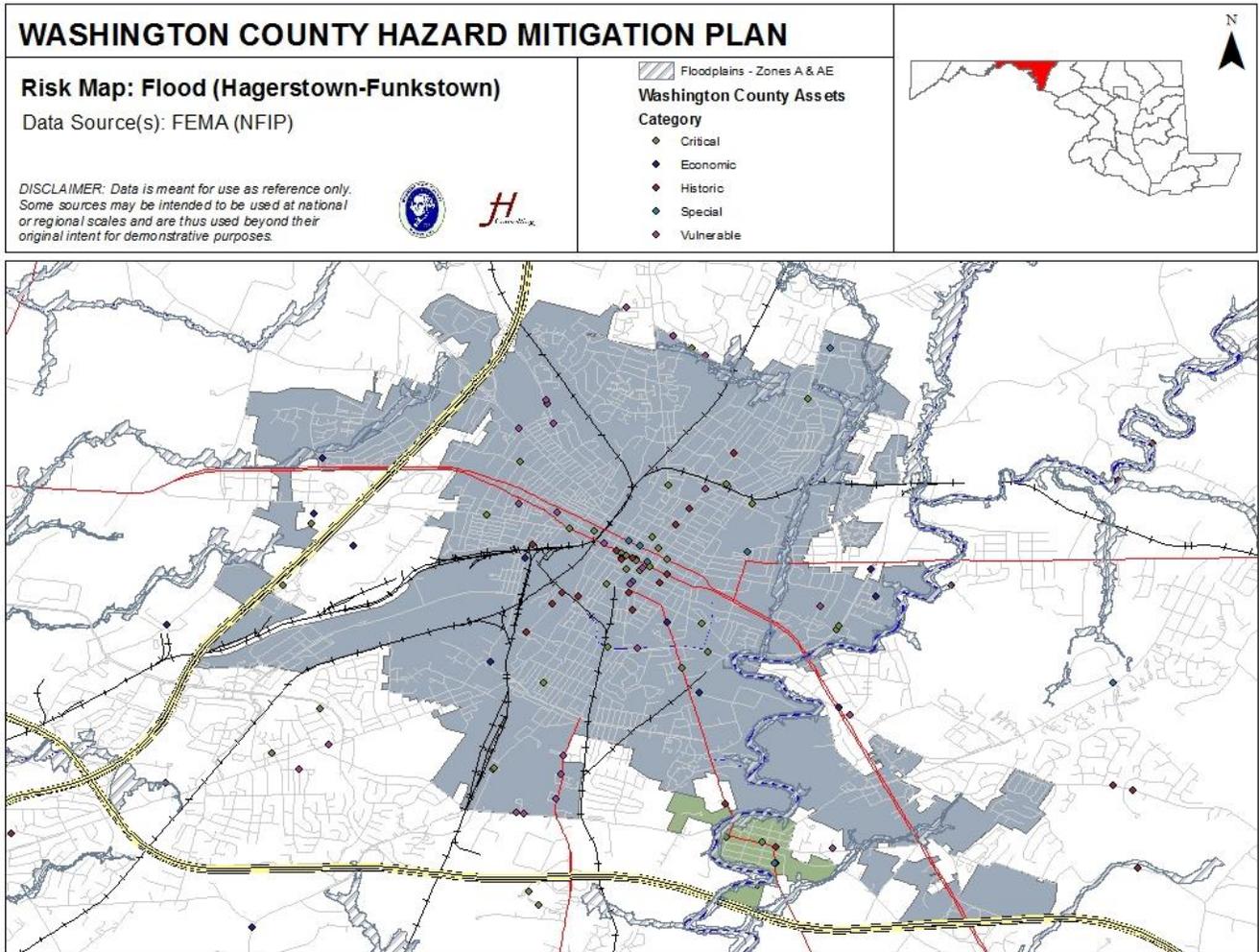
Boonsboro



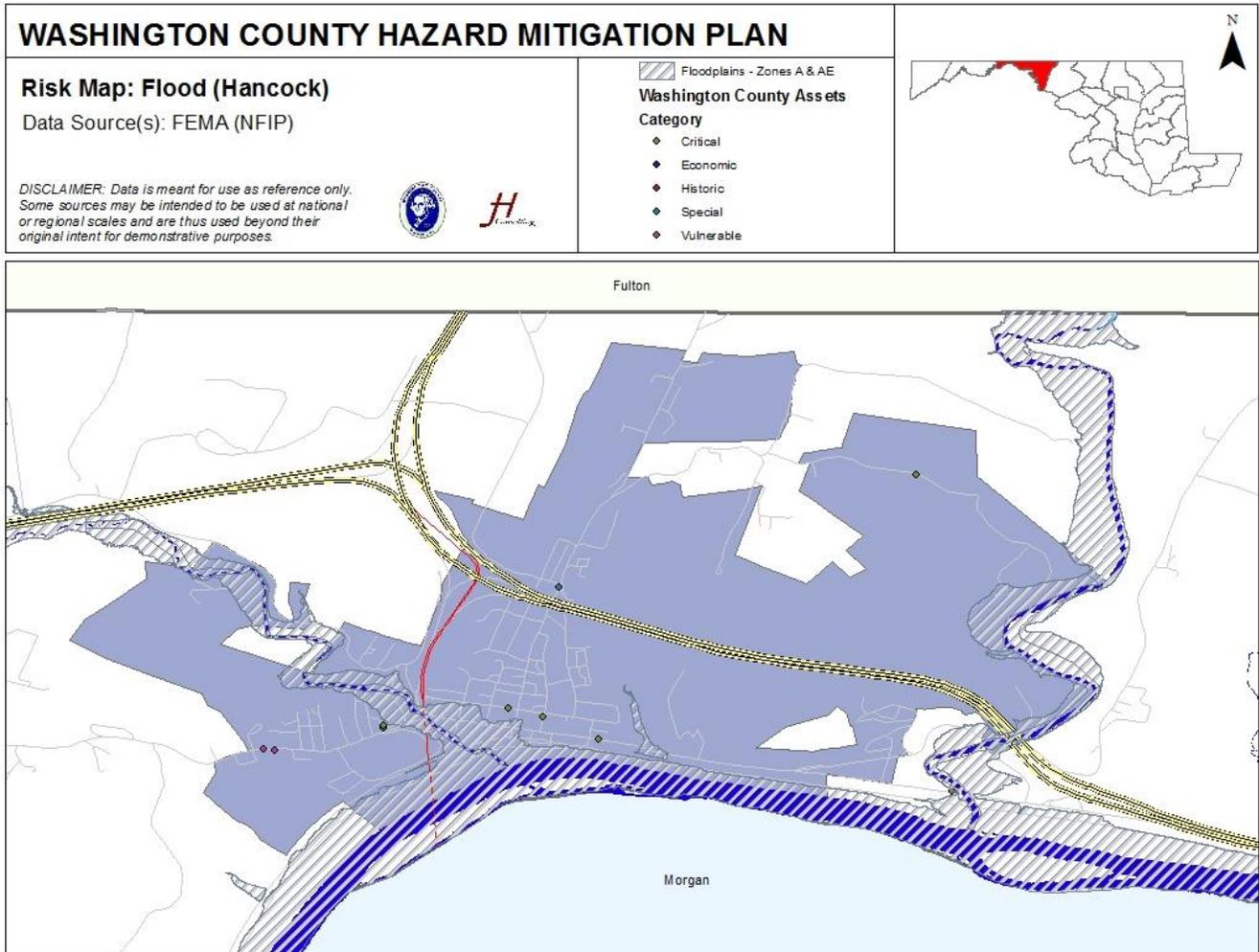
Clear Spring Area



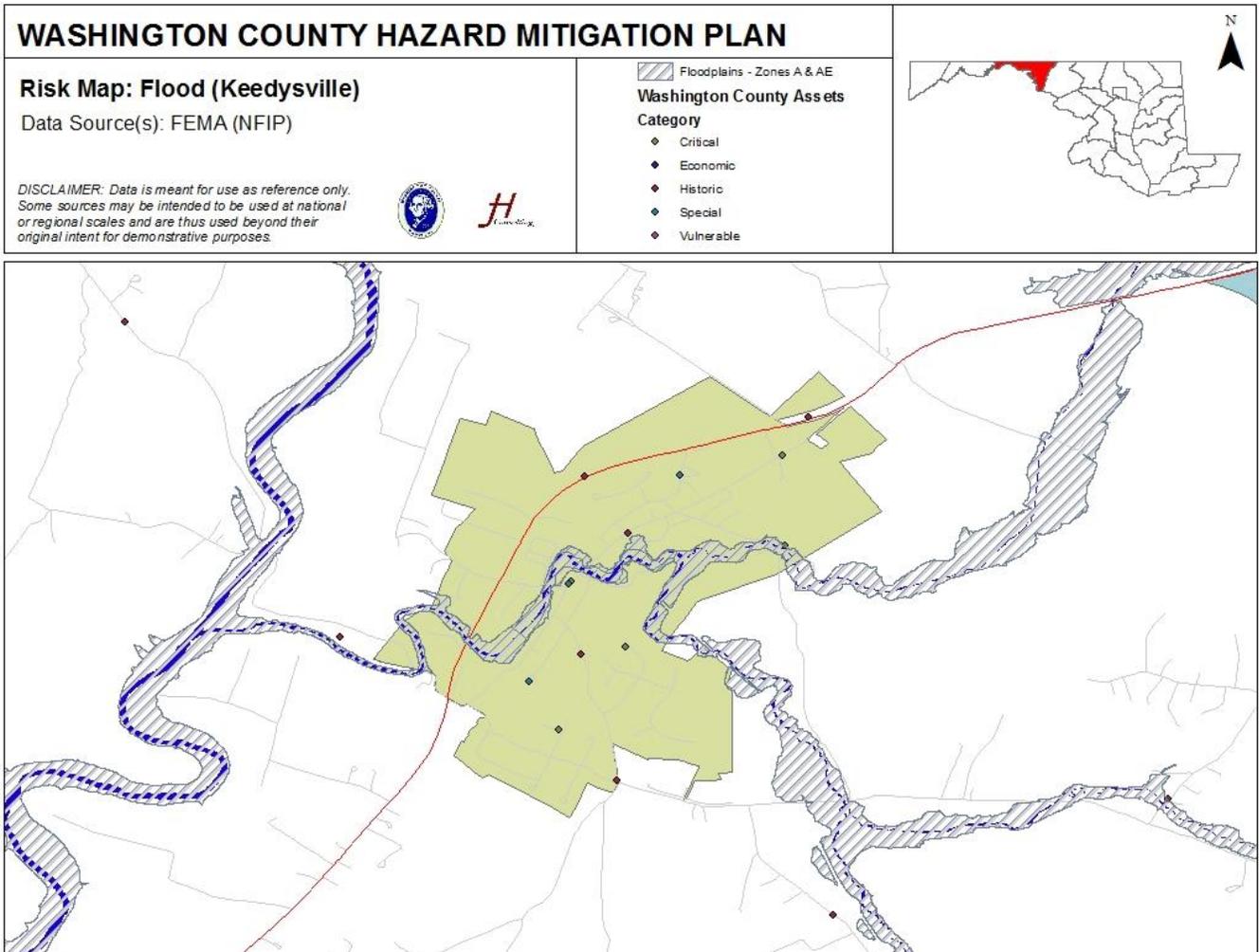
Hagerstown-Funkstown



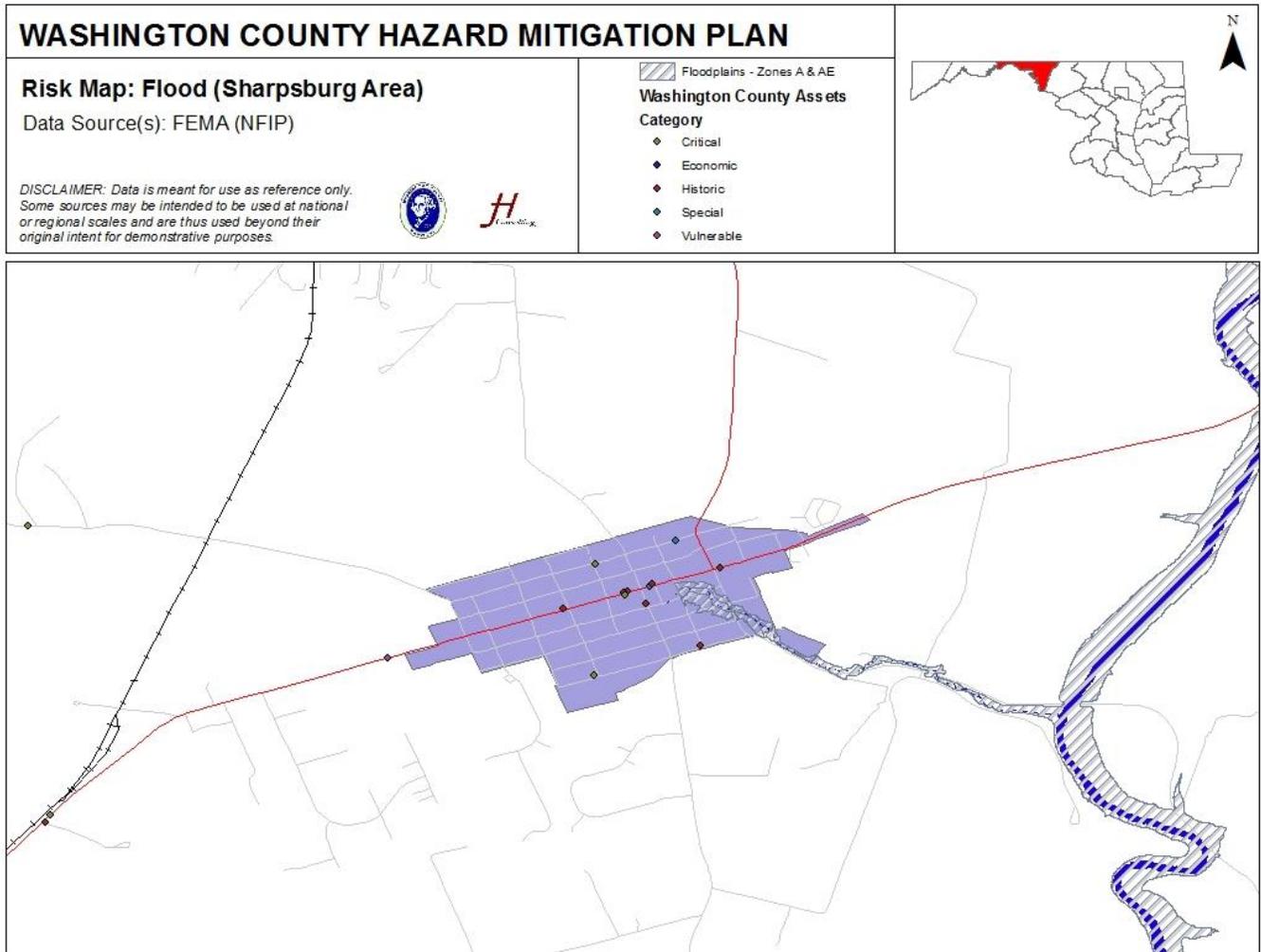
Hancock



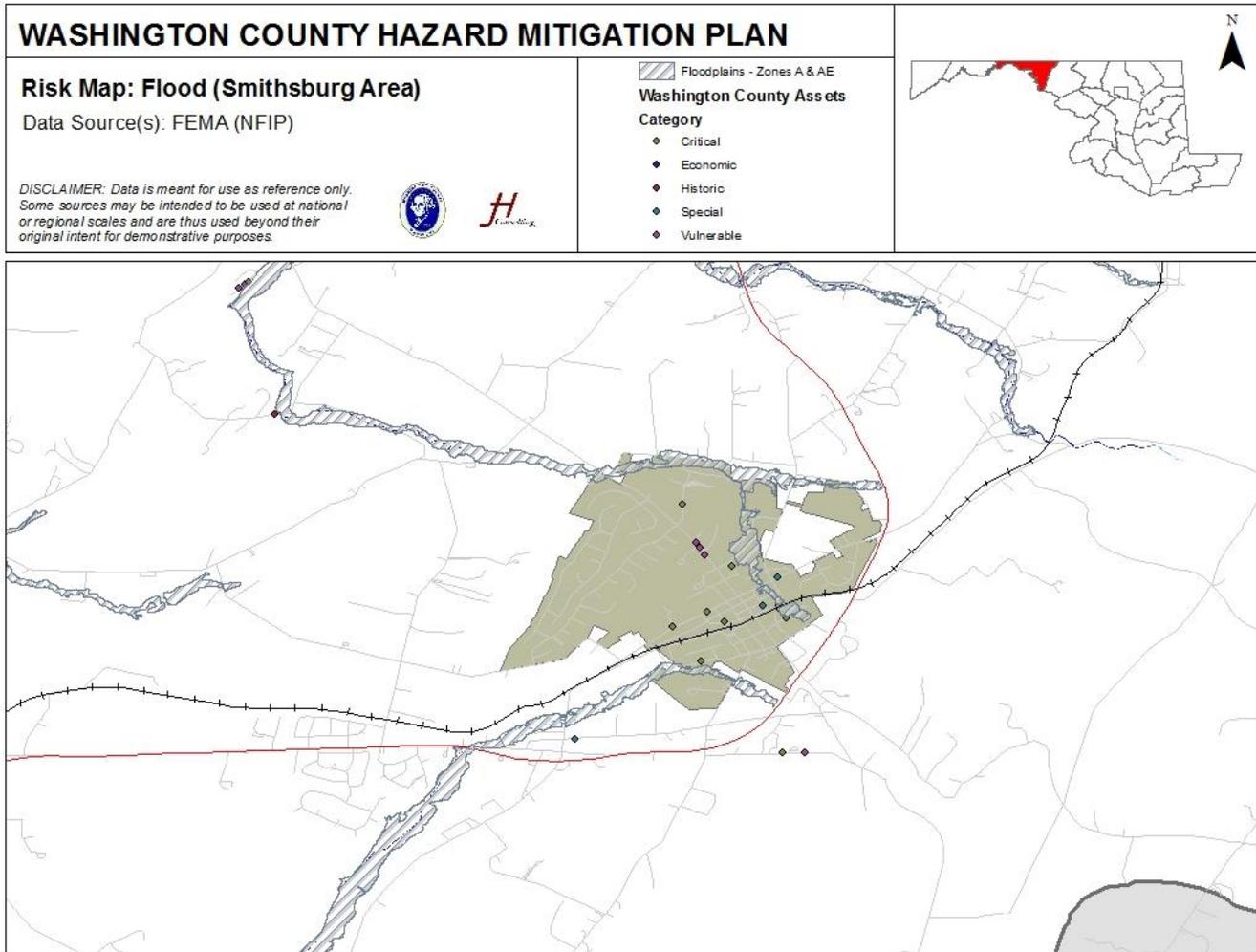
Keedysville



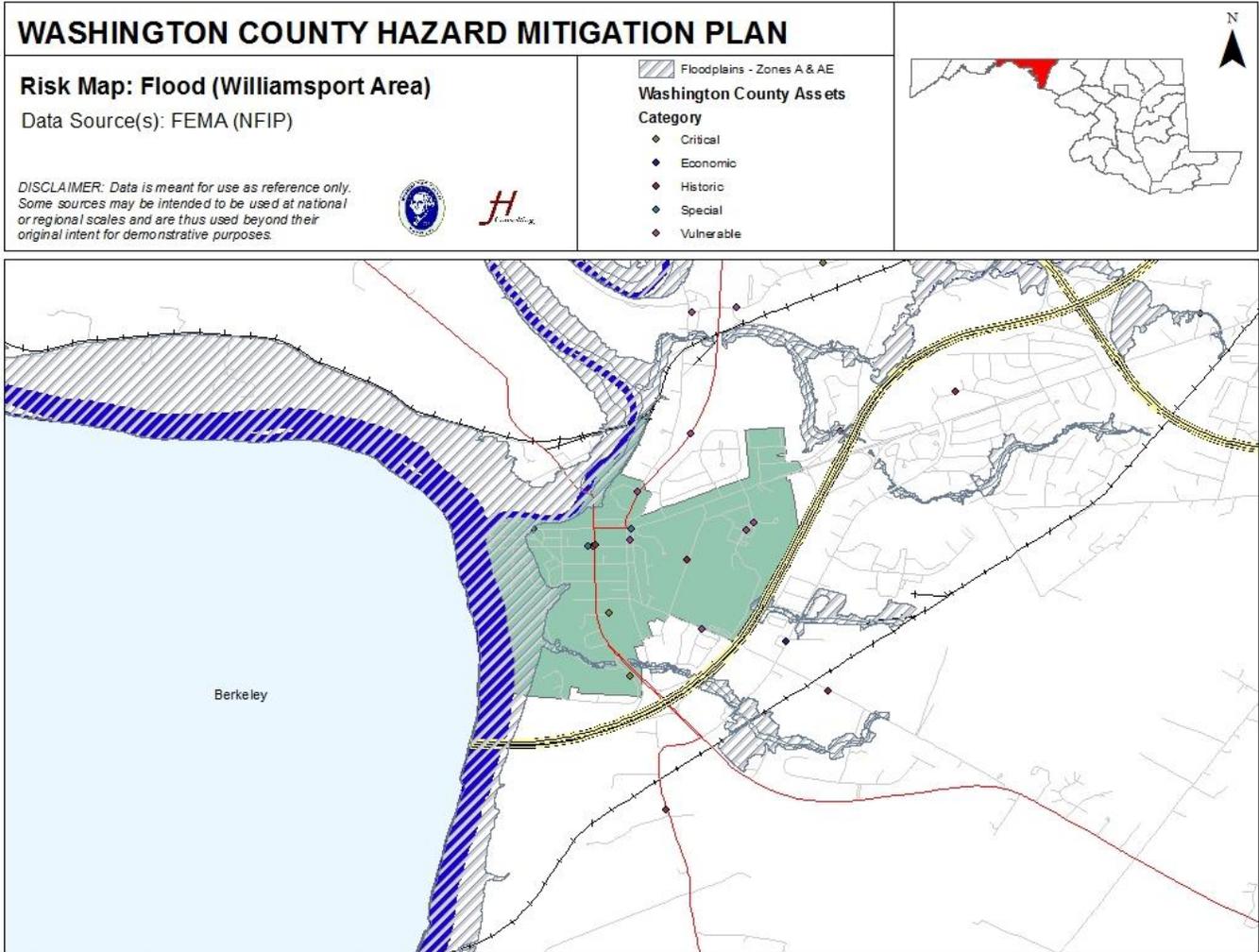
Sharpsburg Area



Smithsburg Area



Williamsport Area



2.2.5 HAZMAT

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time	Hours to minutes	MEDIUM HIGH	NOT RANKED

2017 UPDATE

Previously *Chapter 5: Transportation and On-Site Hazmat*, this chapter has been renamed, reformatted and reorganized. New data was added to show events in the past five years since the last update. New sections include loss estimates, possible causes, and social vulnerability.

HAZARD OVERVIEW

A hazardous material may be defined as a substance or material which, because of its chemical, physical or biological nature, poses a threat to life, health, or property if released from a confined setting. A release may occur by spilling, leaking, emitting toxic vapors, or any other process that enables the material to escape its container, enter the environment, and create a potential hazard. Several common hazardous materials include those that are explosive, flammable or combustible, poisonous or radioactive. Related combustible hazardous materials include oxidizers and reactive materials, while toxins produced by etiological (biological) agents are types of poison that can cause disease.

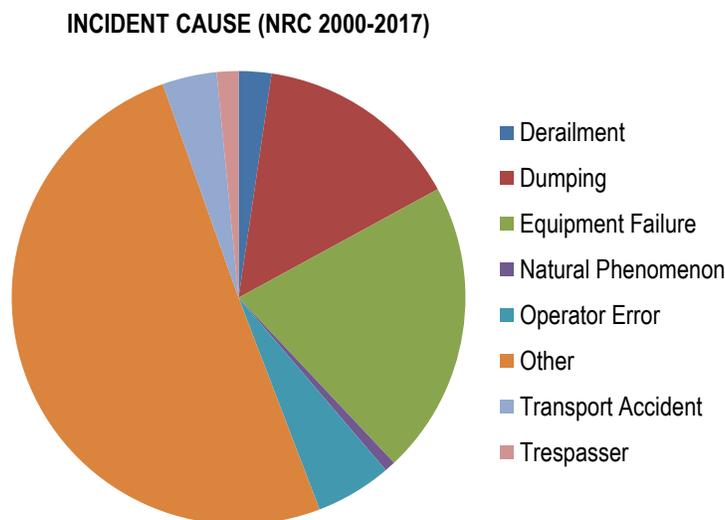
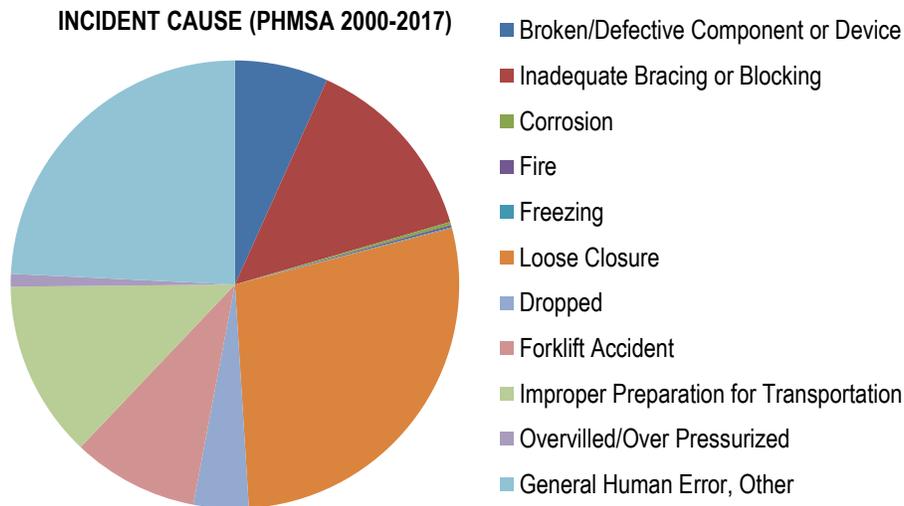
A hazmat release while in transit is of great concern to the U. S. Department of Transportation. While most hazardous materials are stored and used at fixed sites, these materials are usually produced elsewhere and shipped to the fixed facility by rail car, truck, or onboard ships or barges. These vehicles are identified by signs or placards denoting the hazard, however, the possibility of release is present at any time. Hazardous materials are constantly being moved in Maryland on interstate highways, the rail system and on shipping lanes in the Chesapeake Bay and its tributaries. On-site use of hazmat is particularly evident in the Baltimore area near rail, truck and shipping terminals.

There are two major agencies that collect data as they relate to hazardous materials incidents the Pipeline and Hazardous Materials Safety Administration (PHMSA) governed by the U.S. Department of Transportation (DOT), and the National Response Center (NRC), governed by the U.S. Coast Guard (USCG).



POSSIBLE CAUSES

There are a variety of causes of hazardous materials incidents, as reported by PHMSA and the NRC. Some of the most common include human errors. The following graphs identify the reasons given for reporting hazmat incidents. Because more incidents are reported on the PHMSA database (around 1,300 as compared to around 130 on the NRC), there are more detailed reasons for the causes.



LOCATION & EXTENT

Certain places are more prone to accidents involving hazmat; these include roads and highways, rail lines, waterways, and fixed facilities (such as Tier II reporting facilities). In general, and as evidenced by the PHMSA and NRC databases, there are more incidents



along highways. The lists below show the locations where incidents have been reported by each one between 2000 and 2017.

Historically, most hazmat moving through Washington County has been on the Norfolk Southern and CSX rail systems. The 2002 *Washington County Comprehensive Plan* notes that 30 freight trains per day travel through Hagerstown

PHMSA		NRC	
Rail	3	Railroad	37
Highway	1302	Mobile	31
Air	3	Fixed	45
		Pipeline	3
		Continuous	3
		Storage Tank	8
		Unknown Sheen	2

on these systems. Today, however, the bulk of hazardous materials pass through the county by truck, particularly on I-70 and I-81, which cross the county from west to east and north to south. Given the projected increase in truck traffic over the next several decades, the potential for transportation accidents involving hazmat will increase significantly. The 2002 *Washington County Comprehensive Plan* projects that nearly 5 million trucks will travel on I-81 and nearly 2 million trucks will travel I-70 per year by 2020.

The municipalities most susceptible to transportation Hazmat incidents include Hagerstown and Williamsport which are adjacent to I-81, and Hancock, Clear Spring, and Funkstown which are adjacent to I-70. In addition, Hagerstown, Williamsport, Smithsburg and Hancock are adjacent to or in close proximity to rail lines.

The 2013 *Washington County Commodity Flow Study* indicates that there are roughly 114 trucks that carry hazardous materials during peak hours and 90 during non-peak hours in a 30 and 20-hour sample period of a day along I-68 and I-70. This is roughly 200 in a 50-hour sample period or 96 hazmat-carrying trucks in 24 hours.

HISTORICAL OCCURRENCES

The Pipeline and Hazardous Materials Safety Administration reports 1308 incidents happening in Washington County from 2000 to 2017. The National Response Center reports 129 incidents from 2000 to 2017.

The most costly event, according to the PHMSA data, occurred on October 20, 2004 in Hagerstown costing around \$25,000. The incident occurred when a driver made delivery to the wrong property causing oil to spill into a basement. The driver called the service department to lay down sorbent dust. The rest of property mitigation was handled by an environmental cleanup company.



VULNERABILITY & IMPACTS

TABLE 2.2.5.A HAZMAT CONSEQUENCE ANALYSIS	
Type of Impact	Description
Public /Responder Health and Safety	Responders must be aware of the type of substance they are dealing with; each substance has different characteristics that affect humans in different ways, for example, moderate to severe skin and/or eye irritation, burns, toxic inhalation hazard, explosiveness, etc. First responders, through proper channels, should advise the public of the type of hazard that a substance may pose.
Continuity of Operations (incl. Delivery of services)	Typically, soon after an incident, or even during one, a business or facility can continue to operate. For incidents involving transportation, there may be issues with flow of traffic through and around a city, town, or highway.
Property, Facilities, And Infrastructure	Property, facilities, and infrastructure will be affected differently depending on the type of substance.
Economic Condition	Hazmat incidents will mostly occur at businesses or to companies who are involved in transportation. The responsibility of cleanup of a hazmat incident is of the entity to which the product belongs.
Environmental	Environmental impacts include reduced air quality, runoff from firefighting efforts and substances that can reach water sources and pollute groundwater, and death of flora and fauna, if incident is severe.

LOSS & DAMAGES

According to data from PHMSA, since 2000, there have been approximately 1,300 incidents involving hazardous materials, costing nearly \$336,000 in Washington County. Of those, 82 cost \$1,000 or more and 9 cost \$5,000 or more. This amounts to an average of no more than around \$260 per incident.

PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.5.B HAZMAT RISK CALCULATION					
Probability		+	Severity	=	Risk
FREQUENT			MARGINAL		MEDIUM HIGH
Events	1,437		Because the average cost of an event according to data from PHMSA is lower than \$260, and historically there have rarely been injuries or deaths, the severity of his hazard may not be as high as expected.		The risk for hazardous materials in Washington County is medium high.
Years	18				
= 80					
PHMSA and the NRC reported 1,308 + 129 events from 2000 to 2017. These numbers were added to calculate the probability. This gives an average of 80 reported incidents per year, a frequent occurrence.					

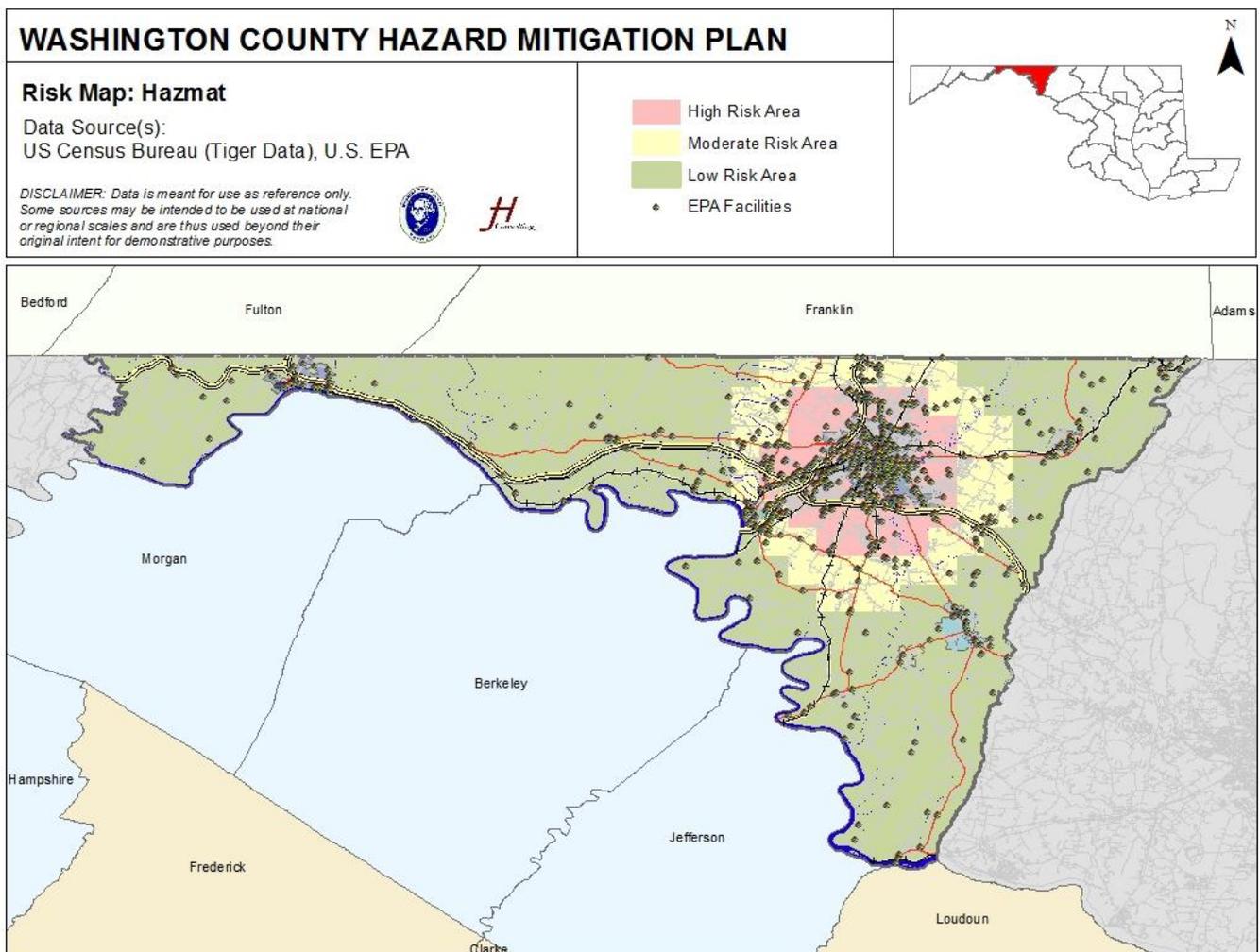
COMMITTEE INPUT

The Washington County Hazard Mitigation Plan update committee took the time to describe some instances of hazmat incidents in their community. These are as follows.



- **Interstate Highways:** The probability is high for incident with major evacuations due to what is handled through this county. No major incidents yet.
- **Hagerstown:** The reduction in trained hazmat personnel is limiting ability to handle a sustained incident.
- **Sharpsburg:** There is one water plant with an intake on the Potomac River which is susceptible to hazmat spills in the Potomac.
- **2015:** I-81 NB at mile marker 8 involving a radiological motor vehicle collision.

RISK MAP



2.2.4 FIRE: MAJOR FIRE, EXPLOSION & WILDFIRE

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>2017 Washington County Risk Assessment</i>	<i>2016 State of Maryland Risk Assessment</i>
At any time	Minutes	MEDIUM HIGH	MEDIUM (Wildfire Only)

2017 UPDATE

Chapters 16: *Major Fire/Explosion* and 17: *Wildfire* from the previous mitigation plan were combined into one profile for this plan update. The historical occurrences were updated to reflect changes in the past five years. New maps and social vulnerability descriptions are included in this update.

HAZARD OVERVIEW

The field of Emergency Management came into being as a way to coordinate fire control activities. Fire insurance itself dates back to when attempts were made to alleviate the damage from fires during the early settlement of the colonies in New England.

Fire is defined as the state, process, or instance of combustion in which fuel or other material is ignited and combined with oxygen, giving off heat, light and flame. An explosion is defined as an expansion with violent force of materials through a chemical change or through decomposition. A wildfire is defined as any large fire that spreads rapidly and is difficult to extinguish

<i>Station</i>	<i>Department</i>	<i>City</i>
City #1	First Hagerstown Hose Co	Hagerstown
City T#1	Pioneer Hook & Ladder Co	Hagerstown
City #2	Antietam Fire Co	Hagerstown
City #3	Independent Junior Fire Co	Hagerstown
City #4	Western Enterprise Fire Co	Hagerstown
City #5	South Hagerstown Fire Co	Hagerstown
1	Sharpsburg Vol Fire Co	Sharpsburg
2	Williamsport Vol Fire & EMS Co	Williamsport
4	Clear Spring Vol Fire Co	Clear Spring
5	Hancock Vol Fire Co	Hancock
6	First Hose Co of Boonsboro	Boonsboro
7	Smithsburg Community Vol Fire Co	Smithsburg
9	Leitersburg Vol Fire Co	Leitersburg
10	Funkstown Vol Fire Co	Funkstown
11	Potomac Valley Vol Fire Co	Sharpsburg
12	Fairplay Vol Fire Co (CLOSED)	Fairplay
13	Maugansville Goodwill Vol Fire Co	Maugansville
16	Mt. Aetna Vol Fire Dept.	Mt Aetna
19	Sharpsburg Area EMS	Sharpsburg
25	Washington Co Air / Rehab Units	Hagerstown
26	Vol Fire Co of Halfway	Halfway
27	Long Meadow Vol Fire Co	Hagerstown
49	Clear Spring Vol Ambulance	Clear Spring
59	Hancock Rescue Squad	Hancock
69	Boonsboro Ambulance & Rescue Services	Boonsboro
75	Community Rescue Service	Hagerstown
79	Smithsburg EMS	Smithsburg

Source: www.marylandfirefighters.com



Washington County is no different than other rural counties throughout the country, having a network of volunteer fire companies whose primary role historically has been to suppress fires and minimize damage to life and property as a result of these fires.

In May of 2017, Washington County acquired a state-of-the-art air unit. Air units are designed as a station where firefighters refill their self-contained breathing apparatus bottles. This unit can be deployed not only for fires, but also hazmat incidents, and cave entrapments, among others (Heim, 2017).

POSSIBLE CAUSES

The National Park Service lists several possible causes of wildfires including human-caused and nature-caused. Human-caused fires “result from campfires left unattended, the burning of debris, negligently discarded cigarettes and intentional acts of arson”, which account for up to 90% of fires. Lightning or lava causes the remaining 10% of fires (NPS).

In Washington County, the majority of wildfires since 2010 have been caused by debris burning, followed by arson, confirming the NPS’s data of mostly human-caused events.

LOCATION & EXTENT

Because more than 35% of Washington County’s land surface is covered by forests, wildfire is a major concern. With 22,000 acres of forest in high fire risk areas owned by the State of Maryland, particularly in the mountains between Sideling Creek and Clear Spring, and on South Mountain, the Department of Natural Resources takes a leading role in fire suppression throughout the county.

All municipalities in Washington County share the threat of fire to residential, commercial or other structures. The municipalities that are near the Norfolk Southern and CSX rail lines face the threat of fire or explosion from a transportation incident while Hancock, Clear Spring, Hagerstown, Funkstown, and Williamsport have the possibility of a similar incident along I-70 and I-81.

Fires and explosions can occur at any time and in any location in Washington County where buildings with gas lines or tanks are present.

HISTORICAL OCCURRENCES

The Maryland Department of Natural Resources maintains annual wildland fire reports for the state. The available reports are between the years of 2010 and 2015. The



reports break out the data by regions; Washington County is part of the western region of the state. Data available from the reports is presented in the following table. Generally, wildfires in Washington County occur during March and April, mainly caused by burning debris. 2015 was the year that most acres burned in the western region, in which Washington County accounted for most of the acreage burnt in the region. From 2010 to 2015 there have been 11 wildfires in Washington County.

TABLE 2.2.4.B WILDFIRES IN WASHINGTON COUNTY						
<i>Year</i>	<i>Month</i>	<i>Fuel Type</i>	<i>Acres Burned</i>	<i>Total Acres Burned in Western Region</i>	<i>Percentage of Regional Acreage Burned by Washington County</i>	<i>Main Fire Cause in State</i>
2010	March	Grass	9.2	143.7	63.12	Arson
	April	Grass	81.5			
2011	March	Grass	33.5	148.4	40.77	Debris Burning
	April	Grass	27			
2012	March	Grass	37.8	183.8	34.17	Arson
	April	Grass	25			
2013	April	Grass	161.5	287.4	71.33	Debris Burning
	April	Grass	43.5			
2014	March	Grass	22	225.1	56.46	Debris Burning
	April	Grass	105.1			
2015	April	Grass	17.5	123	99.67	Debris Burning
Totals			563.6	123		

Source: Maryland Department of Natural Resources Annual Wildland Fire Reports

The Harold Mail Media reports daily Hagerstown Fire Department calls. A 20-day sample was taken and analyzed. The following table details the results. The majority of calls that fire departments receive are not related to fire, but medical or injuries. Only a small percentage are actually relating to outside, vehicle, house, apartment, or building fires; there is no detail available from wildfire response, but it could be categorized as “outside” fires.

TABLE 2.2.4.C HAGERSTOWN FIRE DEPARTMENT CALLS			
<i>Type of Call</i>	<i>Total over 20 Days</i>	<i>Average Daily</i>	<i>Percentage of Total Calls</i>
Medical Emergency / Personal Injury	113	6	49%
Other (assist PD, public service, fuel spill)	30	2	13%
Assist other FD	27	1	12%
Automatic Fire Alarm	26	1	11%
Outside, Vehicle, House, Apartment, Building Fire	19	1	8%
Gas Leak / Odor Investigation / Furnace Malfunction	14	1	6%
Total	229	12	

Source: Harold Mail Media



It is more difficult to accurately quantify the amount of explosions that have occurred in Washington County; however, there have been some instances of explosions around the county as reported by various media outlets.

- On February 19, 1990, there was an explosion caused by a natural gas leak at a motel in Hagerstown. The explosion threw debris as far as 300 feet from the building killed four people and caused ten people to be treated for smoke inhalation and minor injuries.
- On August 25, 2016, a propane gas leak was to blame for a residential explosion where a \$1.5M house was reduced to ashes near Hancock. The explosion overturned various vehicles close to the structure. As many as 60 to 70 firefighters from 25 to 30 units in Maryland, Pennsylvania and West Virginia responded to the call (Dearth, 2016).
- Residents reported an explosion that shook their houses in Fairplay on January 29, 2017. A 911 supervisor said that fire departments and EMS searched the area and could not find the exact location.

Many times explosions occur as a result of a gas leak; as noted previously, firefighters respond to, on average, one call about a reported gas leak or odor. These rarely turn into incidents that involve explosions, but definitely have the potential to cause an incident as evidenced by some of the historical explosions in the county that relate directly back to gas leaks.

VULNERABILITY & IMPACTS

TABLE 2.2.4.D FIRE CONSEQUENCE ANALYSIS	
<i>Type of Impact</i>	<i>Description</i>
Public /Responder Health and Safety	Aside from the obvious injuries such as burns, one of the most dangerous parts of being close or responding to a fire is the inhalation hazard. The table below illustrates the different effects on human health from air that is polluted. See Table 2.2.4.D Air Quality Index below.
Continuity of Operations (incl. Delivery of services)	Major fires, explosions, and wildfires have the potential of partially or totally burning down residences and businesses. One of these could have devastating effects on the continuity of operations if there is no longer a building; therefore it is essential to have a plan in place that addresses the possibility of total or partial loss of a building due to this hazard.
Property, Facilities, And Infrastructure	Properties, facilities, and infrastructure are susceptible to this type of hazard. There is potential for partial or total loss.



TABLE 2.2.4.D FIRE CONSEQUENCE ANALYSIS	
Type of Impact	Description
Economic Condition	If an incident occurs in a residential area, the cost of rebuilding or replacing would fall on insurance companies. However, the cost of fighting the fires falls on each jurisdiction and depending on the severity of the incident is the severity of the cost. This hazard can also adversely affect businesses if incidents were to happen in a place of business.
Environmental	Environmental impacts include reduced air quality, runoff from firefighting efforts that can reach water sources and pollute groundwater, and death of flora and fauna.

The Air Quality Index (AQI) is an index for reporting daily air quality in an area; it informs how clean or polluted the air is. Fires cause smoke that enters the environment and that smoke can cause adverse health effects if there is enough of it. A way to measure the quality of the air is using this index. The U.S. Environmental Protection Agency (EPA) calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide.

For each of these pollutants, the EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country (Air Now, 2016).

TABLE 2.2.4.E AIR QUALITY INDEX SCALE		
Description	Value	Meaning
Good	0-50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51-100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101-150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151-200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201-300	Health alert: everyone may experience more serious health effects.
Hazardous	301-500	Health warnings of emergency conditions. The entire population is more likely to be affected.

LOSS & DAMAGES

In the United States an average of around 6.5M acres burn each year as a result of wildfire. Estimated annual fire suppression costs for federal agencies average \$1.5 billion between 2000 and 2016 (NIFC, n.d.). Most of the acreage involved and the accompanying suppression efforts are in the western states on land managed by the U.S. Forest Service, the Bureau of Land Management, the Bureau of Indian Affairs, the U.S. Fish and Wildlife



Service and the National Park Service. Unfortunately, in recent years, more private property has been affected by wildfires as urban development encroaches on forest and range land.

PROBABILITY & SEVERITY CALCULATIONS

According to data considered above, the Hagerstown Fire Department (not including the other various fire departments in the county) responds to an average of one fire a day and one gas leak/odor a day. That is roughly 365 calls for each, a total of 730 per year. On average, there are two wildfires a year that county fire fighters respond to, not including the help they lend to neighboring communities.

TABLE 2.2.4.F FIRE RISK CALCULATION				
<i>Probability</i>		<i>Severity</i>		<i>Risk</i>
FREQUENT		CRITICAL		MEDIUM HIGH
Although there is data available on amounts of fires, explosions and wildfires, it is difficult to accurately quantify how many Washington County fire departments actually respond to.	+	Because fires and explosions are not typically considered an event that counties can recover costs from the losses are high. Many residential and commercial fires utilize private insurance to cover their costs.	=	The combination of frequent occurrence with critical severity gives this hazard a medium high risk to the county.

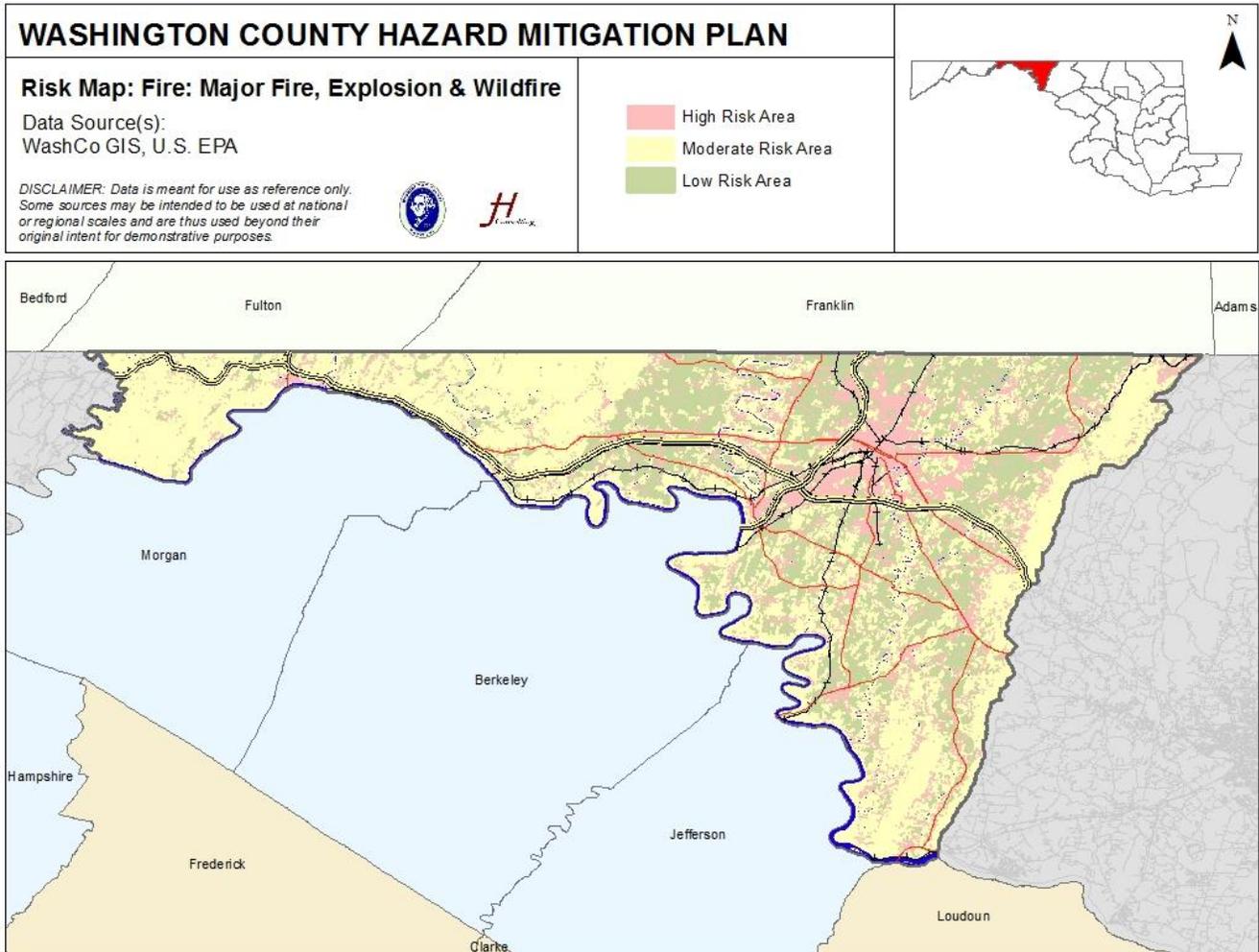
COMMITTEE INPUT

The Washington County Hazard Mitigation Plan update committee took the time to describe some instances of fires in their community. These are as follows.

- **Hagerstown:** There has been a reduction in resources resulting in increased response times to significant fires causing increased fire spread before containment. Single incident coverage.
- **Hagerstown, 2017:** Gloeum Cement had a fire in the cement mill. The problem was attributed to water system failures, limited staffing, and contaminated equipment.
- **Clear Spring:** There was a fire in the downtown area where old homes are connected; several dwellings were lost.



RISK MAP



2.2.6 LAND SUBSIDENCE

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time	Hours to none	MEDIUM HIGH	NOT RANKED

2017 UPDATE

This new profile has combined the previous chapters 9: *Karst Topography* (partial) and 18: *Soil Movement*. The data was updated to reflect changes in the last few years, new maps and sections were added. This profile also contains a brief section on a potential earthquake hazard.

HAZARD OVERVIEW

According to Strahler's Physical Geography, karst topography is prevalent where limestone solution has been especially active. The term "karst" comes from the type of landscape noted along the Dalmatian coastal area of the former country Yugoslavia, but is applied to any limestone area where sinkholes are numerous and small surface streams are nonexistent due to the subsurface drainage system. Examples of karst topography include the Mammoth Cave region in Kentucky and the Yucatan Peninsula in Mexico. In humid areas such as the eastern U.S., carbonic acid removes calcite from limestone by forming calcium bicarbonate which is carried off by groundwater. This chemical process eventually removes vast quantities of limestone and creates the caverns and sinkholes prevalent in karst areas.

A significant portion of Washington County occupies the Great Valley, a limestone belt extending from eastern Pennsylvania through Virginia and Tennessee into Alabama. In Maryland, this belt is approximately 15 miles wide and consists of limestone and shale of Cambrian and Ordovician age (approximately 425-600 million years old). These rock units were folded and faulted during the creation of the Appalachian Mountains (approximately 230 million years ago) and eroded over time into the current landscape.

The most common types of soil movement are the landslide and the slump. According to Strahler's Physical Geography, a landslide typically involves earth and rock that have been disturbed by some other action or been loosened by moisture and subsequently slides downslope. A slump is similar, but involves the slippage of a mass of earth and rock along a rotational axis (slip plane). Usually this mass rotates backward as it



slips downslope. Many small slumps are related to slope disturbance of horizontal or folded rock units during road construction or mining activities. The disturbance of colluvial materials having poor soil characteristics also results in the downslope movement of these materials.

Expansive soils are another common type of soil movement process in Maryland. Expansive soils have a very slow infiltration rate (high runoff potential) when wet. These soils consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission, which in return creates runoff.

Sedimentary rock units alternate between sandstone, shale and limestone which is the prevalent rock type in the Great Valley. When exposed on steep slopes, as shown on Figure 10, normally the sandstone forms the cap rock at the top of the slope with shale or limestone lying underneath. When these weaker rocks are disturbed, the sandstone eventually fails and moves downslope. The slump type of soil movement is most common, particularly in road cuts. While these movements are not normally on a large scale, they do result in road blockage from time to time, particularly where narrow valley floors are shared by a stream and a road or railroad. The table below lists the amount and types of expansive soils that are within the County.

Homes built on expansive soils have the possibility of being structurally damaged due to the shrink-swell properties of this soil type. Best Management Practices (BMPs) for building on expansive soils include: monitoring for extreme changes in soil moisture content and planting trees 15 to 30 feet away from foundations.

<i>Map Unit Symbol</i>	<i>Map Unit Name</i>	<i>Rating</i>	<i>Acres in County</i>	<i>Percent of County</i>
AnB	Andover-Buchanan loams 0-8 percent slopes, very stony	D	275.6	0.1
At	Atkins silt loam	D	1,227.8	0.4
BtB	Brinkerton silt loam, 0-8 percent slopes	D	552.4	0.2
Fa	Fairplay (marl) silt loam	D	1,643.5	0.5
Hh	Hatboro silt loam	D	196.7	0.1
LaB	Lantz-Rohrersville silt loams, 0-8 percent slopes, extremely stony	D	64.6	0.0
Me	Melvin silt loam	D	1,876.4	0.6
RhB	Rohrersville-Lantz silt loams, 0-8 percent slopes	D	891.5	0.3
TyA	Tyler silt loam, 0-3 percent slopes	D	446.5	0.1
TyB	Tyler silt loam, 0-8 percent slopes	D	170.9	0.1
UrB	Urban land, 0-8 percent slopes	D	3,314.7	1.1
UrD	Urban land, 0-25 percent slopes	D	216.0	0.1
Totals			10,876.6	3.6

Source: USDA, Natural Resources Conservation Service



POSSIBLE CAUSES

Mass movements can be secondary effects of heavy rainfall and earthquakes (WHO). Some of the causes attributed to mass movements can include:

- intense deforestation and soil erosion,
- construction of human settlement in landslide prone areas,
- roads or communications lines in mountain areas,
- building with weak foundations,
- buried pipelines, and
- lack of understanding of landslide hazards, and lack of warning systems.

LOCATION & EXTENT

According to the Washington County Soil Survey, those units having a high percentage of calcium carbonate (CACO₃), which readily dissolves in water, include the Pinesburg Station dolomite, the Rockdale Run Formation, the Stonehenge limestone, the Conococheague limestone, the New Market limestone and the Row Park limestone. Soils associated with these limestone units include the Hagerstown-Duffield-Ryder and the Hagerstown-Opequon Groups. These limestone units and associated soils occur essentially in two areas, one extending along the east flank of Fairview Mountain from Clear Spring to Wilson, just west of Conococheague Creek; and the second from Huyett to Chewsville.

The area between Wilson and Huyett extends to the north and south on both sides of Conococheague Creek and is located on the Martinsburg Shale formation which is not susceptible to karst development.

Most of the county's growth area is within the limestone area extending from Huyett to Chewsville. This area includes the municipalities of Hagerstown, Clear Spring, Williamsport, Funkstown and Sharpsburg. Because of the folding and faulting of rock units, this portion of the Great Valley has not had the extreme type of karst development as seen in areas where rock units are essentially horizontal; as is the case in the Mammoth Cave area of Kentucky. However, there is enough uncertainty about the subsurface to raise concerns about the development of sinkholes and subsequent subsidence.

All Washington County municipalities, except Hancock, are located within the Great Valley and therefore are located on limestone bedrock. In terms of karst topography, these municipalities face similar hazards, such as sinkhole and cavern development, as well as the unincorporated part of the Great Valley. In terms of groundwater pollution, the towns of Boonsboro, Keedysville, Hancock, and Clear Spring rely on springs or wells for their water



supply, while Hagerstown, Williamsport, Funkstown and Smithsburg rely on surface water for their needs. The four towns relying on groundwater should closely monitor development that occurs in close proximity to their wells, springs, and recharge areas.

The same geologic conditions that affect the county are also prevalent in the municipalities. Fortunately, with the exception of Hancock, the other municipalities in the county are not located on steep slopes and do not have heavy development pressure for new roads or streets on steep slopes. However, localized soil movement is still possible given the type of rock units present. Hagerstown is the only municipality with a significant amount of expansive soils. This is because of the urban soil component, the upper foot to foot and a half of soil is heavily compacted, creating a highly impervious surface layer.

HISTORICAL OCCURRENCES

Creating an exhaustive list of historical instances of land subsidence would be difficult and beyond the scope of this hazard profile. Mapping from the Maryland Department of Natural Resources/Maryland Geological Survey shows numerous sinkholes throughout the county. There have been numerous anecdotal reports and coverage of sinkholes in the county. An April 2007 article in the Hagerstown Herald Mail discussed the repair of a sinkhole that had depressed an area on the North Hagerstown High School football field by about six inches. A lawn care provider posted videos on YouTube of four sinkhole repairs in the Clear Spring area. Further, as noted below, committee members noted occurrences of sinkholes in various areas of the county.

The United States Department of Agriculture, Natural Resources Conservation Service (NRCS) produces a shapefile mapping layer that depicts several soil features:

- a. escarpment, bedrock;
- b. gravelly spot;
- c. marsh or swamp;
- d. mine or quarry;
- e. rock outcrop;
- f. short, steep slope;
- g. sinkhole; and
- h. wet spot.

According to this layer, a sinkhole is “a closed depression formed either by solution of the surficial rock, or by collapse of underlying caves” (NRCS, 2015). The shapefile presents



data corresponding to these features that occurred between 1998 and 2015. The file shows 368 sinkholes throughout Washington County.

VULNERABILITY & IMPACTS

TABLE 2.2.3.B LAND SUBSIDENCE CONSEQUENCE ANALYSIS	
<i>Type of Impact</i>	<i>Description</i>
Public /Responder Health and Safety	The general public and first responders alike should be aware of the dangers that land subsidence pose, mostly involving injury.
Continuity of Operations (incl. Delivery of services)	Depending on the location of the land subsidence incident, it has the potential to disrupt traffic patterns.
Property, Facilities, And Infrastructure	Mine cave-ins, sinkholes and landslides can affect portions of or whole buildings depending on the severity.
Economic Condition	The cost of repair of any type of land subsidence can vary greatly from one incident to another.
Environmental	Land subsidence activities have the potential to cause erosion and change the landscape or topography of an area.

EARTHQUAKE CONSIDERATIONS

Though not often considered a hazard in the eastern United States, earthquakes do strike the region, sometimes with strong enough magnitudes to cause minor damage. Numerous communities in the Mid-Atlantic region felt a recent earthquake near Louisa, VA (DATE). Further, according to earthquaketrack.com, a 3.0 magnitude earthquake at a depth of 4 km occurred with an epicenter near Ranson, WV (just across the state line from the Washington County area. Recent earthquakes have also occurred within Maryland:

- 1.5 magnitude, 1.2 miles from Havre de Grace on February 4, 2015;
- 2.2 magnitude, 2.2 miles from Maryland City on August 9, 2015; and
- 1.5 magnitude, 7.2 miles from Sykesville on October 30, 2017.

Two earthquakes have been recorded in Washington County, both near Hancock. In September 1962, a 3.3 magnitude quake struck at a depth of 38 km, and in April 1978, a 3.1 magnitude quake struck 15 km in depth.

Given this minimal risk, Washington County compiled a HAZUS-MH run for a 5.0 magnitude earthquake with an epicenter near Hagerstown (39.64, -77.72) at a depth of 10 km. HAZUS estimated approximately 11,836 buildings as at least moderately damaged; an estimated 846 of those could be damaged beyond repair. At the time of such an earthquake, only 26% of hospital beds would be available for use by patients already in the hospital and for those injured by the earthquake. After one week, 48% of the beds would likely be back in service, with 76% operational within 30 days. Two of the county's hospitals, 33 of its



schools, three of its police stations, and eight of its fire stations could be at least moderately damaged by such a scenario. Regarding potable water and electricity service, as many as 30,373 households could lose power and 277 lose water on the day of the event. Water service would likely be quickly restored, but an estimated 39 households could be without power after 90 days. Fourteen bridges could suffer at least moderate damage. As many as 926 people could seek temporary shelter.

LOSS & DAMAGES

Losses associated with land subsidence, specifically sinkholes, are difficult to estimate in a general sense. The specific features of individual sinkholes impact the costs for repair. For instance, Weary (2015) reports that costs totaled approximately \$2,000,000 to repair a sinkhole impacting a roadway in nearby Frederick County, while the 2007 Maugans Avenue sinkhole repair in Washington County totaled \$217,141.

PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.6.C LAND SUBSIDENCE RISK CALCULATION					
Probability		+	Severity	=	Risk
FREQUENT			MARGINAL		MEDIUM HIGH
Events	368	=22	Though the one instance where a dollar estimate was available reports a large loss, it represented repairs to a roadway, which may be more costly than those to structures. Should subsidence impact structures, it may require foundation repairs which, though not potentially as much as the roadway repair, would likely still be significant. As a conservative qualitative estimate, subsidence can cause structural damage.		The risk for land subsidence in Washington County is medium.
Years	17				
The USDA NRCS reported the presence of 368 sinkholes in Washington County between 1998 and 2015. Though these numbers may not capture sinkholes that occurred in that time period, they provide an accurate enough account for estimating purposes, resulting in an average of 22 per year.					

COMMITTEE INPUT

The Washington County Hazard Mitigation Plan update committee took the time to describe some instances of land subsidence in their community. These are as follows.

- **High Karst Area:** Sinkholes develop yearly, no one injured yet.

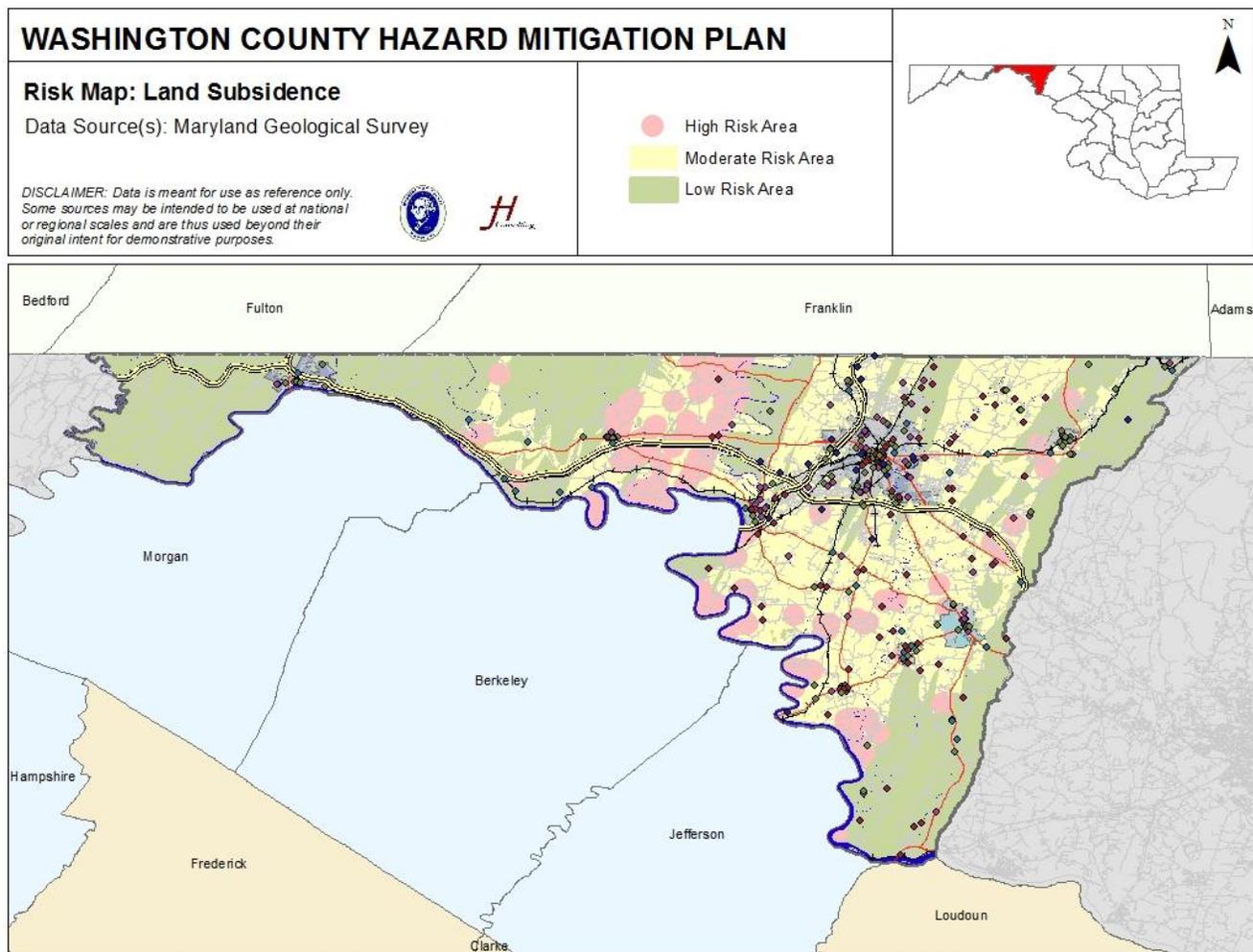


- **Hagerstown:** At the north end of the city, a sink hole developed near a major force main. The sink hole was repaired.
- **March 2017, Keedysville, 11 Millrace Lane:** Three separate sink holes have opened in Keedysville. The last in March of 2017. All were relatively small. No mitigation done.

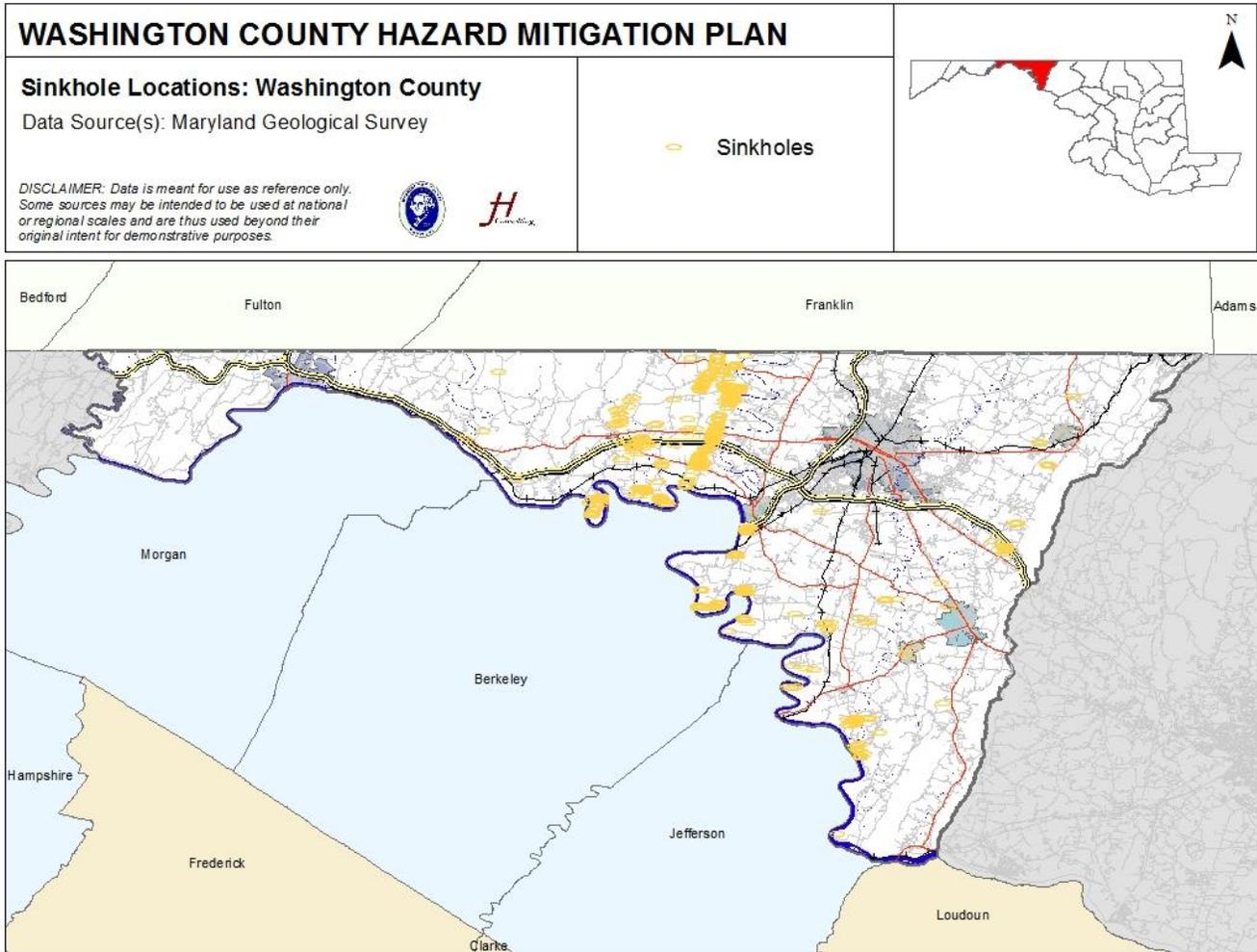
RISK MAP

The risk map section provides an overview map of Washington County depicting risk areas. It also shows sinkhole locations, first on a countywide basis, then municipality-by-municipality.

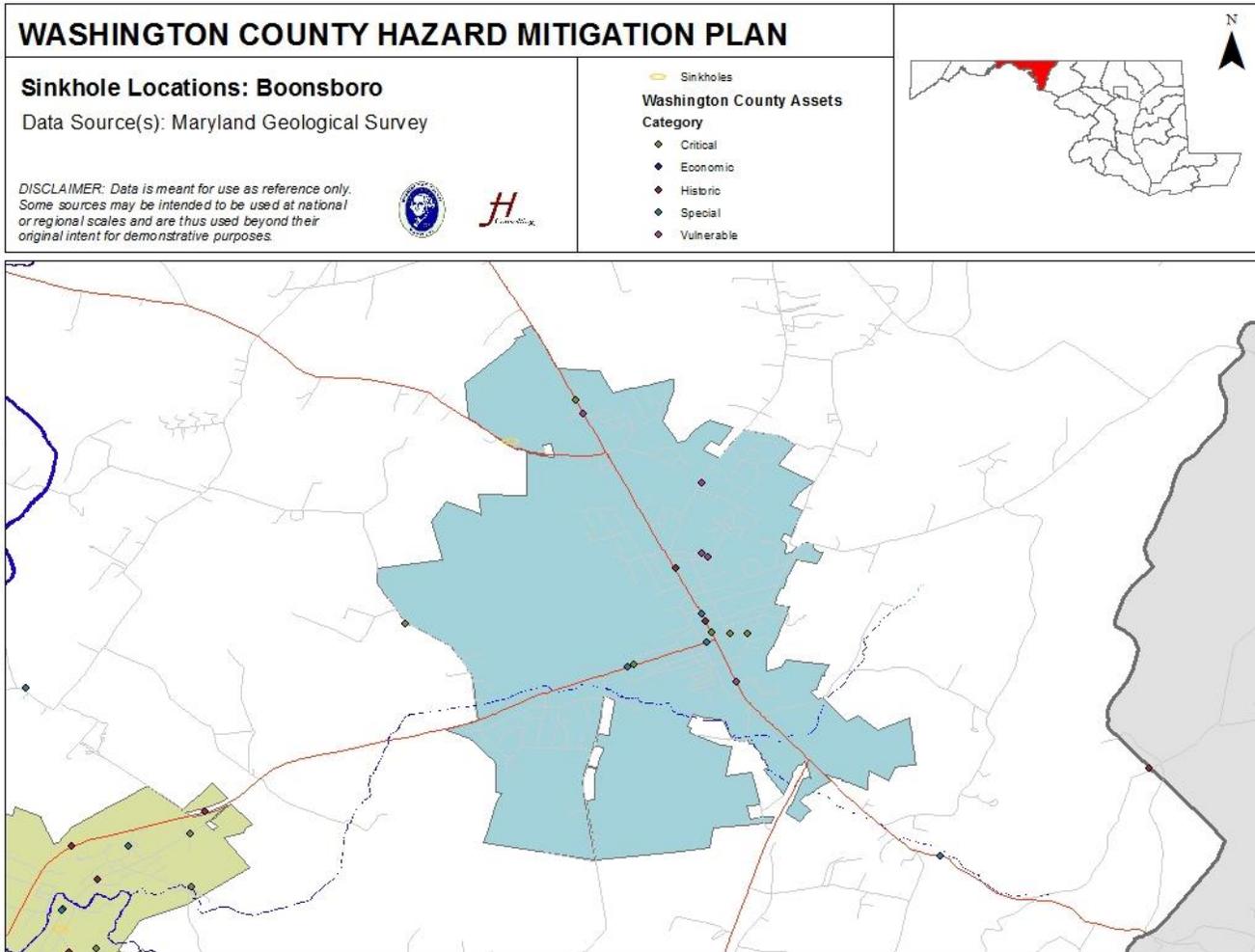
Washington County Overview



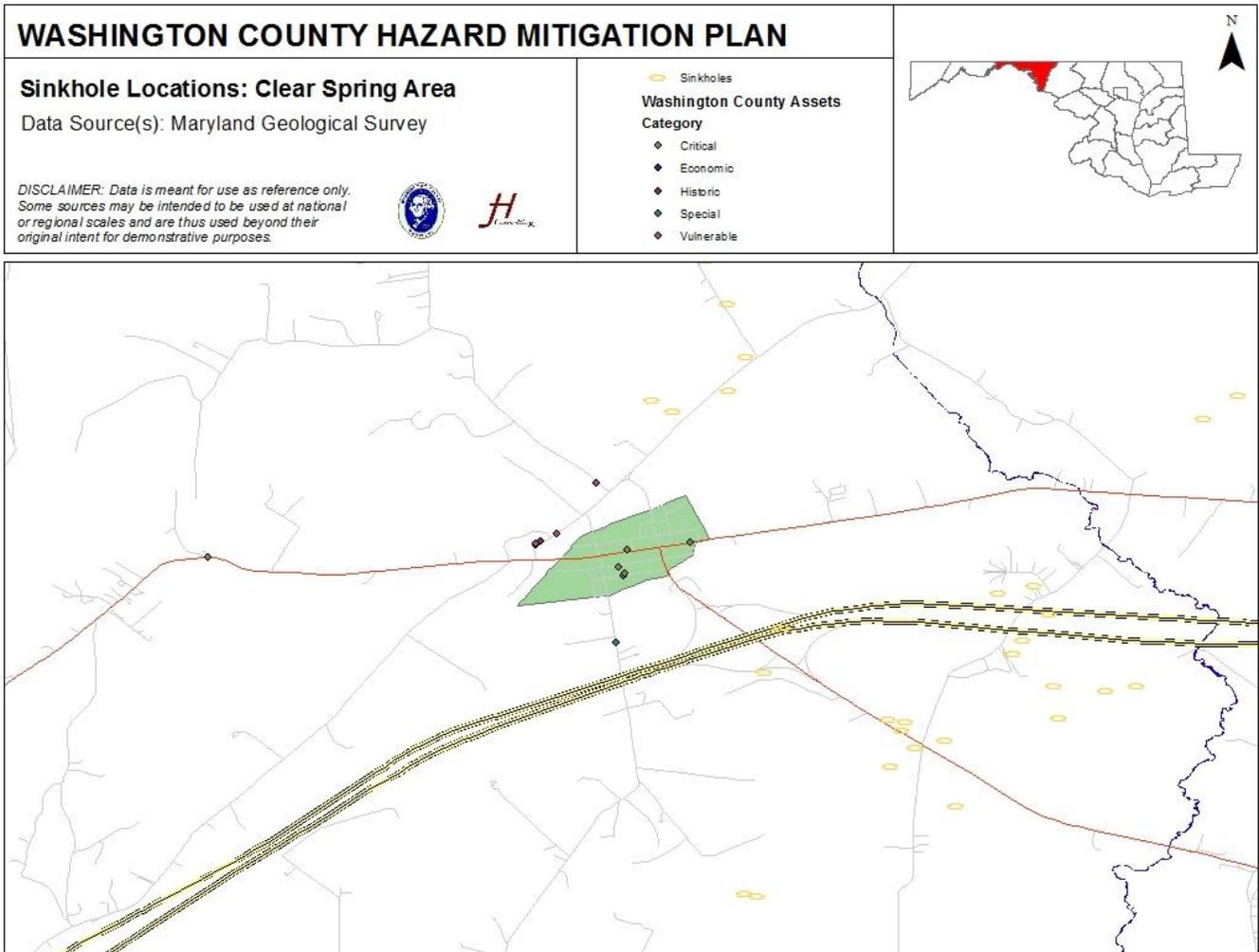
Washington County Sinkholes



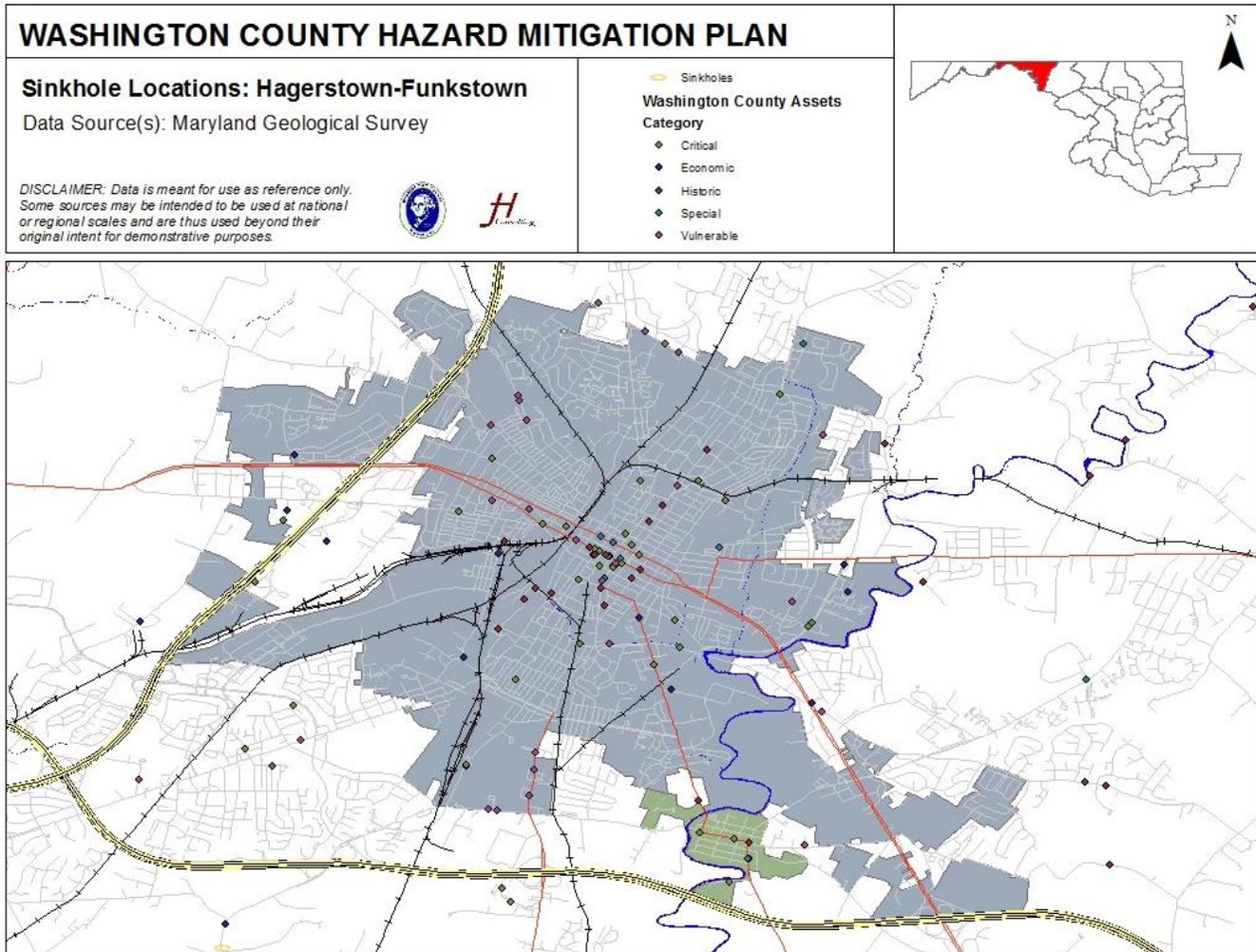
Boonsboro Sinkholes



Clear Spring Area Sinkholes

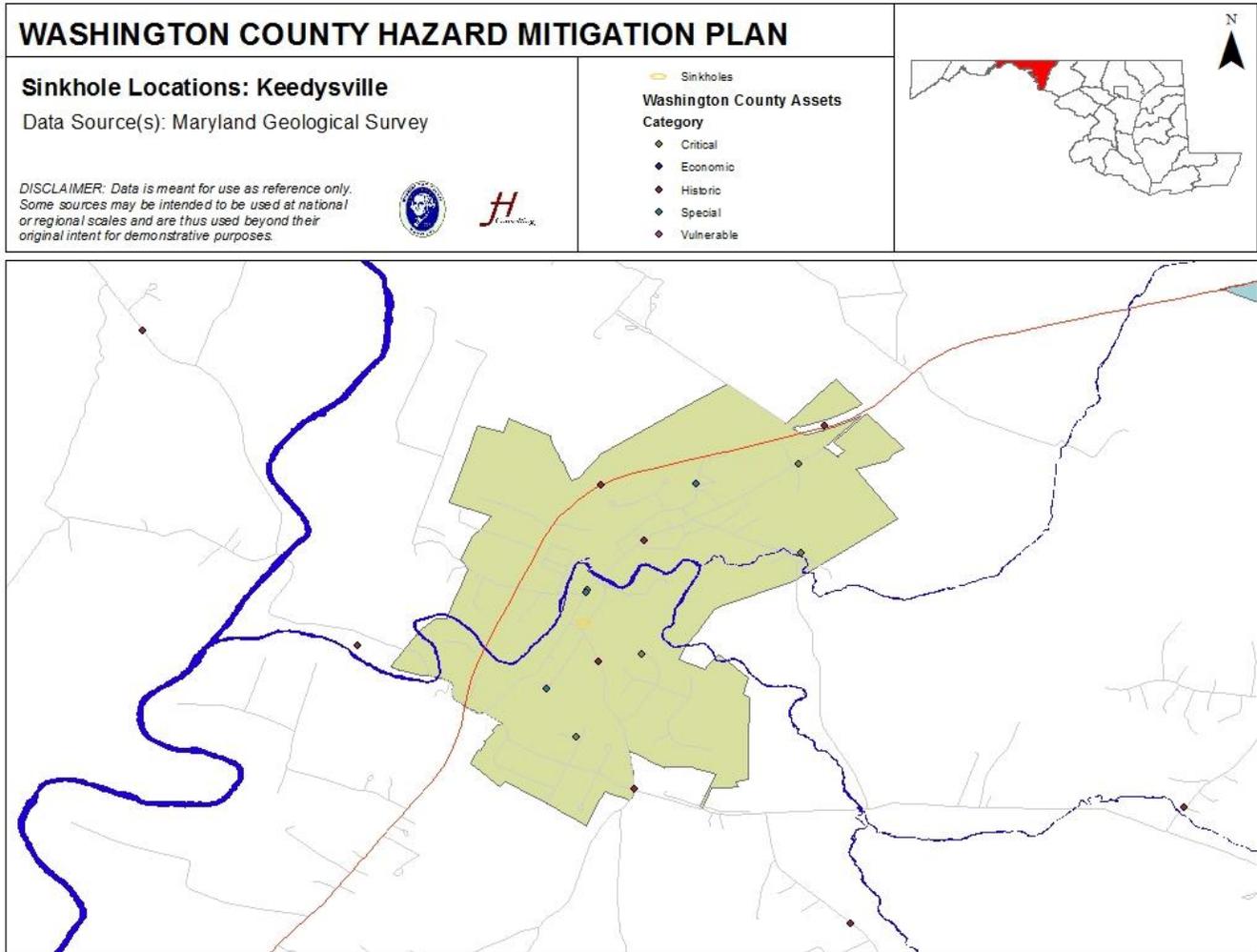


Hagerstown-Funkstown Sinkholes

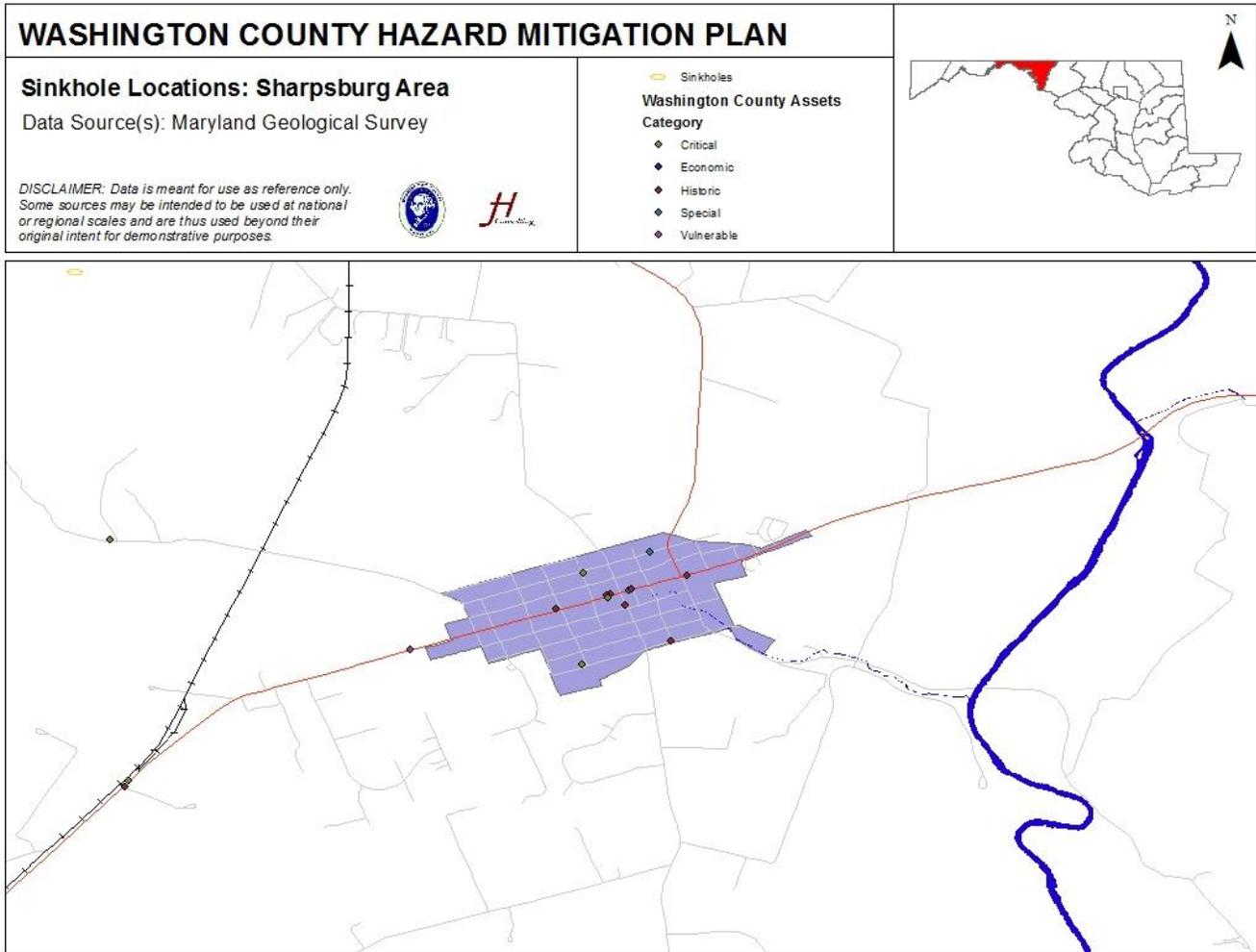


Hancock: The Maryland Geological Survey does not show sinkholes in or near the Town of Hancock.

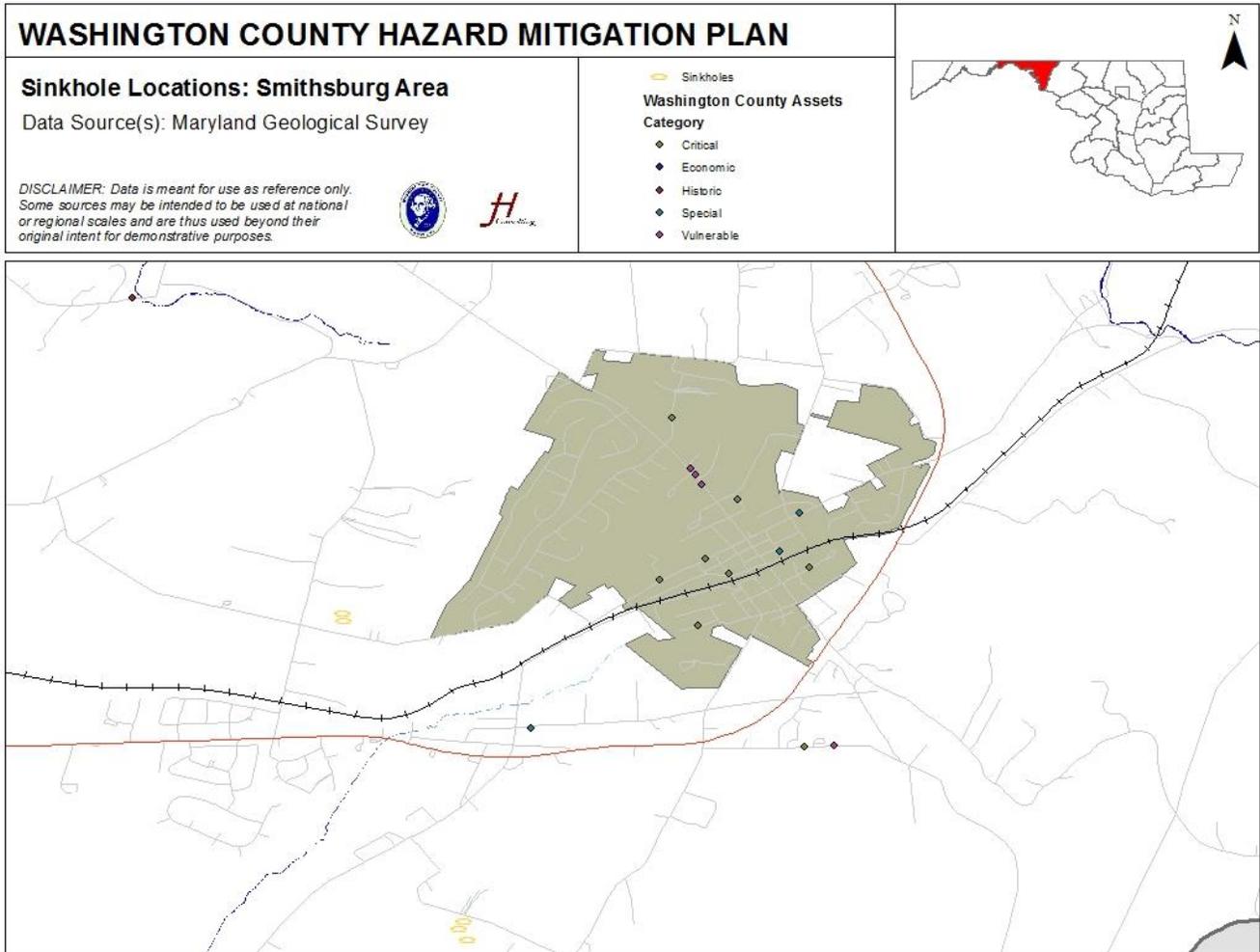
Keedysville Sinkholes



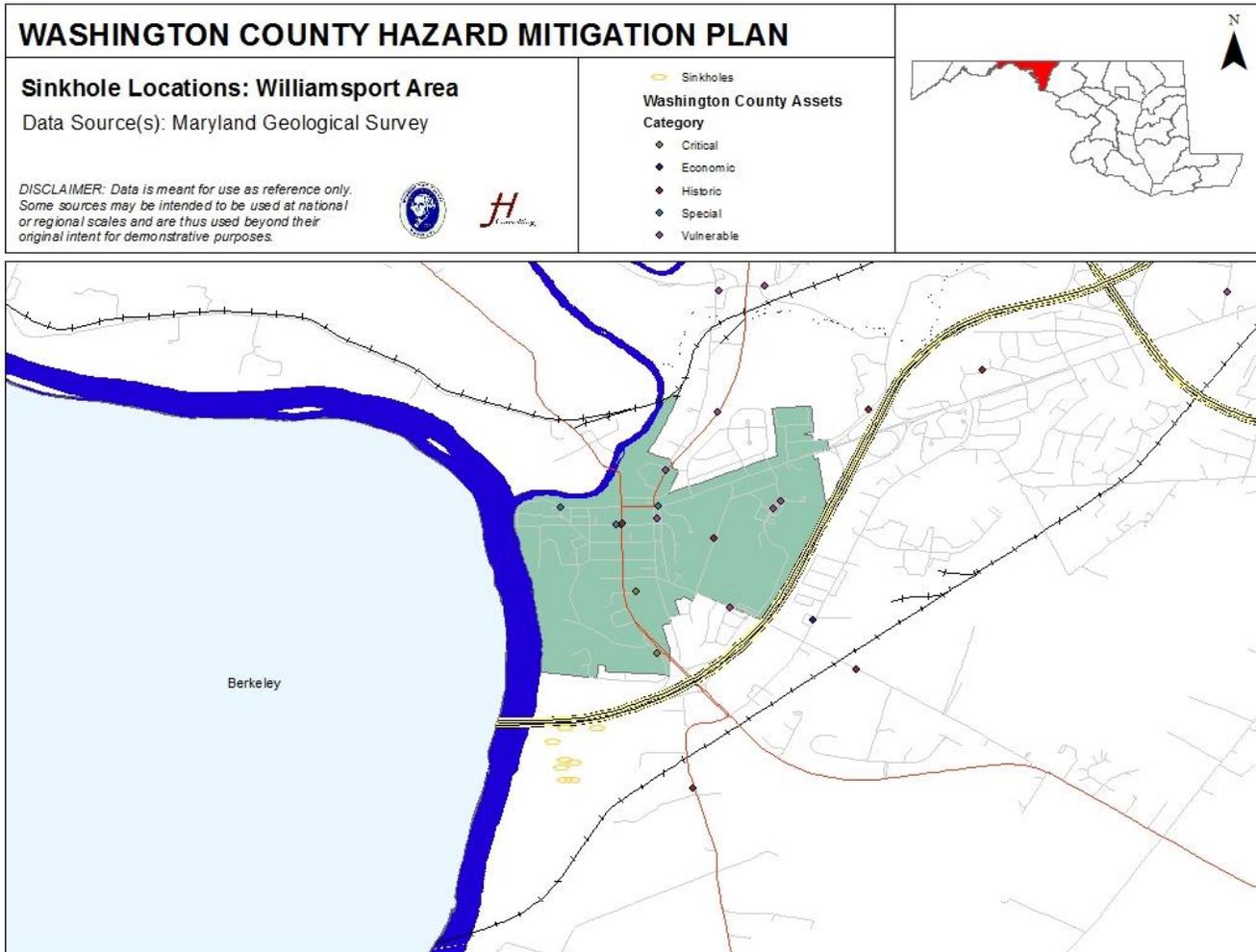
Sharpsburg Area Sinkholes



Smithsburg Area Sinkholes



Williamsport Area Sinkholes



2.2.7 MAJOR TRANSPORTATION ACCIDENT

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time	None	HIGH	NOT RANKED

2017 UPDATE

Previously Chapter 6, this profile has been updated to include up-to-date accident information for the county. New items include possible causes, social vulnerability, loss and damages, and risk calculation.

HAZARD OVERVIEW

In the context of this document, transportation refers to modes of mass transportation including airplanes, railways and roadways, as well as shipping on waterways.

POSSIBLE CAUSES

Major causes of airline crashes are pilot error, mechanical failure and weather. Derailment is by far the leading cause of rail accidents followed by rail-highway crossing incidents.

According to the National Highway Traffic Safety Administration's (NHTSA) 2015 report, 94% of the time, drivers are to blame for accidents; in 2% of cases, the vehicle is at fault, 2% of the time environmental factors are to blame, and 2% of the time the reason is unknown (NHTSA, 2015).

LOCATION & EXTENT

Aircraft accidents can occur at any location, but mainly are confined to airports. Railroad accidents are confined to the rails they travel. Ships and water vessels will have accidents on waterways, and traffic accidents will occur on or near roadways.

HISTORICAL OCCURRENCES

The following pages describe incidents relating to transportation accidents. Data is available from a variety of sources. Aircraft accident reports were generated from data from the National Transportation Safety Board (NTSB), railway accident data was attained from



the Federal Railroad Administration (FRA), and traffic accident data was provided by the Washington County Sheriff's Department in their annual public reports.

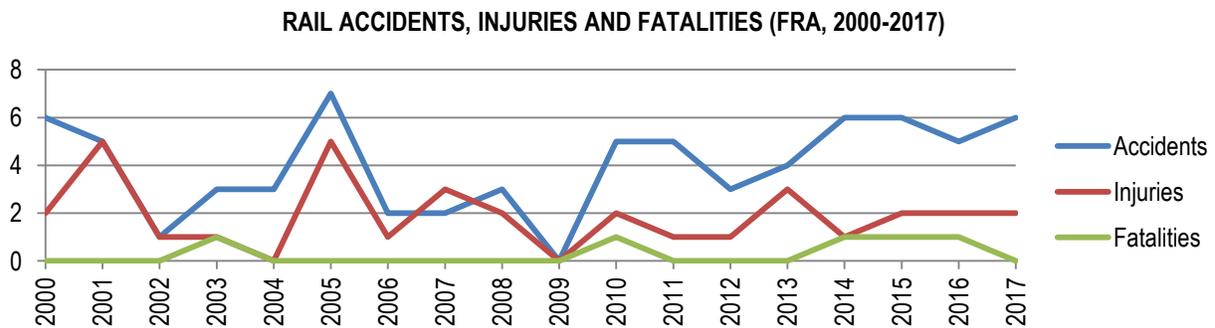
According to data analyzed from the NTSB, the majority of aviation accidents in Washington County have occurred during the spring and summer months, accounting for more than half of the incidents. In total, there have been three fatal aviation accidents in Washington County that accounted for seven deaths and many injuries.

The FRA maintains a database of events that includes information on number of accidents, injuries and fatalities in a

<i>Date</i>	<i>Make/Model</i>	<i>Event Severity</i>
2/15/1982	PIPER PA-28R-180	Non-Fatal
4/1/1984	CESSNA 172H	Non-Fatal
7/5/1985	CESSNA 172H	Non-Fatal
8/27/1989	BEECH C50	Fatal (2)
3/7/1991	PIPER PA-24-250	Non-Fatal
3/22/1991	PIPER PA-24-250	Non-Fatal
1/30/1993	CESSNA 150K	Non-Fatal
3/17/1993	PIPER PA-28R-200	Non-Fatal
11/17/2000	Cessna 172K	Non-Fatal
4/13/2001	Piper PA-34-200	Non-Fatal
6/20/2002	Mooney M20	Non-Fatal
7/26/2002	Beech S-35	Fatal (1)
5/30/2006	Classic Aircraft Corp. Waco YMF	Non-Fatal
7/23/2009	Robinson Helicopter R44	Fatal (4)
7/17/2014	CESSNA 172P	Non-Fatal

Source: NTSB Reports

given year. Between 2000 and 2017 there were a total of 41 accidents, 14 injuries, and 4 fatalities in Washington County (data for 2009 is not available). Although the railroads have made efforts to make rail safer and overall have reduced accidents, in Washington County, data indicates that the trend of accident occurrences has gone up overall since 2000.



Traffic incidents account for the most accidents and fatalities in Washington County when it comes to transportation. Since 2010 alone, there have been 43 fatalities in 41 accidents, and a total of 1,782 injuries. The following tables detail the traffic accident data available from 2010 to 2016 and the top accident locations within Washington County, according to the Washington County Sheriff's Department's annual reports.



TABLE 2.2.7.B TRAFFIC ACCIDENT DATA IN WASHINGTON COUNTY								
Description	2010	2011	2012	2013	2014	2015	2016	Total
Fatal Crashes	7	3	10	5	6	7	3	41
Injury Crashes	277	280	276	236	240	200	273	1,782
Property Damage Only	1,937	1,915	1,603	1,551	1,540	1,683	1,733	11,962
Total Crashes	2,221	2,198	1,889	1,792	1,786	1,890	2,019	13795
Total Deaths of All Fatalities	7	3	11	5	7	7	3	43

Source: Washington County Sheriff's Annual Report

TABLE 2.2.7.C TOP ACCIDENT LOCATIONS IN WASHINGTON COUNTY				
Street Name	2014	2015	2016	Total
Virginia Ave	86	123	97	306
Halfway Boulevard	116	118	137	371
Pennsylvania Ave	70	90	75	235
Dual Highway	50	88	49	187
Valley Mall Road	91	83	122	296
Maugans Ave	39	69	49	157
Massey Boulevard*	35	61	N/A	96
Hopewell Rd	49	46	61	156
Potomac St (Williamsport)*	N/A	40	54	94
Robinwood Dr*	50	N/A	52	102
Oak Ridge Dr*	36	N/A	49	85

* Only streets that appeared more than once on all the reports were included.

Source: Washington County Sheriff's Annual Report

VULNERABILITY & EFFECTS

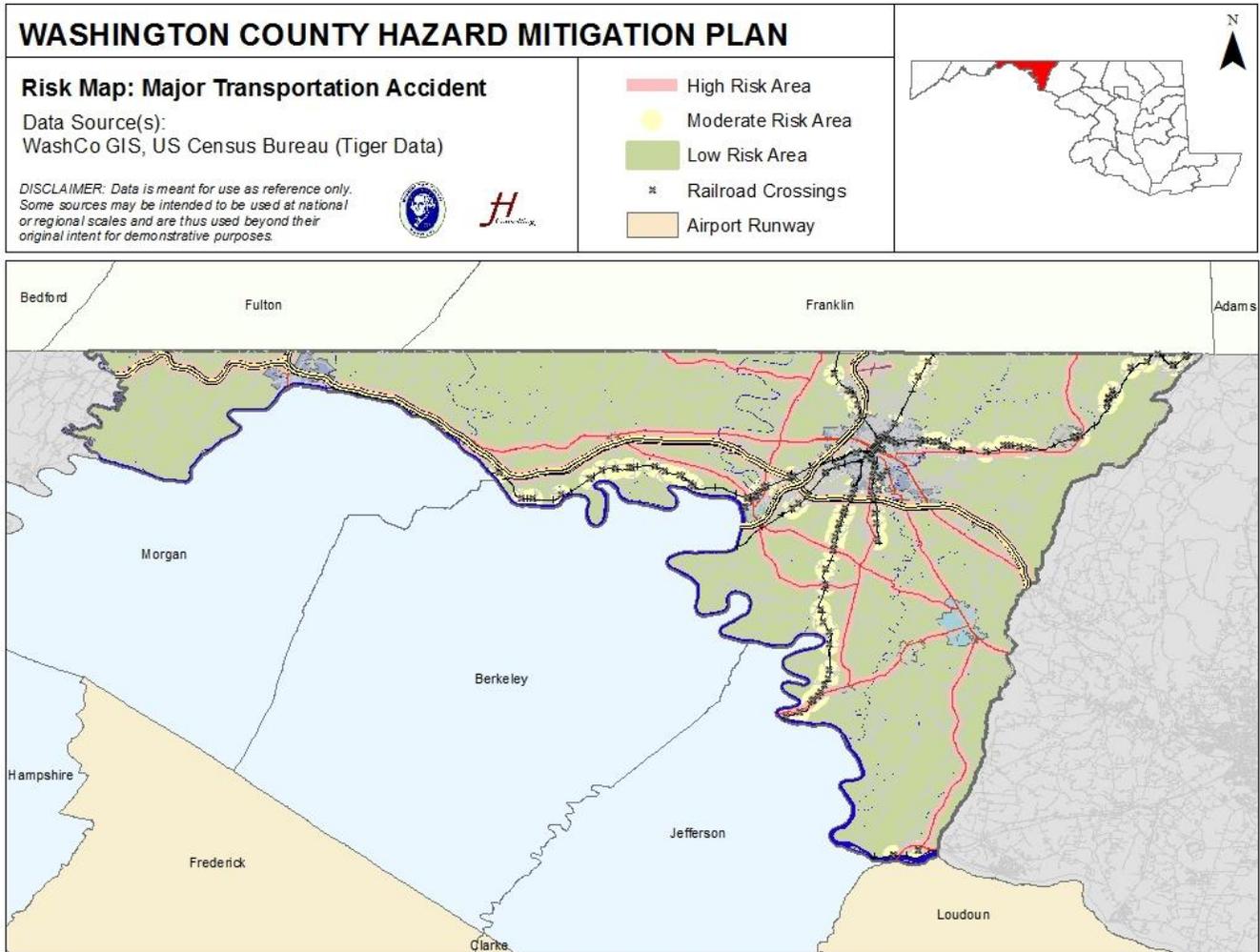
TABLE 2.2.7.D MAJOR TRANSPORTATION ACCIDENT CONSEQUENCE ANALYSIS	
Type of Impact	Description
Public /Responder Health and Safety	Transportation accidents can cause injuries or death to those involved and injuries to first responders in the form of cuts, scrapes, and burns.
Continuity of Operations (incl. Delivery of services)	The effects of a major transportation accident are localized to a specific area, rail or highway, which should be accounted for when implementing traffic rerouting.
Property, Facilities, And Infrastructure	Unless an accident involves a building or facility, the majority of the damages sustained from major transportation accidents will be on the county's infrastructure, mainly minor.
Economic Condition	The economy of this hazard will mainly affect the parties involved, costs of cleanup activities, and costs of first responders.
Environmental	Environmental impacts are minimal. See Section 2.2.5 Hazmat for possible environmental consequences.

LOSS & DAMAGES

Railroads and airlines do not make the loss and damages amounts from accidents available to the public so attempting to calculate the cost of these is nearly impossible. However, the Insurance Information Institute keeps track of claim costs of private auto



RISK MAP



2.2.8 OPIOID EPIDEMIC

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time	N/A	HIGH	NOT RANKED

2017 UPDATE

This profile was not previously considered. It is now included because the Governor of Maryland declared a state of emergency due to the opioid epidemic in early 2017.

HAZARD OVERVIEW

In the United States, what is commonly referred to as the ‘opioid epidemic’, not for being a spreadable or infectious disease, but by acting like one, has grown to alarming proportions. In 2015 alone, 12.5 million people misused prescription opioids. Opioids are drugs that are primarily used for pain relief; they include both legal and illegal substances. Legal, prescribed opioids include oxycodone, hydrocodone, and morphine. Illegal drugs include substances such as heroin and fentanyl. According to the Department of Health and Human Services, 2.1 million people misused prescription opioids for the first time, over 33K people died from overdosing on opioids, over 15K deaths were attributed to overdosing on commonly prescribed opioids. Around 828K people used heroin, 135k for the first time, and around 20k deaths were attributed to overdoses of synthetic opioids or heroin (HHS, 2017).

This is a problem that is affecting every state in the nation. On March 1, 2017, Maryland Governor Larry Hogan announced a state of emergency to expand and coordinate resources to combat the opioid epidemic, consistent with the previously-announced 2017 Heroin Prevention, Treatment, and Enforcement Initiative – a multi-pronged strategy to tackle the evolving threat of heroin and opioid addiction. Efforts are coordinated by Maryland’s emergency management authority with other state and local jurisdictions, as well as private sector and nonprofit entities to ensure whole-community involvement (The Network for Public Health Law, 2017).

The Centers for Disease Control and Prevention conduct studies on prescribing rates. Some of the findings include the following.

- After a steady increase in the overall national opioid prescribing rate from 2006, the total number of prescriptions dispensed peaked in 2012 at more than 255 million and a prescribing rate of 81.3 prescriptions per 100 persons.



- The overall national opioid prescribing rate declined from 2012 to 2016, and in 2016, the prescribing rate had fallen to the lowest it had been in more than 10 years at 66.5 prescriptions per 100 persons (over 214 million total opioid prescriptions).
- However, in 2016, prescribing rates continue to remain very high in areas across the country.
 - In about a quarter of U.S. counties, enough opioid prescriptions were dispensed for every person to have one.
 - While the overall opioid prescribing rate in 2016 was 66.5 prescriptions per 100 people, some counties had rates that were seven times higher than that.
- Prescribing rates for opioids vary widely across different states and counties. Emerging hotspot areas are identified by the darker colors on the maps.

POSSIBLE CAUSES

There are a number of possible reasons why the population has increased their use of opioids. One simple explanation may be that it is easier to get high than it is to get help (Lopez, 2017). This is the culmination of various broken or dysfunctional systems in our society today. The following is a brief description of some of the reasons German Lopez identifies in his article *The opioid epidemic, explained* about why there has been an increase in the use of opioids in the U.S.

- Pharmaceutical companies market their drugs as safe and effective and spend large amounts of money on lobbyists in Washington.
- Doctors are pressured to treat pain more seriously and treat patients rapidly, often times resulting in overprescribing drugs, done with incentives from drug companies.
- Patients with chronic pain issues likely could benefit from alternative, non-opioid treatments but rarely do so due to high costs of or no coverage by health insurance.
- Losing access to legally prescribed painkillers, over time, contributed to the increase in use of illegal drugs such as heroin and fentanyl. A study by JAMA Psychiatry in 2014 found that 75% of heroin users in treatment started with painkillers, while the Centers for Disease Control (CDC) found in 2015 that people who are addicted to painkillers are 40 times more likely to be addicted to heroin.
- As the demand for painkillers increased, so did the demand for heroin; this allowed for people that were not addicted to painkillers before to have easier access.

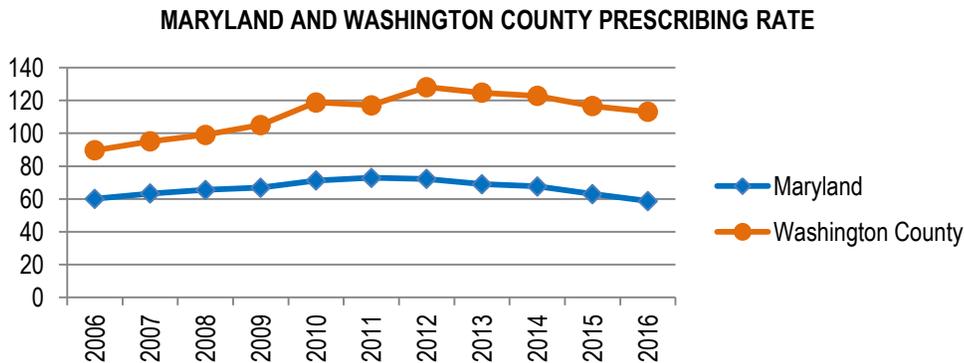


Painkillers at the same time have become less accessible due to the crack down on excessive prescriptions.

- Heroin is stronger (more addictive) than painkillers and fentanyl is stronger than heroin.

LOCATION & EXTENT

The opioid epidemic is one that has, in some way, reached into the lives of nearly every person in the U.S. This “disease” does not have a preference for age, class, economic status, or even gender. It is difficult to pinpoint a specific location of this epidemic. However, the CDC maintains data on states’ and counties’ prescription rates. The following graph illustrates the rate at which the state of Maryland and Washington County prescribe opioids; it indicates that Washington County is above the state average prescribing rate.



HISTORICAL OCCURRENCES

The calculation of historical occurrences for this type of hazard is different from other hazards. The Maryland Department of Health issues annual reports that detail alcohol and drug-related intoxication deaths for every county in the state. Available reports begin in 2007; the most recent is from 2014. Overall, there has been an upward trend in deaths caused by the substances analyzed throughout the years; calculations indicate that overall, there has been a 33% increase in alcohol and drug-related intoxication deaths in Washington County.



TABLE 2.2.8.A DRUG AND ACOHOL-RELATED INTOXICATION DEATHS IN WASHINGTON COUNTY												
Substance	2007	2008	2009	2010	2011	2012	2013	2014	Total	Overall Percentage Increase 2007 to 2014	Average Annual Washington County Deaths	Average Annual State Deaths
Heroin	5	13	11	6	8	11	14	21	89	420%	11	371
Prescription Opioid	7	10	4	7	11	9	11	16	75	229%	9	305
Oxycodone	0	4	3	2	5	2	5	5	26	500%	3	94
Methadone	6	4	0	3	5	4	3	10	35	167%	4	164
Fentanyl	0	0	0	2	1	1	4	1	9	100%	1	52
Cocaine	3	1	0	3	3	5	6	6	27	200%	3	170
Benzodiazepine	1	2	2	2	4	3	2	5	21	500%	3	64
Alcohol	3	10	4	5	4	3	6	11	46	367%	6	194
Totals	25	44	24	30	41	38	51	75	328	33%	41	1,413

Source: Maryland Department of Health and Mental Hygiene Drug- and Alcohol-Related Intoxication Deaths in Maryland

VULNERABILITY & IMPACTS

TABLE 2.2.8.B OPIOID EPIDEMIC CONSEQUENCE ANALYSIS	
Type of Impact	Description
Public /Responder Health and Safety	This hazard is concentrated within the general population. Residents should be aware of higher crime and how to manage and handle people who exhibit addictive behavior. Having a loved one addicted to opioids may cause financial, physical, and emotional stress. First responders can be in danger when responding to overdose incidents due to the nature of unknown drugs and their side effects.
Continuity of Operations (incl. Delivery of services)	Businesses whose employees suffer from addiction may see reduced productivity that could lead to a deficit of available human resources.
Property, Facilities, And Infrastructure	Increase in crime may cause some damage to property.
Economic Condition	The opioid epidemic is becoming more and more costly to residents and governments. Costs include first response activities, hospital care, treatment, etc.
Environmental	Environmental impacts for opioid epidemic are minimal.

LOSS & DAMAGES

According to a Matrix Global Advisors report in 2015, the health care cost of the opioid epidemic in Maryland is of over \$451M, accounting for around 1.8% of the total health care costs in the state, and a per capita health care cost of \$75. These calculations accounted for the population, cost of health care in the state, and the rate of opioid abuse.

The Council of Economic Advisers estimated the cost of the opioid crisis in 2015 to be around \$504B which took healthcare bills, criminal justice costs, and lost productivity into consideration (LaMagna, 2017).

- **Hospitals:** The Beth Israel Deaconess Medical Center in Boston studied the average cost of treating an opioid overdose patient in intensive care units. They found that the



cost between 2009 and 2015 rose 58%. The average cost was around \$92K per patient.

- **Criminal Justice:** state and local governments have incurred costs of nearly \$8B in criminal justice-related activities. Around 45% of addicts will become repeat offenders within three years from their prison release.
- **Businesses:** Absenteeism and decreased job performance due to drug use has cost companies around \$20B.
- **Unseen costs:** Other costs related to drug overdoses that are difficult to quantify include impact on the quality of life, the pain endured by the people affected, loss of tax revenue, etc.

PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.8.C OPIOID EPIDEMIC RISK CALCULATION			
<i>Probability</i>		<i>Severity</i>	<i>Risk</i>
FREQUENT		CATASTROPHIC	HIGH
Based on state data, there is, on average, more than one death a month in Washington County, which does not include the amount of actual opioid users. For this reason, this hazard is a constant threat to the county therefore making it a frequent occurrence.	+	The severity definition table describes catastrophic as having a death or major structural loss. With the opioid epidemic, there is rarely if ever a structural loss. However, this hazard has claimed over 320 lives in the last eight years.	=
			The risk assessment matrix graphs the catastrophic severity and frequent occurrence of this hazard as a high risk to the county.

RISK MAP

The risk to Washington County is the same for all areas, opioids addiction is non-discriminatory; for this reason, the whole county is at high risk.



2.2.9 REPORTABLE DISEASE EPIDEMIC

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time	Days to weeks	MEDIUM HIGH	NOT RANKED

2017 UPDATE

Previously *Chapter 12: Epidemic*, this profile was reformatted, reorganized, and updated to include new section headings. The table of reportable conditions was updated to include health department report case count data from 2010 to 2015. The impact to various entities is described and a new risk map is included.

HAZARD OVERVIEW

According to the Maryland Hazard Analysis, epidemics can be considered as part of a broad hazard category that could be termed “public health emergencies”. In addition to disease epidemics, such events can take the form of large scale incidents of food or water contamination, infestations of disease bearing insects or rodents, or extended periods without adequate water or sewer service. Epidemics may also be secondary to some other disaster such as flood, tornado, and hurricane or hazmat incident. According to the U.S. Centers for Disease Control, in 1997 Maryland ranked high in terms of sexually transmitted diseases, but low for vaccine preventable diseases such as hepatitis B. The Maryland Department of Health (MDH) maintains counts for diseases. The surveillance and reporting of these diseases is the responsibility of the local health department, which investigates and completes reporting both electronically and manually as per MDH regulations.

POSSIBLE CAUSES

Epidemics can develop with little or no warning and quickly erode the capacity of local medical care providers. A fast developing epidemic can last several days and extend into several weeks. In some extreme cases, they can last for several months. An epidemic can occur at any time of the year, but the warm summer months, when bacteria and microorganism growth are at their highest, present the greatest risk.

The overall health of the population can be a factor in assessing the risk to the population. In general, the healthier the population is the less inclined they are to become ill. The general health status score of residents in Washington County is 3.4 (rated from 1 –



poor to 5 – excellent), which is about average. The CDC Behavioral Risk Factor Surveillance System Survey Questionnaires from 2003 to 2012 informed the health of residents. The survey found the following (City-data.com).

- 70% of residents exercised in the past month. This is less than average.
- 45.4% of residents smoked 100+ cigarettes in their lives. This is about average.
- 77.9% of adult residents drank alcohol in the past 30 days. This is about average.

The survey also found that the most common underlying causes of death in Washington County from 1999 to 2014 are the following.

- Atherosclerotic heart disease (5,687)
- Bronchus or lung, unspecified - Malignant neoplasms (4,075)
- Acute myocardial infarction, unspecified (3,659)
- Chronic obstructive pulmonary disease, unspecified (2,932)
- Unspecified dementia (2,223)
- Alzheimer's disease, unspecified (2,002)
- Stroke, not specified as hemorrhage or infarction (1,715)
- Pneumonia, unspecified (1,355)
- Congestive heart failure (1,166)
- Unspecified diabetes mellitus, without complications (1,058)

LOCATION & EXTENT

The statistics for disease and epidemics are gathered on a county basis, municipalities are included in the overall risk analysis performed by the state. An epidemic can affect all parts of Washington County, but is more probable to occur in densely populated areas, such as the City of Hagerstown, particularly large, multi-unit residential developments, and facilities at which a large workforce is employed.

HISTORICAL OCCURRENCES

The following table contains data from 2005 to 2015 available from the Maryland Department of Health regarding reportable diseases in Washington County. The Washington County Health Department reports to the state. In total, there are 81 reportable diseases. The following summarizes the MDH annual reports on notifiable conditions.



TABLE 2.2.9.A CASES OF SELECTED NOTIFIABLE CONDITIONS REPORTED IN MARYLAND

Condition	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Amebiasis	0	0	0	0	1	0	0	0	0	0	0
Animal Bites	299	314	295	334	341	326	363	433	384	305	319
Babesiosis	0	0	0	1	0	1	0	0	0	0	0
Botulism	1	0	0	0	0	0	0	0	1	2	0
Campylobacteriosis	4	5	4	2	9	17	12	17	18	22	28
Chikungunya	ND	3	0								
Chlamydia*	431	411	409	397	392	456	517	490	468	454	496
Cryptosporidiosis	0	0	0	1	0	2	0	3	0	2	2
Dengue Fever	0	0	0	0	0	1	0	0	0	0	0
Ehrlichiosis	1	0	0	0	0	0	0	0	0	0	0
Encephalitis - non-Arboviral	0	0	3	1	0	2	3	1	0	0	0
Giardiasis	3	4	13	3	2	4	10	1	9	10	5
Gonorrhea*	108	120	146	111	69	73	86	55	70	158	179
H. influenzae - Invasive Disease	6	1	1	1	3	1	4	1	6	4	3
Hemolytic Uremic Syndrome post-diarrheal	0	0	0	0	0	2	0	0	0	0	0
Hepatitis A (Acute-Symptomatic)	4	2	7	1	1	0	1	0	0	0	0
Hepatitis B (Acute-Symptomatic)	2	2	2	0	2	1	6	1	2	1	3
Hepatitis C (Acute-Symptomatic)	0	0	0	1	2	0	0	5	5	0	1
Kawasaki Syndrome	0	0	1	1	0	0	0	0	0	0	0
Legionellosis	1	1	1	13	8	5	5	7	3	6	1
Listeriosis	0	0	0	0	0	1	0	0	2	0	0
Lyme Disease	53	50	82	54	87	99	72	66	71	55	34
Malaria	0	0	1	1	0	0	0	0	1	1	0
Meningitis, Aseptic	50	8	34	7	38	16	21	11	7	2	1
Meningococcal Invasive	0	0	2	0	0	0	1	0	0	0	0
Mumps (Infectious Parotitis)	0	0	1	0	0	0	0	0	0	0	0
Mycobacteriosis, Other than TB & Leprosy	9	0	0	10	9	12	9	22	22	20	17
Pertussis	1	2	1	2	4	3	0	3	4	0	0
Pneumonia - Hospitalized Healthcare Worker	8†	0	8†	9†	14†	6†	7†	5†	7†	0	0
Q Fever	0	0	0	0	0	0	1	0	0	0	0
Rabies - Animal	14	15	20	16	18	9	8	11	5	9	10
Rocky Mountain Spotted Fever (RMSF)	0	0	1	0	2	ND	ND	ND	ND	ND	ND
Salmonellosis - Other than Typhoid Fever	17	9	34	15	11	21	25	16	6	17	16
Septicemia in Newborns	0	0	0	0	ND	7	0	0	0	0	0
Shiga toxin producing E. coli (STEC)	0	3	3	1	3	4	5	6	3	1	0
Shigellosis	1	1	1	2	0	0	1	0	0	3	3
Strep Group A - Invasive Disease	3	1	3	4	5	6	9	1	2	2	0
Strep Group B - Invasive Disease	6	6	10	10	13	8	17	19	14	20	18



TABLE 2.2.9.A CASES OF SELECTED NOTIFIABLE CONDITIONS REPORTED IN MARYLAND

Condition	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Strep pneumoniae - Invasive Disease	21	11	25	14	25	21	18	15	16	5	5
Strep pneumoniae - Invasive (Drug Resistant)	0	0	0	0	0	0	1	0	ND	ND	ND
Syphilis - Primary and Secondary*	1	0	0	0	2	1	0	3	0	5	10
Tetanus	0	0	1	0	0	0	0	0	0	0	0
Tuberculosis	3	3	0	1	3	0	1	1	0	1	0
Vibriosis (Non-Cholera)	0	0	0	0	1	0	0	0	1	1	0
West Nile Virus Symptomatic Infections	1	0	0	0	0	0	0	2	0	1	0
Yersiniosis	0	0	0	0	0	0	1	0	0	0	2
Totals	1,048	969	1,109	1,013	1,065	1,105	1,204	1,195	1,127	1,110	1,153

* Sexually Transmitted Infections (STI)

† Highest reported amount in the state for Pneumonia-hospitalized healthcare workers.

Source: Maryland Department of Health Annual Reports

No change from previous year

Decrease in number of cases from previous year

Increase in number of cases from previous year

ND No data available for reporting year

VULNERABILITY & IMPACTS

TABLE 2.2.9.B REPORTABLE DISEASE CONSEQUENCE ANALYSIS

Type of Impact	Description
Public / Responder Health and Safety	Illness and death can be attributed to epidemics. People who work with vulnerable populations such as children or the elderly should take extra precautions. Responders such as health department workers, hospital, clinical, and nursing home workers would potentially be exposed more to an epidemic than the general public.
Continuity of Operations (incl. Delivery of services)	An epidemic could potentially disrupt school, work, and cause medical facilities to have an influx of patients.
Property, Facilities, And Infrastructure	Properties, facilities, and infrastructure would not be affected by an epidemic.
Economic Condition	An epidemic could cause people to miss a few days or weeks of employment which would translate to insurance payments and paid time off in some cases.
Environment	Unless the disease is waterborne and reaches water supplies, an epidemic would not affect the environment.

LOSS & DAMAGES

Losses based on historical epidemic occurrences are difficult to estimate. According to a study by Molinari (2007), seasonal influenza results in a substantial economic impact, estimated, in part, at \$16.3 billion in lost earnings. By population, Washington County represents 0.46% of the United States. Since seasonal influenza primarily impacts the human population, using Washington County's composition of the U.S. as a multiplier (i.e., 0.0046) and applying it to the potential economic impact, lost earnings in Washington County could reach a staggering \$74,980,000 each year. Though that number appears high,



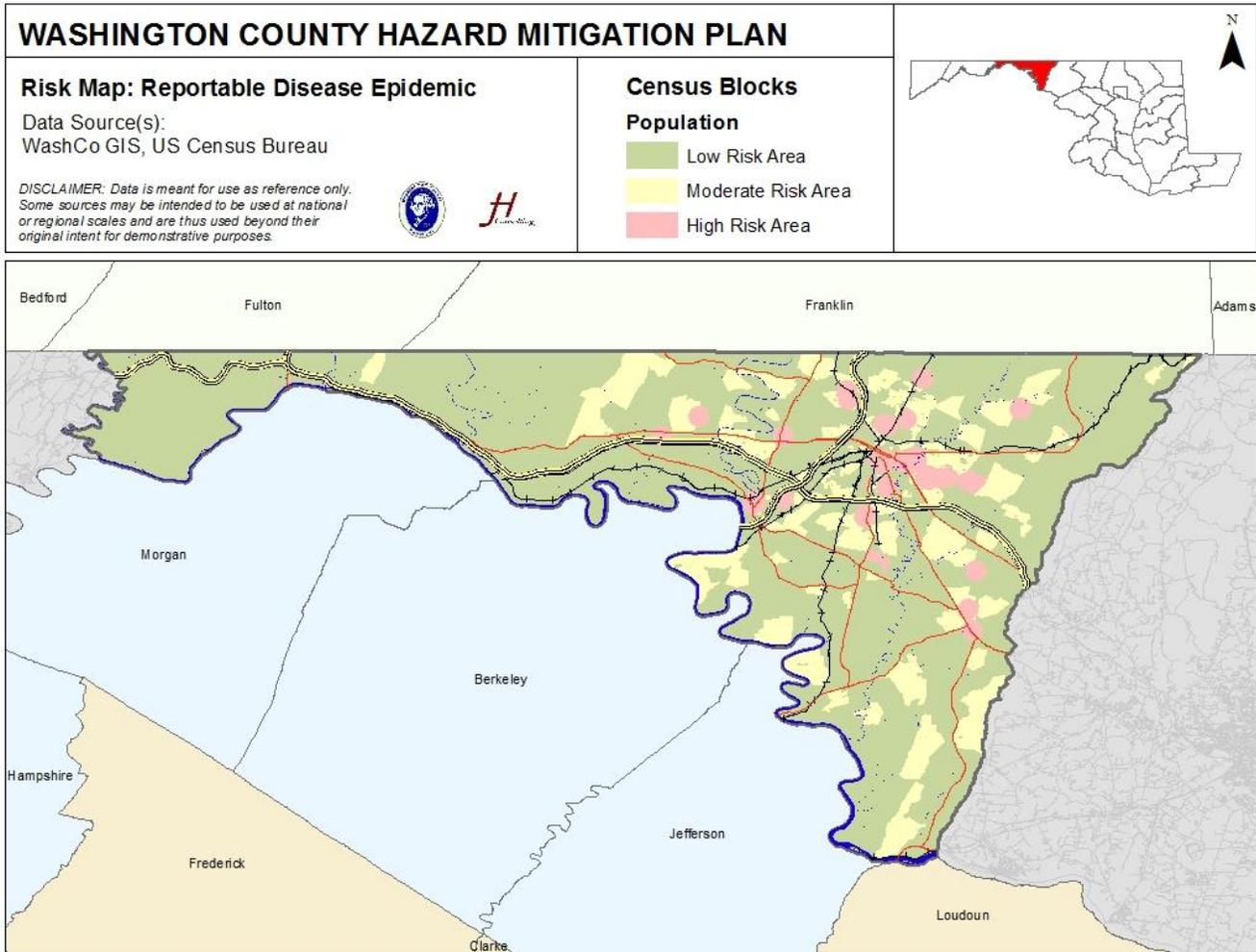
it equates to approximately \$498 per year for each person in the county. Epidemics rarely affect structures. Epidemics may affect people and, at times, the operations of critical facilities, businesses, and other community assets.

PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.9.C REPORTABLE DISEASE EPIDEMIC RISK CALCULATION					
Probability			Severity		Risk
FREQUENT			MARGINAL		MEDIUM HIGH
Events	12,098	=1,099	Prevention activities make a noticeable difference in the preparedness level of the county. With reportable diseases, the county has direct support from state and federal agencies. Many of the diseases noted above are treatable.	=	The risk of a reportable disease epidemic in Washington County is medium high.
Years	11				
The probability of a reportable disease occurrence is extremely high. However, not all of these reportable diseases mentioned above could become an epidemic.		+			



RISK MAP



2.2.10 SEVERE SUMMER WEATHER

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time, typically during summer months	Weeks to days	MEDIUM HIGH	MEDIUM HIGH (Wind) MEDIUM (Thunderstorm) MEDIUM (Tornado)

2017 UPDATE

In the previous plan, all the hazards presented herein were their own chapters; *Chapter 11: Thunderstorm-Lightning*, *Chapter 14: Hurricane*, *Chapter 15: Tornado*. The committee decided to group these hazards as they are mostly occurring during summer months. This profile also includes hail and wind events. New graphics, maps and sections have been added to this update. All the data has been updated to reflect new events within the past five years since the last update.

HAZARD OVERVIEW

For the purposes of this analysis, severe summer weather will include hail, hurricane, lightning, thunderstorm, tornado, and wind events that typically occur throughout the summer months in all regions of Washington County.

Hail

The National Severe Storms Laboratory (NSSL), a division of NOAA, defines hail as “a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into balls of ice” (Severe Weather 101.) Hail can damage aircraft, homes, cars, and can even injure or be deadly to livestock. Obviously, the larger the size of the hail the more potential it has to cause damage or injury. A hot summer afternoon thunderstorm is capable of transforming the landscape from verdant green to icy white with the onset of a hailstorm. The first sign that hail may be arriving is growing whitening among the shafts of rain. Soon a rattling sound is heard as hailstones strike roofs and pavements, and the ground whitens, becoming slippery as hailstones cover grass and roadways. A hailstorm can be the most damaging part of a thunderstorm, inflicting injury to both man and beast, and destroying crops, gardens, and property like a giant pummeling machine.



TABLE 2.2.10.A TORRO HAILSTORM INTENSITY SCALE				
	<i>Intensity</i>	<i>Typical Hail Diameter (mm)</i>	<i>Typical Damage</i>	<i>Example Size Description</i>
H0	Hard Hail	5	No damage.	Pea
H1	Potentially Damaging	5-15	Slight general damage to plants, crops.	Mothball
H2	Significant	10-20	Significant damage to fruit, crops, vegetation.	Marble, Grape
H3	Severe	20-30	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored.	Walnut
H4	Severe	25-40	Widespread glass damage, vehicle bodywork damage.	Pigeon's egg > squash ball
H5	Destructive	30-50	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries.	Golf ball > Pullet's egg
H6	Destructive	40-60	Bodywork of grounded aircraft dented, brick walls pitted.	Hen's egg
H7	Destructive	50-75	Severe roof damage, risk of serious injuries.	Tennis ball > Cricket ball
H8	Destructive	60-90	(Severest recorded in the British Isles) Severe damage to aircraft bodywork.	Large orange > Soft ball
H9	Super Hailstorms	75-100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.	Grapefruit
H10	Super Hailstorms	>100	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open.	Melon

Hurricane

A hurricane is essentially a tropical cyclone which develops over oceans in latitudes between 8 and 15 degrees N and S of the equator where the water temperature is normally over 80 degrees Fahrenheit. Warming of the air at low levels creates instability, and along with an easterly “wave” creates a deep circular low pressure area. Once formed, the storm moves north and west in the northern hemisphere. The diameter of a hurricane may be 100-300 miles with wind velocities more than 75 miles per hour and the barometric pressure in the center or eye of the storm commonly falling to 965 mb or lower. Hurricanes are rated for intensity by using the Saffir-Simpson Scale which gives an estimate of the potential damage that a hurricane may cause based on wind speed and surface pressure. This scale ranges from Category 1 to 5, with Category 1 having winds from 74-95 mph and pressure greater than 980 mb, while a Category 5 hurricane can have winds in excess of 156 mph and pressure of less than 920 mb.



TABLE 2.2.10.B SAFFIR SIMPSON HURRICANE SCALE		
Category	Sustained Winds	Types of Damage Due to Hurricane Winds
1	74-95 mph 64-82 kt 119-153 km/h	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 83-95 kt 154-177 km/h	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 96-112 kt 178-208 km/h	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 113-136 kt 209-251 km/h	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher 137 kt or higher 252 km/h 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.

Lightning

Lightning, high winds, and occasionally tornadoes are associated with thunderstorms. The National Atmospheric and Oceanic Administration defines a thunderstorm as a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud. Lightning has been known to strike up to 6-10 miles from the storm in an area of clear sky. It is estimated that more than 30,000,000 points on the ground in the continental 48 states are hit by lightning in a single year.

Thunderstorm

Thunderstorms are usually high intensity storms of short duration originating in a warm moist air mass that either is forced to rise by mountainous terrain or by colliding with a cooler dense air mass. The process of convection in the atmosphere brings about the release of moisture from the warm air mass as it rises, cools and condenses. This condensation proceeds until most of the moisture in the air mass has been precipitated. Since the motion of the air is nearly vertical, and attains high velocities, rainfall is intense and generally concentrated over a small area in a short time frame. Thunderstorms can be



10-15 miles in diameter and normally last 20 to 30 minutes. The National Weather Service considers a thunderstorm to be severe only if it produces wind gusts of 58 mph or higher, large hail (3/4 in. diameter or larger), or tornadoes.

Tornado

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. Normally thunderstorms and associated tornadoes develop in warm, moist air in advance of strong eastward moving cold fronts in late winter and early spring. Tornadoes can also occur along a “dryline” which separates very warm, moist air to the east from hot, dry air to the west. Both of these scenarios are common in the Central Plains. Another way that tornadoes can be created occurs when warm moist air flows upslope. Under the right temperature and moisture conditions, intense thunderstorms can produce tornadoes

Fujita Scale		Examples of Possible Damage	Enhanced Fujita Scale	
#	3-Second Gust (mph)		#	3-Second Gust (mph)
0	45-78	Light Damage. Some damage to chimneys; break branches off trees; push over shallow-rooted trees; damage to sign boards.	0	65-85
1	79-117	Moderate Damage. Surface peeled off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off roads.	1	86-110
2	118-161	Considerable Damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light-object missiles generated.	2	111-135
3	162-209	Severe Damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; cars lifted off ground and thrown.	3	163-165
4	210-261	Devastating Damage. Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.	4	166-200
5	262-317	Incredible Damage. Strong frame houses lifted off foundations and carried considerable distance to disintegrate; automobile-sized missiles fly through the air in excess of 100-yards; trees debarked; incredible phenomena will occur.	5	Over 200

in higher terrain. Tornadoes can occur in every state, although the mid-west states have by far the greatest potential for this type of event. Tornadoes are ranked by intensity using the Enhanced Fujita (EF) Scale, replacing the original Fujita Scale devised by Dr. Theodore Fujita at the University of Chicago in 1971. This scale is an update to the original scale and is listed in Table 31. The EF scale is broken into 6 categories from F-0 to F-5. F-0 relates to



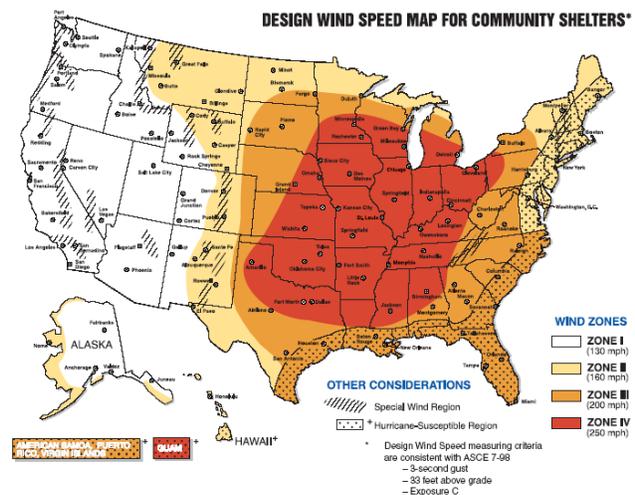
a tornado having a wind speed up to 72 miles per hour, while an F-5 tornado would have winds up to 318 mph.

Wind

“Downbursts” cause the high winds in a thunderstorm. Downburst winds result from the sudden descent of cool or cold air toward the ground. As the air hits the ground, it spreads outward, creating high winds. Unlike tornadoes, downburst winds move in a straight line, without rotation.

A wind event is typically not associated with other hazards, such as thunderstorms. Wind events will have little or no rain associated with them and may last considerably longer than other events like thunderstorm wind and tornadoes. The National Centers for Environmental Information (NCEI) records two types of stand-alone wind events: high wind events and strong wind events. (NWS Instruction 10-1605).

A wind storm is a severe weather condition indicated by high winds and with little or no rain. Localized geographical conditions can exacerbate the damages from high winds and cause increases in wind intensity. According to the above map, Maryland is in Zone III for design wind speed.



POSSIBLE CAUSES

The types of severe weather described in this profile can be significantly altered by human activities. Some of these activities can be described as the following.

- **Urban Heat Island Effect:** a local climatic condition in which a metropolitan area may become as much as 22° F warmer than the surrounding countryside.
- **Burning of Fossil Fuels:** gasses emitted from burning of fossil fuels can linger in the atmosphere contributing to climate changes. (Keller & Devecchio, 2015, p 317).
- **Climate Change:** weather and climate change are closely related to the increase of occurrences in severe weather. For more complete information, refer to section [2.3 Complicating Variables](#).

LOCATION & EXTENT

Thunderstorm activity affects Washington County by both the interaction of warm and cool air masses and by the lifting of warm air as it passes over the Appalachian Mountains. Thunderstorms are more common in the spring when frontal zones are passing over the county from west to east and during the summer months when warm, moist air is lifted over the Blue Ridge and the Ridge and Valley area from the south and west. Intense thunderstorms can result in rapid runoff, particularly in the headwaters of small stream basins and in rapidly urbanizing areas. In urban areas, runoff from stormwater is a problem for downstream property owners when new construction occurs upslope from older developed areas, which have inadequate Stormwater facilities. The municipalities in Washington County face the same threat from thunderstorms as the overall county. In some cases, in older developed areas, inadequate stormwater management contributes to damage from flash flooding in low lying residential areas or in older residential areas downslope from new construction.

With its inland situation, Washington County is not normally as affected by the high winds associated with the passage of a hurricane as a coastal community. However, hurricanes can carry a lot of moisture over the Blue Ridge and the amount of runoff associated with the resulting precipitation can be significant. Hurricanes that track through the Gulf of Mexico or move inland from the Atlantic and then pass over the Appalachians have the greatest potential for excessive rainfall in the mountainous area extending from Alabama to New York.

As is the case with most other weather related events, municipalities in Washington County share the same concerns as the county for tornadoes. The municipalities located in the Great Valley, including Hagerstown, Boonsboro, Funkstown, Keedysville, Sharpsburg, Smithsburg and Williamsport are located on relatively flat land and are probably more susceptible to wind events than municipalities like Hancock and Clear Spring, which are located in a valley setting affording some protection by surrounding mountains.

HISTORICAL OCCURRENCES

The National Oceanic and Atmospheric Administration keeps records of severe summer events. A search for events of this nature between 2000 and 2017 yielded 292 events. There have been approximately 17 hurricanes or tropical storms or depressions that have come very close or have crossed Washington County since 1876. Since 2000, there



have been only two named hurricanes: Ernesto in 2006 between August 24 and September 4, and Sandy in 2012, between October 21 and October 31 (NOAA).

The table to the right outlines the various types of events that the NCEI records and have occurred in Washington County since 2000. For a detailed list of severe summer weather events, refer to [Appendix 3: Detailed Lists of Hazards](#).

TABLE 2.2.10.D SEVERE SUMMER WEATHER EVENTS	
Event Type	Number of Events
Hail	59
Heavy Rain	15
Heavy Wind	19
Hurricane	2
Lightning	5
Strong Wind	17
Thunderstorm Wind	171
Tornado	4
Total	292

Source: NCEI & NOAA 2000-2017

VULNERABILITY & IMPACTS

TABLE 2.2.10.E SEVERE SUMMER WEATHER CONSEQUENCE ANALYSIS	
Type of Impact	Description
Public / Responder Health and Safety	Severe summer weather can exacerbate existing illnesses. Severe summer weather can cause injury and, on rare occasion, death.
Continuity of Operations (incl. Delivery of services)	The cascading effects of severe summer weather such as power and water outages are what most would affect continuity of operations and delivery of services.
Property, Facilities, And Infrastructure	High wind, tornadoes, hail, and lightning have the potential for damaging trees, residences, and infrastructure alike.
Economic Condition	If an event is severe enough, it may cause people to not be able to go to work causing losses for families and businesses. The cost of cleanup activities could be very high after a severe summer event.
Environment	Weather events are part of what keeps the environment as it is; rain provides life to the flora and fauna. In severe events, the wind may cause erosion and downed trees; lightning may cause fires.

LOSS & DAMAGES

Total damages per NCEI 2000-2017: \$4,452,240, around \$15,250 per event. There have been five disaster or emergency declarations relating to severe summer weather since 2000 totaling over \$83 million.



PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.10.F SEVERE SUMMER WEATHER RISK CALCULATION						
Probability		+	Severity	=	Risk	
FREQUENT					CRITICAL	
Events	292		The cost of severe weather events may be high, but rarely do they cause injury or death in the county.		The overall risk of severe summer events to Washington County is medium high.	
Years	18					= 16.2
There are roughly 16 severe weather events every year in Washington County, mostly concentrated in the summer months.						

COMMITTEE INPUT

The Washington County Hazard Mitigation Plan update committee took the time to describe an instance of a severe summer weather event in their community. This was as follows.

- **Hagerstown:** Severe thunderstorms produced heavy rain and strong winds. Results were downed trees, power outages, blocked transportation and property damage.

RISK MAP

The risk map section presents two images. The first is from the National Oceanic and Atmospheric Administration and shows historic hurricane tracks through Washington County (map centered at Hagerstown). Severe storms have often resulted from the remnants of hurricanes. The second image is a map depicting historic tornado tracks in Washington County.



Historical Hurricane Tracks

Search Hurricanes By

Location: City of Hagerstown (Civil), Washing

Radius: 65 Nautical Miles

Refine Search

Results (27)

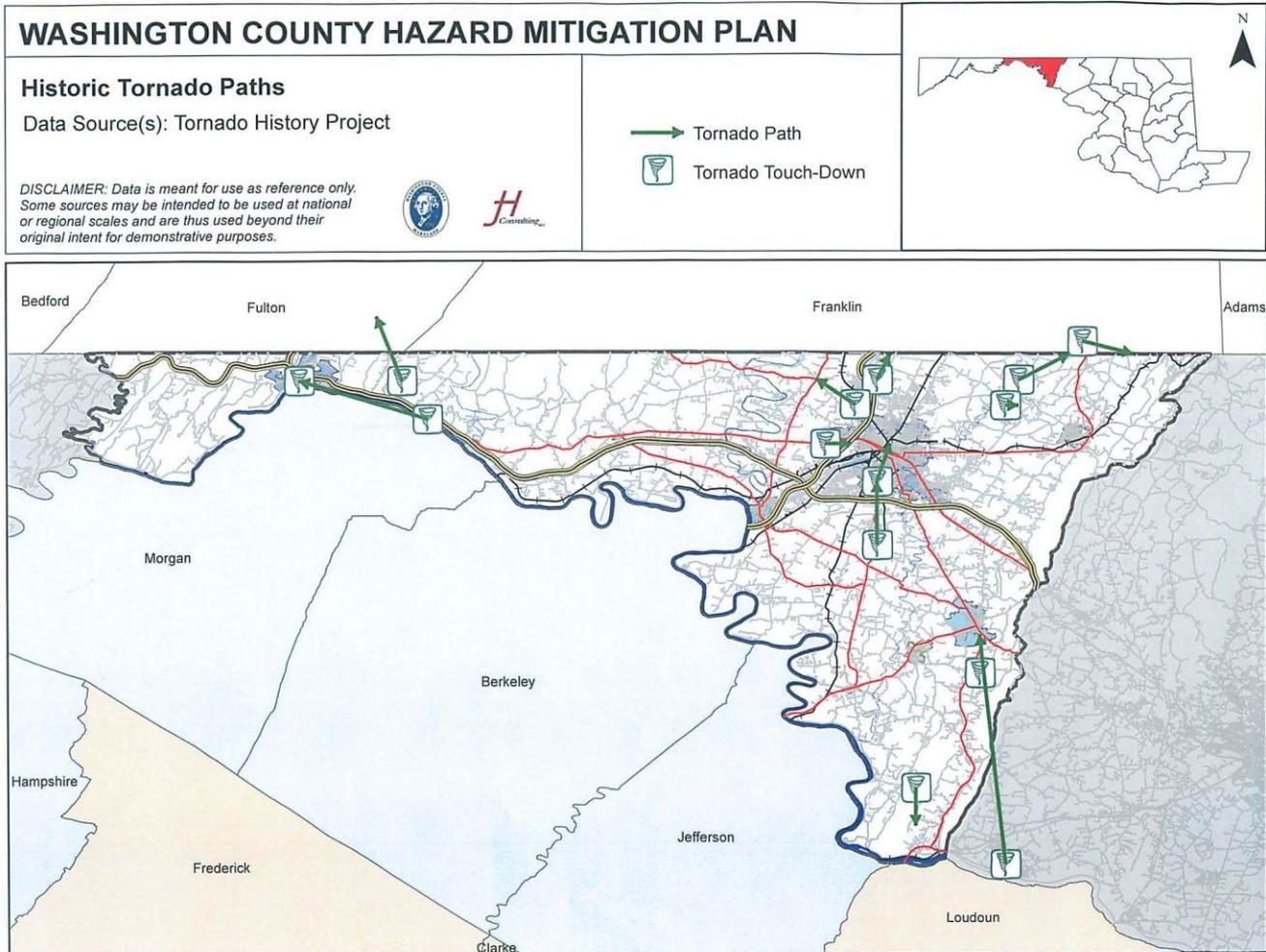
Name	Period
UNNAMED 1893	Aug 17, 1893 to Aug 27, 1893
UNNAMED 1893	Aug 15, 1893 to Sep 02, 1893
UNNAMED 1893	Oct 20, 1893 to Oct 23, 1893
UNNAMED 1893	Sep 25, 1893 to Oct 15, 1893

Pos: 40.43 , -77.87 Search Center: 39.64 , -77.72

United States Department of Commerce | National Oceanic and Atmospheric Administration | National Ocean Service | Website owner: Office for Coastal Management | Last Modified: 7/25/2017



Tornado Paths



2.2.11 SEVERE WINTER WEATHER

<i>Period of Occurrence</i>	<i>Warning Time</i>	<i>Washington County Risk Assessment</i>	<i>State of Maryland Risk Assessment</i>
At any time, typically in the winter months.	Weeks to days	MEDIUM HIGH	HIGH (Winter Storm)

2017 UPDATE

The previous plan's *Chapter 7: Severe Winter Storms* was renamed and now includes more types of winter weather such as blizzards, winter weather, and heavy snow. The historical data was updated to reflect events that have occurred in the past five years since the last update. New maps and sections were added.

HAZARD OVERVIEW

The typical winter storm in Maryland usually brings heavy snowfall (6+ inches), sleet or freezing rain accompanied by cold temperatures and occasionally high winds. Depending on the speed at which these storms travel and the air mass temperature, heavy amounts of snow, sleet, freezing rain or some combination will be the result. Typically, a winter storm will last for 24 to 48 hours and move out of the area into New England. Then, depending on the controlling air mass, temperatures will continue to be cold and the snow or ice will linger for days or sometimes weeks, or, conversely, the temperature will warm quickly and the snow or ice will melt in a short time.

Severe winter weather, for the purposes of this analysis, will include the following types of events that typically occur throughout the winter months in all areas of Washington County.

- **Blizzard:** A winter storm which produces the following conditions for three hours or longer: a) sustained winds or frequent gusts 30 knots (35 mph) or greater, and b) falling and/or blowing snow reducing visibility frequently to less than 1/4 mile, on a widespread or localized basis (NCEI).
- **Ice Storm:** Ice accretion meeting or exceeding locally/regionally defined warning criteria (typical value is 1/4 or 1/2 inch or more), on a widespread or localized basis (NCEI).
- **Winter Storms:** A winter weather event which has more than one significant hazard (i.e., heavy snow and blowing snow; snow and ice; snow and sleet; sleet and ice; or snow, sleet and ice) and meets or exceeds locally/regionally defined 12 and/or 24



hour warning criteria for at least one of the precipitation elements, on a widespread or localized basis (NCEI).

- **Winter Weather:** A winter precipitation event that causes a death, injury, or a significant impact to commerce or transportation but does not meet locally/regionally defined warning criteria. A winter weather event could result from one or more winter precipitation types (snow, or blowing/drifting snow, or freezing rain/drizzle), on a widespread or localized basis (NWS Instruction 10-1605).

POSSIBLE CAUSES

The types of severe weather described in this profile can be significantly altered by human activities. Some of these activities can be described as the following.

- **Urban Heat Island Effect:** a local climatic condition in which a metropolitan area may become as much as 22° F warmer than the surrounding countryside.
- **Burning of Fossil Fuels:** gasses emitted from burning of fossil fuels can linger in the atmosphere contributing to climate changes. (Keller, Devecchio, 2015, p 317).
- **Climate Change:** weather and climate change are closely related to the increase of occurrences in severe weather. For more complete information, refer to section [2.3 Complicating Variables](#).

LOCATION & EXTENT

All areas of Washington County are equally susceptible to severe winter weather events. Although, the amount of snow may vary from slightly more snowfall occurring west to east, but by and large, the towns are similar to the county in terms of winter storm effects.

HISTORICAL OCCURRENCES

An overview of winter storm events in the county is shown in the table to the right. For a full list of NCEI reported events refer to [Appendix 3: Detailed Lists of Hazard Events](#). The following are brief descriptions of severe winter weather events in Washington County; these weather events had emergency or disaster declarations associated with them.

<i>Event Type</i>	<i>Number of Events</i>
Heavy Snow	3
Ice Storm	5
Winter Storm	44
Winter Weather	80
Total	132

Source: NCEI 2000-2017



May 6, 2010 Snowstorm

On April 8, 2010, Governor Martin O'Malley requested a major disaster declaration due to severe winter storms and snowstorms during the period of February 5-11, 2010. On May 6, 2010, President Obama declared that a major disaster exists in the State of Maryland. This declaration made Public Assistance requested by the Governor available to State and eligible local governments and certain private nonprofit organizations on a cost-sharing basis for emergency work and the repair or replacement of facilities damaged by the severe winter storms and snowstorms (FEMA, 2010).

Feb 2-3: Low pressure tracked through the Ohio Valley on the 2nd before emerging off the Mid-Atlantic Coast during the early morning hours of the 3rd. The forcing from the low combined with cold air already in place to produce snow across Maryland during late afternoon hours on the 2nd into the early morning hours of the 3rd. Snowfall totaled up to 5.0 inches in Smithsburg and also near Sharpsburg.

Feb 5-6: A potent area of low pressure strengthened over the central portion of the nation on the fifth of February. The storm system slowly moved through the Mid-Atlantic during the night of the 5th before redeveloping off the Mid-Atlantic coast on 6th. The storm system finally moved away from the area on the night of the 6th. Strong high pressure continued to pump in plenty of cold air across the region for the entire event. Due to the slow movement of the storm, there was a prolonged period of precipitation. The storm system ushered in copious amounts of moisture from the Gulf of Mexico and the Atlantic Ocean. The deep moisture combined with the forcing from the storm system to bring a period of heavy precipitation to the area on the night of the 5th through the daytime hours on the 6th. Precipitation finally ended during the evening hours of the 6th as the storm system moved away. Most of the precipitation fell in the form of snow due to the cold air that was already in place. Major snow accumulations were reported throughout the state of Maryland. A snowfall report of 30.5 inches was received about three miles east-northeast of Hancock. Snowfall totaled up to 26.0 inches near Sharpsburg and also in Smithsburg.

Feb 9-10: A potent area of low pressure tracked through the Midwest on the 9th. As the low approached the Mid-Atlantic coast, this system phased with energy in the southern branch of the jet stream to cause strong low pressure to develop just off the Delmarva Peninsula. The low continued to rapidly strengthen as it moved off to our northeast on the 10th. The system spread snow across Maryland that began on the 9th and lasted into the 10th. Major snow accumulations were reported with this storm, especially across the northeastern portion of Maryland. As the low pressure rapidly intensified, strong winds



caused blowing and drifting snow that led to blizzard conditions across portions of the state. Snowfall amounts were reported between 11 and 17 inches across the county (FEMA, 2010).

The total per capita impact of this storm (calculated from the preliminary damage assessments by multiplying the total 2010 population of the county by the per capita impact of the PDA) was of \$6.44 in Washington County, making the public assistance total \$949,449.20 for the county.

Hurricane Sandy: October 26 to November 4, 2012

Although hurricanes are not typically considered a winter weather event, the case of Sandy is quite different; a cold front from the Arctic collided with the storm and changed the conditions from rain to snow over the states in the Northern Atlantic U.S. NCEI does not report any precipitation for the days Hurricane Sandy passed over Washington County but it does report a flood occurrence on October 30, 2012, during the days of Hurricane Sandy.

Hurricane Sandy moved up the Atlantic coast and then turned northwest and made landfall northeast of Maryland. Heavy rain and high winds over spread coastal regions and most of Maryland. Heavy rain caused flood and river flooding. Antietam Creek near Leitersburg exceeded its flood stage and Licking Creek exceeded flood stage (NCEI).

On November 8, 2012, Governor Martin O'Malley requested a major disaster declaration due to Hurricane Sandy during the period of October 26 to November 4, 2012. Preliminary Damage Assessments (PDAs) were conducted. PDAs estimate damages immediately after an event and are considered, along with several other factors, in determining whether a disaster is of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments, and that Federal assistance is necessary. On November 20, 2012, President Obama declared that a major disaster exists in the State of Maryland (FEMA, 2012).

The total per capita impact of this storm was of \$4.67 in Washington County, making the public assistance total \$688,498.10 for the county.

Winter Storm Jonas: January 22-23, 2016

On February 19, 2016, Governor Larry Hogan requested a major disaster declaration due to a severe winter storm and snowstorm during the period of January 22-23, 2016.

Coastal low pressure rapidly intensified as it tracked up the Mid-Atlantic coast. At the same time, high pressure to the north was funneling cold air into the region. The strong low



pressure system was able to tap into moisture from the Gulf of Mexico and the Atlantic Ocean resulting in heavy amounts of precipitation. The cold air caused that precipitation to fall in the form of snow. Gusty winds also accompanied this storm. The combination of gusty winds and low visibility along with snow and blowing snow caused blizzard conditions across central and southern Maryland. Snowfall averaged between 22 and 38 inches across Washington County. Maugansville and Cascade reported receiving 37.5 inches of snow. Snowfall totaled up to 32.5 inches near Long Meadow (NCEI).

The per capita impact for Washington County was \$4.87; with a population of around 148,000 in 2010, the total county impact is just under \$705K.

VULNERABILITY & IMPACTS

TABLE 2.2.11.B SEVERE WINTER WEATHER CONSEQUENCE ANALYSIS	
<i>Type of Impact</i>	<i>Description</i>
Public / Responder Health and Safety	Severe winter weather can exacerbate existing illnesses. Severe winter weather can cause illness, injury and, on rare occasion, death.
Continuity of Operations (incl. Delivery of services)	The cascading effects of severe winter weather include mostly power outages and road blockages resulting from severe storms. This is what most likely could affect continuity of operations and delivery of services.
Property, Facilities, And Infrastructure	Severe winter weather has the potential for damaging trees, infrastructure and buildings.
Economic Condition	If an event is severe enough, it may cause people not to be able to go to work causing losses for families and businesses. The cost of cleanup activities could be very high after a severe winter event.
Environment	Weather events are part of what keeps the environment as it is; snow provides life to the flora and fauna. In severe events, the wind may cause erosion and heavy ice and snow may cause downed trees.

LOSS & DAMAGES

Washington County has had five disaster or emergency declarations since 2000 totaling around \$190,209,508.69 in public assistance dollars. This amount includes one event that is typically considered a summer event but because of its manifestation as a winter storm, is included in this profile: Hurricane Sandy.

The amount of public assistance presented here includes not only Washington County, but all other counties in Maryland that received public assistance from a disaster. The actual dollar amount for Washington County is much lower, however, \$190 million spent for severe winter weather, even when spread out amongst several counties is still high. This number does not include winter storm events that did not receive declarations, such as the ones that the county sees several times a year.



PROBABILITY & SEVERITY CALCULATIONS

TABLE 2.2.11.C SEVERE WINTER WEATHER RISK CALCULATION					
Probability		+	Severity	=	Risk
FREQUENT			MARGINAL		MEDIUM HIGH
Events	132		According to NCEI data, there has been no cost associated with severe winter weather events. However, presidential disaster declarations tell a different story. There have been no recorded deaths or injuries attributed to this hazard. The population is well accustomed to the effects of winter in the area.		The risk to Washington County associated with winter weather is medium high.
Years	17				
= 7.76					
There are roughly seven winter events every year, making this hazard a frequent occurrence.					

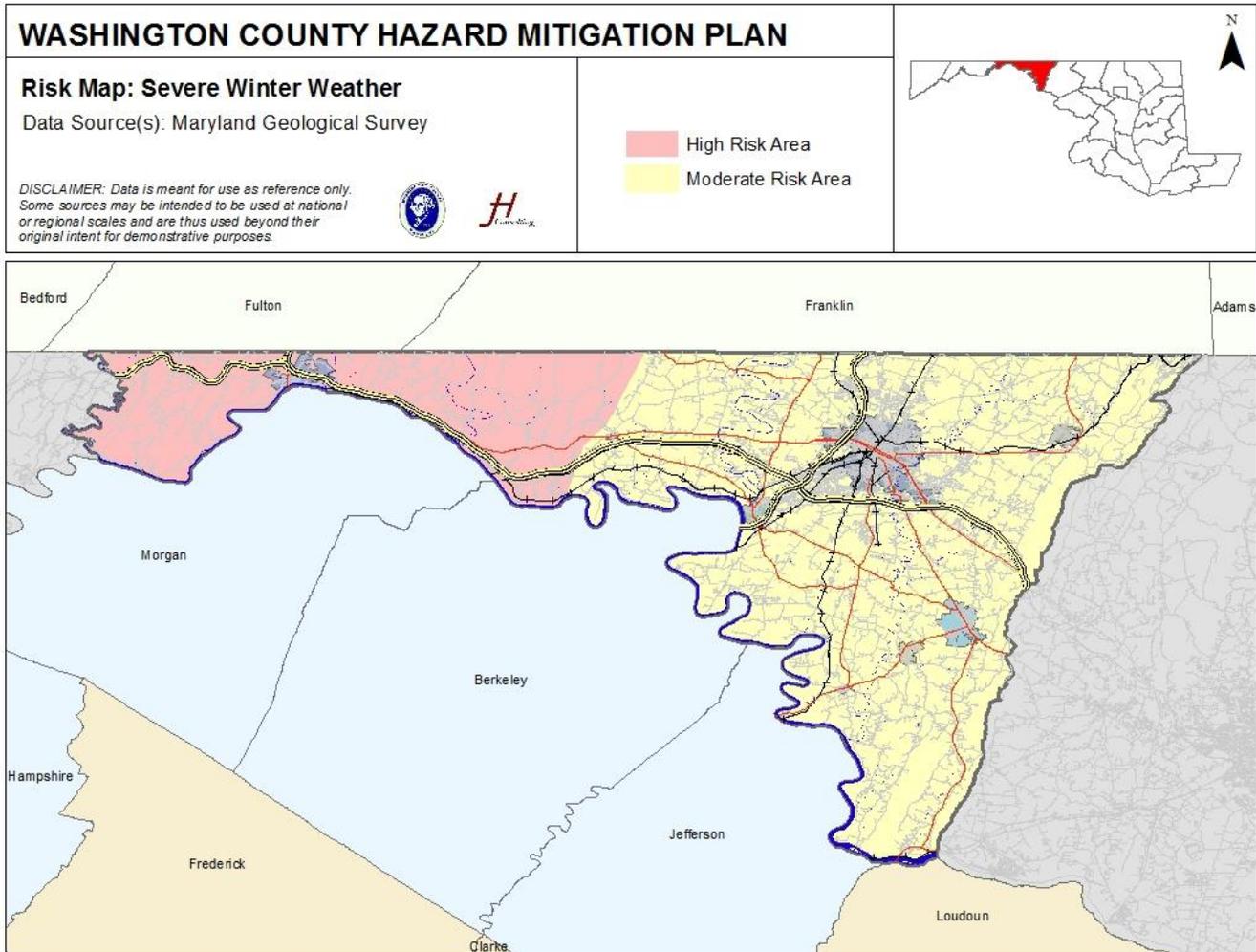
COMMITTEE INPUT

The Washington County Hazard Mitigation Plan update committee took the time to describe some instances of severe winter weather in their community. These are as follows.

- **Hagerstown Area:** Although predicted and warned sufficiently, sudden heavy and prolonged snowfall amounting to 25"+ in height produced random power outages and most citizens lost mobility for at least an entire day.
- **January 2016, Winter Storm Jonas:** 42" of snow, limited availability of emergency services to respond. One of several large snowstorms in last 30 years. It was a weeklong event for storm and cleanup. A major concern is the number of employees who could not get to work.



RISK MAP



2.3 COMPLICATING VARIABLES

This section is new to the Washington County Hazard Mitigation Plan. It includes profiles from the previous plan that were included as hazards; previous chapters 9: *Groundwater Pollution* (partial) and 19: *Power Outages*.

Complicating variables, in this plan, will mean any activity, event, or incident that makes the impacts of a hazard worse. There can be many types of complicating variables; here are the categories under which each can fall.

- Natural effects
- Technological effects
- Health and social effects

Direct consequences of disasters can include fatalities, injuries, and damages to humans, animals or property. However, disasters do not end there; there are a variety of indirect effects, both tangible and intangible associated with disasters even before a disaster strikes. Some examples of these include loss of livelihood and income, loss of community and population, mental and psychosocial impacts, costs of rebuilding, repair or replacement, loss of inventory, wages and tax revenue, etc. (Coppola, 2015). All of these also have a cost associated with them but it is much more difficult to assign a specific dollar value and quantify accurately.

A number of situations could occur that would result in a disruption to a number of critical systems throughout Washington County. Some hazards are complicated by a series of loosely-related variables; these are often considered *cascading hazards*. For example, high winds may cause sporadic damage throughout the county, but often do not become a significant countywide concern until a large number of residents are without power.

A single event may not always reach all impacts described herein. However, it is important to understand that the impacts of hazards go beyond what is seen immediately before or after the event or incident. The effects of one event can be years or months in the making and last months or even years, especially where public health, social, economic, environmental and infrastructure impacts are concerned.

2.3.1 Natural Effects

Climate Change

Many natural hazards are related to climate such as droughts, severe weather, floods, and wildfires. There is an important distinction between weather and climate.



Weather refers to the atmospheric conditions of a geographical region over a short period of time, such as days or weeks. Climate, in contrast, refers to the atmospheric conditions of a geographical area over long periods of time, such as years, or even decades (Keller, Devecchio, 2015, pp. 406-407).

According to the U.S. Global Change Research Program (2016), there are several weather and climate changes that have already been observed in the United States.

- Since recordkeeping began in 1895, the average U.S. temperature has increased by 1.3°F to 1.9°F with most of the increase happening since 1970. In addition, the first decade of the 2000s has been the warmest on record.
- The average precipitation across the U.S. has increased since 1900 with some areas experiencing higher than the national average and some lower. Heavy downpours are increasing, especially over the last 30-50 years.
- Drought events have increased in the west. Changes in precipitation and runoff, combined with changes in consumption and withdrawal, have reduced surface and groundwater supplies in many areas.
- Some types of severe weather events have experienced changes; heat waves are more frequent and intense, and cold waves have become less frequent and intense overall.
- The intensity, frequency, and duration of North Atlantic hurricanes have increased since the early 1980s.

Climate change can have a significant impact on human health and the environment. The changes mentioned above can affect the environment by leading to changes in land-use, ecosystems, infrastructure conditions, geography and agricultural production. Extreme heat, poor air quality, reduced food and water supply and quality, changes in infectious agents and population displacement can lead to public health concerns such as heat-related illnesses, cardiopulmonary illnesses, food, water and vector-borne diseases and have consequences on mental health and stress (USGCRP, 2016).

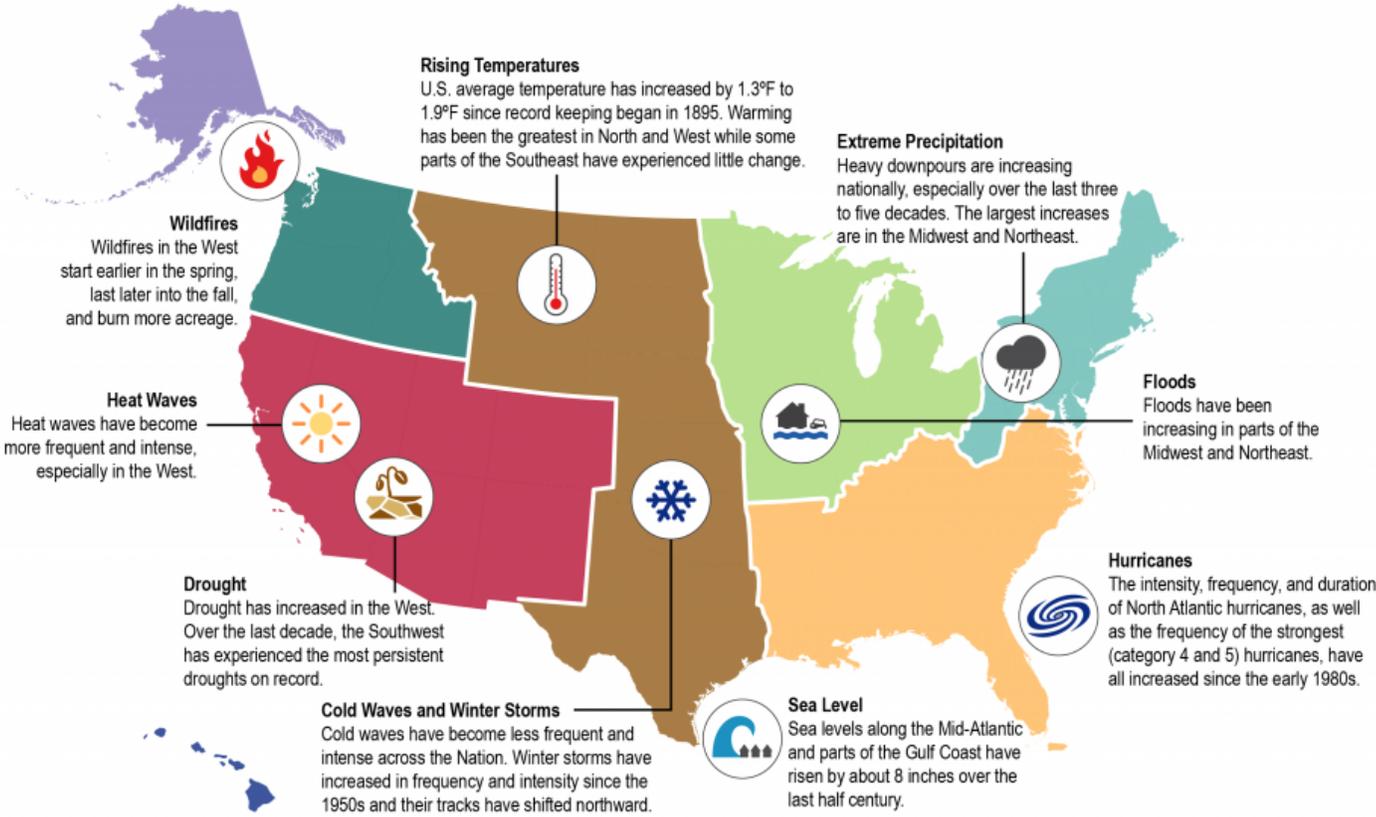
The National Climate Assessment (NCA) defined climate trends for national U.S. regions in 2014. The major trends are seen to be

- wildfires and heat waves on the west coast,
- rising temperatures and increased severity and frequency of winter storms in the middle of the country,
- more rain and flooding in the Midwest and northeastern parts of the country, and



- an increase in sea levels in the mid-Atlantic with an increase of hurricane activity in the southeastern states.

In Maryland, the trend will be an increase in extreme precipitation which will lead to more events of hazards such as flooding, and possible dam failures or reportable disease epidemics.



Flood

Flooding is a primary hazard in Washington County; however, rising waters can also result from several other hazards identified by this plan. For example, severe thunderstorms and tropical storms and hurricanes can include soaking rain that causes flooding. Long cold spells can cause the surface of rivers to freeze, leading to ice jams. A rise in the water level or a thaw breaks the ice into large chunks, which can become jammed at human-made (e.g., bridges) and natural obstructions, resulting in severe flooding. A midwinter or early spring thaw can produce large amounts of runoff in a short period of time. Because the ground is hard and frozen, water cannot penetrate it and be reabsorbed. The water then runs off the surface and flows into lakes, streams, and rivers, causing excess water to flood



surrounding areas. After a wildfire, the charred ground where vegetation has burned away cannot easily absorb rainwater, increasing the risk of flooding and mudflows over a number of years.

Construction and development can change natural drainage paths and create or increase flood risks. New buildings, parking lots, and roads (i.e., impervious surfaces) mean less land to absorb excess precipitation forcing water onto land it previously would not reach. Industrial companies may impound water for their operations, causing land disturbances. Timbering operations may alter natural drainage paths or change the vegetation that is available to absorb rainwater. Changes to wetlands and erosion are other land disturbances that impact the permeability of areas.

The most common hazard leading to flooding as a complicating variable is a dam failure. Dams can breach or overtop with little warning. Natural breaches can be triggered by flash floods, debris jams, the accumulation of melting snow, and the build-up of water pressure on a dam with unknown deficiencies after days of heavy rain, etc. Flooding can also occur when excess water is released downstream to relieve pressure from a dam. Similarly, levees are designed to reduce risk against a certain level of flooding. However, no levee provides full protection. Levees can be breached or overtopped when the water rises from heavy rains.

Erosion

Dictionary.com defines “erosion” as “the process by which the surface of the earth is worn away by the action of water, glaciers, winds, waves, etc.” Erosion is a natural process controlled by weather drivers such as rainfall, bedrock wear in rivers, flooding, wind abrasion, groundwater process, and other mass movements of soils. The rates at which these processes act control how fast a surface is eroded (Cheraghi, Jomaa, Sander, & Barry, 2016).

In Washington County, erosion may happen as a result of, or may otherwise complicate or worsen the impacts of a variety of hazards. Heavy rains or snow melt may swell creeks and streams, causing waters to rush through them at a much higher velocity than is normal. At extremely high flows, kolks or vortices form from large volumes of rapidly rushing water. Kolks cause extreme local erosion, plucking bedrock and creating pothole-type geographical features called rock-cut basins (Alt, 2001). Rushing waters may wash away part of stream banks, depositing the sediment and material in other areas, and the deposits may cause future occurrences of hazards such as flooding in areas previously



unaffected by flooding. In areas where material erodes, residents may experience property damage if structures are built in close proximity to stream banks or may experience less tangible losses as parts of their properties are washed away.

High winds can also cause erosion, stripping lands of valuable minerals and other cover. Two varieties of wind erosion can occur. *Deflation* occurs when wind picks up loose particles and carries them away. *Abrasion* refers to instances when surfaces wear down after be struck by airborne particles in the wind (Blanco-Canqui & Rattan, 2008; Dewey, Ryan, & Anderson, 1993; Balba, 1995). Wind erosion is more severe during times of drought (Wiggs, 2011); unchecked erosion of soils could result in the types of subsidence discussed in the land subsidence hazard profile (see [Section 2.2.6 Land Subsidence](#)).

2.3.2 Technological Effects

Power Outages

Power outages may last seconds, hours or days depending on the cause. The most common causes of power outages are natural causes, human error and equipment failure. Natural causes include strong storms, heat, and sometimes small animals. Strong storms may result in trees or branches falling on power lines. Lightning strikes can damage substations, power lines, and equipment. High winds, heavy rains, salt, snow, and ice can damage equipment as well. Regarding heat, there are several reasons why high temperatures can cause outages. For instance, equipment may overheat, cables may expand and stretch due to the demand for air conditioning resulting in high current and finally, some equipment shuts down to protect itself from high temperatures.

Power outages can occur over widespread areas or a concentrated location and are one of the typical impacts of major disaster events. Therefore, depending on the severity of the disaster event coupled with a mass power outage, significant public health, and safety risk prompt local emergency management to coordinate resources such as, opening shelters and distributing food and water.

Two utility companies provide power to Washington County: First Energy (Potomac Edison) and Hagerstown Light Department. First Energy provides the majority of power and also maintains the majority of the power lines in the county. The Hagerstown Light Department provides electric service to about 17,500 customers within the municipal limits of Hagerstown and maintains all electric lines within its jurisdiction when outages occur. The municipalities in Washington County face the same threat from power outage as the overall county. In some cases, in older developed areas, inadequately updated power lines in



residential areas could have a higher rate of power outage as compared to newly developed areas.

The most significant impact that a power outage can have is the inability of businesses and government offices to function properly. Because most power outages occur during severe weather storms, when the citizens of the county are depended upon public emergency services, it is extremely important that these buildings and offices be equipped with generators to ensure public safety. Allegheny Power recommends taking the following precautions in the event of a power outage occurring: flashlights and extra batteries, battery-powered radio, water for drinking and cooking, a portable heater, camping equipment such as sleeping bags, a portable lamp or lantern, and a camp stove, and a telephone that does not require electricity to operate.

Infrastructure Decay/Damage

Hazard occurrences can impact critical infrastructure such as the power grid, water and sewer lines, communications systems, and transportation networks in various ways. (See above for a discussion of power grid impacts.) Infrastructure issues can compound the impacts of hazards. For example, major transportation accidents can damage roadways, necessitating temporary detours. In some cases, accidents can damage the transportation system for longer periods of time, such as when bridges or intersection signals are damaged. Other hazards result in longer-term infrastructure impacts. Floods can wash out roadways, hampering the provision of emergency services in an impacted area. Land subsidence can have similar impacts.

The transportation network is not the only system that can be affected. Severe summer and winter weather can down telephone lines or damage communications towers. Wind, ice build-up, etc. can contribute to such problems. Droughts can impact available water supplies from which public and private systems draw. Earthquakes can damage in-ground infrastructure resources. Supplies may be contaminated by a variety of hazardous materials should an incident occur near a water source.

In some cases, the failure of a segment of critical infrastructure due to decay can be the impetus for a hazard event. For example, the failure of a levee or dam may result in flooded areas. Bridge failures can lead to major transportation accidents. The American Society of Civil Engineers (ASCE) issues a “report card” describing infrastructure challenges across the nation. In its 2017 report, the nation earned a *D+*. The ASCE issues reports on a state-by-state basis as well. The organization noted that driving on roads in need of repair in



Maryland costs drivers up to \$550 per year and 5.8% of the state's bridges were rated structurally deficient. Drinking water needs totaled as much as \$6.9 billion, with wastewater needs totaling \$9.92 billion. State grades were last issued in 2011, at which time Maryland's infrastructure received a C-.

Hazmat Incidents

Section 2.2.5 Hazmat profiles hazardous material incidents as stand-alone incidents, yet these impacts can be complicating variables. As an example, flood waters may inundate areas where hazardous materials are used or stored, thereby becoming contaminated and carrying those materials elsewhere. Severe summer and winter weather can impact covered facilities the report using and storing hazardous materials. In some of these instances, hazardous materials may not be released, yet extra response measures may be necessary to keep them from releasing should a facility be damaged by a weather event. Major transportation accidents may involve a variety of hazardous materials.

2.3.3 Health and Social Effects

Groundwater Pollution

There are concerns about groundwater pollution in areas where limestone formations are located and where wells and septic systems are concentrated. Fortunately, the majority of the county's population in the Hagerstown I-81 corridor is served by public water and sewer. Any new concentrated urban development served by wells and septic systems should be closely monitored for groundwater pollution. Groundwater depletion is also a concern in areas where quarrying activities have occurred or are being undertaken. Certain hazard events may increase the potential for groundwater pollution. Flood waters, for instance, can become contaminated as runoff picks up contaminants from paved surface areas. Hazardous materials involved in releases from covered facilities or transportation accidents can impact groundwater sources.

Population Displacement

Numerous hazard occurrences may result in a displacement of the population, either temporary or long-term. Some displacements may involve a relatively small number of people, such as when a house or apartment fire occurs. Others, during floods or hazmat incidents, may displace entire communities. Mass care sheltering operations typically address short-term displacements. It should be noted that evacuation and sheltering are



complex emergency operations and place strains on the emergency services tasked with carrying them out. Larger incidents, though, may require segments of the population to relocate. Relocation incidents can have drastic effects on individual residents, severely straining their personal resources available for recovery. Residents may choose not to rebuild. Relocation can have impacts on the tax base as impacted areas may take years to reach pre-relocation population levels.

Though population displacement itself is considered a complicating variable, numerous other complicating variables may affect the level and severity of a displacement. For example, should displacement from a community with a high percentage of socially and economically disadvantaged populations be necessary, those populations may be disproportionately impacted because of their ability to recover. Some of the residents may not have access to adequate insurance to facilitate rebuilding. Some may be retired or otherwise not in the workforce, with a lack of disposable income available for rebuilding. Further, some risks, such as those associated with the opioid epidemic may further impact the ability for some residents to recover. Social services dedicated to helping homeless populations may be overwhelmed in the aftermath of these types of situations.

Economic Loss

The U.S. Department of Homeland Security, Federal Emergency Management Agency (FEMA) lists “economic recovery” as one of its 32 core capabilities for emergency preparedness. FEMA defines this core capability as the return of economic and business activities to a healthy state and the development of new business and employment opportunities that result in an economically viable community. Large-scale disasters can have dire impacts on local economies. Chain or franchise style businesses as well as regional or national corporations may be able to shift operations and otherwise dedicate resources to recovering following a major incident. However, small businesses often lack these resources. Many small businesses close after major emergency situations. Forbes cites a FEMA report that 40% of businesses never reopen after a disaster and that of those that do, only 29% remain operational after two years (Scott, 2014, September 4).

The cascading effects of disaster-related economic impacts are sometimes subtle. In some cases, small businesses operate near their owners’ homes. When the business is impacted, the home may also be impacted, resulting in a crippling blow to the owner. Going back to work is a key element of returning a community to a new normal following a large-scale incident. As businesses close and employees cannot return to work, the key piece of



recovery becomes severely challenged. An altered economic outlook for a community may affect its ability to attract and retain residents.

Illness, Injury, and/or Death

Hazard events often result in personal impacts for those that are affected, including a variety of illnesses, potential injury, and even death. Floods, fires, hazardous material incidents, and major transportation accidents frequently result in fatalities. Other hazards, such as severe weather and even temperature extremes, can also result in death. The direct impacts of disasters are often intuitive and obvious.

Other examples, though, are not. These include, but are not limited to the following. During severe summer and winter weather events resulting in power outages, some residents may turn to auxiliary power supplies such as generators. Though manufacturer specifications note the importance of utilizing these units in well-ventilated areas, residents may place them in basements, garages, etc. increasing their own susceptibility to carbon monoxide poisoning. Standing flood waters can become hazardous as bacteria grows and spreads. These risks increase as residents begin clean-up or even attempt to recreate in flood waters. Extreme temperatures can be particularly problematic for very young and elderly populations. The residual effects of hazardous materials incidents may continue to compound for long periods after a hazard occurrence, sometimes evading post-incident monitoring.



2.4 INVENTORY ASSETS

§201.6(c)(2)(ii)	[The risk assessment shall include a] description of the jurisdiction's vulnerability of the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
§201.6(c)(2)(ii)(A)	The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

This risk assessment identifies potentially-vulnerable community assets such as critical facilities, critical infrastructure, historical properties, commercial/industrial facilities, etc. *Assets* contribute directly to the quality of life in the community as well as ensure its continued operation. As such, government facilities are often listed, as are water/wastewater and transportation infrastructure. Assets can also be irreplaceable items within the community, such as historical structures or even vulnerable populations (including the elderly or youths).

Methodology

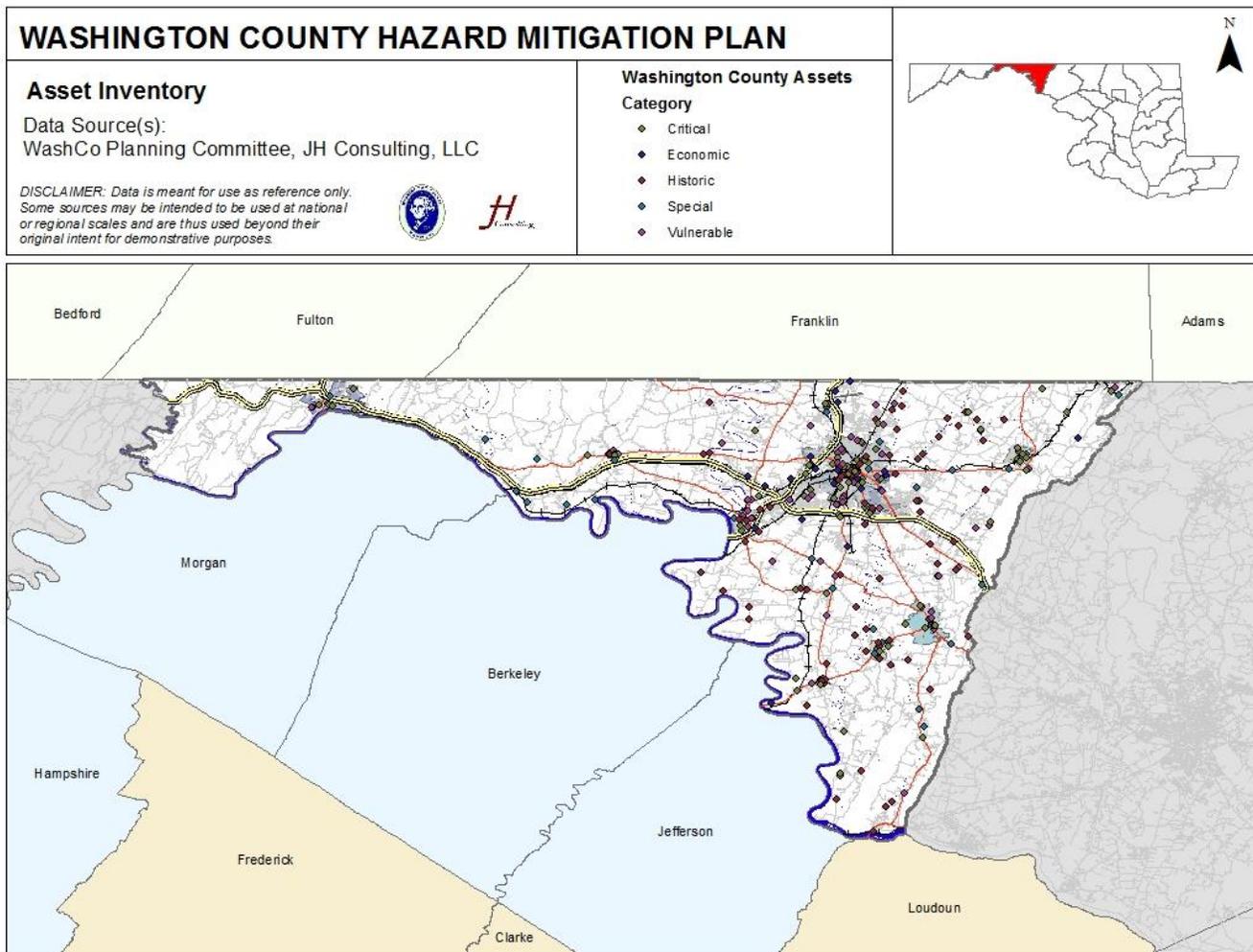
Inventorying assets first involves determining what in the community can be affected by a hazard event. The hazard profiles contained in [Section 2.2 Hazard Profiles](#) above contain generalized loss estimates that, in some cases identify the types of facilities that could be impacted by the hazards considered in this plan. Additionally, the core planning committee used its meetings during the update process to significantly revise the original asset list that was included in this plan. In the following lists, assets are grouped into the following categories.

- **Critical Facilities:** Governmental facilities, water/wastewater facilities, emergency services facilities, medical facilities (hospitals/clinics), and transportation infrastructure.
- **Vulnerable Populations:** Schools, nursing homes, and senior centers.
- **Economic Assets:** Large commercial/industrial facilities or large employers (not covered in other categories).
- **Special Considerations:** Residences, community outreach facilities, post offices, and libraries.
- **Historical Considerations:** Areas/structures listed on the National Register of Historic Places.



Asset Inventory

The following table lists assets in Washington County municipalities and unincorporated areas. The table denotes the name, address, and category of asset for each facility listed as well as a determination of vulnerability for each hazard. Vulnerability is listed as low (L), moderate/medium (M), or high (H). Vulnerability was assessed by mapping the assets using mapping software and overlaying hazard areas. The following image shows, at a high level, the assets in Washington County.



2.4.1 ASSET INVENTORY

TABLE 2.4.1.A ASSET INVENTORY																			
Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
	X				Business	Airport Business Park	Pennsylvania Ave	Maugansville	L	L	L	L	L	M	L	L	L	M	M
				X	Higher Education	Antietam Bible College	13535 Broadfording Church Rd	Maugansville	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Antietam Co. 2	790 Potomac Avenue	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
		X			Site	Antietam Furnace Complex Archeological Site	22043 Mt. Aetna Road	Hagerstown	L	L	L	M	L	L	L	L	L	M	M
		X			Building	Antietam Hall	525 Indian Lane	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			District	Antietam Iron Furnace Site and Antietam Village	Confluence of Antietam Creek and Potomac River	Antietam	L	L	L	L	L	M	L	L	L	M	M
			X		Recreational	Antietam Nat. Battlefield HQ	5831 Dunker Church Rd	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
		X			District	Antietam National Battlefield	N of Sharpsburg off MD 45	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
				X	Nursing Home	Avalon Manor Nursing Home	14014 Marsh Pike	Long Meadow	L	L	L	L	L	L	L	L	M	M	M
		X			Structure	B & O Bridge	NW of Keedysville over Antietam Creek	Keedysville	L	L	L	L	L	M	L	L	L	M	M
		X			Site	B & O Railroad Potomac River Crossing	At confluence of the Shenandoah and Potomac Rivers	Harpers Ferry	L	L	L	M	L	L	L	L	L	M	M
		X			Building	Baker Farm	N of Keedysville off MD Rt. 34	Keedysville	L	L	L	M	L	M	L	L	L	M	M
				X	Higher Education	Barbara Ingram Art School	7 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Bell-Varner House	SE of Leitersburg on Unger Rd.	Leitersburg	L	L	L	L	L	M	L	L	L	M	M
				X	School	Bester Elementary School	30 E. Memorial Blvd.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
			X		Recreational	Big Pool Boat Ramp	Ft. Frederick St. Park	Clear Spring	L	L	L	L	L	L	L	L	L	M	H
			X		Post Office	Big Pool Post Office	Big Pool Rd.	Clear Spring	L	L	L	L	L	L	L	L	L	M	H



TABLE 2.4.1.A ASSET INVENTORY

Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
			X		Recreational	Blairs Valley Boat Ramp	Indian Springs Wildlife Area	Clear Spring	L	L	L	L	L	M	L	L	L	M	H
X					Fire	Boonsboro Company #6 Fire Department	5 St. Paul St.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
				X	School	Boonsboro Elementary School	5 Campus Ave.	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
				X	School	Boonsboro High School	10 Campus Ave.	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
		X			District	Boonsboro Historic District	Main St., Potomac St., St. Paul St., High St., Lakin Ave., Center St., Park Dr., Park Ln, Park View, Young Ave.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
			X		Library	Boonsboro Library	19 N. Main St	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
				X	School	Boonsboro Middle School	1 J-H Wade Dr.	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
X					Police	Boonsboro Police	St. Paul St.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Boonsboro Post Office	5 Potomac St.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Boonsboro Substation	Near Boonsboro	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Government	Boonsboro Town Hall	21 N. Main St.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Boonsboro Waste Water Treatment Plant	Monroe Rd.	Boonsboro	L	L	L	M	L	M	L	L	L	M	M
X					Infrastructure	Boonsboro Water Treatment Plant		Boonsboro	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Bowman House	323 N. Main St.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Brightwood	N of Hagerstown off MD 6, 2 mi. N of Paramont	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	School	Broadfording Chr. Academy	13535 Broadfording Church Rd	Maugansville	L	L	L	L	L	M	L	L	M	M	M
X					Medical	Brook Lane Psychiatric Hospital	13218 Brooklane Dr	Leitersburg	L	L	L	L	L	M	L	L	M	M	M
			X		Post Office	Brownsville Post Office	2439 Boteler Rd.	Rohrersville	L	L	L	L	L	L	L	L	L	M	M
			X		Recreational	C&O Canal National Park	North Bank Potomac River	Clear Spring	L	L	L	L	L	L	L	L	L	M	M
	X				Business	C&O Canal Park HQ	16500 Sheperdstown Pike	Sharpsburg	L	L	L	L	L	L	L	L	L	M	M



TABLE 2.4.1.A ASSET INVENTORY

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			X		Recreational	Camp Harding County Park	Pectonville Rd.	Clear Spring	L	L	H	L	L	L	L	L	L	M	H
				X	School	Cascade Elementary School	14519 Pennersville Rd.	Cascade	L	L	L	L	L	L	L	L	M	M	M
			X		Post Office	Cascade Post Office	25208 Military Rd.	Cascade	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Cascade WTP		Cascade	L	L	L	L	L	L	L	L	L	M	M
			X		Post Office	Cavetown Post Office	22509 Cavetown Church Rd.	Cavetown	L	L	L	H	L	M	L	L	L	M	M
		X			Building	Cedar Grove	15435 Dellinger Rd.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
				X	School	Cedar Ridge School	12146 Cedarr Ridge Rd.	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Chapline, William, House	109 W. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
				X	Nursing Home	Charlotte's Home	212 Maple Ave	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
			X		Post Office	Chewsville Post Office	21106 Twin Springs Dr.	Chewsville	L	L	L	H	M	M	L	L	L	M	M
				X	Daycare	CitiCorp Family Center	14629 Citicorp Dr	Maugansville	L	L	L	L	L	M	L	L	M	M	M
X					Police	City Police Sub Station	Murph Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Clagett, Robert, Farm	Garrett's Mill Rd.	Knoxville	L	L	L	M	L	L	L	L	L	M	M
X					Medical	Clear Spring Ambulance Company #49	233 Cumberland St.	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Clear Spring Company #4	30 Mulberry St.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
				X	School	Clear Spring Elementary School	12627 Broadfording Rd	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
				X	School	Clear Spring High School	12630 Broadfording Rd.	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
				X	School	Clear Spring Middle School	12628 Broadfording Rd.	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
			X		Recreational	Clear Spring Park	West St.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Clear Spring Post Office	21 Mulberry St.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
X					Government	Clear Spring Town Hall	146 Cumberland St.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Clear Spring Waste Water Treatment Plant	Toms Run	Clear Spring	L	L	L	L	L	M	L	L	L	M	M



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X					Infrastructure	Clear Spring Water Treatment Plant	Rt. 40 West	Clear Spring	L	L	L	M	L	M	L	L	L	M	H
X					Infrastructure	Clear Spring Water Treatment Plant	Cedar Ridge School	Clear Spring	L	L	L	L	L	L	L	L	L	M	M
				X	Nursing Home	Clearview Nursing Home	9946 Downsville Pike	Williamsport	L	L	L	L	L	M	L	L	M	M	M
				X	Higher Education	College U. of MD. at Hagerstown	32 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Colonial Theatre	12--14 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Company 10 Fire and Rescue	2 S Westside Ave.	Funkstown	L	L	L	L	L	M	L	L	L	M	M
				X	School	Conococheague Elementary School	12408 Learning Ln.	Williamsport	L	L	L	L	L	M	L	L	M	M	M
X					Government	County Courthouse	95 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Medical	County Health Department	1302 Pennsylvania Ave.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
X					Government	County Office Building	100 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Government	County Office Building	33 W. Washington St.	Hagerstown	L	L	L	H	L	L	L	L	L	M	M
X					Government	County Office Building	80 W. Baltimore St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
	X				Business	Crossroads Corporate Center	Near I-81 & Rt. 40 Int	Halfway	L	L	L	L	L	M	L	L	L	M	M
				X	Government	Department of Community and Economic Development	14 N. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Ditto Knolls	E of Hagerstown on Landis Rd.	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Donnelly, Daniel, House	14906 Falling Waters Rd.	Williamsport	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Dorsey-Palmer House	N of Hagerstown on MD 60	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Doub Farm	N of Keedysville	Keedysville	L	L	L	L	L	M	L	L	L	M	M
		X			District	Doub's Mill Historic District	SW of Beaver Creek on Beaver Creek Rd.	Beaver Creek	L	L	L	L	L	M	L	L	L	M	M



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Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
				X	School	E. Russell Hicks Middle School	1321 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
	X				Business	Early Ind. Park	Rt. 65	Fairplay	L	L	L	L	L	M	L	L	L	M	M
				X	School	Eastern Elementary School	1320 Yale Dr.	Funkstown	L	L	L	L	L	L	L	L	M	M	M
				X	School	Ebenezer Christian School	Virginia Ave	Halfway	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Elliot-Bester House	205--207 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Elmwood	16311 Kendle Rd.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
X					Medical	Emergency Air Unit Co. 25	17556 York Rd.	Halfway	L	L	L	L	L	M	L	L	M	M	M
				X	School	Emma K Doub Elementary School	1221 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
				X	School	Emmanuel Christian School	16221 National Pike	Williamsport	L	L	L	L	L	M	L	L	M	M	M
				X	Nursing Home	Fahrney-Keedy Home	8507 Mapleville Rd.	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Fairplay Co. 12	18002 Tilghmantown Rd.	Fairplay	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Fairplay Post Office	8215 Sharpsburg Pike	Fairplay	L	L	L	L	L	M	L	L	L	M	M
				X	School	Fairview Outdoor Educational Center	12808 Draper Rd.	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Fiery, Joseph, House	15107 Hicksville Rd.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
X					Fire	First Hose Co.1	33 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
			X		Recreational	Fort Frederick State Park	RT. 56 near Big Pool	Clear Spring	L	L	L	L	L	L	L	L	L	M	H
		X			Structure	Fort Frederick State Park	SE of Big Pool near jct. of MD 56 and 44	Big Pool	L	L	L	L	L	L	L	L	L	M	H
				X	School	Fountain Rock Elementary School	17145 Lappens Rd	Fairplay	L	L	L	L	L	L	L	L	M	M	M
				X	School	Fountaindale Elementary School	901 Northern Ave.	Hagerstown	L	L	L	L	L	M	L	L	M	M	M
			X		Recreational	Four Locks Boat Ramp	Four Locks Rd.	Clear Spring	L	L	L	M	L	M	L	L	L	M	M



TABLE 2.4.1.A ASSET INVENTORY

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	X				Business	Friendship Technology Park	Near I-70 & Rt. 632 Int	Halfway	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Funk, Jacob M., Farm	21116 Black Rock Road	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
				X	School	Funkstown Elementary School	23 Funkstown Rd.	Funkstown	L	L	L	L	L	L	L	L	M	M	M
		X			District	Funkstown Historic District	Roughly bounded by Antietam Creek, US 40A, Stouffer Ave., and High St.	Funkstown	L	L	L	L	L	L	L	L	L	M	M
			X		Post Office	Funkstown Post Office	29 Frederick St.	Funkstown	L	L	L	L	L	L	L	L	L	M	M
X					Government	Funkstown Town Hall	30 E Baltimore St.	Funkstown	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Funkstown WWTP	Lagoon Rd.	Funkstown	L	L	H	L	L	M	L	L	L	M	M
		X			Building	Garden Hill	1251 Frederick St.	Hagerstown	L	L	L	M	L	M	L	L	L	M	M
	X				Business	Gateway Business Park	Near I-81 & Rt. 40 Int	Halfway	L	L	L	L	L	L	L	L	L	M	M
				X	School	Gateway Christian Academy	11017 Kemps Mill Rd.	Williamsport	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Geeting Farm	S of Keedysville at Geeting and Dog Rds.	Keedysville	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Good--Hartle Farm	13357 Little Antietam Rd.	Hagerstown	L	L	L	M	L	M	L	L	L	M	M
		X			Building	Good--Reilly House	107 E. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
				X	School	Grace Academy	13321 Cearfoss Pike	Hagerstown	L	L	L	L	L	M	L	L	M	M	M
				X	School	Greenbrier Elementary School	21222 San Mar Rd.	Boonsboro	L	L	L	L	L	M	L	L	ML	M	M
			X		Recreational	Greenbrier State Park	South Mountain	Boonsboro	L	L	L	M	L	L	L	L	L	M	M
				X	School	Hag. Mennonite Fellowship	12341 Huyett Lane	Maugansville	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Hager House	19 Key St.	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
		X			Building	Hagerman, William, Farmstead	7207 Dam #4 Rd.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Hagerstown Armory	328 N. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M



TABLE 2.4.1.A ASSET INVENTORY

Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather	
				X	Higher Education	Hagerstown Business College	18618 Crestwood Dr.	Long Meadow	L	L	L	L	L	L	L	L	L	M	M	
	X				Business	Hagerstown Business Park	Burhans Blvd.	Hagerstown	L	L	L	L	L	M	L	L	L	M	M	
X					Infrastructure	Hagerstown Central Maint. Garage	425 E. Baltimore St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M	
		X			Building	Hagerstown Charity School	102 E. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M	
				X	School	Hagerstown Children's School	143 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M	
					Government	Hagerstown City Hall	1 E. Franklin St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M	
		X			District	Hagerstown City Park Historic District	Roughly bounded by W. Howard St., Guilford Ave., Memorial, S. Walnut St., and the Norfolk & Western RR tracks	Hagerstown	L	L	L	L	L	L	L	L	L	L	M	M
		X			District	Hagerstown Commercial Core Historic District	Potomac, Washington, Franklin, Antietam, Summit and Jonathan Sts.	Hagerstown	L	L	L	H	L	L	L	L	L	L	M	M
				X	Higher Education	Hagerstown Community College	11400 Robinwood Dr.	Funkstown	L	L	L	L	L	L	L	L	L	M	M	M
X					Infrastructure	Hagerstown Electric Division	425 E. Baltimore St.	Hagerstown	L	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Hagerstown Fire Dept.	25 W. Church St.	Hagerstown	L	L	L	L	L	L	L	L	L	L	M	M
		X			District	Hagerstown Historic District	Roughly bounded by Prospect and Canon Aves., Memorial Blvd. and the CSX RR tracks.	Hagerstown	L	L	L	L	L	L	L	L	L	L	M	M
	X				Business	Hagerstown Industrial Park	Frederick St.	Hagerstown	L	L	L	L	L	L	L	L	L	L	M	M
X					Police	Hagerstown Police (substation)	32 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	L	L	M	M



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X					Police	Hagerstown Police Auxiliary	309 Valley Rd.	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
			X		Post Office	Hagerstown Post Office	44 W. Franklin St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Government	Hagerstown Public Works	51 W. Memorial Boulevard.	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
X					Government	Hagerstown Water Division	51 W. Memorial Boulevard	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
X					Infrastructure	Hagerstown WWTP	Near Antietam Cr. & Alt. Rt. 40	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Halfway Co. 26	11114 Lincoln Ave.	Halfway	L	L	L	L	L	M	L	L	L	M	M
				X	School	Hancock Elementary School	290 W Main St.	Hancock	L	L	L	M	L	L	L	L	M	M	H
X					Fire	Hancock Fire Company 5	3 Fulton St.	Hancock	L	L	L	L	L	L	L	L	L	M	H
			X		Library	Hancock Library	220 Park Rd.	Hancock	L	L	L	L	L	L	L	L	L	M	H
				X	School	Hancock Middle and High School	289 W Main St.	Hancock	L	L	L	L	L	L	L	L	M	M	H
X					Police	Hancock Police Department	126 W High St.	Hancock	L	L	L	L	L	L	L	L	L	M	H
			X		Post Office	Hancock Post Office	210 N Pennsylvania Ave.	Hancock	L	L	L	L	L	L	L	L	L	M	H
X					Fire	Hancock Rescue Company 59	6 E Main St.	Hancock	L	L	L	L	L	L	L	L	L	M	H
X					Government	Hancock Town Hall	126 W High St.	Hancock	L	L	L	L	L	L	L	L	L	M	H
X					Infrastructure	Hancock Transfer Station	Tonoloway Creek	Hancock	L	L	L	L	L	L	L	L	L	M	H
X					Infrastructure	Hancock WTP	231 Park Rd.	Hancock	L	L	L	L	L	L	L	L	L	M	H
X					Infrastructure	Hancock WWTP	Tonoloway Creek	Hancock	L	L	L	L	L	L	L	L	L	M	H
		X			Building	Hays, Joseph C., House	103-105 W. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
X					Fire	HazMat Response Team	17556 York Rd.	Halfway	L	L	L	L	L	M	L	L	L	M	M
				X	School	Heritage Academy	12215 Walnut Point Way	Williamsport	L	L	L	L	L	M	L	L	M	M	M
				X	School	Hickory Elementary School	11101 Hickory School Rd.	Halfway	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Highbarger, Jacob, House	201 W. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M



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				X	School	Highland View Academy	10100 Academy Dr	Mt. Aetna	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Hills, Dales, and the Vineyard	16 Dogstreet Rd.	Keedysville	L	L	L	L	L	M	L	L	L	M	M
				X	School	Hillside Mennonite School	11610 Greencastle Pike	Williamsport	L	L	L	M	L	M	L	L	M	M	M
		X			Building	Hitt's Mill and Houses	W of Keedysville off MD 34	Keedysville	L	L	L	M	L	M	L	L	L	M	M
		X			Building	Hoffman Farm	18651 Keedysville Rd.	Keedysville	L	L	L	L	L	M	L	L	L	M	M
		X			District	Hogmire-Berryman Farm	N of Spielman off MD 63	Spielman	L	L	L	L	L	M	L	L	L	M	M
				X	Nursing Home	Homewood Nursing Home	16107 Elliott Pkwy	Halfway	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Houses At 16--22 East Lee Street	16--22 E. Lee St.	Hagerstown	L	L	L	H	L	L	L	L	L	M	M
		X			Building	Huckleberry Hall	Charles Mill Rd. W of jct. with MD 64	Leitersburg	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Hunt Ridge Bus. Park	Near I-81 & Rt. 40 Int	Halfway	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Hunters Green Bus. Center	North of I-70	Halfway	L	L	L	L	L	L	L	L	L	M	M
	X				Business	Hunters Green Business Center	Hunters Green Pkwy.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Huyetts Business Park	Greencastle Pike	Williamsport	L	L	L	L	L	L	L	L	L	M	M
				X	School	Huyetts Mennonite School	16404 National Pike	Williamsport	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Independent Co. 3	100 Eastern Boulevard North	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
			X		Recreational	Indian Springs Wildlife Area	Fairview Mountain Area	Clear Spring	L	L	L	L	L	M	L	L	L	M	H
		X			Building	Ingram-Schipper Farm	N of Boonsboro	Boonsboro	L	L	L	L	L	L	L	L	L	M	M
	X				Business	Interstate Industrial Park	Governor Lane Blvd.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Jamison Railyard	West Hagerstown	Hagerstown	L	L	L	L	M	M	L	L	L	M	M
	X				Business	Jamison Railyard	West of Hagerstown	Halfway	L	L	L	L	L	M	L	L	L	M	M
		X			Building	John Brown's Headquarters	Chestnut Grove Rd.	Samples Manor	L	L	L	L	L	L	L	L	L	M	M



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				X	Higher Education	Kaplan University	18618 Crestwood Dr	Long Meadow	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Keedy House	NW of Boonsboro off U.S. 40A on Barnes Rd.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Keedysville Booster Pump Station	120 North Main Street	Keedysville	L	L	L	L	L	M	L	L	L	M	M
			X	X	Community Center	Keedysville Community Center (Old School)	40 Mount Vernon Drive	Keedysville	L	L	L	L	L	M	L	L	L	M	M
		X			District	Keedysville Historic District	Along Main St.	Keedysville	L	L	L	L	L	M	L	L	L	M	M
			X		Library	Keedysville Library	20 Taylor Drive	Keedysville	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Keedysville Post Office	21 S. Main St.	Keedysville	L	L	L	L	L	M	L	L	L	M	M
X					Government	Keedysville Town Hall	19 South Main Street	Keedysville	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Keedysville Water Storage Tank	14 1/2 Appomattox Court	Keedysville	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Keedysville WTP	33 Mt. Hebron Rd.	Keedysville	L	L	L	M	L	M	L	L	L	M	M
		X			Building	Kefauver Place	20515 Park Hall Rd.	Rohrersville	L	L	L	L	L	L	L	L	L	M	M
	X				Business	Lakeside Corporate Center	Ritchie Rd.	Smithsburg	L	L	L	M	L	L	L	L	L	M	M
		X			Building	Lantz--Zeigler House	21000 Leitersburg Pike	Hagerstown	L	L	L	M	L	M	L	L	L	M	M
				X	School	Laurel Hill School	13210 Brook Lane Dr.	Leitersburg	L	L	L	L	L	M	L	L	M	M	M
		X			District	Lehman's Mill Historic District	Lehman's Mill Rd. between Marsh Pike and Marsh Run	Hagerstown	L	L	H	L	L	L	L	L	L	M	M
X					Fire	Leitersburg Co. 9	21431 Leiter St	Leitersburg	L	L	L	L	L	M	L	L	L	M	M
		X			District	Leitersburg Historic District	Leitersburg-Smithsburg Rd., Leiter St., Leiter's Mill Rd., Ringgold St.	Leitersburg	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Light Business Park	Cameo Dr.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	School	Lincolnshire Elementary School	17545 Lincolnshire Rd.	Halfway	L	L	L	L	L	M	L	L	M	M	M



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		X			Building	Long Meadows	N of Hagerstown on Marsh Pike	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Longmeadow Co. 27	19307 Longmeadow Rd	Long Meadow	L	L	L	L	M	L	L	L	L	M	M
				X	Nursing Home	Loyalton Nursing Home	20009 Rosebank Way	Funkstown	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Magnolia Plantation	NW of Knoxville off Sandy Hook Rd.	Knoxville	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Mannheim	San Mar Rd.	Sanmar	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Maples, The	2 mi. SW of Smithsburg on MD 66	Smithsburg	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Marsh Mills	17426 and 17432 Spielman Rd.	Fairplay	L	L	H	L	L	M	L	L	L	M	M
				X	School	Marshall St. Center	1350 Marshall St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
X					Government	Maryland Dept. of Social Services	122-128 N. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Government	Maryland District Court	W. Antietam St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Site	Maryland Heights, Spur Battery	Hoffmaster Rd.	Sandy Hook	L	L	L	L	M	L	L	L	L	M	M
X					Police	Maryland State Police	Col. Henry K Douglas Dr.	Funkstown	L	L	L	L	L	M	L	L	L	M	M
		X	X		Building	Maryland Theatre	21 S Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Maugansville Co. 19	13730 Maugansville Rd.	Maugansville	L	L	L	L	L	M	L	L	L	M	M
X					Fire	Maugansville Co. 35	18440 Showalter Rd.	Maugansville	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Maugansville Post Office	13809 Maugansville Rd.	Maugansville	L	L	L	L	L	M	L	L	L	M	M
				X	School	Maugansville School	18023 Maugans Avenue	Maugansville	L	L	L	L	L	M	L	L	M	M	M
		X			Building	McCauley, Henry, Farm	E of Hagerstown on Mt. Aetna Rd.	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
			X		Recreational	McCoys Ferry Boat Ramp	McCoys Ferry Rd.	Clear Spring	L	L	H	M	L	L	L	L	L	M	H
X			X		Government	MD VEIP	Washington St. West	Halfway	L	L	L	L	L	M	L	L	L	M	M
X					Government	Md. Corr. Inst. Hagerstown	Roxbury Road	Fairplay	L	L	L	L	L	M	L	L	L	M	M
X					Government	Md. Corr. Training Center	18800 Roxbury Rd.	Fairplay	L	L	L	L	L	M	L	L	L	M	M



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X					Medical	Md. State CISD Region 2	747 Northern Avenue	Hagerstown	L	L	L	L	L	M	L	L	M	M	M
				X	Nursing Home	Mennonite Fellowship Home	12349 Huyett Ln.	Williamsport	L	L	L	L	L	M	L	L	M	M	M
				X	Nursing Home	Mennonite Old People's Home	13346 Maugansville Rd	Maugansville	L	L	L	L	L	M	L	L	M	M	M
X					Medical	Meritus Medical Center	11116 Medical Campus Rd.	Funkstown	L	L	L	L	L	L	L	L	M	M	M
	X				Business	MKS Business Park	Eastern Blvd.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Mount Airy	MD 34	Sharpsburg	L	L	L	L	M	M	L	L	L	M	M
				X	School	Mt. Aetna 7th Day Adventist School	10207 Crystal Falls Dr	Mt. Aetna	L	L	L	L	L	L	L	L	M	M	M
X					Fire	Mt. Aetna Co. 16	10305 Crystal Falls Dr	Mt. Aetna	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Mt. Aetna WTP	Mt. Aetna	Mt. Aetna	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Mt. Aetna WTP	Greenbrier State Park	Mt. Aetna	L	L	L	L	L	L	L	L	L	M	M
			X		Recreational	Museum of History	Main St.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Government	MVA	Col. Henry K Douglas Dr.	Funkstown	L	L	L	L	L	L	L	L	L	M	M
			X		Post Office	N. Hagerstown Post Office	12912 Conamar Dr.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
	X				Business	Newgate Industrial Park	Near I-81 & Rt. 40 Int	Halfway	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Nicodemus Mill Complex	20019 Nicodemus Mill Rd.	Keedysville	L	L	L	L	L	M	L	L	L	M	M
				X	School	North Hagerstown High School	1200 Pennsylvania Ave.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
				X	School	Northern Middle School	701 Northern Ave.	Hagerstown	L	L	L	L	L	M	L	L	M	M	M
		X			District	Oak Hill Historic District	Roughly bounded by W. Irvin, Potomac, and Prospect Aves. and Forest Dr.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	School	Oak Hill House	12806 Independence Rd.	Clear Spring	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Old Forge Farm	E of Hagerstown	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Old Washington County Library	21 Summit Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M



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				X	School	Pangborn Elementary School	195 Pangborn Blvd.	Hagerstown	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Paradise Manor	N of Hagerstown at 2550 Paradise Dr.	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
				X	School	Paradise Mennonite School	19308 Paradise Church Rd.	Long Meadow	L	L	L	L	L	M	L	L	M	M	M
				X	School	Paramount Elementary School	19410 Longmeadow Rd.	Long Meadow	L	L	L	L	L	L	L	L	M	M	M
			X		Government	Park & Rec.	351 N. Cleveland Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
			X		Government	Park & Rec. Headquarters	11400 Robinwood Dr.	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Piper House	200 E. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
				X	School	Pleasant Valley Elementary School	1707 Rohrsersville Rd.	Potomac Valley	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Plumb Grove	12654 Broadfording Rd.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
X					Police	Police/Corr Hagerstown Police	50 N. Burhans Blvd.	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
				X	School	Potomac Heights Elementary School	301 E. Magnolia Ave.	Long Meadow	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Potomac Valley Co. 11	2202 Dargan School Rd	Potomac Valley	L	L	L	L	L	L	L	L	L	M	M
		X			District	Potomac Broadway Historic District	Roughly, Potomac St. & Oak Hill Ave. from Franklin St. to Maple Ave. & North Ave. & Broadway from Park Pl. to Mulberry	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Price-Miller House	131--135 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	R Paul Smith Power Station	15952 Lockwood Rd.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
				X	Nursing Home	Reeders Memorial Home	141 S. Main St.	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Rescue Co. 19	110 1/2 W. Chapline St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M



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X					Fire	Rescue Co. 255	301 Devonshire Road	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Rescue Co. 75	110 Eastern Boulevard North	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Rescue Company #69 Fire Department	7619 Old National Pike	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Medical	Robinwood Medical Center	11110 Medical Campus Rd.	Funkstown	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Rockland Farm	728 Antietam Dr.	Hagerstown	L	L	H	L	L	L	L	L	L	M	M
				X	School	Rockland Woods School	18201 Rockland Dr.	Fairplay	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Rockledge	13535 Foxfire Ln.	Hagerstown	L	L	L	M	L	M	L	L	L	M	M
		X			Building	Rohrer House	E of Hagerstown	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
			X		Recreational	Rohrersville Comm. Building	Rohrersville School Rd	Rohrersville	L	L	L	L	L	L	L	L	L	M	M
			X		Post Office	Rohrersville Post Office	4314 Main St.	Rohrersville	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Rose Hill	0.5 mi. S of Williamsport on MD 63	Williamsport	L	L	L	L	L	M	L	L	L	M	M
X					Government	Roxbury Corr. Inst	18701 Roxbury Rd.	Fairplay	L	L	L	L	L	M	L	L	L	M	M
				X	School	Salem Ave. Elementary School	1323 Salem Ave.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
				X	School	San Mar Childrens Home	8504 Mapleville Rd.	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
				X	School	School Antietam Academy	40 W. Oak Ridge Dr.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
		X			Building	Search Well	SE of Burtner on Manor Church Rd.	Burtner	L	L	L	L	L	M	L	L	L	M	M
			X		Government	SHA Maintenance Shop	Old National Pike	Boonsboro	L	L	L	M	L	L	L	L	L	M	M
			X		Recreational	Shafer Memorial Park		Boonsboro	L	L	L	L	L	M	L	L	L	M	M
X					Government	Shapsburg Co. 1	110 W. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
				X	School	Sharpsburg Elementary School	17525 Sheperstown Pike	Sharpsburg	L	L	L	L	L	M	L	L	M	M	M



TABLE 2.4.1.A ASSET INVENTORY

Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
		X			District	Sharpsburg Historic District	E. and W., Chapline, Antietam, and High Sts., N. and S. Church, Mechanic, Hall, and Potomac Sts.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
			X		Library	Sharpsburg Library	106 E. Main St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Sharpsburg Post Office	118 E. Chapline St	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
X					Government	Sharpsburg Town Hall	106 E. Main St	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
X					Police	Sheriff & Detention Center	500 Western Md. Pkwy.	Halfway	L	L	L	L	H	M	L	L	L	M	M
				X	Medical	Shiningtree Childrens Home	21328 Mt. Aetna Rd	Mt. Aetna	L	L	L	L	L	L	L	L	L	M	M
			X		Recreational	Sligo Adventist Camp	Girl Scout Rd	Boonsboro	L	L	L	M	L	M	L	L	L	M	M
X					Infrastructure	Smithsburg Electric Substation	Ringgold	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
				X	School	Smithsburg Elementary School	67 N Main St.	Smithsburg	L	L	L	L	L	L	L	L	M	M	M
				X	School	Smithsburg High School	66 N Main St.	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
			X		Library	Smithsburg Library	33 E Water St.	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
				X	School	Smithsburg Middle School	68 N Main St.	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
X					Police	Smithsburg Police Department	21 W Water St.	Smithsburg	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Smithsburg Post Office	43 Grove Ln.	Smithsburg	L	L	L	L	M	L	L	L	L	M	M
X					Fire	Smithsburg Rescue Company 79	8 N Maple Ave.	Smithsburg	L	L	L	L	M	M	L	L	L	M	M
X					Infrastructure	Smithsburg Sewer Pumping Station	Henrietta St.	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Smithsburg Sewer Pumping Station	Chips Meadow	Smithsburg	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Smithsburg Sewer Pumping Station	E School Ln.	Smithsburg	L	L	L	L	L	M	L	L	L	M	M



TABLE 2.4.1.A ASSET INVENTORY

Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
X					Infrastructure	Smithsburg Town Hall	21 W. Water St.	Smithsburg	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Smithsburg Water Pumping Station	66 W Water St.	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Smithsburg Water Tank	Federal Lookout Rd.	Smithsburg	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Smithsburg WWTP	Little Grove Creek	Smithsburg	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Smithsburt WTP	Edgemont Reservoir	Smithsburg	L	L	L	M	L	L	L	L	L	M	M
		X			Building	Snively Farm	N of Eakles Mills on Mt. Briar Rd.	Eakles Mills	L	L	L	L	L	L	L	L	L	M	M
				X	Nursing Home	Somerford Nursing Home	10116 Sharpsburg Pike	Funkstown	L	L	L	L	L	L	L	L	M	M	M
X					Fire	South Hagerstown Co. 5	409 West First St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	School	South Hagerstown High School	1101 S. Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
			X		Recreational	South Mountain State Park	South Mountain	Boonsboro	L	L	L	M	L	L	L	L	L	M	M
		X			District	South Prospect Street Historic District	18--278 S. Prospect St.	Hagerstown	L	L	L	L	M	L	L	L	L	M	M
X					Fire	Special Operations Team	638 Frederick St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Sprechers Mill House	NE of Williamsport on Hopewell Rd.	Williamsport	L	L	L	L	H	L	L	L	L	M	M
X					Building	Spring House	33 Mt. Hebron Rd.	Keedysville	L	L	L	M	L	M	L	L	L	M	M
		X			Building	Springfield Farm	S of U.S. 11	Williamsport	L	L	L	L	L	M	L	L	L	M	M
				X	School	Springfield Middle School	334 Sunset Ave.	Williamsport	L	L	L	L	L	M	L	L	M	M	M
			X		Post Office	St. James Post Office	17619-B Lappens Rd.	Fairplay	L	L	H	L	M	L	L	L	L	M	M
				X	School	St. James School	17641 College Rd.	Fairplay	L	L	L	L	L	M	L	L	M	M	M
				X	School	St. Maria Goretti High School	1535 Oak Hill Ave.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
		X			Building	St. Mark's Episcopal Church--Lappans	18313 Lappans Rd.	Boonsboro	L	L	L	L	L	M	L	L	L	M	M
				X	School	St. Mary Catholic	218 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
				X	School	Stone Bridge Academy	13200 Brook Lane Dr	Leitersburg	L	L	L	L	L	M	L	L	M	M	M



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X					Government	Storage Shed	Taylor Park	Keedysville	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Substation	Near Antietam Creek	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Substation	Near Halfway	Halfway	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Substation	Near Reid	Long Meadow	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Substation 8	3417 Rohrersville Rd	Rohrersville	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Tammany	NE of Williamsport off US 11	Williamsport	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Tolson's Chapel	111 E. High St.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Top Flight Air Ind. Park	Showalter Rd	Maugansville	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Transfer Station	Dargan Road	Potomac Valley	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Transfer Station	Near Rt. 34	Sharpsburg	L	L	L	L	M	M	L	L	L	M	M
			X		Government	Transit Center	119 W. Franklin St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Infrastructure	Transportation Dept.	1000 W. Washington St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	School	Tri-State Christian Academy	7605 Old National Pike	Boonsboro	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Trovinger Mill	3 mi. E of Hagerstown on Trovinger Mill Rd. and Antietam Creek	Hagerstown	L	L	H	L	L	M	L	L	L	M	M
				X	School	Truth Christian Academy	41 Bryan Circle	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
				X	Higher Education	U of Md. Exp. Farm	Sharpsburg Pike	Fairplay	L	L	L	L	L	M	L	L	M	M	M
X					Government	U.S. Ag. Dept. NRCS, SCD	1260 Maryland Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
X					Government	U.S. Social Security Admin.	1258 Maryland Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Valentia	S of Hagerstown on Poffenberger Rd. off MD 65	Hagerstown	L	L	H	L	L	M	L	L	L	M	M
				X	Nursing Home	Village at Robinwood Nursing Home	19800 Tranquility Circle	Funkstown	L	L	L	L	L	L	L	L	M	M	M



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Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
				X	Medical	W. Md. Retardation Center	Marshall St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
				X	Higher Education	Washington Co. Ag. Ed. Center	7303 Sharpsburg Pike	Fairplay	L	L	L	L	L	M	L	L	M	M	M
X					Infrastructure	Washington Co. Airport	18434 Showalter Rd	Maugansville	L	L	L	L	L	M	L	L	L	M	M
X					Fire	Washington Co. Airport Squad	18434 Showalter Rd	Maugansville	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Washington Co. Bus. Air Park	Air Park Rd.	Maugansville	L	L	L	L	L	M	L	L	L	M	M
	X				Business	Washington Co. Bus. Park	Near I-81 & Rt. 40 Int	Halfway	L	L	L	L	L	M	L	L	L	M	M
			X		Library	Washington Co. Free Library	110 South Potomac St.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	School	Washington Co. Tech. School	50 W. Oak Ridge Drive	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
	X				Business	Washington County Board of Education	820 Commonwealth Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
		X			Building	Washington County Courthouse	W. Washington St. and Summit Ave.	Hagerstown	L	L	L	L	L	L	L	L	L	M	M
				X	Adult Education	Washington County Job Development Center	22930 Federal Lookout Rd.	Smithsburg	L	L	L	L	L	L	L	L	M	M	M
X					Infrastructure	Washington County Landfill	Landfill Rd.	Maugansville	L	L	L	L	L	L	L	L	L	M	M
			X		Recreational	Washington Mon. State Park	South Mountain	Boonsboro	L	L	L	L	L	L	L	L	L	M	M
		X			Structure	Washington Monument	Washington Monument State Park	Boonsboro	L	L	L	L	L	L	L	L	L	M	M
X					Fire	Western Enterprise Co. 4	526 Washington Square	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
				X	School	Western Heights Middle School	1300 Marshall St.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M



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X					Medical	Western Maryland Hospital	1500 Pennsylvania Ave.	Hagerstown	L	L	L	L	L	L	L	L	M	M	M
			X		Recreational	Western Maryland Rail Trail	North Bank Potomac River	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Western Maryland Railway Station	Burhans Blvd.	Hagerstown	L	L	L	L	M	M	L	L	L	M	M
		X			Structure	Western Maryland Railway Steam Locomotive No. 202	City Park	Hagerstown	L	L	L	L	L	M	L	L	L	M	M
				X	Nursing Home	Wilhelm Assisted Living	1205 Kuhn Ave.	Funkstown	L	L	L	L	L	L	L	L	M	M	M
X					Government	Williamsport City Hall	2 N Conococheague St.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
				X	School	Williamsport Elementary School	1 S Clifton Dr.	Williamsport	L	L	L	L	L	M	L	L	M	M	M
				X	School	Williamsport High School	5 S Clifton Dr.	Williamsport	L	L	L	L	L	M	L	L	M	M	M
		X			District	Williamsport Historic District	Roughly bounded by C and O Canal, Conococheague Cr., Springfield Ln., and W. Frederick St.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
			X		Library	Williamsport Library	104 E Potomac St.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
X					Police	Williamsport Police	2 N Conococheague St.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
			X		Post Office	Williamsport Post Office	28 W Salisbury St.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
				X	Nursing Home	Williamsport Retirement Village	154 N Artizan Ave.	Williamsport	L	L	L	L	L	M	L	L	M	M	M
X					Fire	Williamsport Volunteer Fire and EMS	2 Brandy Dr.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	Williamsport Water and Sewer	16232 Elliott Pkwy.	Williamsport	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Willows, The	SW of Cavetown on MD 66	Cavetown	L	L	L	M	L		L	L	L	M	M
		X			Building	Wilson School	Rufus Wilson Rd.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M
		X			Building	Wilson, Rufus, Complex	14293 Rufus Wilson Rd.	Clear Spring	L	L	L	L	L	M	L	L	L	M	M



TABLE 2.4.1.A ASSET INVENTORY

Critical	Economic	Historic	Special	Vulnerable	Type	Name	Address	City/Town	Drought	Extreme Temperatures	Flood	Fire / Explosion / Wildfire	Hazmat	Land Subsidence	Major Transportation Accident	Opioid Epidemic	Reportable Disease Epidemic	Severe Summer Weather	Severe Winter Weather
		X			Building	Wilson-Miller Farm	SE of Sharpsburg	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
		X			Structure	Wilson's Bridge	U.S. 40	Hagerstown	L	L	H	L	L	L	L	L	L	M	M
				X	School	Winter St. Elementary School	59 Winter St.	Hagerstown	L	L	L	L	L	M	L	L	M	M	M
		X			Building	Woburn Manor	7661 Dam #4 Rd.	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WTP	Martins Crossroads	Maugansville	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WTP	Sandy Hook	Potomac Valley	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WTP	Elk Ridge	Potomac Valley	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WTP	Weverton	Potomac Valley	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WTP	Snyders Landing	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WTP	Keedysville	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WWTP	MCI	Fairplay	L	L	L	L	L	M	L	L	L	M	M
X					Infrastructure	WWTP	Sandy Hook	Potomac Valley	L	L	L	L	M	M	L	L	L	M	M
X					Infrastructure	WWTP	Harpers Ferry Rd	Sharpsburg	L	L	L	M	L	M	L	L	L	M	M
X					Infrastructure	WWTP	Keedysville	Sharpsburg	L	L	L	L	L	M	L	L	L	M	M



3.0 ACTION PLAN

The action plan contains information on goals that the steering committee decided upon and projects that the jurisdictions updated or created. This section explains in further detail the process by which goals were established and how existing and new projects were prioritized.



3.1 MITIGATION GOALS AND OBJECTIVES

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

Hazard mitigation goals and objectives represent what the community wants to achieve through the implementation of mitigation projects. These goals work together to lessen loss of life, injury, and damage to property, the economy, and the environment from the identified hazards in [Section 2.2 Hazard Profiles](#).

The committee members discussed the existing 2011 plan’s goals and objectives during the second meeting on August 29, 2017. They determined that the existing list was too extensive, repetitive, unclear and unmanageable. For this reason, they decided to eliminate objectives that had one or no projects attached to them, combine goals and objectives in a more intuitive manner. The consultant presented the revised goal and objective list to the steering committee during a conference call on September 8, 2017 and the committee approved the new goals and objectives. The final list is as follows.

TABLE 3.1.A GOALS AND OBJECTIVES		
<i>Goal</i>	<i>Description</i>	<i>Objectives</i>
GOAL 1	Maintain and enhance Washington County’s jurisdictions’ capacity to continuously make Washington County less vulnerable to hazards.	1.1 Maximize utilization of Washington County’s GIS software and applications. 1.2 Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.
GOAL 2	Build local officials’ and public support for and increase understanding of hazard mitigation actions to reduce vulnerability to all hazards.	2.1 Increase awareness and knowledge of hazard mitigation principles and practice among local and municipal public officials. 2.2 Provide assistance to municipal officials and help municipalities obtain funding for mitigation planning and project activities. 2.3 Publicize and encourage the adoption of appropriate hazard mitigation actions. 2.4 Heighten public awareness of natural hazards. 2.5 Prioritize new mitigation projects, starting with sites facing the greatest threat to life, health, and property.
GOAL 3	Protect existing and future properties and public infrastructure from all hazards that could affect Washington County.	3.1 Upgrade or replace public roads and storm water management features to include mitigation into the project design and construction. 3.2 Improve routes utilized in hazard events to mitigate life-threatening road conditions and road closures. 3.3 Encourage property-owner self-protection measures. 3.4 Utilize the most effective approaches to protect buildings from flooding, including acquisition, demolition, elevation, and mitigation reconstruction. 3.5 Enact and enforce regulatory measures to ensure that new development will not increase hazard threats.



TABLE 3.1.A GOALS AND OBJECTIVES		
<i>Goal</i>	<i>Description</i>	<i>Objectives</i>
		3.6 Review and update Building Codes to ensure that manufactured housing, including mobile homes, are constructed and installed in a manner to minimize impacts from hazards. 3.7 Ensure existing high risk residential structures are utilizing retrofitting techniques to mitigate repetitive flooding. 3.8 Use public funding to protect public services and critical facilities and on private property where benefits exceed cost. 3.9 Maximize the use of outside funding sources.
GOAL 4	Promote sustainable development to improve the quality of life by minimizing the impacts of hazards.	4.1 Provide for the conservation and preservation of natural resources. 4.2 Limit additional housing (especially elderly and high density) in areas of high hazard risk.

A list of previous goals and objectives and a description of how they were changed is included in [Appendix 1: Meeting Documentation and Committee Involvement](#).



3.2 PROJECT IMPLEMENTATION

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

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

This portion of the plan builds on the goals presented in [Section 3.1 Mitigation Goals and Objectives](#). Each jurisdiction in Washington County filled out a new projects worksheet during the last meeting on September 27, 2017 (see [Appendix 1: Meeting Documentation and Committee Involvement](#) for worksheets completed). This worksheet identifies problem areas relating to hazards, briefly outlines the problem, and describes possible solutions; these are the jurisdictional hazard mitigation projects.

Each project herein relates to at least one goal and objective as outlined in [Section 3.1](#); they are also listed with a timeframe, primary coordinator, support agencies, and potential funding source (and cost estimate). It is important to note that the cost estimates are tentative and meant as a starting point for research on project feasibility. More specifically, these cost estimates are only ranges of probable project costs; all figures are approximations. At the time the implementation of any strategy is considered, a full cost estimate should be sought prior to securing funding. Possible funding sources identified include the following.

- 319 Nonpoint Source Program
- Brownfields and Voluntary Cleanup Programs
- Community Development Block Grant (CDBG)
- Disaster Housing Program
- Emergency Conservation Program
- Emergency Management Performance Grants (EMPG)
- Emergency Watershed Protection Program
- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance Program



- Non-Insured Crop Disaster Assistance Program
- Pre-Disaster Mitigation Program
- Repetitive Flood Claims Program (RFC)
- Section 108 Loan Guarantee Programs
- Severe Repetitive Loss (SRL) Program
- State Revolving Loan Fund
- Sewerage Facilities Supplemental Assistance Program
- Water Supply Program
- Weatherization Assistance Program



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Boonsboro	Drought	Wells tend to dry during long periods of no or low precipitation.	Continue to monitor the water supply and work on infrastructure to mitigate drought hazards.	3.1, 3.3, 3.8	5 years	2	Minimal funding for monitoring activities	Local Funding	Boonsboro Town Council	Washington County Department of Environmental Management
Boonsboro	Flood	There is flooding in some areas of the town that affects roads and houses.	Proactively continue to enforce floodplain ordinances, controlling and improving stormwater management systems and participating in the NFIP	3.1, 3.5, 3.8	Ongoing	1	Minimal funding for enforcement activities.	Local Funding	Boonsboro Town Council and Floodplain Manager	Washington County Division of Public Works, Storm Water Management
Clear Spring	Flood	Heavy waters back up the town. Toms Run, the culvert that carries the water through the town has deteriorated and walls need to be replaced. Property owners and businesses have suffered losses.	Construct a plan to rebuild damaged culvert; identify corrections and apply to funding sources.	1.1 3.1, 3.8, 3.9	5 years	5	Up to \$1M contingent on size of project	CDBG	Clear Spring Streets	Washington County Division of Public Works, Storm Water Management
Clear Spring	Drought	The town has three wells that supply the municipality. There are concerns when the water supply is low.	The town has identified that the wells are on the same aquifer. Identify additional water sources, and encourage residents to conserve water when necessary.	1.1 2.1, 2.4 3.5	3 years	2	Requires little to no additional funding	Local Funding	Clear Spring Water	Washington County Department of Environmental Management
Clear Spring	Hazmat	Interstate 70: There is heavy traffic through town and local residents have a problem getting around the area.	Work with the state for additional detours that don't affect the town.	1.1 3.2	1 year	4	Requires little to no additional funding	Local Funding	Clear Spring Town Council	MDOT
Clear Spring	Groundwater Contamination	Sewer lines have infiltration; the sewer flow is more than water flow. The sewer plant is old and outdated.	Identify problem areas and prepare an RFP for correction of the problem.	3.1, 3.9	1 year	3	Requires little to no additional funding	Local Funding	Clear Spring Sewer	Washington County Department of Environmental Management



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Clear Spring	Opioid Epidemic	Several people have been charged with obstruction; residents are losing loved ones.	Educate the public.	2.1, 2.4	On-going	1	Up to \$2,500 on campaign	Local Funding	Clear Spring Town Council	Washington County DES
Clear Spring	Flood	Due to inadequate conveyance systems for a 100-year flooding event, the town of Clear Spring floods at Main Street where 20+ homes have flooded.	20+ years ago, MDSHA installed a bypass culvert to take some of the flood water. Acquire properties and improve the conveyance system.	1.1 3.4, 3.6	5 years	6	Approx. \$200,000 per structure	HMGP, PDM, RFC	Clear Spring Town Council	MDSHA, Washington County Department of Planning and Zoning
Funkstown	Flood	The trailer park on Poplar Street floods. The town has reached out to the property owner to purchase the property with FEMA funds. The town has already had the property appraised.	The property will be purchased and residents will be relocated. The property will be turned into a park.	1.1 3.4	5 years	4	Approx. \$200,000 per structure	HMGP, PDM	Funkstown Town Council	Washington County Department of Planning and Zoning
Funkstown	Flood	Pump stations flood during a large flood causing the electrical components to burn up. Problem areas have been identified in the town.	The electrical components will be raised and a generator will be installed for the sewer pump stations in the flood zone area.	3.8, 3.9	5 years	2	Up to \$50,000 contingent on size of generator	HMGP	Funkstown Water	Washington County Department of Environmental Management
Funkstown	Flood	The storm sewers collect water during heavy rains and floods causing Inflow and infiltration in the sanitary sewer system. Inflow and infiltration in the sanitary sewer system is caused during heavy rains and floods.	Install water tight covers or inflow guards on sewer manholes.	3.1, 3.8, 3.9	3 years	3	Up to \$200 per manhole	Local Funding	Funkstown Sewer	Washington County Department of Environmental Management



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Funkstown	Opioid Epidemic	Washington County is experiencing a serious problem with the opioid epidemic. The opioid epidemic is a crisis for Funkstown and the town has identified problem areas.	The town will work with the Washington County agencies to promote awareness.	1.2	On-going	1	Up to \$2,500 on campaign	Local Funding	Funkstown Town Council	Washington County DES
Hagerstown	Fires	Old buildings, dense development, high percentage of rental units and multi-family buildings, disabled occupancy, hoarding, and unpermitted occupancy cause loss of life, destruction of property, and strain on the water system during fires.	Rental licensing of rental units has been implemented and the fire department does neighborhood sweeps with smoke detectors. Still need to educate property owners about the risks and strategies to reduce risk. Require upgrades to fire stopping systems during renovations.	1.2 3.6	5 years	1	Requires little to no additional funding	Local Funding	Hagerstown Code Administration and Permitting	Hagerstown Fire Department
Hagerstown	Lightning	Large, older buildings without adequate fire stopping in attic areas cause fires in unprotected spaces to grow beyond the ability of fire protective systems to suppress them causing loss of life and destruction of property.	Building code changes protect new construction. Educate property owners about risks. Require upgrades during building upgrades.	2.4 3.3, 3.6	3 years	2	Requires little to no additional funding	Local Funding	Hagerstown Code Administration and Permitting	Hagerstown Planning and Zoning



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Hagerstown	Flood	Unfiltered and unrestricted flow in older portions of the city of flood water cause pollutants to reach surface waters and follow karst pathways to the groundwater	New development meets sewer water management requirements, gain improvements with renovation or reuse projects. Continue to retrofit the public sewer management system as funding allows.	1.1 3.1, 3.8, 3.9	5 years	3	Up to \$1M contingent on size of project	CDBG	Hagerstown Utilities, Wastewater Division	Hagerstown Engineering
Hancock	Flood	The town of Hancock has experienced flooding of businesses and commercial properties on Main Street due to the Potomac River.	The Pizza Hut has been flood-proofed and Shaw Motors is in process of acquisition. Continue to acquire flood prone properties and implement flood-proofing measures.	3.4 4.1, 4.2	5 years	1	Approx. \$200,000 per structure	HMGP, PDM, RFC, SRL	Hancock Town Council	Washington County DES, MEMA
Keedysville	Flood	Every 5-10 years, Little Antietam Creek floods and enters a number of buildings causing property loss.	Research ways to alleviate the flooding and limit permits in the flood zone.	3.3, 3.5, 3.7	2 years	1	Requires little to no additional funding	Local Funding	Keedysville Planning and Zoning	Washington County Department of Planning and Zoning
Keedysville	Opioid Epidemic	There have been overdoses and fatalities due to opioids.	Partner with a group in town that is organizing to find ways to inform the public of this problem. Use town resources to promote awareness and available treatment programs.	2.1, 2.2, 2.4, 2.5	On-going	2	Up to \$2,500 on campaign	Local Funding	Keedysville Town Council	Washington County Sheriff's Office, Washington County DES



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Smithsburg	Fires	The town's existing 8-inch water transmission line from the water storage tanks to the distribution system is failing. With the aging line is beginning to crack and leak, water supply can become limited and/or lost should the line break and fail.	A feasibility study has been conducted and loan funding obtained to replace the aging water transmission line. The replacement of the water transmission line is being designed and due for construction in 2018.	2.4 3.9	2 years	1	Approx. \$1.17M	State Revolving Fund	Smithsburg Water and Sewer	Washington County Department of Environmental Management
Smithsburg	Major Transportation Accident	The CSX Railroad runs through the Town of Smithsburg and directly borders the side of the Smithsburg Emergency Medical Services (SEMS) building. Should a train de-rail at the railroad crossing in front of or beside of SEMS, the town and surrounding area would be without medical responders.	SEMS is currently looking for available property within the town growth area to relocate. If a proposed annexation is approved within the Town of Smithsburg, the developer has agreed to provide land for a new rescue company.	1.1, 1.2 3.8, 3.9	3 years	2	Up to \$500,000 for facility	Local Funding	SEMS	Smithsburg Town Council
Sharpsburg	Flood	Areas of the town are in the floodplain.	Restrict additional buildings in the floodplain and encourage mitigation reconstruction and elevation where appropriate.	3.3, 3.5, 3.7 4.2	Ongoing	2	Minimal cost	Local Funding	Floodplain Managers	Sharpsburg Town Council
Sharpsburg	All Hazards	N/A	Develop community outreach programs to educate officials and the public about the hazards the town faces.	2.1, 2.4	5 years	1	Minimal cost	Local Funding	Sharpsburg Town Council	Floodplain Managers



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Williamsport	Flood	There are no control measures to reduce the water in the C&O canal.	Identify funding sources that could address storm water runoff issues as well as storm drains.	3.8, 3.9	5 years	1	Varies per size of individual projects	319 Nonpoint, CDBG, State Revolving Fund	Williamsport Town Council	Washington County Division of Public Works, Storm Water Management
Washington County	Heavy Snow	Not enough resources, lack of public awareness. First responders have difficulty getting to the scene, and the public gets caught in the weather.	Seek funding sources for additional equipment. Educate the public on new notification systems and where to go for information.	1.2 2.1, 2.3 3.9	On-going	1	Varies per equipment	EMPG, SHSP	Washington County DES	N/A
Washington County	Summer Weather	Concern for the elderly population and general public awareness.	Educate the public on the new notification system and on where to get information.	1.2 2.1, 2.4	1 year	2	Up to \$2,500 on campaign	Local Funding	Washington County DES	Washington County Commission on Aging
Washington County	N/A	Without the incorporation of mitigation practices into the comprehensive plan, land development without mitigation plans will be ineffective.	Participate in the HMP update and incorporate appropriate items in the revised comprehensive plan that will guide future land use decisions.	2.1, 2.2	5 years	4	Requires little to no additional funding	Local Funding	Washington County DES	Washington County Department of Planning and Zoning
Washington County	Hazmat	The amounts and types of hazardous materials transported through the county roadways makes it possible for their release.	Identify and train for the response to current materials being transported. Conduct a commodity flow study to identify current hazmat being transported on roadways.	2.1, 2.2	3 years	5	Up to \$10,000 for flow study	HMEP	Washington County LEPC	Washington County Division of Emergency Management
Washington County	Opioid Epidemic	There is an increasing number of people who are dying because of opioid overdose.	Increase citizen and provider Narcan training. Conduct citizen outreach on awareness and crisis intervention teams and peer intervention specialists.	2.1, 2.4	1 year	7	Up to \$2,500 on campaign	Local Funding	Washington County Sheriff's Office	Washington County DES



TABLE 3.2.A JURISDICTIONAL PROJECTS

<i>Juris-diction</i>	<i>Hazard</i>	<i>Problem</i>	<i>Solution / Project</i>	<i>Goal and Objective Alignment</i>	<i>Project Timeframe</i>	<i>Priority</i>	<i>Cost Estimate</i>	<i>Funding Source</i>	<i>Coordinating Agency</i>	<i>Support Agency</i>
Washington County	Flood	Flooding causes street closures and damages homes and cause stream closures due to poor water quality.	There has been some updating to the stormwater system to address issues. Under the MS4 Phase II permit for Washington County, develop a list of projects to address storm water best management practices that will address requirements of the permit, improve local water quality, and reduce associated flooding.	2.2 3.1, 3.5, 3.8	5 years	6	Varies per size of individual projects	319 Nonpoint, CDBG, State Revolving Fund	Washington County Division of Public Works, Storm Water Management	Washington County Department of Planning and Zoning
Washington County	All Hazards	Municipalities may not have sufficient training to use public notification systems that the county utilizes.	Provide each municipality the opportunity to get familiar with and train in public notification systems such as NextDoor and Everbridge.	1.2 2.4	1 year	3	Requires little to no additional funding	Local Funding	Washington County DES	N/A



4.0 PLAN MAINTENANCE PROCESS

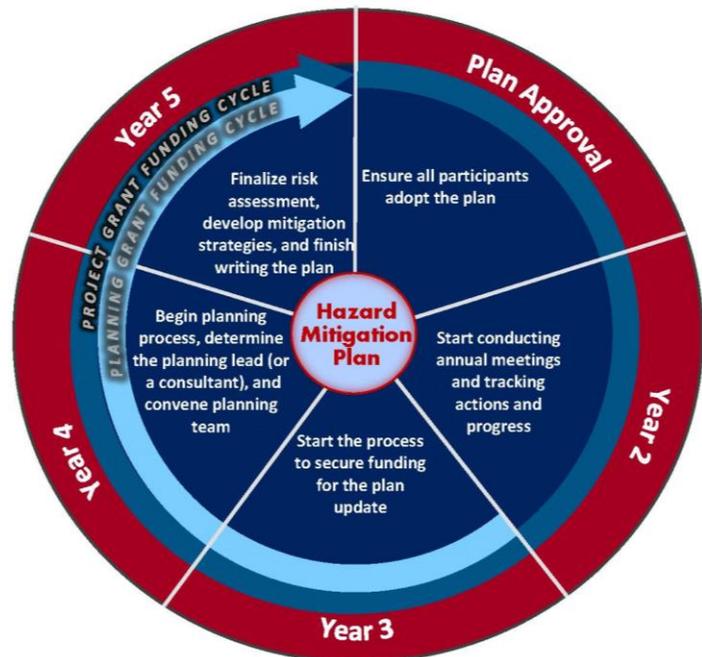
§201.6(c)(4)(i)	[The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.
§201.6(c)(4)(ii)	[The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.
§201.6(c)(4)(iii)	[The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

4.1 Monitoring, Evaluating, and Updating the Plan

Washington County Department of Emergency Services and the steering committee have established a method for the systematic and periodic review of this document. Washington County DES, as the custodial agency, assumes responsibility for scheduling committee meetings, as necessary, and also serves as the point of contact for the committee and MEMA during the 5-year period.

Washington County DES will consider the FEMA-suggested five-year update cycle where in the first year the plan is approved and adopted by the county and jurisdictions; the second year should consist of beginning annual meetings and continuing the public outreach; during the third year, Washington County DES should begin the process of securing funding for the next plan update; in the fourth year of the cycle the committee should begin planning for the next update; in the fifth year the full committee should reconvene to begin the next plan update process.

The formal updating process will consist of an annual online survey to review mitigation projects, the risk assessment, and to compare the two, prior to each in-person meeting. Each jurisdiction will be responsible for completing the survey and returning it to Washington County DES. In addition to online surveys, the committee will have



opportunities to meet at pre-established meetings throughout the year. WCDES has determined that the committee can meet at one of the quarterly local emergency planning committee (LEPC) meetings. These meetings are currently held one to two times a year, but are scheduled to take place quarterly starting in 2019. During one of these quarterly meetings, the committee will discuss updates and maintenance of this plan.

Each jurisdiction within the county is responsible for identifying and recording special hazard events and incidents for the benefit of the next plan update. Additionally, the jurisdictions will keep a status narrative for their projects within this plan; they will make note of what has been accomplished and the work that is still outstanding. These notes and recordings will be incorporated into the next hazard mitigation plan update and be available to the next committee.

The annual surveys and in-person meetings can include a variety of topics that will benefit the monitoring of the plan during the five-year cycle as well as the next plan update.

- Hazard list and hazard profile changes or updates
- Hazard occurrences and risk assessment
- Community outreach strategies
- Project status updates and effectiveness
- Asset inventory review and update
- Changes in development in the county and each municipality

The committee will evaluate the performance of the plan based on several criteria. For instance, the committee should consider revising mitigation strategies if it appears that the plan is failing according to one of the following measures.

- **Cost Effectiveness:** Is sufficient funding available to implement the project at a cost manageable by the local government? If not, is funding available? Will the costs of implementing the project be significantly less than the cumulative future costs potentially incurred by an un-corrected situation?
- **Property Protection:** How significant will the action be at eliminating or reducing damage to structures and infrastructure?
- **Life Safety:** How effectively will the action protect lives and prevent injuries?
- **Environmental Impacts:** Will implementing the project adversely affect the environment in any way? Will implementing the project actually benefit the environment?



- **Social Impacts:** Will the public perceive the project as positively lessening hazard-related losses? Will implementing the project adversely affect any segment of the population?
- **Legal Impacts:** Do your governmental organizations and/or partner agencies have the authority to implement the actions?
- **Political Impacts:** Will implementing the project create negative political issues?
- **Overall Feasibility:** Do local policies and capabilities currently allow for the implementation of the project? Are programs available to assist in funding the implementation of the project? Do local leaders generally agree that implementing the project will be beneficial to the community?

4.2 Implementation through Existing Programs

To date, local policies have not hindered hazard mitigation efforts. The jurisdictions participating in this planning process have used a variety of funding to complete mitigation projects in the past, including the Hazard Mitigation Grant Program, Homeland Security Grant Program, Emergency Management Performance Grant, Community Development Block Grant, and local funding. Local government policies and programs have supported the use of this funding and, thus, the implementation of mitigation projects. Further, all participating government jurisdictions have demonstrated a capability to successfully implement and administer mitigation projects.

Certain departments of local government within the structures of the participating jurisdictions can offer valuable insight on hazard mitigation in a number of ways. For example, the Washington County Department of Planning and Zoning not only supports updates to the county's comprehensive plan, it can serve as a technical resource for zoning and other similar issues. Further, it can ensure that the goals of the hazard mitigation plan, where appropriate, align with comprehensive planning goals. For example, Section 3.1 outlines four broad goals and a number of objectives to guide the actions contained in this plan. The department of planning and zoning houses the county's geographic information systems (GIS) resources, which can support Objective 1.1 under the first goal: "Maximize utilization of Washington County's GIS software and applications." As the custodial agency, the department may support Objective 3.5 under Goal 3: "Enact and enforce regulatory measures to ensure that new development will not increase hazard threats." The county's plan review and permitting section within the Division of Engineering & Construction Management may assist with Objective 3.6 under Goal 3: "Review and update building



codes to ensure that manufactured housing, including mobile homes, are constructed and installed in a manner to minimize impacts for hazards.” Municipalities have similar resources, particularly within the planning commissions that coordinate updates to their comprehensive plans.

Further, many communities are recognizing the complementary benefits of hazard mitigation and storm water management. The county’s Division of Public Works coordinates the county’s storm water management program, which includes MS4 and NPDES permitting as well as inspection of select storm water management facilities. According to the division’s website, the county owns and maintains over 120 storm water management facilities. This division can consider site-specific nuisance flood mitigation as SWM facilities are maintained and added. It may also consider certain “green infrastructure” or “low-impact development” approaches (e.g., rain barrels, retention basins, curb cuts, and even tree cover) and their roles in flood mitigation. These types of structures can capture storm water runoff and “treat” it onsite, thus reducing the amount of water that enters storm drains and that can potentially back-up. (NOTE: Public works participated in this update as a member of the committee.)

The comprehensive plans that have been developed by the planning commissions serving the county and the municipalities therein align nicely with hazard mitigation concepts. Each of the comprehensive plans in the county either includes or has a variation of each of the following elements. [Table 4.2.A](#) lists the elements along with points that are particularly relevant to hazard mitigation.

TABLE 4.2.A COMPEHENSIVE PLANS’ RELEVANCE TO HAZARD MITIGATION	
<i>Plan Element</i>	<i>Relevance to Hazard Mitigation</i>
Goals & Objectives	<p>Definition*: <i>This section establishes goals and objectives that serve as a guide for the development and economic and social well-being of the local jurisdictions. The goals and objectives tell the world how the community wants to function and look in the future.</i></p> <p>This section provides an opportunity for local officials to acknowledge the reciprocal benefits of hazard mitigation to community-level comprehensive planning. This section also serves as a statement of the community’s stance on resilience at it moves forward.</p>
Land Use	<p>Definition: <i>The land use element outlines the most appropriate and desirable patterns of growth and development.</i></p> <p>This section can include risk areas as key points of information for consideration as to these appropriate and desirable patterns. Incorporating mitigation in this section does not automatically imply banning development from all high hazard areas; rather, it can identify those areas where certain types of resilient construction techniques would be beneficial.</p>



Transportation	<p>Definition: <i>The transportation element describes and presents transportation patterns and includes the entire spectrum of transportation facilities (transit, roads, bicycle and pedestrian amenities, and transit-oriented development) applicable to the jurisdiction.</i></p> <p>This section can recognize the importance of the transportation infrastructure to overall emergency and disaster preparedness. Within such a discussion, maintaining critical arterial routes can be prioritized as a mitigative measure.</p>
Community Facilities	<p>Definition: <i>The community facilities element identifies the location, character and extent of public and semi-public buildings, lands, and facilities.</i></p> <p>This section provides another perspective from which to consider high-risk areas.</p>
Development Regulations	<p>Definition: <i>The development regulations section identifies development tools that are the best available mechanisms to implement the plan, including streamlined review for development in designated growth areas.</i></p> <p>This section can discuss how local ordinances and regulations can be amended to account for hazard risks. As with the land use element, these regulations may recommend or require certain types of resilient construction.</p>
Sensitive Areas	<p>Definition: <i>The sensitive areas element sets goals, objectives, principles, policies, and standards to protect sensitive areas from the adverse effects of development. The Land Use Article requires jurisdictions to protect streams and their buffers; the 100-year floodplain; habitats of threatened and endangered species; and steep slopes, wetlands, and agricultural and forest lands intended for resource protection or conservation.</i></p> <p>This section gives communities the option of designating high risk areas as sensitive areas.</p>
Implementation	<p>Definition: <i>Recognizing the importance of designing land development regulations that implement the plan, this section is supposed to address recommendations for land development regulations.</i></p> <p>This section can include a series of actions that may be duplicated in the hazard mitigation plan (and vice versa). It allows communities to acknowledge those initiatives that overlap both community development and hazard mitigation goals.</p>
Development Capacity Analysis	<p>Definition: <i>This section is an estimate of the total amount of development that may be built in an area under a certain set of assumptions, including land use laws and policies (e.g., zoning), environmental constraints, etc.</i></p> <p>This section can include high risk areas as a type of environmental constraint.</p>
Municipal Growth	<p>Definition: <i>This element requires municipalities to identify areas for future growth consistent with their long-range visions.</i></p> <p>This section supports the multi-jurisdictional approach of this hazard mitigation plan by integrating discussions of high risk areas and their relation to areas targeted for future growth. It also provides space to consider such measures as resilient construction in municipal areas.</p>
Water Resources	<p>Definition: <i>This element identifies drinking water supplies needed by projected populations.</i></p> <p>This section supports the continued operation of critical infrastructure, particularly water systems. By identifying drinking water supply needs and potential upgrades necessary to meet those needs, this section gives local officials the opportunities to discuss upgrades and other means of ensuring reliability of water during emergencies.</p>

* Source: Maryland Department of Planning



These elements are required by the “content requirements” of the Maryland Department of Planning’s *Land Use Article*. The following images include areas from the local comprehensive plans and serve as examples of opportunities for alignment with hazard mitigation goals and objectives.

Figure 4.2.a: Washington County Visions, Goals, and Objectives (2002 Version, p. 11)

CHAPTER 2
VISIONS, GOALS AND OBJECTIVES

A. PLAN VISIONS

1. County Government Mission

On January 16, 2001 the Board of Commissioners of Washington County adopted the following as the County Mission. The Mission of Washington County Government is to provide exemplary public services by:

- Supporting and strengthening individual and community self reliance and responsibility;
- Promoting education, economic opportunities, public health, safety, and welfare;
- Protecting the environment and cultural resources we share; and
- Planning for future urbanization and a culturally diverse population.

The County’s Mission of County Government along with the States “Eight Visions” have been used as the basis for the development of the goals and objectives articulated in the Comprehensive Plan.

These missions provide opportunities for integrating resilience into the overall vision and goals for the county, as well as the plan.



Figure 4.2.b: Boonsboro Land Use Goal

Town of Boonsboro, Maryland 2009 Comprehensive Plan

Chapter 3: Land Use Element

This chapter sets forth land use policies and recommendations to help the Town of Boonsboro maintain its historic, small-town character, while recognizing opportunities for growth and economic development. Land use guidance for the nearly 1,000 acres of land annexed at the end of 2006 is particularly important, as is the relationship between this annexed land and the remainder of the Town.

Issues related to annexation, growth, and demand for public services are discussed in detail in Chapter 2 (the Municipal Growth Element), while the adequacy of public water and sewer service is discussed at length in Chapter 4, the Water Resources Element.

Goals and Objectives

1. Promote new development on the annexed properties that is in keeping with character of the Town's current residential development, and support the Town's economic development and other goals.
2. Ensure that future development avoids environmentally sensitive areas.
3. Encourage appropriate amounts and types of commercial development at appropriate locations in the Town.

Existing Land Use

Boonsboro's existing land use pattern, shown in Map 3.1, is a diverse mix of residential, commercial, institutional and undeveloped areas. Table 3.1 summarizes the typical amount of existing land uses. Boonsboro is primarily residential in nature, with commercial activities in nodes along US Alternate 40 (Main Street).

Residential uses are generally single-family detached in nature, with some townhouse, multi-family, and apartment developments. Commercial areas are generally small in size, and cater to the needs of the local population or to the Town's tourism industry. The exception is the 50,000 square foot Weis supermarket on Chase Six Boulevard, which opened in 2005. Before Weis opened, Boonsboro residents typically did their major shopping in Hagerstown or Frederick.

The County public school complex (containing Boonsboro Elementary, Middle, and High Schools) along MD 66 (Maple Avenue) comprise most of the Town's institutional uses.

The Londontown Manufacturing Company (a clothing factory), south of the school complex, was Boonsboro's only major industrial activity, but it closed in the early 1990's. The Londontown site is currently occupied by Gesac, Inc. and remains appropriate for light industrial or employment-focused activity.

These goals can be amended to include references to high risk areas.

3-1



Figure 4.2.c: Hagerstown Community Facilities Goals

City of Hagerstown, Maryland 2008 Comprehensive Plan

Community Facilities Element

Introduction

This chapter addresses community facilities and services provided by the City of Hagerstown, and also includes information on services provided by others, such as schools, libraries, emergency services, and solid waste management.

Goals

1. Maintain and expand police, fire, and EMS services to serve the City's growing population and geographic area.
2. Support civic institutions that add to overall quality of life.
3. Grow the parks and recreation system to provide adequate open space, athletic fields, and indoor and specialty recreation facilities for the City's growing population.
4. Support and advocate for the expansion of school services to serve existing neighborhoods and the growing population in the Medium Range Growth Boundary.

Issues Addressed by this Element

1. Hagerstown will need expanded and relocated fire protection and emergency services in order to adequately serve areas within the Medium Range Growth Area.
2. The Hagerstown region will need at least two new elementary schools and one new high school in the near term to serve the growing educational needs of the Medium Range Growth Area.
3. Some residential areas lack neighborhood parks.

This goal supports emergency preparedness, wherein better responses can reduce losses.

This goal identifies an area where the city can increase greenspace and mimic natural features as an opportunity for mitigating flooding.



Figure 4.2.d: Smithsburg Actions within Floodplain Buffers

7. Viable pedestrian ways and bicycle routes are an integral component of the road and street network and are interconnected with a system of paths and walkways.

8. Areas unsuitable for development because of environmental factors (such as floodplains, steep slopes, and geology) will not be annexed into the Town except for the purpose of conservation and preservation.

9. Annexation requests in areas that will impact views will not be granted unless a stringent plan for viewshed protection, which includes a significant amount of permanent open space, is established.

Actions:

1. The zoning and floodplain ordinances are updated to reflect stream and floodplain buffers. Uses are limited to stormwater management, natural resource protection, open space, and recreation.

2. The subdivision regulations are amended to require that residential areas be within a five-minute walking distance of a park. This means that parks are located every quarter-mile in developed areas of town.

3. Zoning regulations are updated to require that redevelopment in sensitive areas reduces the amount of impervious surfaces and intensity of use as well as increasing tree canopy.

4. The subdivision ordinance is updated to establish the system of greenways and trails throughout Town as development occurs. This system also connects the Town to nature trails in the nearby South and Catoctin Mountains.

5. The subdivision ordinance is updated to require sidewalks and bike lanes be designated along both sides of all new and upgraded roads.

6. The Town works with developers and landowners to ensure that the hillside at the north of the Town's growth area becomes a community park with wooded areas for passive recreation and hiking trails as well as active recreational opportunities.

7. Areas of permanent open space should be created through the conveyance of conservation easements to the Town and/or designated land trusts.

8. The existing parks in Smithsburg are maintained, and new parks are developed in conjunction with open space and viewshed preservation.

Smithsburg Comprehensive Plan 2011
Adopted February 7, 2012 6-7

This action serves as an example of a land use practice that can reduce the types of structures subject to flood exposure.

Given the potential overlap in these efforts, this plan recognizes the importance of ensuring relevant representation during future updates of both comprehensive plans and the hazard mitigation plan. During the 2017 mitigation plan update, representatives from the Washington County Department of Planning and Zoning and Hagerstown Planning Office served on the steering committee guiding the update. As such, consistency with comprehensive planning goals could be discussed. Personnel from the Washington County DES may consider asking to participate in future updates to, at minimum, the county's comprehensive plan to ensure inclusion of mitigation concepts.



General opportunities for hazard mitigation plan integration with other plans and ordinances within Washington County are outlined in Table 4.2.B. The method or opportunity for each type of plan's integration with the hazard mitigation plan is described in the second column. The intent of Table 4.2.B is to serve as a list of recommended potential considerations for the custodians of these various plans as they update the documents.



TABLE 4.2.B PLAN INTEGRATION											
<i>Existing Program</i>	<i>Responsible Agency(ies)</i>	<i>Applicable Plan (i.e., Document)</i>	<i>Mitigation Action Comparison</i>								
Emergency Operations Planning	Washington County Department of Emergency Services Emergency response agencies	Emergency operations plans Hazard/vulnerability analyses Commodity flow studies	Ensure consistency between updated hazard analyses and the risk assessment portion of the plan Consider mitigation projects as part of the overall cycle of emergency management								
			<table border="1"> <thead> <tr> <th>PLAN ELEMENTS/POLICIES</th> <th>ASSOC. MITIGATION OBJECTIVE*</th> </tr> </thead> <tbody> <tr> <td>Establish and maintain effective response program</td> <td>1.2: Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.</td> </tr> <tr> <td>Support continuity of critical infrastructure and key resources</td> <td>3.8: Use public funding to protect public services and critical facilities and on private property where benefits exceed cost.</td> </tr> <tr> <td>Identify specific risk areas for certain hazards</td> <td>2.4: Heighten public awareness of natural hazards. 1.2: Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.</td> </tr> </tbody> </table>	PLAN ELEMENTS/POLICIES	ASSOC. MITIGATION OBJECTIVE*	Establish and maintain effective response program	1.2: Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.	Support continuity of critical infrastructure and key resources	3.8: Use public funding to protect public services and critical facilities and on private property where benefits exceed cost.	Identify specific risk areas for certain hazards	2.4: Heighten public awareness of natural hazards. 1.2: Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.
			PLAN ELEMENTS/POLICIES	ASSOC. MITIGATION OBJECTIVE*							
Establish and maintain effective response program	1.2: Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.										
Support continuity of critical infrastructure and key resources	3.8: Use public funding to protect public services and critical facilities and on private property where benefits exceed cost.										
Identify specific risk areas for certain hazards	2.4: Heighten public awareness of natural hazards. 1.2: Improve coordination and communication between responder agencies, other relevant organizations, and jurisdictions with each other and the public.										



TABLE 4.2.B PLAN INTEGRATION				
<i>Existing Program</i>	<i>Responsible Agency(ies)</i>	<i>Applicable Plan (i.e., Document)</i>	<i>Mitigation Action Comparison</i>	
			<p>PLAN ELEMENTS/POLICIES Support resiliency by ensuring new development stays clear of known hazard areas or is built in such a way as to withstand the effects of known hazards</p> <p>Protect green spaces in special flood hazard areas</p>	<p>ASSOC. MITIGATION OBJECTIVE 3.4: Utilize the most effective approaches to protect buildings from flooding, including acquisition, demolition, elevation, and mitigation reconstruction. 3.7: Ensure existing high risk residential structures are utilizing retrofitting techniques to mitigate repetitive flooding. 4.1: Provide for the conservation and preservation of natural resources.</p>
Infrastructure (i.e., Water, Sewer) Development	Washington County Department of Water Quality Utility providers	Jurisdictional and/or utility-specific capital improvement plans Jurisdictional source water protection plans Washington County Water and Sewer Plan	Ensure protection of environmental features as infrastructure projects are undertaken Support resiliency by extending or improving public utility service to residents Support improved emergency communications	
			<p>PLAN ELEMENTS/POLICIES Support infrastructure development as a means of attracting economic development</p>	<p>ASSOC. MITIGATION OBJECTIVE 3.8: Use public funding to protect public services and critical facilities and on private property where benefits exceed cost.</p>
Commercial/Economic Development	Jurisdictional zoning departments and officers Planning commissions for the county, Hagerstown, and the towns within the county	Zoning ordinances Building codes Subdivision and land development ordinances Comprehensive plans (each contains a "Economic Development", "Land Use and Development", "Housing",	Ensure adherence to floodplain, zoning, building, subdivision, and other relevant ordinances Consider the implementation of storm water management projects Consider incorporating green infrastructure/low-impact development into site-specific projects (e.g., use of porous pavement, tree planting initiatives, planter boxes, bio swales, etc.)	



TABLE 4.2.B PLAN INTEGRATION				
<i>Existing Program</i>	<i>Responsible Agency(ies)</i>	<i>Applicable Plan (i.e., Document)</i>	<i>Mitigation Action Comparison</i>	
		“Community Facilities”, and “Historical and Cultural Resources” elements)	<p>PLAN ELEMENTS/POLICIES</p> <p>Encourage responsible land use</p> <p>Identify areas suitable for residential development (or redevelopment)</p> <p>Identify areas suitable for commercial development (or redevelopment)</p> <p>Identify areas suitable for industrial development (or redevelopment)</p>	<p>ASSOC. MITIGATION OBJECTIVE</p> <p>3.5: Enact and enforce regulatory measures to ensure that new development will not increase hazard threats.</p> <p>4.2: Limit additional housing (especially elderly and high density) in areas of high hazard risk.</p> <p>3.5: Enact and enforce regulatory measures to ensure that new development will not increase hazard threats.</p> <p>3.5: Enact and enforce regulatory measures to ensure that new development will not increase hazard threats.</p>
Stormwater Management	Utility providers Washington County Division of Public Works (Stormwater Management Program)	Jurisdictional MS4 permitting processes (where applicable)	Identification of site-specific flooding concerns and other water quality issues Provides a means for consideration of low-impact development options for flood mitigation	



TABLE 4.2.B PLAN INTEGRATION				
<i>Existing Program</i>	<i>Responsible Agency(ies)</i>	<i>Applicable Plan (i.e., Document)</i>	<i>Mitigation Action Comparison</i>	
			PLAN ELEMENTS/POLICIES Encourage onsite management of runoff	ASSOC. MITIGATION OBJECTIVE 2.3: Publicize and encourage the adoption of appropriate hazard mitigation actions. 2.5: Prioritize new mitigation projects, starting with sites facing the greatest threat to life, health, and property. 4.1: Provide for the conservation and preservation of natural resources.

* Reference Section 3.1: Mitigation Goals and Objectives.



4.3 Continued Public Involvement

The Washington County committee understands that the general public must be involved in the initial planning process, as well as the updates to the completed plan. Washington County DES will utilize the Emergency Management Volunteers group with approximately 50 volunteers to implement the public outreach that will include mitigation; the EM volunteer group typically has one public outreach event every month. Some of the events in which the EM volunteer group can garner public participation include:

- Community Emergency Response Team (CERT) trainings, twice a year,
- the Strong Challenge,
- Children's Village (for second graders),
- the Hagerstown Home Show,
- National Night Out,
- Emergency Preparedness Day, and
- other recreational and emergency preparedness activities.

After every annual committee meeting, the Emergency Management volunteer group will be presented with a survey that they can take to the public during these events. The survey will be designed by the committee and WCDES and include a variety of preparedness and mitigation topics, focused on different aspects of this plan, and be different every time.

Further, as the updated plan is adopted, the public will be given the chance to comment on the updated plan prior to its adoption by passage resolution or ordinance. WCDES, at a minimum, will maintain file copies of the Hazard Mitigation Plan that are available for review and inspection during routine business hours. WCDES intends to log all comments received regarding the mitigation plan. Members of the public are invited to contact WCDES with comments regarding hazard events, etc. Local officials are also invited to review the plan's effectiveness at determining hazard susceptibility based on data from hazard events as they occur.



5.0 APPENDICES

This section contains the following appendices.

Appendix 1: Meeting Documentation & Committee Involvement

Appendix 2: Public Surveys and Involvement

Appendix 3: Detailed Lists of Hazard Events

Appendix 4: 2012 Project Updates

Appendix 5: Threat and Hazard Identification Risk Assessment (THIRA)

Appendix 6: Citations

Appendix 7: Adopting Resolutions



APPENDIX 1

MEETING DOCUMENTATION & COMMITTEE INVOLVEMENT

This section contains the following information.

- Meeting sign in sheets
- Meeting presentations
- Meeting worksheets and information completed by the committee
- Committee contact log



WASHINGTON COUNTY HAZARD MITIGATION PLAN

Hazard Mitigation Plan 2017 Update – Steering Committee Meeting #1

July 31, 2017 ~ 1:30 pm

Sign In Sheet

	Name	Affiliation	Email
1.	Douglas DeHaven	Hagerstown Fire Dept Fire Marshal Office	ddehaven@hagerstownmd.org
2.	Amy Heimberger	JH Consulting	aheimberger@jhcpreparedness.com
3.	Tom Brown, Jr.	Wash Co. EM	cbrown@washco-md.net
4.	Joe Wesmiller	Wash Co. Em	jwesmiller@washco-md.net
5.	Stephen Goddard	W.C. Planning & Zoning	sgoddard@washco-md.net
6.	R. David Hays	Div. of Emerg. Suc's	dhays@washco-md.net
7.	Juanita Grimm	Clear Spring	clear-spring@myactiv.net
8.	Beck Bishop	KEEDYSVILLE	TOWNHALL@KEEDYSVILLEMD.COM
9.	Debra Smith	Smithsburg	dsmith@townofsmithsburg.org
10.	Julie Pippel	Wash. Co. Div. Env. Mngt.	jpippel@washco-md.net
11.	Jim Sterling	WASH Co Dept. Public Works	ISTERLING@washco-md.NET
12.	JEFF HARVEY	JH CONSULTING, LLC	jharvey@jhcpreparedness.com
13.	CHARLIE SUMMERS	WASH. Co EMERGENCY Mgt.	CSUMMERS@WASHCO-MD.NET
14.			
15.			
16.			

**WASHINGTON COUNTY
HAZARD MITIGATION PLAN 2017 UPDATE
STEERING COMMITTEE MEETING #1**

AGENDA

Date: July 31, 2017
Time: 1:30 p.m.
Estimated Duration: 60-90 minutes
Location: Washington County Division of Emergency Services Building
16232 Elliott Parkway
Williamsport, MD 21795

1. Welcome & Introductions
2. Brief Overview of Process
 - What is hazard mitigation?
 - The hazard mitigation plan
 - Steering committee roles & responsibilities
 - Estimated project schedule
3. Hazards Review
 - Existing and proposed lists of hazards
 - Cascading effects
 - Historical occurrences
 - Perceptions and story activity
 - Probability vs. severity
 - Risk assessment matrix
 - Risk assessment matrix activity
 - Community perceptions
4. Tasks
 - Capabilities assessment
 - Asset inventories
5. Public Outreach and Engagement
6. Meeting Schedule
7. Questions & Answers
8. Adjournment

WASHINGTON COUNTY HAZARD MITIGATION PLAN 2017 UPDATE



Division of Emergency Services
 July 31, 2017
 1:30 pm
 16232 Elliott Parkway
 Williamsport, MD 21795



WELCOME AND INTRODUCTIONS




AGENDA

- Overview of Hazard Mitigation and the Planning Process
- Hazard Review
- Tasks
- Public Outreach & Engagement
- Meeting Schedule
- Q & A



OVERVIEW OF HAZARD MITIGATION AND THE PLANNING PROCESS

What is hazard mitigation?

Federal Emergency Management Agency (FEMA):

- oversees the hazard mitigation process at the local, regional, state, and national levels, and
- defines mitigation as, "the effort to reduce loss of life and property by lessening the impact of disasters" (FEMA.gov, 2016).



OVERVIEW OF HAZARD MITIGATION AND THE PLANNING PROCESS

The Hazard Mitigation Plan

The
Hazard
Mitigation
Plan

- Planning Process
- Description of the planning area
- Risk Assessment
 - Hazard profiles
 - Assets inventory
 - Development trends
- Action plan
 - Goals
 - Strategies (projects)
- Plan maintenance
- Appendices

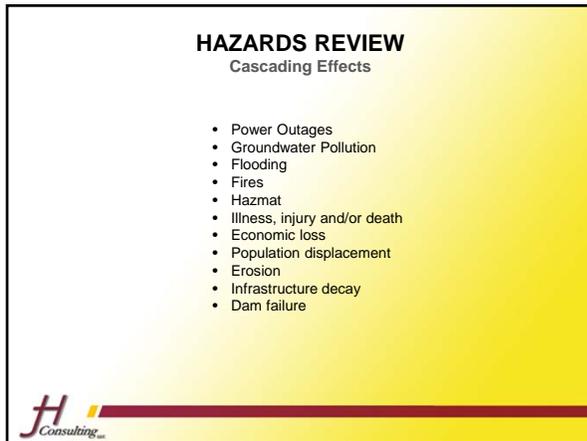
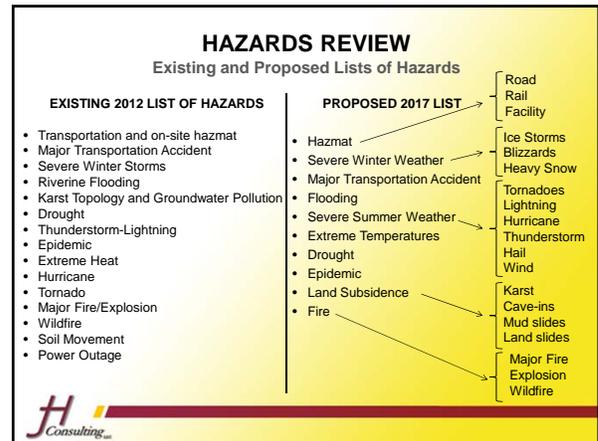
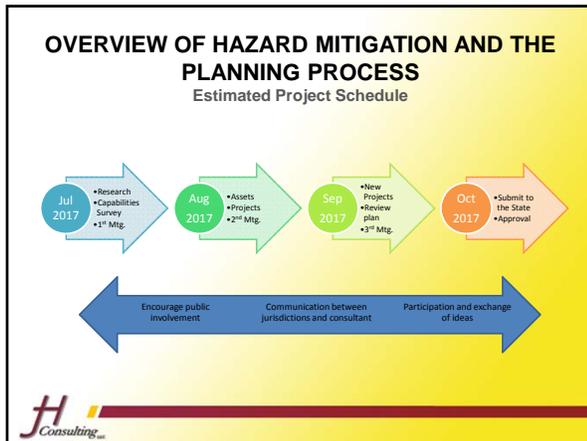


OVERVIEW OF HAZARD MITIGATION AND THE PLANNING PROCESS

Steering Committee Roles & Responsibilities

- Committee Review – Will need to meet regularly to work through the document in order to complete the timeline.
- Additional contact with committee members will be made by phone, through email, and teleconferences as needed.
- Committee members will be asked to complete tasks specific to their jurisdiction.
- JHC planning staff will be primarily responsible for research and document drafting.

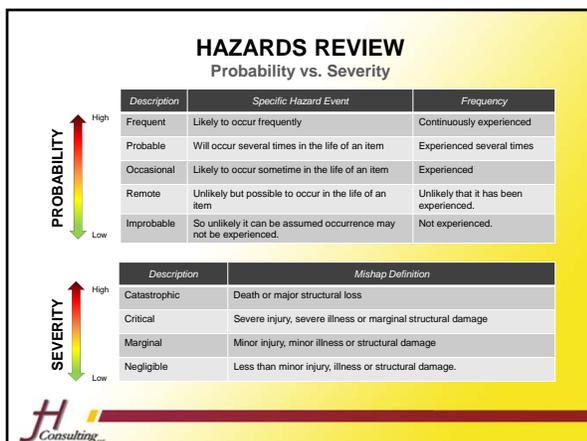




HAZARDS REVIEW

Historical Occurrences

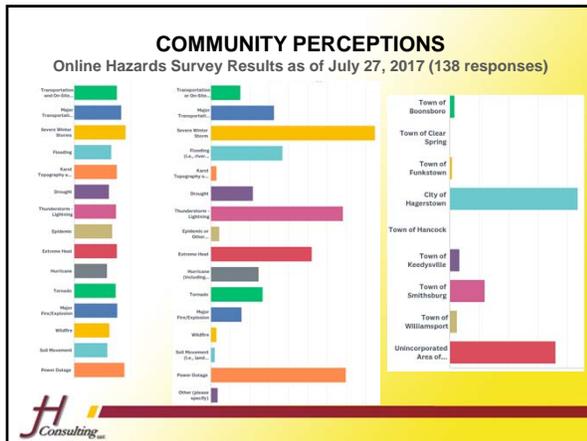
NCEI EVENTS IN WASHINGTON COUNTY, MD 2000-2017				
Event	# of Events	Deaths	Injuries	Damage
Extreme Temperatures	25	0	0	\$0
Cold	10	0	0	\$0
Heat	15	0	0	\$0
Drought	2	0	0	\$0
Flood	12	0	0	\$70,000
Flash Flood	11	0	0	\$20,000
Winter Weather	73	0	0	\$0
Severe Summer Weather	154	0	1	\$2,030,800
Tornado	3	0	0	\$375,000
Lightning	5	0	1	\$145,000
Hail	37	0	0	\$15,000
Heavy rain	15	0	0	\$0
Wind	94	0	0	\$1,800,800
Wildfire	1	0	0	\$0
Total	278	0	1	\$2,120,800



HAZARDS REVIEW

Risk Assessment Matrix

RISK ASSESSMENT MATRIX						
		PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
SEVERITY	Catastrophic	Very High	Very High	High	Moderate	Low
	Critical	High	High	Moderate	Low	Very Low
	Marginal	High	Moderate	Low	Very Low	Very Low
	Negligible	Moderate	Low	Low	Very Low	Very Low



TASKS

Capabilities Assessment

You received an online survey by email. This survey asks you about your jurisdiction's:

- rules and regulations regarding floodplain, zoning, and building codes,
- comprehensive plans.
- participation in the NFIP, and
- available capital and public works budget.

H Consulting

TASKS

Asset Inventories

- Need to update the Asset Inventory included in the plan.
 - Critical Facilities
 - Vulnerable Populations
 - Economic Assets
 - Special Considerations
 - Historical Considerations
- You will receive a list of the assets that were included for your county in the existing plan. Make revisions, deletions, and additions.

H Consulting

PUBLIC OUTREACH & ENGAGEMENT

Meetings and Online Survey

Public input is required per FEMA, and can be obtained in multiple ways.

- Hazard Mitigation meetings for the public to comment on the process.
- Copies of the plan placed at county offices/libraries for public review and comment.
- Online surveys regarding the current plan, public thoughts on hazard mitigation, and comments on the updated plan draft.
 - Social media presence is very important for these surveys to be successful.

H Consulting

MEETING SCHEDULE

The next two committee meetings have been established.

Tuesday, August 22, 2017 at 1:30 pm

Tuesday, September 19, 2017 at 1:30 pm

You will have opportunity to participate in the planning and updating of the plan throughout the entire process.

H Consulting

Q & A

THANK YOU!

H Consulting

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting
Risk Assessment Matrix Exercise

Name: _____

Agency/Municipality/Other: _____

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic					
	Critical					
	Marginal					
	Negligible					

Hazard Probability Classifications

Description	Specific Hazard Event
Frequent	Likely to occur frequently within a year time span.
Probable	Will likely occur several times over the course of several years
Occasional	Likely to occur once in a several year period.
Remote	Unlikely to occur once in a several year period, but possible.
Improbable	So unlikely it can be assumed occurrence will not occur

Hazard Severity Classifications

Severity Levels	Severity Description
Catastrophic	Death or major structural loss
Critical	Severe injury, severe illness or marginal structural damage
Marginal	Minor injury, minor illness, or minor structural damage
Negligible	Injuries or structural damage are not expected

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: CHARLES SUMMERS

Jurisdiction: WASH. CO. OR

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Epidemic	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Flood	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: JUNE 2014 Location: CLEAR SPRING MS	RAIN FELL DEPOSITING 6" IN TWO HOURS TOMS RUN RAN OUT OF ITS BANK AND FLOODED DOWNTOWN CLEAR SPRING WHERE MANY STRUCTURES HAD BEEE BUILT OVER TOP OF THE STREAM
Fire	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Hazmat	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Land Subsidence	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____

Major Transportation Accident
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Summer Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Winter Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: JAN 15
Location: ENTIRE COUNTY
WINTER STORM JUNOS AND THE COUNTY'S ABILITY TO RESPOND TO IT, PLACED RESPONSIBILITY BECAUSE OF EMERGENCY RESPONDERS LIABILITY TO RESPOND TO CALLS FOR SERVICE

Temperature Extremes
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: D. Sterling

Jurisdiction: Public Works

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Epidemic	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Flood	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Fire	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Hazmat	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: - Location: <u>INTERSTATE HIGHWAYS</u>	<u>The probability is high for INCIDENT with major evacuations due to what is hauled thru this county</u> <u>NO MAJOR INCIDENTS YET -</u>
Land Subsidence	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	<u>High KARST AREA - sinkholes develop heavily - NO ONE INJURED YET</u>

Major Transportation Accident

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: _____

Location: _____

Severe Summer Weather

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: _____

Location: _____

Severe Winter Weather

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: *FK 1/6*

Location: *Winter Storm Jonas - 1 of several large snow storms in last 30 yrs - working event for storm + cleanup - Major concern is # of employees to work storm thru extremely*

Temperature Extremes

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: _____

Location: _____

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: _____

Location: _____

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: _____

Location: _____

Not Concerned

Somewhat Concerned

Concerned

Very Concerned

Date: _____

Location: _____

Faint handwritten notes and signatures at the bottom of the page.

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: Doug DeBruin

Jurisdiction: Hagerstown FD

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: <u>Approx 6 years ago</u> Location: _____	- No or little planning as to what to do/who to call for structural issues from damages. - NO Multi-agency role or Responsibility
Epidemic	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	AS Seen w/ local OD responses, resources become drained. Cannot keep up w/ daily call vol.
Flood	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Fire	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input checked="" type="checkbox"/> Very Concerned	Date: <u>M15</u> Location: _____	Date Reduction in resources resulting in increase response time to significant fires causing increase fire spread before containment Stalling/Approaches - single incident coverage
Hazmat	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	Reduction in a trained personnel is limiting ability to handle sustained incident
Land Subsidence	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____

Major Transportation Accident
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Summer Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Winter Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Temperature Extremes
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: Julie Pippel

Jurisdiction: Wash. Co. Div. of Env. Mngt.

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input checked="" type="checkbox"/> Very Concerned	Date: _____ Location: <u>Mt. Aetna</u>	<u>Mt. Aetna - Springs production dropped below required for system. Drilled a new well</u>
Earthquake	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____
Epidemic	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____
Flood	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____
Fire	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____
Hazmat	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: <u>Sharpsburg</u>	<u>We have one water plant with intake on Potomac which is susceptible to spills in Potomac.</u>
Land Subsidence	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: <u>North End of Hagerstown</u>	<u>- sink hole developed under near major force main. Repaired sink hole</u>

Major Transportation Accident
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Summer Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Winter Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Temperature Extremes
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: Debra Smith

Jurisdiction: Smithsburg

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Epidemic	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Flood	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	<u>Certain areas in Smithsburg are prone to flooding</u>
Fire	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Hazmat	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: <u>2010</u> Location: <u>Behind W. WATERST.</u>	<u>Deaf person on railroad tracks hit by train & killed.</u> <u>Train tracks in Smithsburg run thru residential areas - prone to pedestrian</u>
Land Subsidence	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____

Major Transportation Accident
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Summer Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Winter Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____
*Due to mountainous areas -
winter conditions can be
severe.*

Temperature Extremes
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: PECK BISHOP

Jurisdiction: KEEYSVILLE

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Epidemic	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Flood	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: 2012 or 2013 Location: LITTLE ANTIETAM CREEK	CREEK IS SUBJECT TO BRIEF PERIODS OF FLOODING, LAST OCCURRED IN SUMMER 2012 OR 2013. BASEMENTS OF SEVERAL BUILDINGS EXP. WATER DAMAGE - NO MITIGATION
Fire	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Hazmat	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Land Subsidence	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input checked="" type="checkbox"/> Very Concerned	Date: MARCH 2017 Location: 11 MILLRACK LANE	THREE SEPARATE SINK HOLE HAVE OPENED IN KEEYSVILLE. THE LAST IN MARCH 2017. ALL WERE RELATIVELY SMALL. NO MITIGATION DONE

Major Transportation Accident
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Summer Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Winter Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Temperature Extremes
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: Juanita Grimm

Jurisdiction: Clear Spring

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Epidemic	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Flood	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: 2015 Location: Downtown Clear Spring	Too much rain was received in a short period of time. Downtown flooded, firefighters had to wear interest to rescue families, storm left town in a total mess, people lost properties and personal belongings.
Fire	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: downtown Clear Spring	most of the homes are connected, older homes, lost several dwellings
Hazmat	<input type="checkbox"/> Not Concerned <input checked="" type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Land Subsidence	<input checked="" type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____

- Major Transportation Accident
- Not Concerned
 - Somewhat Concerned
 - Concerned
 - Very Concerned

Date: _____
 Location: I-70

Every time there is an accident on I-70 traffic is rerouted thru Clear Spring causing accidents and backups. And is an inconvenience to locals. (some traffic if not rerouted just get on Route 40 to HV-Dess a/cident)

- Severe Summer Weather
- Not Concerned
 - Somewhat Concerned
 - Concerned
 - Very Concerned

Date: _____
 Location: _____

- Severe Winter Weather
- Not Concerned
 - Somewhat Concerned
 - Concerned
 - Very Concerned

Date: _____
 Location: _____

- Temperature Extremes
- Not Concerned
 - Somewhat Concerned
 - Concerned
 - Very Concerned

Date: _____
 Location: _____

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date: _____
 Location: _____

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date: _____
 Location: _____

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date: _____
 Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: D. Hays

Jurisdiction: DES

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
Drought	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Earthquake	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Epidemic	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Flood	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____
Fire	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: 2017 Location: Security Rd. Hag. MD	2017: Holsum Cement fire fire in cement mill. Water system failures, limited staffing, contaminated equip.
Hazmat	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input checked="" type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: 2015 Location: FBI N.B. @ 8mm	Radiological MVC
Land Subsidence	<input type="checkbox"/> Not Concerned <input type="checkbox"/> Somewhat Concerned <input type="checkbox"/> Concerned <input type="checkbox"/> Very Concerned	Date: _____ Location: _____	_____ _____ _____

- Major Transportation Accident
- Not Concerned
 - Somewhat Concerned
 - Concerned
 - Very Concerned

Date: Jan. 2009
Location: I 70 W.B.
37 mi

MVC involved involved 50 vehicles, 71 victims & 17 trans. pt 2. w/ 2 fatalities

Severe Summer Weather

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date:
Location:

Severe Winter Weather

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date: Jan 2016
Location: Wash. Co.

2016 Winter Storm Texas
42" snow, limited ability
of Emer. Svc's to respond

Temperature Extremes

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date:
Location:

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date:
Location:

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date:
Location:

- Not Concerned
- Somewhat Concerned
- Concerned
- Very Concerned

Date:
Location:

Major Transportation Accident
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Summer Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Severe Winter Weather
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: *See front*

Temperature Extremes
 Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

Not Concerned
 Somewhat Concerned
 Concerned
 Very Concerned
Date: _____
Location: _____

TELL ME A STORY

From the hazards listed below for the hazard mitigation plan update, tell me about a specific problem you've encountered in your jurisdiction relating to at least three of these hazards. Provide the date (year at minimum), location (street name, park name, etc.), and a brief description of what happened and why, and if there was anything that was done about it since it occurred. Use the reverse side of this page if you require more space.

Name: Tom Brown, Jr.

Jurisdiction: Wash Co EMM

Hazard	Level of Concern	Date and Location	Brief Description
Example: Storm Surge	<input type="checkbox"/> Not Concerned	Date: August 2014 Location: Coast of South Beach along Ocean Drive between 5th St. and 14th St.	Tropical Storm Enrique caused erosion on South Beach in Miami because of a 10' storm surge. The water reached Ocean Drive and flooded local businesses and swept away cars. After the water receded, recovery took several months and many businesses could not recover. Three people died and dozens were injured; five are still missing. Since then, low impact mitigation strategies have been implemented along the beach to avoid widespread destruction.
	<input type="checkbox"/> Somewhat Concerned		
	<input checked="" type="checkbox"/> Concerned		
	<input type="checkbox"/> Very Concerned		
Drought	<input checked="" type="checkbox"/> Not Concerned	Date: _____	_____
	<input type="checkbox"/> Somewhat Concerned	Location: _____	_____
	<input type="checkbox"/> Concerned	_____	_____
	<input type="checkbox"/> Very Concerned	_____	_____
Earthquake	<input checked="" type="checkbox"/> Not Concerned	Date: _____	_____
	<input type="checkbox"/> Somewhat Concerned	Location: _____	_____
	<input type="checkbox"/> Concerned	_____	_____
	<input type="checkbox"/> Very Concerned	_____	_____
Epidemic	<input type="checkbox"/> Not Concerned	Date: _____	_____
	<input checked="" type="checkbox"/> Somewhat Concerned	Location: _____	_____
	<input type="checkbox"/> Concerned	_____	_____
	<input type="checkbox"/> Very Concerned	_____	_____
Flood	<input type="checkbox"/> Not Concerned	Date: 2015?	During/After heavy rainfall Flash Flooding center of town. May have been result of land development North and East of Clear Spring. No deaths or injuries.
	<input type="checkbox"/> Somewhat Concerned	Location: Clear Spring, MD	
	<input checked="" type="checkbox"/> Concerned	_____	
	<input type="checkbox"/> Very Concerned	_____	
Fire	<input type="checkbox"/> Not Concerned	Date: _____	_____
	<input type="checkbox"/> Somewhat Concerned	Location: _____	_____
	<input checked="" type="checkbox"/> Concerned	_____	_____
	<input type="checkbox"/> Very Concerned	_____	_____
Hazmat	<input type="checkbox"/> Not Concerned	Date: _____	_____
	<input type="checkbox"/> Somewhat Concerned	Location: _____	_____
	<input checked="" type="checkbox"/> Concerned	_____	_____
	<input type="checkbox"/> Very Concerned	_____	_____
Land Subsidence	<input type="checkbox"/> Not Concerned	Date: _____	_____
	<input checked="" type="checkbox"/> Somewhat Concerned	Location: _____	_____
	<input type="checkbox"/> Concerned	_____	_____
	<input type="checkbox"/> Very Concerned	_____	_____

Severe Winter
Weather

concerned

2015?
Wash Co.

large snow storms causing significant closings both roadway and business. Unable to maintain roadway openings. Power outages as cascading effect. Difficulty getting first responders to remote locations.

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: CHARLES Summers

Agency/Municipality/Other: WASHINGTON Co Emerg. Mgt.

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic	FIRE				
	Critical		MAJOR TRANSPORTATION ACCIDENT	SEVERE WINTER STORM	EPIDEMIC LAND SUBSIDENCE	
	Marginal	HAZMAT SEVERE SUMMER WEATHER	EXTREME TEMPS.	FLOODING		
	Negligible			DROUGHT		

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: Juanita Grimm

Agency/Municipality/Other: Clear Spring

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic		major transportation accident	Fire Flood Hazmat		
	Critical					
	Marginal	Severe winter weather		Severe summer weather	Epidemic	
	Negligible	Extreme Temperatures		Drought		Land Subsidence

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: Debra Smith

Agency/Municipality/Other: Smithsburg

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic			Hazmat (oil)		
	Critical			Fires		
	Marginal			Severe Winter Weather Land Subsidence Severe Summer Weather	major transportation accident Drought	Flooding Severe Summer Weather Extreme temps
	Negligible				Epidemic	

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: Julie Poppel

Agency/Municipality/Other: Environmental Management

Dept. of Water Quality
 Dept. of Solid Waste

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic	Catastrophic Severe Weather	Severe * Summer Weather	Drought - water systems Flooding: water & sewer	Hazmat spill Near water source.	
	Critical		Land Subsidence water & sewer		Epidemic	
	Marginal			Catastrophic , Severe Subsidence Extreme - Frozen Temp. Lines	Fire - water/ sewer - Landfill	
	Negligible					

* Could be catastrophic if it disables water, sewer or solid waste operation
 such as Tornado/Hurricane

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: Tim Sterling

Agency/Municipality/Other: Dept Public Works - Wash Co

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic					
	Critical		HAZMAT MAJOR TRANSPORTATION			
	Marginal	FIRE	FIRE	WINTER WEATHER FLOODING SEVERE SUMMER WEATHER EXTREME TEMPS		Epidemic
	Negligible			LAND SUBSIDENCE		Drought

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: Doug DeHaven

Agency/Municipality/Other: _____

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic					
	Critical	FIRE		flooding <hr/> Severe Summer weather	Epidemic	
	Marginal	Major Transportation Accidents	Major Transportation Accidents HAZ MAT	Severe winter weather <hr/> Extreme Temperatures	Drought	Land Subsidence
	Negligible					

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: R. David Hays

Agency/Municipality/Other: Div. of Emerg. Serv's

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic	Fire	Major Trans. Acc.		Hazmat	
	Critical	Severe Summer Weather	Flooding	Severe Winter Weather	Extreme Temps. Epidemic	
	Marginal				Land Sub.	
	Negligible				Drought	

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: Tom Brown, Jr

Agency/Municipality/Other: Wash Co. EM

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic					
	Critical	Hazmat Fire	Major Transportation Accident			
	Marginal		Severe Winter Weather Flooding Severe Summer Weather Extreme Temperatures ...	Drought	Land Subsidence Epidemic	
	Negligible					

WASHINGTON COUNTY HAZARD MITIGATION PLAN UPDATE

July 31, 2017 Steering Committee Meeting

Risk Assessment Matrix Exercise

Name: S. Goodrich

Agency/Municipality/Other: W.C. Planning & Zoning

Instructions: Please fill out the Risk Assessment Matrix below using the appropriate definitions. Write in where you think each hazard discussed falls in the matrix. More than one hazard may be located in one box. Not every box needs to be filled in.

RISK ASSESSMENT MATRIX		HAZARD PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
HAZARD SEVERITY	Catastrophic					
	Critical					
	Marginal		May Trans Acc.	Severe Winter Weather Flooding Severe Summer Weather Drought Five	Haemiat land subsidence Epidemic	
	Negligible			Ext Temp		

WASHINGTON COUNTY HAZARD MITIGATION PLAN

Hazard Mitigation Plan 2017 Update – Steering Committee Meeting #2

August 29, 2017 ~ 12:00 pm

Sign In Sheet

	Name	Affiliation	Email
1.	Amy Heimberger	JH Consulting	aheimberger@jhcpreparedness.com
2.	JOHN REGINALDI	WEMA	JOHN.REGINALDI@MARIAND-GOV
3.	CHARLIE SUMMERS	WASH. Co. E.M.	Csummers@WASHCO-MD-NET
4.	Donnie Stotelmayer	TOWN OF WILLIAMSPORT	dlistotelmayer@williamSPORTMD.ORG
5.	AUDI COLOMBO	" "	acolombo@mrdc.net
6.	Doug DeHaven	CITY of HAGERSTOWN - Fire Dept	ddehaven@hagerstownMD-ORG
7.	Charles T. Brown, Jr.	Wash Co EMT	cbrown@washco-md.net
8.	Blair Reynolds	Wash Co Engineering	breyolds@washco-md.net
9.	Steve Spodric	W.C. Planning & Zoning	sgoodric@washco-md.net
10.	RICH EICHELBERGER	WASH. Co. CONSTRUCTION	REICHELBER@WASHCO-MD.NET.
11.	TRICK BISHOP	KEEDYSVILLE	TOWN HALL@KEEDYSVILLEMD.COM
12.	DAVID D. SMITH	HANCOCK	HANMD@VERIZON.NET
13.	Juanita Grimm	Clear Spring	Clear-Spring@myact.net
14.	Travis Allen	Wash Co Planning & Zoning	fallene@washco-md.net
15.	DAVID MASON	WACO SOLID WASTE	DMASON@WASHCO-MD-NET
16.	Julie Pippel	Wash. Co. DEM	jpippel@washco-md.net

**WASHINGTON COUNTY
HAZARD MITIGATION PLAN 2017 UPDATE
STEERING COMMITTEE MEETING #2**

AGENDA

Date: August 29, 2017
Time: 12:00 p.m.
Estimated Duration: 60 minutes
Location: Washington County Division of Emergency Services Building
16232 Elliott Parkway
Williamsport, MD 21795

1. Welcome & Introductions
2. Planning Process
3. Hazards Overview
 - List of hazards
 - Risk assessment matrix results
 - Hazard perceptions (committee and public)
4. Tasks
 - Assets
 - Projects
5. Public Outreach and Engagement
6. Meeting Schedule
7. Discussion
8. Adjournment

WASHINGTON COUNTY HAZARD MITIGATION PLAN 2017 UPDATE



Division of Emergency Services
August 29, 2017
12:00 pm
16232 Elliott Parkway
Williamsport, MD 21795



WELCOME AND INTRODUCTIONS




AGENDA

- Planning Process
- Hazards Review
- Tasks
- Public Outreach & Engagement
- Meeting Schedule



OVERVIEW OF THE PLANNING PROCESS

Estimated Project Schedule



The flowchart shows a four-month process:

- Jul 2017:** Research, Capabilities Survey, 1st Mtg.
- Aug 2017:** Assets, Projects, 2nd Mtg.
- Sep 2017:** Prioritize Projects, Review plan, 3rd Mtg.
- Oct 2017:** Submit to the State, Approval.

 A large blue arrow at the bottom indicates ongoing activities: Encourage public involvement, Communication between jurisdictions and consultant, and Participation and exchange of ideas.



HAZARDS REVIEW

Lists of Hazards

- Drought
- Epidemic
- Extreme Temperatures
- Fire
- Flooding
- Hazmat
- Land Subsidence
- Major Transportation Accident
- Severe Summer Weather
- Severe Winter Weather



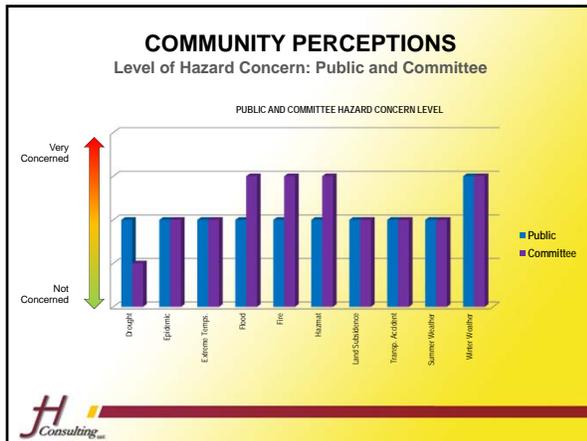
HAZARDS REVIEW

Risk Assessment Matrix Results

		PROBABILITY				
		Frequent	Probable	Occasional	Remote	Improbable
SEVERITY	Catastrophic	High	High	High	Medium	Low
	Critical	High	High	Medium	Low	Very Low
	Marginal	High	Medium	Medium	Low	Very Low
	Negligible	Medium	Low	Low	Very Low	Very Low

Note: Specific hazard examples from the matrix include Flood, Hazmat, Transportation Accident, Severe Summer Weather, Extreme Temperatures, Severe Winter Weather, Drought, Epidemic, and Land Subsidence.





- ### TASKS
- Asset Inventories
- Need to update the Asset Inventory included in the plan.
 - Critical Facilities
 - Vulnerable Populations
 - Economic Assets
 - Special Considerations
 - Historical Considerations
 - You have a list of the assets that were included for your jurisdiction. These were included in the previous plan.
 - Make revisions, deletions, and additions.

- ### TASKS
- Projects
- Need to update the existing projects included in the plan.
 - Make revisions, deletions, and additions.
 - To your knowledge, what has been done on each one?
 - Is it still a priority?
 - New Projects
- S** – specific
M – measurable
A – achievable
R – realistic
T – time sensitive

- ### PUBLIC OUTREACH & ENGAGEMENT
- Meetings and Online Survey
- Public input is required per FEMA, and can be obtained in multiple ways.
- 2 Online Public surveys
 - Hazards (155 Responses)
 - Projects (8 Responses)
 - Presentations
 - Governing bodies (city council, county commission, LEPC)
 - Civic associations
 - Press releases and media spots

MEETING SCHEDULE

The next committee meeting has been established.

Tuesday, September 19, 2017 at 1:30 pm

You will have opportunity to participate in the planning and updating of the plan throughout the entire process.

THANK YOU!

WASHINGTON COUNTY HAZARD MITIGATION PLAN 2017 UPDATE



Division of Emergency Services
September 8, 2017
10:00 am
Conference Call



AGENDA

- Review goals and objectives
- Presentation of projects
- Update of current mitigation projects
- Project status update
- Reminders
- New tasks!



REVIEW GOALS AND OBJECTIVES

Discussion




PRESENTATION OF PROJECTS

Discussion

- New Projects

S – specific
M – measurable
A – achievable
R – realistic
T – time sensitive



GLASBERGEN
"Does 'high-rise' refer to the building or the budget?"



CURRENT MITIGATION PROJECTS

Discussion




REMINDERS

Asset Inventories

- Need to update the Asset Inventory included in the plan.
 - Critical Facilities
 - Vulnerable Populations
 - Economic Assets
 - Special Considerations
 - Historical Considerations
- You have a list of the assets that were included for your jurisdiction. These were included in the previous plan.
- Make revisions, deletions, and additions.



REMINDERS
Meetings and Online Surveys

Public input is required per FEMA, and can be obtained in multiple ways.

- 2 Online Public surveys
 - Hazards (157 Responses)
 - Projects (10 Responses)
- Presentations
 - Governing bodies (city council, county commission, LEPC)
 - Civic associations
- Press releases and media spots

Remember to copy, screenshot, or take a picture of any information that is in any way presented to the public!



REMINDERS
Meeting Schedule

The next committee meeting has been established.

Tuesday, September 19, 2017 at 1:30 pm

You will have opportunity to participate in the planning and updating of the plan throughout the entire process.



NEW TASKS
NFIP Questionnaire

- FEMA Region III is now requesting that ALL jurisdictions fill out a 3-page questionnaire regarding NFIP activities.
- This is in addition to the capabilities survey you completed online.
- You will be receiving a copy by email from Amy following this call.



THANK YOU!



HAZARDS
Lists of Hazards

- Drought
- Epidemic
- Extreme Temperatures
- Fire
- Flooding
- Hazmat
- Land Subsidence
- Major Transportation Accident
- Severe Summer Weather
- Severe Winter Weather



WASHINGTON COUNTY HAZARD MITIGATION PLAN 2017 UPDATE



Division of Emergency Services
September 13, 2017
10:00 am
Conference Call



AGENDA

- Review goals and objectives
- Presentation of projects
- Update of current mitigation projects
- Reminders
- New tasks!



REVIEW GOALS AND OBJECTIVES

Discussion




PRESENTATION OF PROJECTS

Discussion

- New Projects

S – specific
M – measurable
A – achievable
R – realistic
T – time sensitive




CURRENT MITIGATION PROJECTS

Discussion




REMINDERS

Asset Inventories

- Need to update the Asset Inventory included in the plan.
 - Critical Facilities
 - Vulnerable Populations
 - Economic Assets
 - Special Considerations
 - Historical Considerations
- You have a list of the assets that were included for your jurisdiction. These were included in the previous plan.
- Make revisions, deletions, and additions.



REMINDERS
Meetings and Online Surveys

Public input is required per FEMA, and can be obtained in multiple ways.

- 2 Online Public surveys
 - Hazards (157 Responses)
 - Projects (10 Responses)
- Presentations
 - Governing bodies (city council, county commission, LEPC)
 - Civic associations
- Press releases and media spots

Remember to copy, screenshot, or take a picture of any information that is in any way presented to the public!



REMINDERS
Meeting Schedule

The next committee meeting has been established.

Tuesday, September 19, 2017 at 1:30 pm

You will have opportunity to participate in the planning and updating of the plan throughout the entire process.



NEW TASKS
NFIP Questionnaire

- FEMA Region III is now requesting that ALL jurisdictions fill out a 3-page questionnaire regarding NFIP activities.
- This is in addition to the capabilities survey you completed online.
- You will be receiving a copy by email from Amy following this call.



THANK YOU!



HAZARDS
Lists of Hazards

- Drought
- Epidemic
- Extreme Temperatures
- Fire
- Flooding
- Hazmat
- Land Subsidence
- Major Transportation Accident
- Severe Summer Weather
- Severe Winter Weather



WASHINGTON COUNTY HAZARD MITIGATION PLAN

Hazard Mitigation Plan 2017 Update – Steering Committee Meeting #5

September 27, 2017 ~ 1:30 pm

Sign In Sheet

	Name	Affiliation	Email
1.	Donnie Stotelmyer	TOWN OF WILLIAMSPORT	distotelmyer@williamspor-land.org
2.	Audi Colombo	" "	acolombo@mrdc.net
3.	Debra Smith	Town of Smithsburg	dsmith@townofsmithsburg.org
4.	Beck Bishop	KEESVILLE	TOWNHALL@KEESVILLEMD.COM
5.	Juanita Grimm	Clear Spring	clear-spring@myactv.net
6.	Charles T. Brown, Jr.	Wash Co. E/M	cbrown@washco-md.net
7.	Kathleen A. Maher	City of Hagerstown	Kmaher@hagerstownmd.org
8.	Julie Pippel	Wash. Co. DEM	jpippel@washco-md.net
9.	Amy Heimberger	JH Consulting	aheimberger@jhcpreparedness.com
10.	CHARUE SUMMERS	WASH. Co. Emerg. Mgr.	CSUMMERS@WASHCO-MD.NET
11.	Stephen Spodric	Wash Co. P&Z	sspodric@washco-md.net
12.	Brenda Haynes	TOWN OF FUNKSTOWN	bhaynes@myactv.net
13.	Scott Hobbs	Washington County Engineering	shobbs@washco-md.net
14.	Mark Stransky	Washington County Eng. Plan Review	mstransky@washco-md.net
15.			
16.			

**WASHINGTON COUNTY
HAZARD MITIGATION PLAN 2017 UPDATE
STEERING COMMITTEE MEETING #5**

AGENDA

Date: September 27, 2017
Time: 1:30 p.m.
Estimated Duration: 60-90 minutes
Location: Washington County Division of Emergency Services Building
16232 Elliott Parkway
Williamsport, MD 21795

1. Review & revise goals and objectives
2. NFIP survey
3. Sample draft review & comments
4. Asset lists (Funkstown, Hancock, Boonsboro, Williamsport, Washington Co.)
5. Reportable disease epidemic & opioid epidemic profiles
6. Plan integration
7. New projects
8. Plan maintenance
9. Public meetings

NEW MITIGATION PROJECTS FOR THE HAZARD MITIGATION PLAN UPDATE

This worksheet is designed to assist you in identifying mitigation projects that you are currently working on in your jurisdiction or soon will be. Please fill out the sheet completely and as specifically and accurately as possible.

MITIGATION is “the effort to reduce loss of life and property by lessening the impact of disasters” (FEMA.gov, 2016).

EXAMPLES OF **MITIGATION** ACTIONS ARE PLANNING AND ZONING, FLOODPLAIN PROTECTION, PROPERTY ACQUISITION AND RELOCATION, OR PUBLIC OUTREACH PROJECTS.

EXAMPLES OF **PREPAREDNESS** ACTIONS ARE INSTALLING DISASTER WARNING SYSTEMS, PURCHASING RADIO COMMUNICATIONS EQUIPMENT, OR CONDUCTING EMERGENCY RESPONSE TRAINING.

- FEMA, 2013

The following hazards have been identified by the steering committee for your planning area. Please use these as a guide to filling out the worksheet.

- Drought
- Fire
- Major Transportation Accident
- Summer Weather
- Ex. Temperatures
- Hazmat
- Opioid Epidemic
- Winter Weather
- Flood
- Land Subsidence
- Reportable Disease Epidemic

For project ideas, refer to FEMA’s *Mitigation Ideas: A resource for reducing risk to natural hazards* document available online.

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Heavy Snow	Expend resources - not enough resources - public awareness	First responder difficulty getting to scene Public caught in weather
2. Summer Weather	Elderly population Public Awareness	public not prepared or unaware
3.		
4.		
5.		

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Heavy Snow	unknown implementation of public notification system	seek funding sources for additional equipment Educate public on new notification systems - where to go for info.
2. Summer Weather	implementation of public notification system	Educate public on new notification system - where to get info.
3.		
4.		
5.		

Washington County

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Heavy Snow	Expend resources - not enough resources - public awareness	First responder difficulty getting to scene Public caught in weather
2. Summer Weather	Elderly population public Awareness	public not prepared or unaware
3.		
4.		
5.		

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
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b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Heavy Snow	unknown implementation of public notification system	seek funding sources for additional equipment Educate public on new notification systems - where to go for info.
2. Summer Weather	implementation of public notification system	Educate public on new notification system - where to get info.
3.		
4.		
5.		

Washington County

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. incorporation of Hazard Mitigation plan into updated Comprehensive Land Use	Comp. Plan makes long term recommendations for land use and there need to be assurance that hazard mitigations that can be accomplished through land use regulations are included for future actions.	without incorporation of mitigation in future use practices for hazards related to how land is developed a used the mitigation plans will be ineffective.
2. plan (currently under development)		
3.		
4.		
5.		

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Incorporating HMP into updated Comp. Plan	participation in HMP update and knowledge of need to incorporate	appropriate items will be included in adopted + revised
2.	into Comp Plan currently under development.	Comp Plan that will guide future land use decisions about where + how land will
3.		be developed or not developed
4.		
5.		

3. Based on the projects you identified in question 2, how have you funded the projects, or how do you intend to fund your projects? JH Consulting can help identify mitigation funding sources for you.

Hazard of Concern	Funding Utilized	Funding Identified
a. Ex. Flood	Ex. Pre-Disaster Mitigation (PDM) grant	Ex. Community Development Block Grant
b. Ex. Heavy Snow	Ex. N/A	Ex. Unknown
1. Integrating HMP into Comp Plan	County General Fund for staff salaries of P&Z Department	County General Fund
2.	which is developing updated Comp Plan and participating in HMP update	
3.		
4.		
5.		

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Clear Spring

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Flood	heavy Rain waters back up into the town.	Toms Run the culvert that carries the water thru town has deteriorated and walls need replaced. Property owners and business have suffered losses.
2. Drought	Town has 3 wells that supply the municipality	Water supply goes low
3. Hazzmat	Interstate 70	Heavy traffic thru town local residents have problems getting around area.
4. Severe winter weather	heavy snow	
5. Infiltration	Sewer lines have infiltration	Sewer flow is more than water flow Sewer plant is old and outdated

epidemic

Several people - changed with distribution

residents losing loved ones

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Clear Spring

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Flood	Experienced flood 2 yrs ago - Culvert damaged new rebuilt	Construct plan to rebuild Apply for funding to correct
2. Drought	Identified wells are on same aquifer	Identify additional water source, encourage residents to conserve water when necessary
3. Hazard -	Interstate traffic on local streets	work with State for additional detours
4. Severe winter weather	have bid in place for removal	educate residents to remove @ slow rate
5. Infiltration		try to identify area and prepare RFP for correction of problem

Oploid epidemic

problem with younger generation overdosing

educate public

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. FLOOD	EVERY 5-10 YEARS LITTLE ANTIETAM CREEK FLOODS + EXTENS A NUMBER OF BUILDINGS	PROPERTY LOSS
2. OPIOID EPIDEMIC	OVERDOSES + DEATH IMPACT FAMILIES	← SEE
3.		
4.		
5.		

Keedysville

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. FLOOD	IDENTIFIED PROBLEM	WILL RESEARCH WAYS TO ALLEVIATE FLOODING
2. OPION EPIDEMIE	A GROUP IN K-VILLE IS ORGANIZING TO FIND WAYS TO INFORM PUBLIC	WILL LIMIT PERMITS IN FLOOD ZONE SUPPORT THE GROUP & USE TOWN RESOURCES TO PROMOTE AWARENESS
3.		& AVAILABLE TREATMENT PROGRAMS
4.		
5.		

Keedysville

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
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b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. HAZMAT ID + RESPONSE TRAINING	Amount + Types of Hazardous Materials Being Transported on WASH. Co Roadways	Possible Release of Hazardous Materials
2. OPIOID OVERDOSE	Increasing Number of Persons Dying From Opioid Overdoses	Increase Opioid Mortality
3.		
4.		
5.		

Washington County

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. HAZARD MATERIALS	IDENTIFY + TRAIN FOR THE RESPONSE TO CURRENT HAZARD MATERIALS BEING TRANSPORTED	CONDUCT COMMUNITY FLOW STUDY TO ID CURRENT HAZMATS BEING TRANSPORTED ON ROADWAYS
2 Options Overdose	INCREASED CITIZEN & PROVIDER NARCOTIC TRAINING	CITIZEN OUTREACH + INFO CRISIS INTERVENTION TEAMS PEER INTERVENTION SPECIALIST.
3.		
4.		
5.		

Washington County

3. Based on the projects you identified in question 2, how have you funded the projects, or how do you intend to fund your projects? JH Consulting can help identify mitigation funding sources for you.

Hazard of Concern	Funding Utilized	Funding Identified
a. Ex. Flood	Ex. Pre-Disaster Mitigation (PDM) grant	Ex. Community Development Block Grant
b. Ex. Heavy Snow	Ex. N/A	Ex. Unknown
1. HAZARDOUS MATERIALS ID & RESPONSE TRAINING	HMEP GRANT FUNDING	HMEP GRANT
2. CRIME OVERSIGHT	STATE OUCG GRANTS	STATE OUCG GRANTS
3.		
4.		
5.		

Washington County

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
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b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Building Fires	old buildings, dense development, high percentage of rentals, units and multi-family bldgs, disabled occupants, hoarding, unpermitted renovations.	loss of life, destruction of property, strain on water system.
2. Lightning strikes and bldg fires	Large older bldgs w/out adequate fire stopping in attic areas.	fire in unprotected space grows beyond ability of fire protection systems to suppress; loss of life and destruction of property.
3. Flood-water quality	unfiltered and unrestricted SW flow in older portions of city.	pollutants reach surface waters and follow karst pathways to groundwater.
4.		
5.		

Hagerstown

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1.	rental licensing inspections of rental units; Fire Dept. n' hood sweeps w/ smoke detectors.	Educate property owners about risks and strategies to reduce risk. Require upgrades to fire stopping and systems during renovations.
2.	building codes changes protect new construction.	Educate property owners about risks. Require upgrades during bldg upgrades
3.	new development meets SWM require. gain improvements w/ reno/reuse projects; City retrofits to public system	on-going retrofits to public SWM system as funding allows.
4.		
5.		

Hagerstown

3. Based on the projects you identified in question 2, how have you funded the projects, or how do you intend to fund your projects? JH Consulting can help identify mitigation funding sources for you.

Hazard of Concern	Funding Utilized	Funding Identified
a. Ex. Flood	Ex. Pre-Disaster Mitigation (PDM) grant	Ex. Community Development Block Grant
b. Ex. Heavy Snow	Ex. N/A	Ex. Unknown
1.	rental licensing fees. Fire Dept. grants.	
2.	Municipal funds; state grants	
3.		
4.		
5.		

Hagerstown

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Milling and overlaying & sidewalks on Rt. 11	The roads are in need of replacement & lack of sidewalks	Recieve funding from Flap & Maryland Bike ways
2. Water line replacement	Water pressure is minimum in town & needs replaced.	Recieve grant & loan from MDE for a water line replacement.
3. Identify ways to reduce runoff storm water into the canal	NO control measures to reduce water in the C & O canal.	Need funding to address storm water issues
4. Storm water issues: control measures	Needing storm drains in the town of Williamsport to control storm-	same as above ↑
5.	water	

Williamsport

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Milling & overlay / sidewalk on Rt. 11	Received grant funding	Construction to start fall - 2018
2. Water line replacement	Received funding & loan	Start spring 2018 (March 2018)
3. Identify ways to reduce runoff storm water in the canal	Identify funding sources	Hopefully receive funding to address issues
4. Storm water control measures	Identify funding sources	↓
5.		

Williamsport

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Flood	Glenn Spring in town flooding. Inadequate conveyance system for 100-yr event.	Conococheague St. (Main St) floods, 20+ homes are flooded during 100-yr storm. w/ Glenn Spring.
2. Flood	Hancock in town flooding Potomac River	Main St business/commercial area floods.
3.		
4.		
5.		

Washington County

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Flood	(20+ years ago) MDSA installed bypass culvert to take some of the flood water.	1. Acquisition of property 2. Improvement of conveyance system.
2. Flood	Pizza Hut - flood proofed Shaw Motors - in process	1. Acquire flood prone properties 2. Flood proofing
3.	of acquisition (need \$\$\$)	
4.		
5.		

Washington County

1. What are your hazards of concern? Why do they concern you? What type of impacts or destruction has your county/city/town experienced because of it? Please complete the table below. Use as many spaces as you need.

MS4
- City of Hag
- Womsp. .
- Beansboro
- Smithsburg
- County

Hazard of Concern	Reasons for Concern	Impacts or Destruction from Hazard
a. Ex. Flood	Ex. The storm sewers back up causing flooding throughout the town.	Ex. Main St. floods every time it rains for over two hours and causes the street to be closed to traffic. Businesses are impacted by the loss in revenue from the lack of access.
b. Ex. Heavy Snow	Ex. The buildings in our town are very old and may not handle the increased amount of snow we've seen in the recent years.	Ex. Two residences' roofs have collapsed due to the heavy snow load.
1. Flooding / water quality	Stormwater runoff can cause flooding & water quality issues in local streams	Flooding can cause street closures or damage to homes / poor water quality can cause stream closures
2.		
3.		
4.		
5.		

2. Based on the problems identified in question 1, what has been or will be done to fix them? Each number corresponds to the hazard identified on the previous page.

Hazard of Concern	What Has Been Done	What Will Be Done
a. Ex. Flood	Ex. We have identified the problem areas within the storm water system that need maintenance/rebuilding.	Ex. We will build retention basins in several locations to help with the amount of water reaching the drains.
b. Ex. Heavy Snow	Ex. New construction is now required to address the higher snow loads.	Ex. Any reconstruction of old residences will be required to follow current building code standards to reduce the impacts. We will encourage residents to reinforce their homes.
1. Stormwater System	Started update ^{& continuing} of mapping to address missing data and	Under MS4 Phase II Permit for Wash. Co. - develop a list of projects to address stormwater
2.	use to identify potential projects -	issues that will be address requirements of permit; improve local water quality & reduce associated flooding.
3.		
4.		
5.		

→ develop BMP projects

Washington County

TABLE X COMMITTEE CONTACT LOG

<i>Contact</i>	<i>Jurisdiction</i>	<i>Email/Phone</i>	<i>To/From</i>	<i>Date</i>	<i>Subject</i>
Debra Smith	Town of Smithsburg	Email	To	7/11/2017	Introduction and Capabilities
Brenda Haynes	Town of Funkstown	Email	To	7/11/2017	Introduction and Capabilities
David Smith	Town of Hancock	Email	To	7/11/2017	Introduction and Capabilities
Megan Clark	Town of Boonsboro	Email	To	7/11/2017	Introduction and Capabilities
Donny Stotemyer	Town of Williamsport	Email	To	7/11/2017	Introduction and Capabilities
Juanita Grimm	Town of Clear Spring	Email	To	7/11/2017	Introduction and Capabilities
Charlie Summers	Wash Co Emergency Management	Email	To	7/11/2017	Introduction and Capabilities
Rick Bishop	Town of Keedysville	Email	To	7/11/2017	Introduction and Capabilities
Tom Brown, Jr.	Wash Co Emergency Management	Email	To	7/11/2017	Introduction and Capabilities
Kathleen Maher	Hagerstown Planning Office	Email	To	7/17/2017	Introduction and Capabilities
Megan Clark	Town of Boonsboro	Email	From	7/17/2017	Asked about meeting location
Meeting 1 ~ July 31, 2017 ~ In Person					
Brenda Haynes	Town of Funkstown	Email	To	8/16/2017	Reminder of capabilities survey
David Smith	Town of Hancock	Email	To	8/16/2017	Reminder of capabilities survey
Juanita Grimm	Town of Clear Spring	Email	To	8/16/2017	Reminder of capabilities survey
Kathleen Maher	Hagerstown Planning Office	Email	To	8/16/2017	Reminder of capabilities survey
Mark Cleck	Hagerstown Fire Department	Email	To	8/16/2017	Reminder of capabilities survey
Douglas DeHaven	Hagerstown Fire Department	Email	To	8/16/2017	Reminder of capabilities survey
Stephen Goodrich	Wash Co Planning and Zoning	Email	To	8/16/2017	Reminder of capabilities survey
Debra Smith	Town of Smithsburg	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Brenda Haynes	Town of Funkstown	Email	To	8/16/2017	Asset and project list, reminder of next meeting
David Smith	Town of Hancock	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Megan Clark	Town of Boonsboro	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Donny Stotemyer	Town of Williamsport	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Juanita Grimm	Town of Clear Spring	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Kathleen Maher	Hagerstown Planning Office	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Mark Cleck	Hagerstown Fire Department	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Douglas DeHaven	Hagerstown Fire Department	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Rick Bishop	Town of Keedysville	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Jim Sterling	Wash Co Public Works Operations	Email	To	8/16/2017	Project list, reminder of next meeting
Scott Hobbs	Wash Co Pub Works Insp/Engineer	Email	To	8/16/2017	Project list, reminder of next meeting
Tom Brown, Jr.	Wash Co Emergency Management	Email	To	8/16/2017	Project list, reminder of next meeting

R David Hays	Wash Co Emergency Services	Email	To	8/16/2017	Project list, reminder of next meeting
Stephen Goodrich	Wash Co Planning and Zoning	Email	To	8/16/2017	Asset and project list, reminder of next meeting
Dave Mason	Wash Co Solid Waste	Email	To	8/16/2017	Project list, reminder of next meeting
Charlie Summers	Wash Co Emergency Management	Email	To	8/16/2017	Project list, reminder of next meeting
Bonn Poland	Wash Co IT GIS	Email	To	8/16/2017	Project list, reminder of next meeting
Mark Stransky	Plan Review Flood Plain	Email	To	8/16/2017	Project list, reminder of next meeting
Julie Pippel	Wash Co Environmental Management	Email	To	8/16/2017	Project list, reminder of next meeting
Dan Divito	Wash Co Water Quality	Email	To	8/16/2017	Project list, reminder of next meeting
All	All	Email	To	8/17/2017	Reminder of next meeting, assets, and projects
Debra Smith	Town of Smithsburg	Email	From	8/18/2017	Sent updated asset list
Rick Bishop	Town of Keedysville	Email	From	8/22/2017	Returned updated asset list
Brenda Haynes	Town of Funkstown	Email	From	8/28/2017	Interested in participating but could not attend meetings. Wanted to know what she could do.
Meeting 2 ~ August 29, 2017 ~ In Person					
Kathleen Maher	Hagerstown Planning Office	Email	From	8/30/2017	Suggested a change to 2011 goal #5
Kathleen Maher	Hagerstown Planning Office	Email	From	8/30/2017	Returned updated asset list
Brenda Haynes	Town of Funkstown	Email	To	9/1/2017	Reminder of capabilities survey
David Smith	Town of Hancock	Email	To	9/1/2017	Reminder of capabilities survey
Tom Brown, Jr.	Wash Co Emergency Management	Phone	From	9/5/2017	Called to discuss and approve new goals and objectives revision
Brenda Haynes	Town of Funkstown	Email	From	9/5/2017	Asked about asset list requirements
All	All	Email	To	9/6/2017	Calendar invite 9/8 Conference Call
Charlie Summers	Wash Co Emergency Management	Email	From	9/6/2017	Accepted invitation
Donny Stotemyer	Town of Williamsport	Email	From	9/6/2017	Accepted invitation
Douglas DeHaven	Hagerstown Fire Department	Email	From	9/6/2017	Declined invitation
Rick Bishop	Town of Keedysville	Email	From	9/6/2017	Declined invitation
Scott Hobbs	Wash Co Pub Works Insp/Engineer	Email	From	9/6/2017	Accepted invitation
Julie Pippel	Wash Co Environmental Management	Email	From	9/7/2017	Declined invitation
Meeting 3 ~ September 8, 2017 ~ Conference Call					
All	All	Email	To	9/8/2017	Calendar invite 9/13 Conference Call
Dave Mason	Wash Co Solid Waste	Email	From	9/8/2017	Tentative attendance
Charlie Summers	Wash Co Emergency Management	Email	From	9/8/2017	Declined invitation
Mark Cleck	Hagerstown Fire Department	Email	From	9/8/2017	Declined invitation
Debra Smith	Town of Smithsburg	Email	From	9/10/2017	Declined invitation

Julie Pippel	Wash Co Environmental Management	Email	From	9/11/2017	Tentative attendance
Blair Reynolds	Wash Co Engineering	Email	From	9/13/2017	Tentative attendance
Rich Eichelberger	Wash Co Construction	Email	From	9/13/2017	Tentative attendance
Meeting 4 ~ September 13, 2017 ~ Conference Call					
All	All	Email	To	9/26/2017	Reminder of next meeting and NFIP survey
Meeting 5 ~ September 27, 2017 ~ In Person					
David Smith	Town of Hancock	Email	From	10/17/2017	Returned updated asset list
Brenda Haynes	Town of Funkstown	Email	From	10/20/2017	Assets have not changed, no new projects
David Smith	Town of Hancock	Email	To	10/30/2017	Request completion of NFIP survey
Megan Clark	Town of Boonsboro	Email	To	10/30/2017	Request completion of NFIP survey
Charlie Summers	Wash Co Emergency Management	Email	From	11/8/2017	Sent Hancock project - Shaw Motors
All	All	Email	To	11/17/2017	Please push second survey
Brenda Haynes	Town of Funkstown	Email	To	11/17/2017	Asked for new projects
Megan Clark	Town of Boonsboro	Email	To	11/17/2017	Asked for new projects and NFIP survey and assets
Debra Smith	Town of Smithsburg	Email	To	11/21/2017	Requested new project worksheet be filled out
Brenda Haynes	Town of Funkstown	Email	To	11/21/2017	Requested new project worksheet be filled out
Megan Clark	Town of Boonsboro	Email	To	11/21/2017	Requested new project worksheet be filled out
All	All	Email	To	11/21/2017	Thanked everyone for pushing public survey #2
David Smith	Town of Hancock	Email	From	11/21/2017	Asked about what the public surveys were
David Smith	Town of Hancock	Email	To	11/21/2017	Explained public surveys and included links fo post
Debra Smith	Town of Smithsburg	Email	From	11/21/2017	Asked for clarification on ideas for projects
Brenda Haynes	Town of Funkstown	Email	From	11/21/2017	Will send projects tomorrow.
Megan Clark	Town of Boonsboro	Email	To	11/21/2017	Requested completed NFIP Survey
David Smith	Town of Hancock	Email	To	11/21/2017	Requested completed NFIP Survey
Debra Smith	Town of Smithsburg	Email	From	11/22/2017	Returned new project worksheet
Brenda Haynes	Town of Funkstown	Email	From	11/27/2017	Returned new project worksheet
David Smith	Town of Hancock	Phone	To	11/29/2017	Called to request completion of NFIP survey
Megan Clark	Town of Boonsboro	Phone	To	11/29/2017	Left message requesting 3 missing documents
Megan Clark	Town of Boonsboro	Email	To	11/29/2017	Requested missing documents
David Smith	Town of Hancock	Email	From	11/29/2017	Sent completed NFIP survey
Kimberly Fulk	Town of Sharpsburg	Phone	To	11/29/2017	Left message about HMP update
Kimberly Fulk	Town of Sharpsburg	Phone	From	11/30/2017	Called back. I will send her info requested

2011 GOALS AND OBJECTIVES WASHINGTON COUNTY HAZARD MITIGATION PLAN

Goals and objectives in the previous plan include the following. The number in parenthesis refers to the amount of times an existing project relates to the objective. The text in blue explains the results of consolidating and reorganization of each objective and goal.

GOAL 1 Maintain and enhance the Washington County Department of Emergency Service's capacity to continuously make Washington County less vulnerable to hazards. Revised. Goal 1.

- (2) **Objective 1.1** Institutionalize hazard mitigation. Deleted; objective unclear.
- (1) **Objective 1.2** Improve organizational efficiency. Deleted; the only project associated has been deleted.
- (7) **Objective 1.3** Maximize utilization of best technology. Deleted; redundant.
- (4) **Objective 1.4** Maximize utilization of GIS software and applications. Kept; new objective: 1.1

GOAL 2 Build and support municipal capacity and commitment to become continuously less vulnerable to hazards. Combined with Goal 4 (New Goal 2)

- (7) **Objective 2.1** Increase awareness and knowledge of hazard mitigation principles and practice among local and municipal public officials. Kept; new objective: 2.1
- (6) **Objective 2.2** Provide assistance to municipal officials and help municipalities obtain funding for mitigation planning and project activities. Kept; new objective: 2.2
- (9) **Objective 2.3** Prepare technical reports for critical facilities as necessary. Deleted; objective unclear.

GOAL 3 Improve coordination and communication with other relevant organizations. Added as objective under Goal 1: Objective 1.2. Revised.

- (2) **Objective 3.1** Establish and maintain lasting partnerships. Deleted.
- (0) **Objective 3.2** Streamline policies to eliminate conflicts and duplication of effort. Deleted; no projects are under this objective.
- (2) **Objective 3.3** Incorporate hazard mitigation into activities of other organizations. Completed with this update.

GOAL 4 Increase public understanding, support, and demand for hazard mitigation. Combined with Goal 2 (New Goal 2)

- (19) **Objective 4.1** Identify hazard specific issues and needs. Completed with this update.
- (6) **Objective 4.2** Heighten public awareness of natural hazards. Kept; new objective 2.4
- (19) **Objective 4.3** Publicize and encourage the adoption of appropriate hazard mitigation actions. Kept; new objective: 2.3
- (1) **Objective 4.4** Within 2 years, increase the number of business that have developed a business risk reduction plan. Deleted; objective is unclear about how many businesses it would take to consider an increase.
- (0) **Objective 4.5** Within 3 years, increase by 25% the proportion of businesses and residences that have flood insurance. Deleted; no projects associated.



GOAL 5 Protect existing and future properties (residential, commercial, public, and critical facilities). Combined with Goal 9 (New Goal 3)

- (7) **Objective 5.1** Utilize the most effective approaches to protect buildings from flooding, including acquisition and elevation. Kept; new objective: 3.4. Revised
- (11) **Objective 5.2** Enact and enforce regulatory measures to ensure that new development will not increase hazard threats. Kept; new objective: 3.5
- (5) **Objective 5.3** Within 2 years, reduce by 20% the number of houses in the floodplain that are subject to repetitive losses from flooding. Deleted;
- (5) **Objective 5.4** Within 5 years, increase by 25% the number of critical facilities that have carried out mitigation measures to ensure their functionality in a 100 year flood event. Deleted;
- (3) **Objective 5.5** Review and update Building Codes to ensure that manufactured housing, including mobile homes, are constructed and installed in a manner to minimize wind damage. Kept; new objective: 5.6
- (3) **Objective 5.6** Ensure existing high risk residential structures are utilizing retrofitting techniques to mitigate repetitive flooding. Kept; new objective: 3.7

GOAL 6 Ensure that public funds are used in the most efficient manner. Deleted; public funds should always be used in the most efficient manner.

- (2) **Objective 6.1** Prioritize new mitigation projects, starting with sites facing the greatest threat to life, health, and property. Kept; new objective: 2.5
- (10) **Objective 6.2** Use public funding to protect public services and critical facilities. Kept; new objective: 3.8
- (9) **Objective 6.3** Use public funding on private property where benefits exceed costs. Kept; new objective: 3.9 Revised.
- (5) **Objective 6.4** Maximize the use of outside funding sources. Kept; new objective: 3.9 Revised.
- (6) **Objective 6.5** Encourage property-owner self-protection measures. Kept; new objective: 3.3

GOAL 7 Promote sustainable development to improve the quality of life. New Goal 4

- (0) **Objective 7.1** Establish open space parks and recreational areas in flood hazard areas. Deleted; no projects associated.
- (3) **Objective 7.2** Provide for the conservation and preservation of natural resources. Kept; new objective: 4.1
- (4) **Objective 7.3** Limit additional housing (especially elderly and high density) in areas of high hazard risk. Kept; new objective:

GOAL 8 Prevent destruction of forests and structures in the Urban Wildland Interface.

- (1) **Objective 8.1** Improve communications capability between municipal and county emergency management and law enforcement personnel. Kept; new objective: 1.2 Revised.
- (0) **Objective 8.2** Identify specific high hazard areas in the Urban Wildland Interface and notify residents of means to protect their property from wildfire damage. Deleted; no projects associated.
- (0) **Objective 8.3** Develop evacuation procedures to enable residents near forested areas to evacuate safely. Deleted; no projects associated.



GOAL9 Protect public infrastructure. Combined with Goal 5 (New Goal 3)

- (1) **Objective 9.1** Upgrade or replace public roads and storm water management features to include mitigation into the project design and construction. Kept; new objective: 3.1
- (1) **Objective 9.2** Improve routes utilized in flood hazard events to mitigate life-threatening road conditions and road closures. Kept; new objective: 3.2
- (2) **Objective 9.3** Mitigate problem road sections within the County and municipalities. Deleted; redundant.



NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: Clear Spring

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	yes	
c. Does the municipality support request for map updates?	If yes, state how.		
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	yes	provides flood information
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	yes	review maps and contact County for clarification
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	no	

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	yes	Washington County Permits and Inspection
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	yes	Town Office
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	yes	Town office Washington County Permits & Inspection
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	yes	Washington County Permits & Inspection
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	N/A	

Clear Spring

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	yes	had public meeting
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.		
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.		

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: WASHINGTON COUNTY, MD 240070

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	8/15/17
c. Does the municipality support request for map updates?	If yes, state how.	Yes	Accept c' Eign Community Acknowledg on LONG form
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	Forward to NFIP Rep & AMEC
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	Provide Flood determination form
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	Eng + Const. Mgmt.

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	Yes	ECM
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Yes	ECM
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Yes	ECM
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	ECM
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Via construction, building inspections, permit conditions.

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	Yes	Mostly thru NPDES permits, not CRS.

3. FLOOD INSURANCE			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Yes	Seminars to Insurance Agents & webpage
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Yes	Webpage + mail
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	in person assistance and via email.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: KRESKVILLE

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	AUGUST 15 2017
c. Does the municipality support request for map updates?	If yes, state how.	YES	AT TOWN HALL
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	AT TOWN HALL
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	TOWN HALL

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	YES	Per Z
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	Per Z
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	Per Z
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	NO	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	NO	WASH Co. ENFORCES

KEEGAN JILL

2. FLOODPLAIN MANAGEMENT

Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE

Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	WEBSITE
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	YES	WEBSITE
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	YES	AT TOWN HALL

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: Smithsburg

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Y	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	8/8/2017	
c. Does the municipality support request for map updates?	If yes, state how.	Y	Automatic updates as approved by W.C.
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Y	Amendments would be provided electronically through consultants
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Y	Cooperation w/WC as the administrator
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Y	Planning Department

Smithsburg

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Y	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	N	Washington County
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Y	Planning and Zoning in conjunction w/ WC
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Y	Planning and Zoning in conjunction w/WC
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Y	Planning and Zoning
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Y	In cooperation w/WC who enforces the Ordinance

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	N	

3. FLOOD INSURANCE			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	N	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Y	Through public hearings and advertised meetings regarding proposed revisions in the plan
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	N	

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: FUNKSTOWN

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	
c. Does the municipality support request for map updates?	If yes, state how.	YES	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	NO	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	HELP WITH WASH CO.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	WASH CO + FCMA

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	WASH CO
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.		
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.		
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.		
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.		
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.		

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	NO	
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	NO	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	YES	ZONING ADMINISTRATOR + WASH CO.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: Hagerstown

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Y	Yes. Text amendment effective 8/15/17 adopted the maps following effect the same day.
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	?	MAPS BECAME EFFECTIVE ON AUG. 15, 2017 - NOT SURE IF THE COUNCIL OFFICIALLY ADOPTED
c. Does the municipality support request for map updates?	If yes, state how.	Y	PROVIDE CURRENT MAPPING DATA, AND ADVISE THE PUBLIC ON THE UPDATE PROCESS
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	?	WE MAY, IF THE NEW DATA IS THE RESULT OF A CITY-SPONSORED STUDY. IF IT IS THE RESULT OF A STUDY PREPARED BY A DEVELOPER, WE ENCOURAGE (BUT DON'T REQUIRE) THAT THEY NOTIFY FEMA.
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Y	STEVE USES MAPPING, AND OTHER INFO TO ASSIST RESIDENTS WITH QUESTIONS ABOUT THEIR SPECIFIC PROPERTY.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Y	

STEVE (PLANNING & CODE ADMIN)

Correct

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Y	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	Y	PLANNING & CODE
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Y	" "
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Y	" "
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Y/?	" "
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Y/?	NOT SURE HOW WE MONITOR OR ENFORCE, OTHER THAN BUILDING PERMIT REVIEW

THAN BUILDING PERMIT REVIEW

↓
 Pretty much.
 We ~~got~~ have little flood plain and rarely does anyone propose to build anything in the floodplain. More often than not it is things like grading & ...

Hagerstown

2. FLOODPLAIN MANAGEMENT

Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	?	WE TALKED ABOUT SOME OF THESE AT A STAFF LEVEL, BUT NOT SURE THAT THE COUNCIL EVER REVIEWED... THERE ISN'T A LOT OF BENEFIT TO THE CITY FROM THE COMMUNITY RATING SYSTEM. DUE TO THE SMALL NUMBER OF FLOOD PRONE PROPERTIES

3. FLOOD INSURANCE

Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Y?	STEVE? Only when approached by someone who is told by their mortgage holder they need it.
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	N?	" " This happens almost never and when it does, it is due to development
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	N?	" "

help only extends to confirming where the floodplain is.

considered more recommendation to require new buildings to be 2 feet above 100 year level but decided not to do it.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

MUNICIPALITY: Williamsport

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Yes	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Yes	
c. Does the municipality support request for map updates?	If yes, state how.	Yes	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	Yes	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Yes	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Yes	

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Yes	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	No	Planning and zoning review all permits
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	No	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	No	We have no area to build in a flood zone Reviewed by planning & zoning
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Yes	Maintained by planning & zoning
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Yes	Reviewed by planning & zoning.

2. FLOODPLAIN MANAGEMENT			
Requirement	Recommended Action	Yes/No	Comments
c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include: <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	NO	

3. FLOOD INSURANCE			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Yes	when requested
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	NO	
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Yes	when requested

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

JURISDICTION: TOWN OF HANCOCK

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
Requirement	Recommended Action	Yes/No	Comments
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	YES	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	YES	
c. Does the municipality support request for map updates?	If yes, state how.	YES	
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	YES	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	YES	
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	YES	WHEN WE ARE COPIED ON THEM

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	YES	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	YES	WASHINGTON COUNTY PROVIDES THE FLOODPLAIN MANAGEMENT AND PERMITS ALSO REQUIRE WATER WAY CONSTRUCTION FROM MDE/CORP OF ENG.
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	YES	
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	YES	
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	YES	
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	YES	THROUGH PERMITTING AND OBSERVATIONS

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	YES	RATINGS SYSTEM, ZONING WOULD DISALLOW CONSTRUCTION OF CERTAIN STRUCTURES.

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	YES	PROVIDE RESOURCES AND MATERAILS
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	YES	PROVIDED ADVERTISEMENTS, MEETINGS AND LITERATURE
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	YES	GENERAL THROUGH ABOVE ITEMS AND THROUGH INTERACTION

NATIONAL FLOOD INSURANCE PROGRAM (NFIP) SURVEY

JURISDICTION: BOONSBORO

1. FLOODPLAIN IDENTIFICATION AND MAPPING			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality maintain accessible copies of an effective Flood Insurance Rate Map (FIRM)/Digital Flood Insurance Rate Map (DFIRM)? Does the municipality maintain accessible copies of the most recent Flood Insurance Study (FIS)?	Place these documents in the local libraries or make available publicly.	Y	
b. Has the municipality adopted the most current DFIRM/FIRM and FIS?	State the date of adoption, if approved.	Y	Adopted July 3, 2017
c. Does the municipality support request for map updates?	If yes, state how.	Y	Work with Washington County Administration
d. Does the municipality share with Federal Emergency Management Agency (FEMA) any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data?	If yes, specify how.	N	
e. Does the municipality provide assistance with local floodplain determinations?	If yes, specify how.	Y	Work with Wash. Co. Admin.
f. Does the municipality maintain a record of approved Letters of Map Change?	If yes, specify the responsible office.	Y	Dept. of Planning and Zoning

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Has the municipality adopted a compliant floodplain management ordinance that, at a minimum, regulates the following:	If yes, answer questions (1) through (4) below.	Y	
(1) Does the municipality issue permits for all proposed development in the Special Flood Hazard Areas (SFHAs)?	If yes, specify the office responsible.	N	Boonsboro delegates authority to Wash. Co. Floodplain Admin.
(2) Does the municipality obtain, review, and utilize any Base Flood Elevation (BFE) and floodway data, and/or require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres?	If yes, specify the office responsible.	Y	In cooperation with Wash. Co.
(3) Does the municipality identify measures to keep all new and substantially improved construction reasonably safe from flooding to or above the BFE, including anchoring, using flood-resistant materials, and designing or locating utilities and service facilities to prevent water damage?	If yes, specify the office responsible.	Y	In cooperation with Wash. Co.
(4) Does the municipality document and maintain records of elevation data that document lowest floor elevation for new or substantially improved structures?	If yes, specify the office responsible.	Y	In cooperation with Wash. Co.
b. If a compliant floodplain ordinance was adopted, does the municipality enforce the ordinance by monitoring compliance and taking remedial action to correct violations?	If yes, specify how.	Y	In cooperation with Wash. Co.

2. FLOODPLAIN MANAGEMENT			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
<p>c. Has the municipality considered adopting activities that extend beyond the minimum requirements? Examples include:</p> <ul style="list-style-type: none"> • Participation in the Community Rating System • Prohibition of production or storage of chemicals in SFHA • Prohibition of certain types of structures, such as hospitals, nursing homes, and jails in SFHA • Prohibition of certain types of residential housing (manufactured homes) in SFHA • Floodplain ordinances that prohibit any new residential or nonresidential structures in SFHA 	If yes, specify activities.	N	

3. FLOOD INSURANCE			
<i>Requirement</i>	<i>Recommended Action</i>	<i>Yes/No</i>	<i>Comments</i>
a. Does the municipality educate community members about the availability and value of flood insurance?	If yes, specify how.	Y	When applying for permits
b. Does the municipality inform community property owners about changes to the DFIRM/FIRM that would impact their insurance rates?	If yes, specify how.	Y	When applying for permits
c. Does the municipality provide general assistance to community members regarding insurance issues?	If yes, specify how.	Y	Customer service when asked

APPENDIX 2

PUBLIC SURVEYS AND INVOLVEMENT

This section contains the following information.

- Social media postings of the public surveys
- Public surveys raw data
- Public meeting invitation and information
- Public meeting documentation





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Your post is getting more engagement than 75% of your recent posts. Boost it to reach more people in Maryland.

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Washington County Division Of Emergency Services

Published by Charles Summers [?] · Just now ·

Washington County Emergency Management is updating its Hazard Mitigation Plan. If you are interested and would like to assist, you may want to go to the following link.

<https://www.surveymonkey.com/r/WashingtonHMP1>

By taking this survey and answering these simple questions, you will be helping Washington County plan for our preparation and response to emergencies. The survey should take you no more than 5-10 minutes....

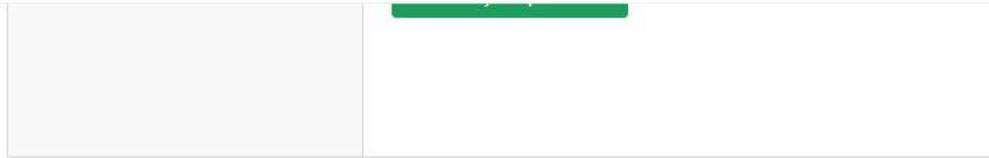
See More

Washington County Hazard Mitigation Survey

Web survey powered by SurveyMonkey.com. Create your own online survey now with SurveyMonkey's expert certified FREE templates.

SURVEYMONKEY.COM

Boost Post



Activity

My agency ▾

VIEWING: Washington County Emergency Management ▾



Emergency Management Survey



Emergency Manager Charles Summers from Washington County Emergency Management · Just now

Washington County Emergency Management is updating its Hazard Mitigation Plan. If you are interested and would like to assist, you may want to go to the following link.

<https://www.surveymonkey.com/r/Washingto...>

By taking this survey and answering these simple questions, you will be helping Washington County plan for our preparation and response to emergencies. The survey should take you no ... [View more](#)

Shared with Washington County Emergency Management in General

REPLY ▾



- Members
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Shortcuts

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Rick Bishop shared a link.

Just now

Washington County Hazard Mitigation Plan 2017 Update

In coordination with all local jurisdictions, Washington County is updating it's Hazard Mitigation plan. Input from residents is greatly encouraged. The survey linked here, seeks your input regarding various hazards that we face. Please take a few minutes to complete this survey www.surveymonkey.com/r/WashingtonHMP1.

	<h3>Washington County Hazard Mitiga...</h3> <p>Web survey powered by SurveyMonkey.com. Create y...</p> <p>SURVEYMONKEY.COM</p>
--	--

Like Comment Share

Facebook interface for the Town of Keedysville, Maryland page. The page name is "Town of Keedysville, Maryland" and the user is logged in as "Rick". The navigation bar includes "Page", "Inbox", "Notifications 1", "Insights", and "Publishing Tools".

The left sidebar shows the page name "Town of Keedysville, Maryland" and options to "Create Page @Username", "Home", "Posts", "Videos", "Photos", "About", "Community", "Promote", and "Manage Promotions".

The main content area shows a post from "Town of Keedysville, Maryland" published by "Rick Bishop [?]" just now. The post title is "Washington County Hazard Mitigation Plan 2017 Update". The text of the post reads: "In coordination with all local jurisdictions, Washington County is updating its Hazard Mitigation plan. Input from residents is greatly encouraged. The survey linked here, seeks your input regarding various hazards that we face. Please take a few minutes to complete this survey www.surveymonkey.com/r/WashingtonHMP1."

Below the post is a sponsored advertisement for "Washington County Hazard Mitigation Survey" powered by SurveyMonkey.com. The ad text says: "Web survey powered by SurveyMonkey.com. Create your own online survey now with SurveyMonkey's expert certified FREE templates. SURVEYMONKEY.COM".

Screenshot of the website www.keedysvillemd.com/news.asp. The browser address bar shows the URL and search bar. The website header features a logo with trees and the text "Where Northern Thrift and Personality Meet Southern Charm and Hospitality KeedysvilleMD.com Keedysville, Maryland".

The navigation menu includes "HOME", "TOWN GOVERNMENT", "COMMUNITY RESOURCES", and "COMMUNICATIONS".

The main content area is titled "Keedysville News" and includes a section for "Town Hall Hours":

- Monday-Wednesday 8:00-4:30
- Thursday & Friday 8:00-12:00

Below this is a section for "Washington County Hazard Mitigation Plan 2017 Update" with the same text as the Facebook post: "In coordination with all local jurisdictions, Washington County is updating its Hazard Mitigation plan. Input from residents is greatly encouraged. The survey linked here, seeks your input regarding various hazards that we face. Please take a few minutes to complete this survey www.surveymonkey.com/r/WashingtonHMP1."

On the right side of the page, there is a calendar for August 2017. The calendar shows the days of the week (S, M, T, W, T, F, S) and the dates from 1 to 31. The date 3 is highlighted in red.



Washington County's Hazard Mitigation Plan



Emergency Manager Charles Summers from Washington County Emergency Management · 2d ago

We are very close to having our new Hazard Mitigation Plan completed. We would again like for your input and assistance in gathering your thoughts on what you see as important and should be addressed in the plan. So, if you would, take a couple minutes and complete the last Citizen Survey. Go the the following link.

<https://www.surveymonkey.com/r/Washingto...>

Your involvement will allow us ... [View more](#)

2d ago · Subscribers of Washington County Emergency Management in General

REPLY · 3

★ Joyce, Rich, Pat, and 2 others thanked you



Robert H. from North End Hagerstown · 2d ago



What?

Thank



Elmer R. from Fountain Head · 1d ago



Subdued street lighting; Speed limit signs; improved police surveillance; more shopping availability; better dining choices;

Thank



Tiffany M. from Frederick Manor · 1d ago



Here's everyone's chance to be heard! Make the difference locally that you always say you wanna make. Stay informed on local issues throughout your community that can effect your future lifestyle.

Thank

Write a reply...



Posts



Washington County Division Of Emergency Services



Published by Charles Summers [?] · November 17 at 1:25pm · 🌐

Washington County's Hazard Mitigation Plan

We are very close to having our new Hazard Mitigation Plan completed. We would again like for your input and assistance in gathering your thoughts on what you see as important and should be addressed in the plan. So, if you would, take a couple minutes and complete the last Citizen Survey. Go to the following link.

<https://www.surveymonkey.com/r/Washingtonhmp2...> See More

	<p>Washington County Hazard Mitigation Survey #2 (Mitigation Actions)</p> <p>Web survey powered by SurveyMonkey.com. Create your own online survey now with...</p> <p>SURVEYMONKEY.COM</p>
---	---

 939 people reached

Boost Post

 Like  Comment  Share



 Laura Lane-Unsworth and Russell J Strickland



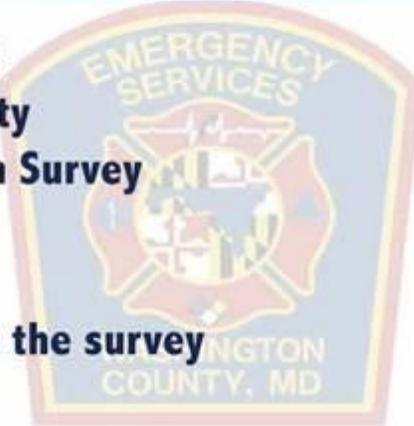
Write a comment...





Participate in the Washington County Hazard Mitigation Survey

Click here to take the survey



I want to . . .

[read the FY2018 Citizen's Guide to the Budget](#)
[apply for a building permit](#)
[look up or pay my taxes/water/sewer bill](#)
[view my county codes](#)
[rent a county park pavillion](#)

Upcoming Events

[Job Posting – Entrant Exam Announcement – Firefighter 1, 2 & Firefighter/Paramedic](#)
November 27 @ 4:00 pm

[2017.11.28 – Regular Commissioners Meeting](#)
November 28 @ 10:00 am - 1:40 pm

BOCC Meeting Agendas

171128	171114	171107
171031	171024	171017
171010	171003	170926

BOCC Approved Minutes

171031	171024	171017
171010	170926	170919



I want to encourage you all to take the second public survey relating to hazard mitigation projects.

We are posting it on our website and social media. This survey is a very easy thing to do and will look good for your participation in the plan.

Please respond as soon as you can, we're getting this project ready to send out. Call or email me if you have any questions.

Thank you,

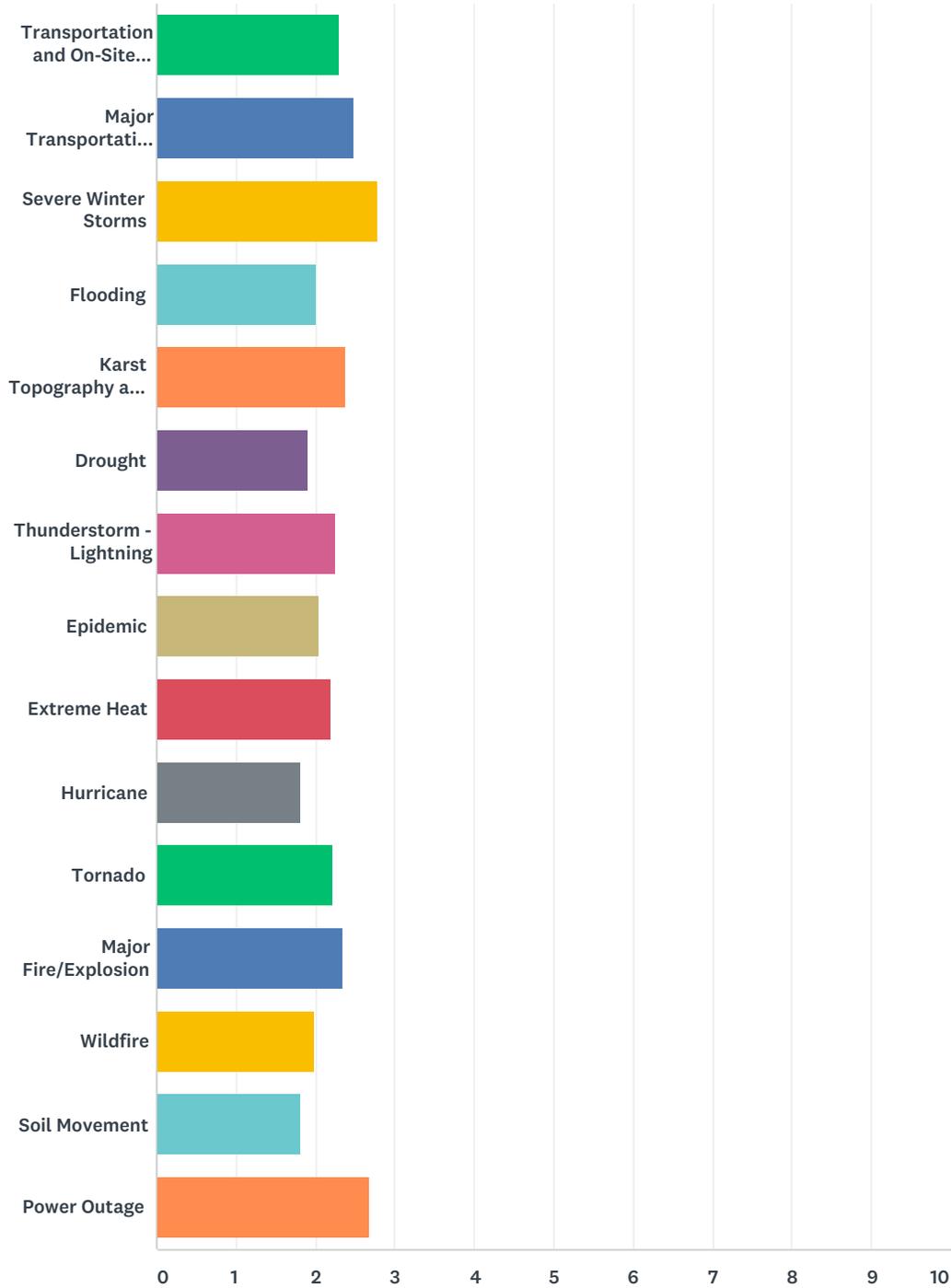
Juanita Grimm
Town Clerk

[Click for Email](#)

[Click to Fill Out the Survey](#)

Q1 Please indicate how concerned you are about the following hazards, specifically where you live.

Answered: 221 Skipped: 0



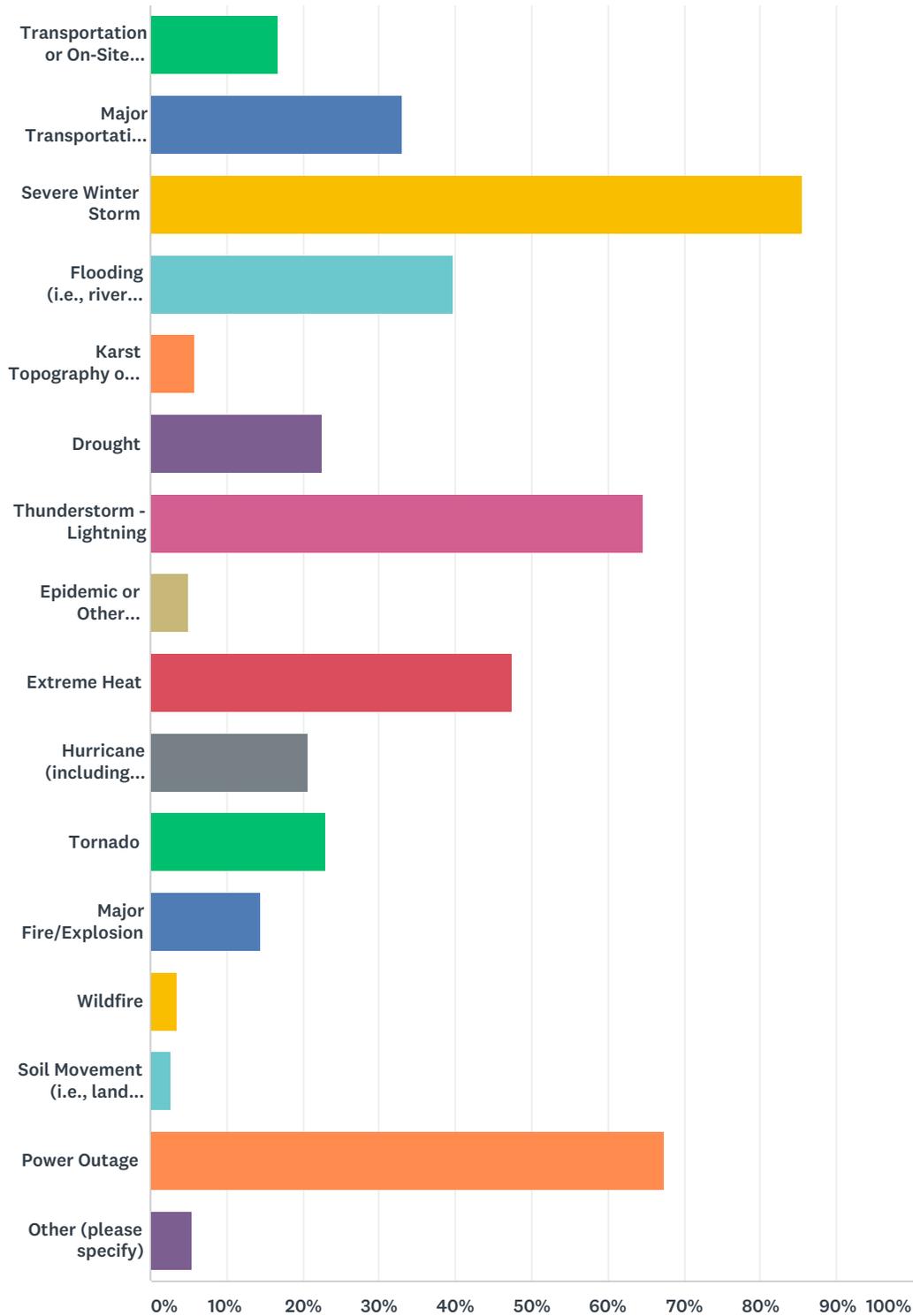
	NOT AT ALL CONCERNED	SOMEWHAT CONCERNED	CONCERNED	VERY CONCERNED	TOTAL	WEIGHTED AVERAGE
Transportation and On-Site Hazardous Materials Incident	22.37%	38.81%	24.20%	14.61%	219	2.31
	49	85	53	32		

Washington County Hazard Mitigation Survey

Major Transportation Accident	18.35% 40	32.11% 70	30.73% 67	18.81% 41	218	2.50
Severe Winter Storms	7.34% 16	30.73% 67	38.53% 84	23.39% 51	218	2.78
Flooding	33.64% 73	39.63% 86	18.43% 40	8.29% 18	217	2.01
Karst Topography and Groundwater Pollution	18.81% 41	37.61% 82	29.36% 64	14.22% 31	218	2.39
Drought	35.16% 77	43.84% 96	16.89% 37	4.11% 9	219	1.90
Thunderstorm - Lightning	24.66% 54	36.99% 81	26.94% 59	11.42% 25	219	2.25
Epidemic	31.48% 68	40.74% 88	17.59% 38	10.19% 22	216	2.06
Extreme Heat	25.69% 56	38.53% 84	25.69% 56	10.09% 22	218	2.20
Hurricane	43.06% 93	39.35% 85	11.11% 24	6.48% 14	216	1.81
Tornado	22.37% 49	44.75% 98	22.37% 49	10.50% 23	219	2.21
Major Fire/Explosion	21.92% 48	33.79% 74	31.96% 70	12.33% 27	219	2.35
Wildfire	39.17% 85	32.72% 71	17.97% 39	10.14% 22	217	1.99
Soil Movement	42.47% 93	36.99% 81	16.89% 37	3.65% 8	219	1.82
Power Outage	8.18% 18	34.55% 76	39.09% 86	18.18% 40	220	2.67

Q2 In the past 10 years, which hazards do you recall having occurred in your community? (Check all that apply)

Answered: 221 Skipped: 0



ANSWER CHOICES

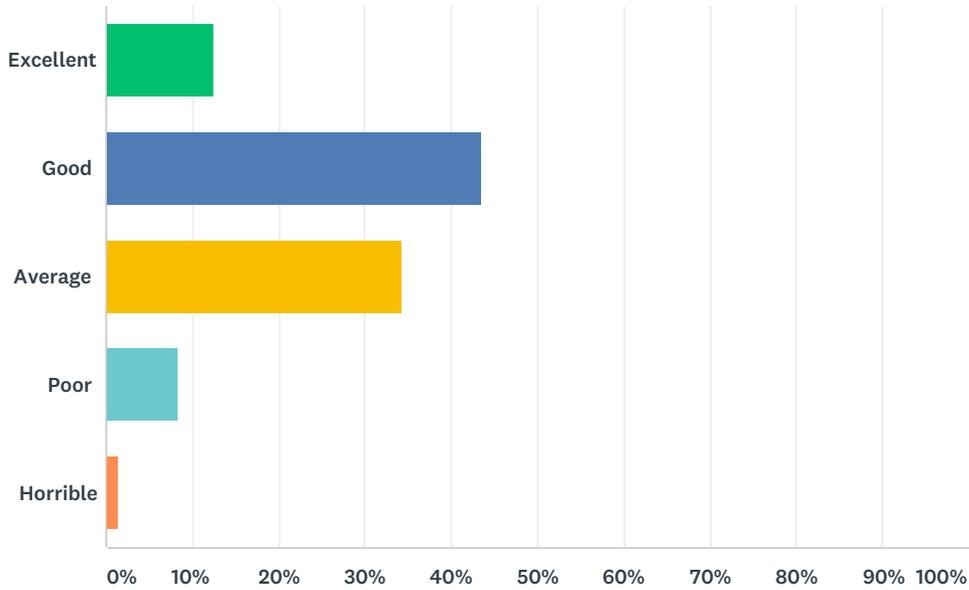
RESPONSES

Washington County Hazard Mitigation Survey

Transportation or On-Site Hazardous Materials Incident	16.74%	37
Major Transportation Accident	33.03%	73
Severe Winter Storm	85.52%	189
Flooding (i.e., riverine OR flash flooding)	39.82%	88
Karst Topography or Groundwater Pollution	5.88%	13
Drought	22.62%	50
Thunderstorm - Lightning	64.71%	143
Epidemic or Other Communicable Disease	4.98%	11
Extreme Heat	47.51%	105
Hurricane (including residual hurricane effects)	20.81%	46
Tornado	23.08%	51
Major Fire/Explosion	14.48%	32
Wildfire	3.62%	8
Soil Movement (i.e., land subsidence or landslide)	2.71%	6
Power Outage	67.42%	149
Other (please specify)	5.43%	12
Total Respondents: 221		

Q3 Think back to a recent hazard occurrence (any from questions 1 or 2.)
How would you rate your community's ability to handle the hazard event?

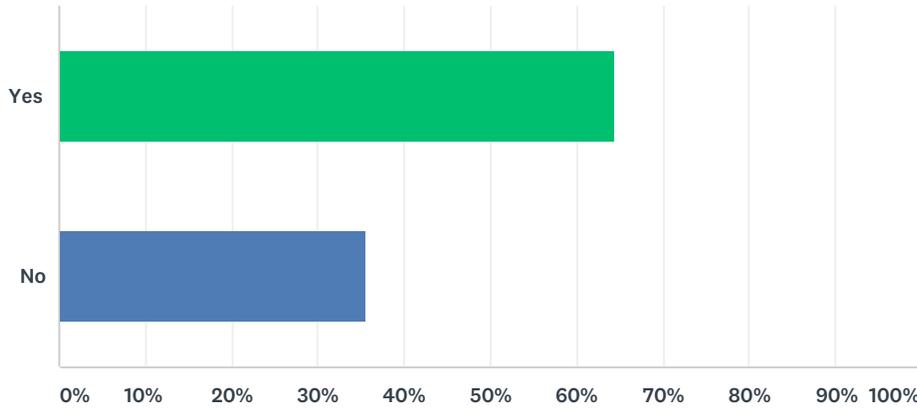
Answered: 216 Skipped: 5



ANSWER CHOICES	RESPONSES	
Excellent	12.50%	27
Good	43.52%	94
Average	34.26%	74
Poor	8.33%	18
Horrible	1.39%	3
TOTAL		216

Q4 During this event did you receive information or warnings from local media (TV, Radio, Text) or social media (Facebook/Twitter) that was either from or forwarded from your local public officials / emergency management officials?

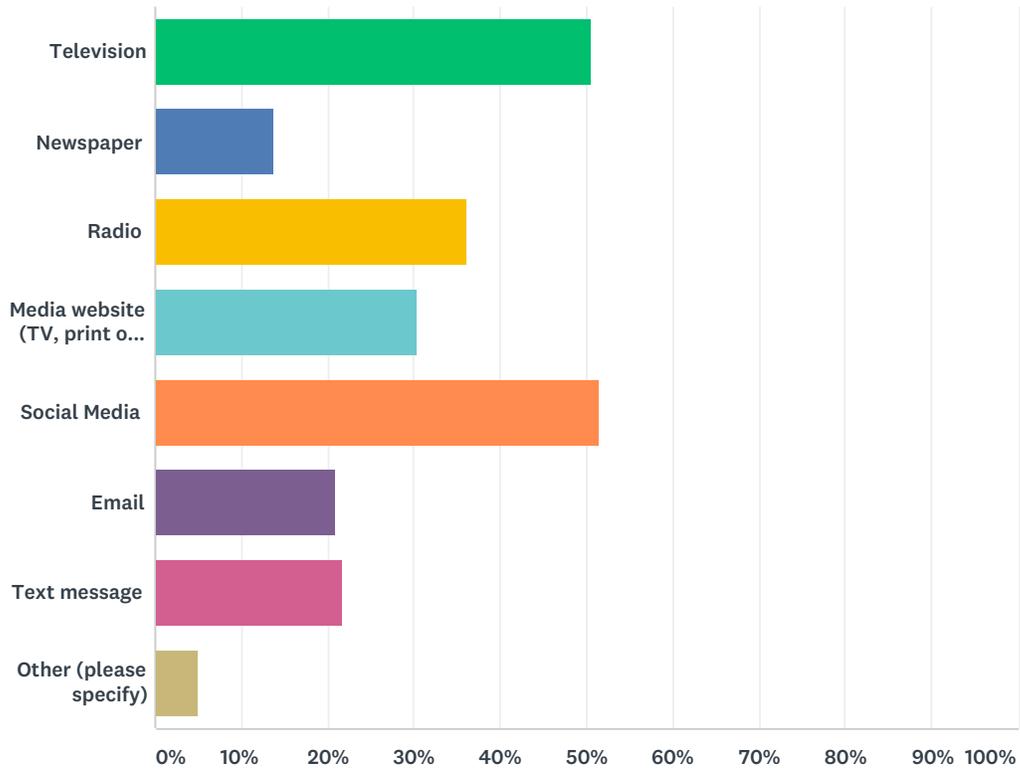
Answered: 216 Skipped: 5



ANSWER CHOICES	RESPONSES	
Yes	64.35%	139
No	35.65%	77
TOTAL		216

Q5 How did you receive this information?

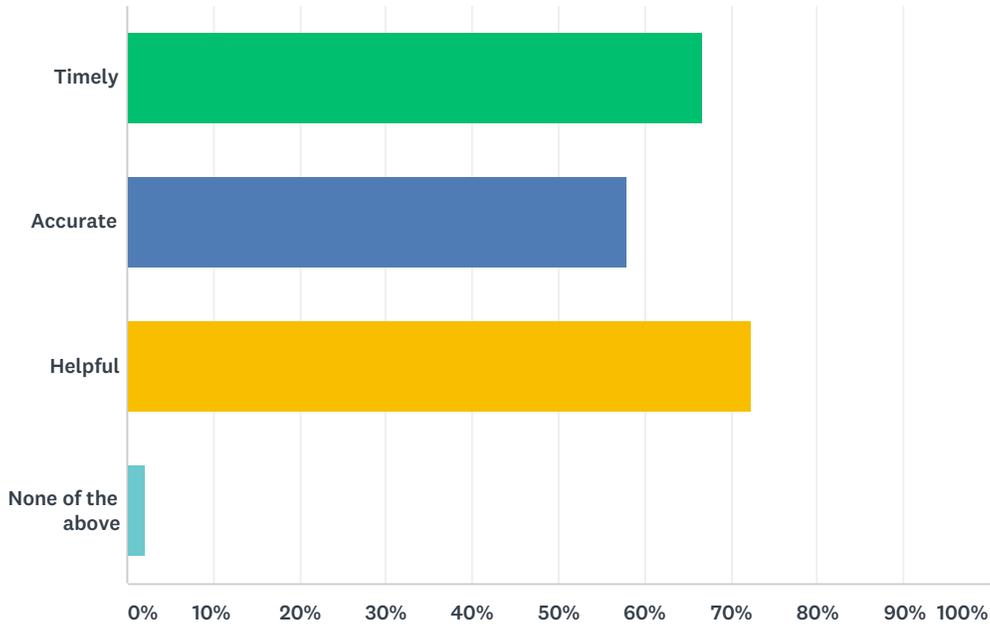
Answered: 138 Skipped: 83



ANSWER CHOICES	RESPONSES	
Television	50.72%	70
Newspaper	13.77%	19
Radio	36.23%	50
Media website (TV, print or radio)	30.43%	42
Social Media	51.45%	71
Email	21.01%	29
Text message	21.74%	30
Other (please specify)	5.07%	7
Total Respondents: 138		

Q6 Was this information timely, accurate and helpful? (choose as many as apply)

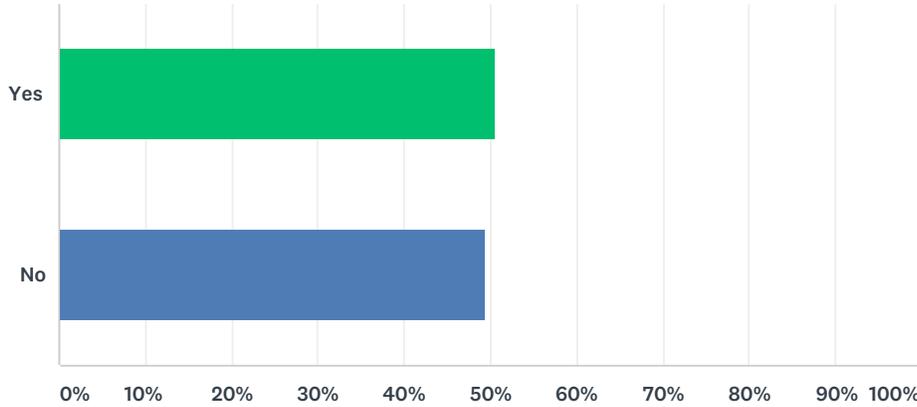
Answered: 138 Skipped: 83



ANSWER CHOICES	RESPONSES	
Timely	66.67%	92
Accurate	57.97%	80
Helpful	72.46%	100
None of the above	2.17%	3
Total Respondents: 138		

Q7 Do you follow Washington County Emergency Management on social media?

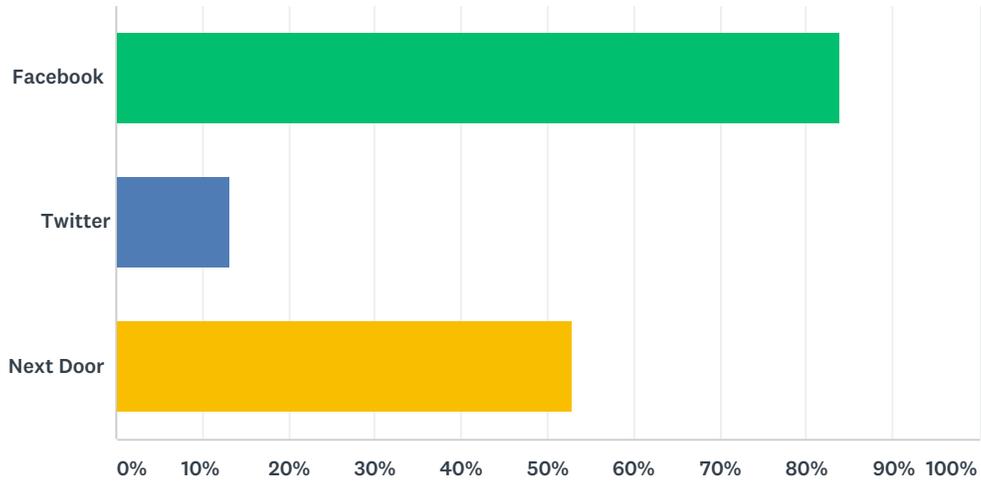
Answered: 138 Skipped: 83



ANSWER CHOICES	RESPONSES	
Yes	50.72%	70
No	49.28%	68
TOTAL		138

Q8 On which platforms do you follow Washington County Emergency Management?

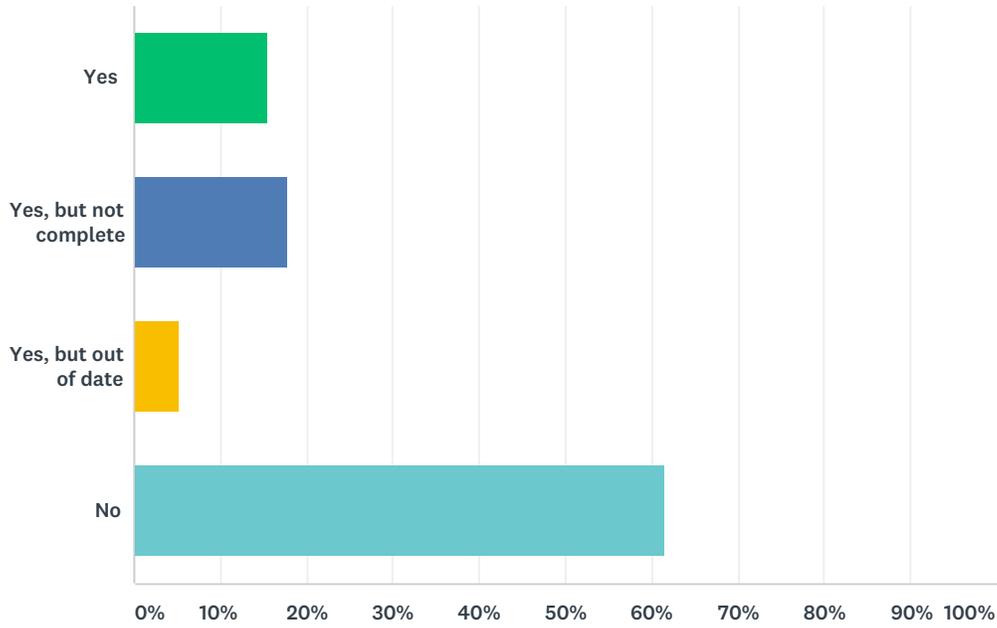
Answered: 68 Skipped: 153



ANSWER CHOICES	RESPONSES
Facebook	83.82% 57
Twitter	13.24% 9
Next Door	52.94% 36
Total Respondents: 68	

Q9 Do you / does your household have a 72-hour kit? (<http://www.ready.gov/build-a-kit>)

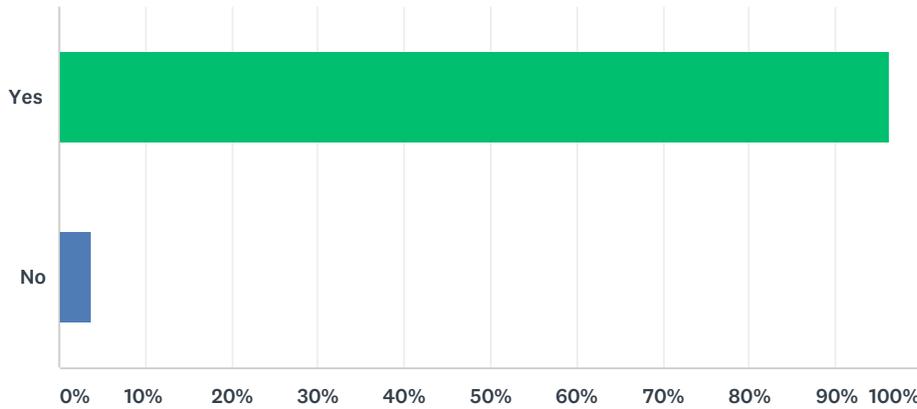
Answered: 213 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	15.49%	33
Yes, but not complete	17.84%	38
Yes, but out of date	5.16%	11
No	61.50%	131
TOTAL		213

Q10 Do you have homeowners/renters insurance?

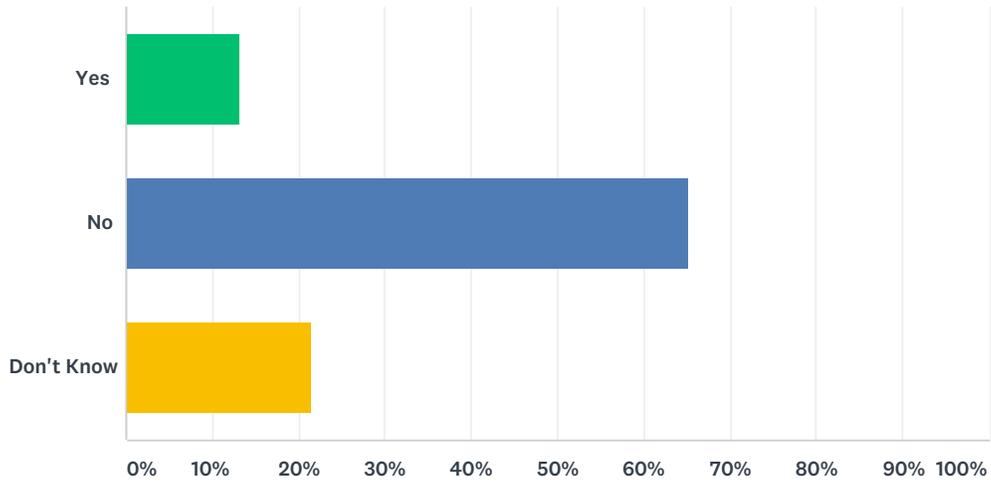
Answered: 213 Skipped: 8



ANSWER CHOICES	RESPONSES	
Yes	96.24%	205
No	3.76%	8
TOTAL		213

Q11 Does your homeowner/renters insurance include flood insurance?

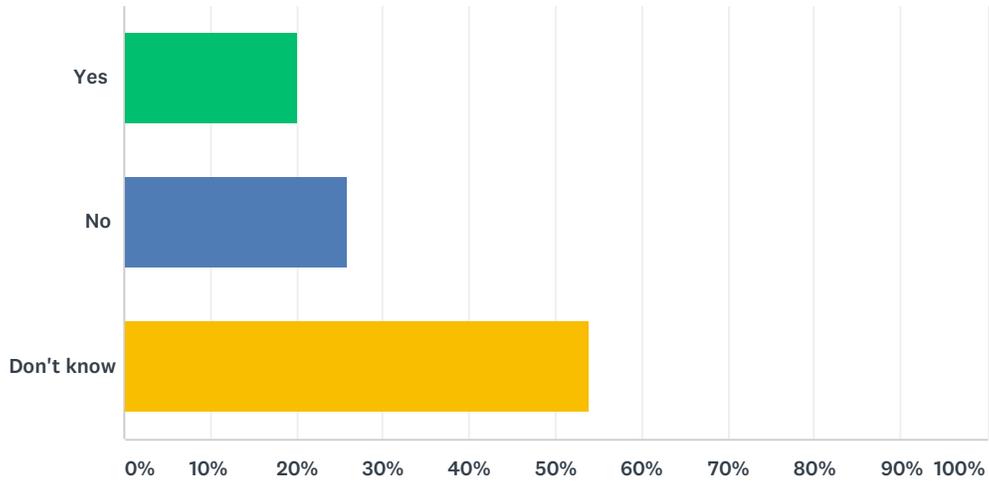
Answered: 204 Skipped: 17



ANSWER CHOICES	RESPONSES	
Yes	13.24%	27
No	65.20%	133
Don't Know	21.57%	44
TOTAL		204

Q12 Does your policy include sewer back up insurance (or have a sewer back up policy rider)?

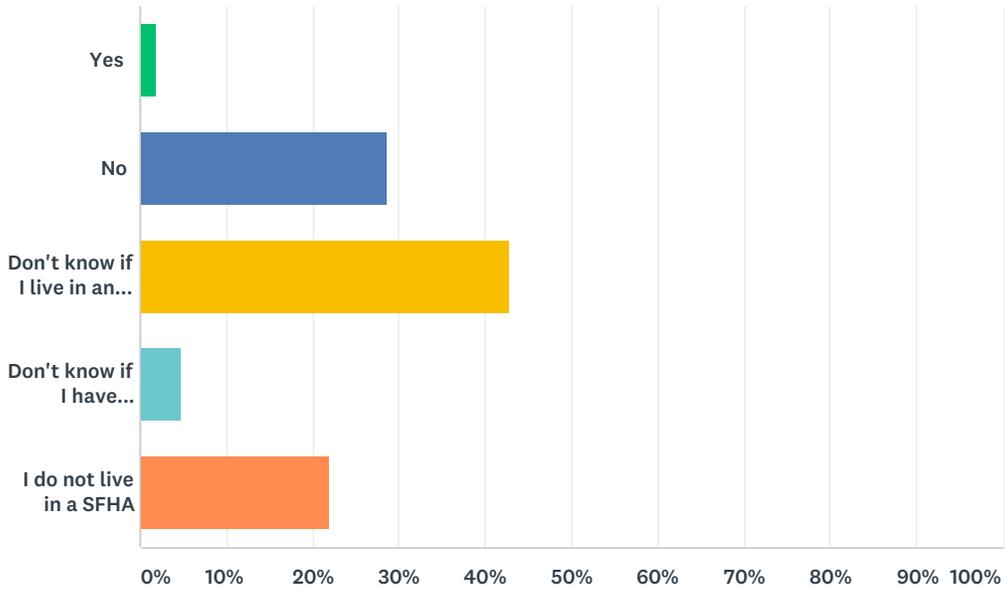
Answered: 204 Skipped: 17



ANSWER CHOICES	RESPONSES	
Yes	20.10%	41
No	25.98%	53
Don't know	53.92%	110
TOTAL		204

Q13 If you live in a Special Flood Hazard Area (SFHA), do you have floodplain insurance?

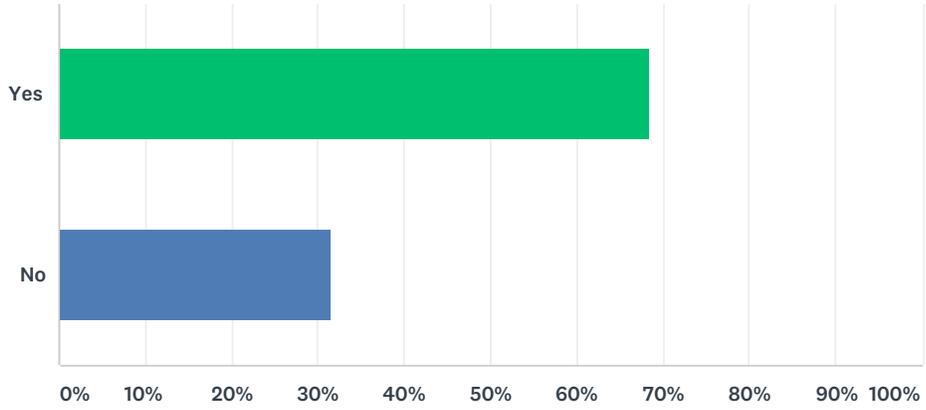
Answered: 210 Skipped: 11



ANSWER CHOICES	RESPONSES	
Yes	1.90%	4
No	28.57%	60
Don't know if I live in an SFHA	42.86%	90
Don't know if I have floodplain insurance	4.76%	10
I do not live in a SFHA	21.90%	46
TOTAL		210

Q14 Are you willing to spend your money on mitigation activities for your home?

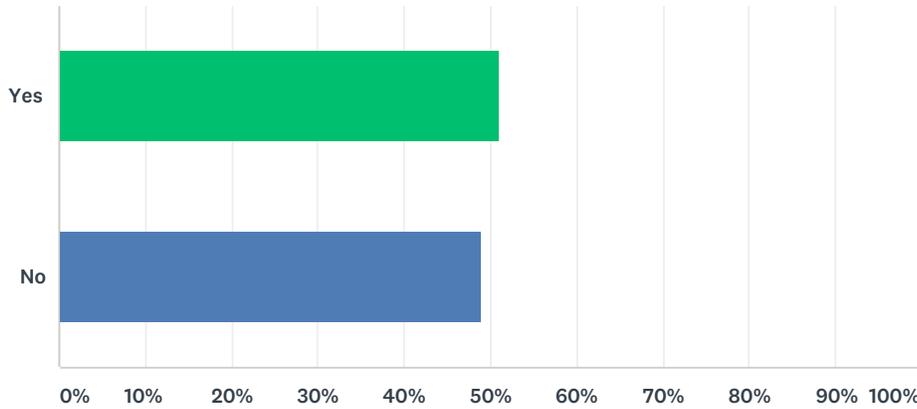
Answered: 206 Skipped: 15



ANSWER CHOICES	RESPONSES	
Yes	68.45%	141
No	31.55%	65
TOTAL		206

Q15 Have you performed any improvements to your home to reduce your risk from a hazard?

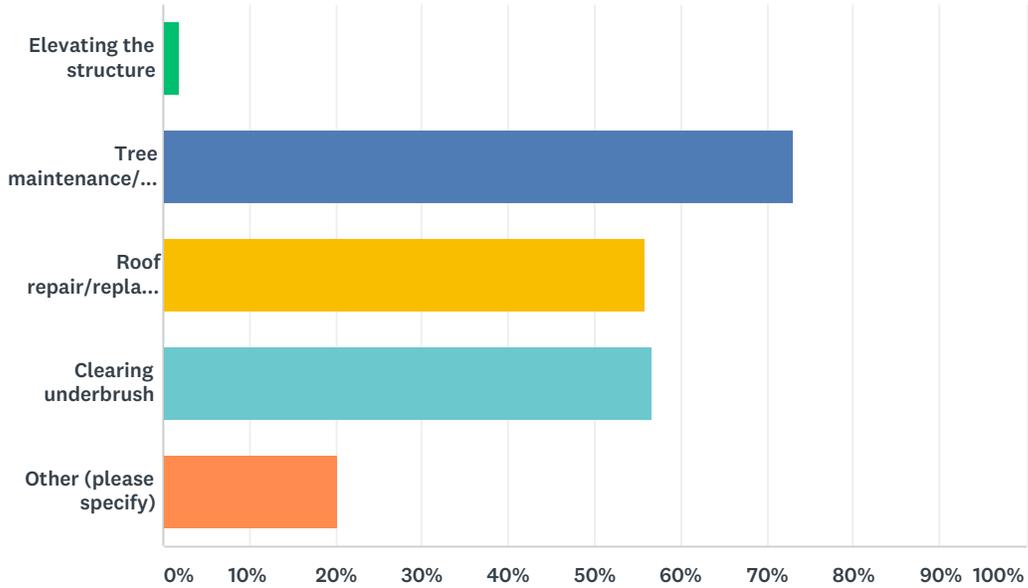
Answered: 206 Skipped: 15



ANSWER CHOICES	RESPONSES	
Yes	50.97%	105
No	49.03%	101
TOTAL		206

Q16 Please indicate what improvements you have made:

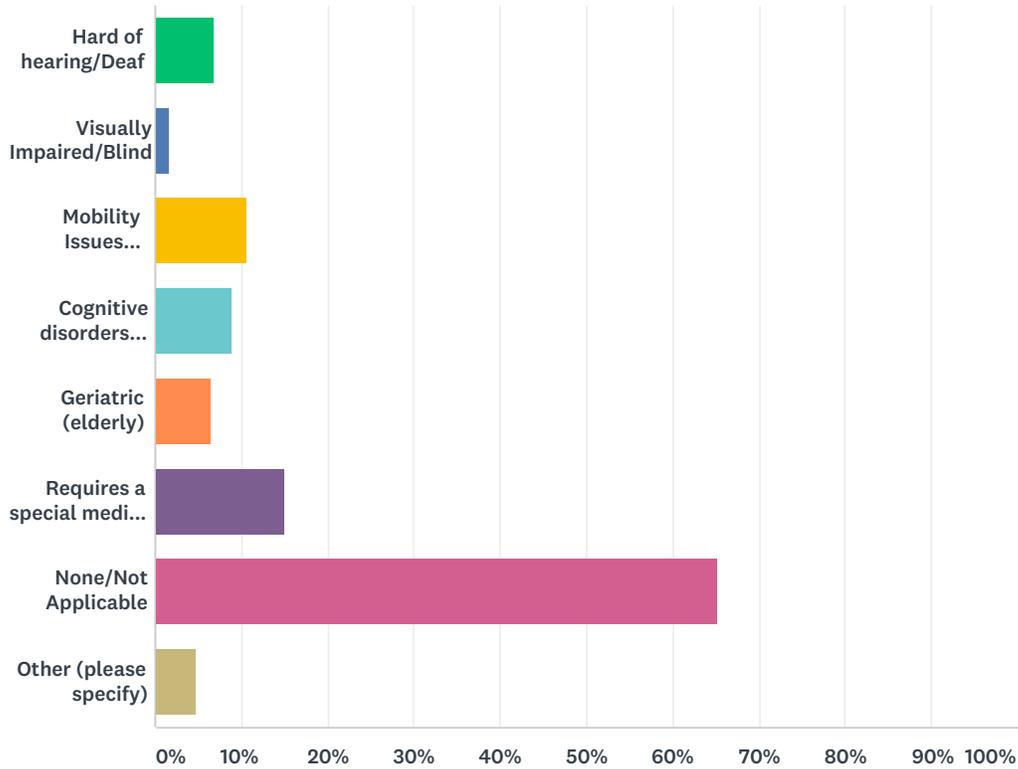
Answered: 104 Skipped: 117



ANSWER CHOICES	RESPONSES
Elevating the structure	1.92% 2
Tree maintenance/removal	73.08% 76
Roof repair/replacement	55.77% 58
Clearing underbrush	56.73% 59
Other (please specify)	20.19% 21
Total Respondents: 104	

Q17 Do you, or someone who resides in your residence, have a special need that emergency service providers should be aware of in an emergency? (Please pick all the apply)

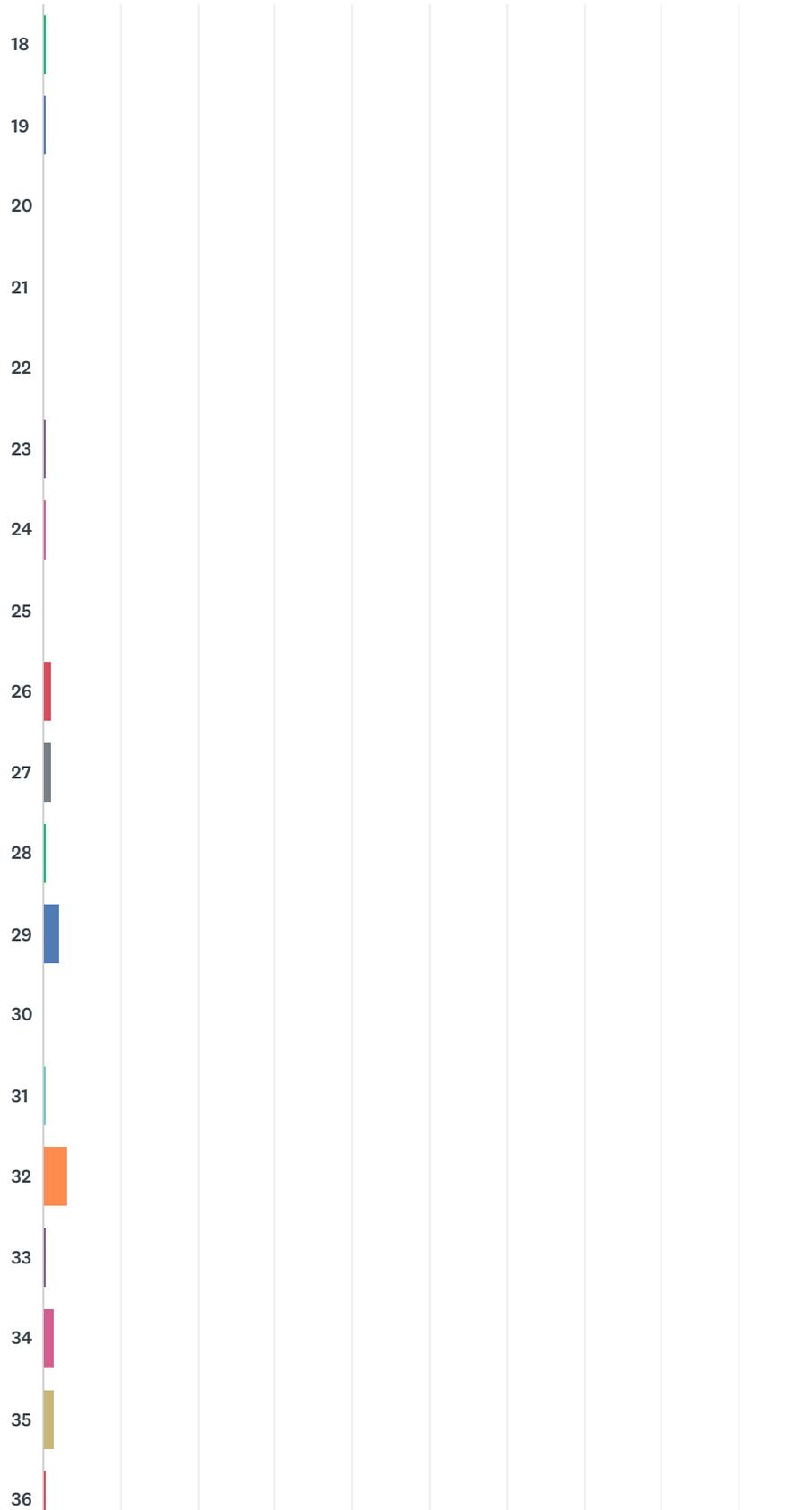
Answered: 187 Skipped: 34



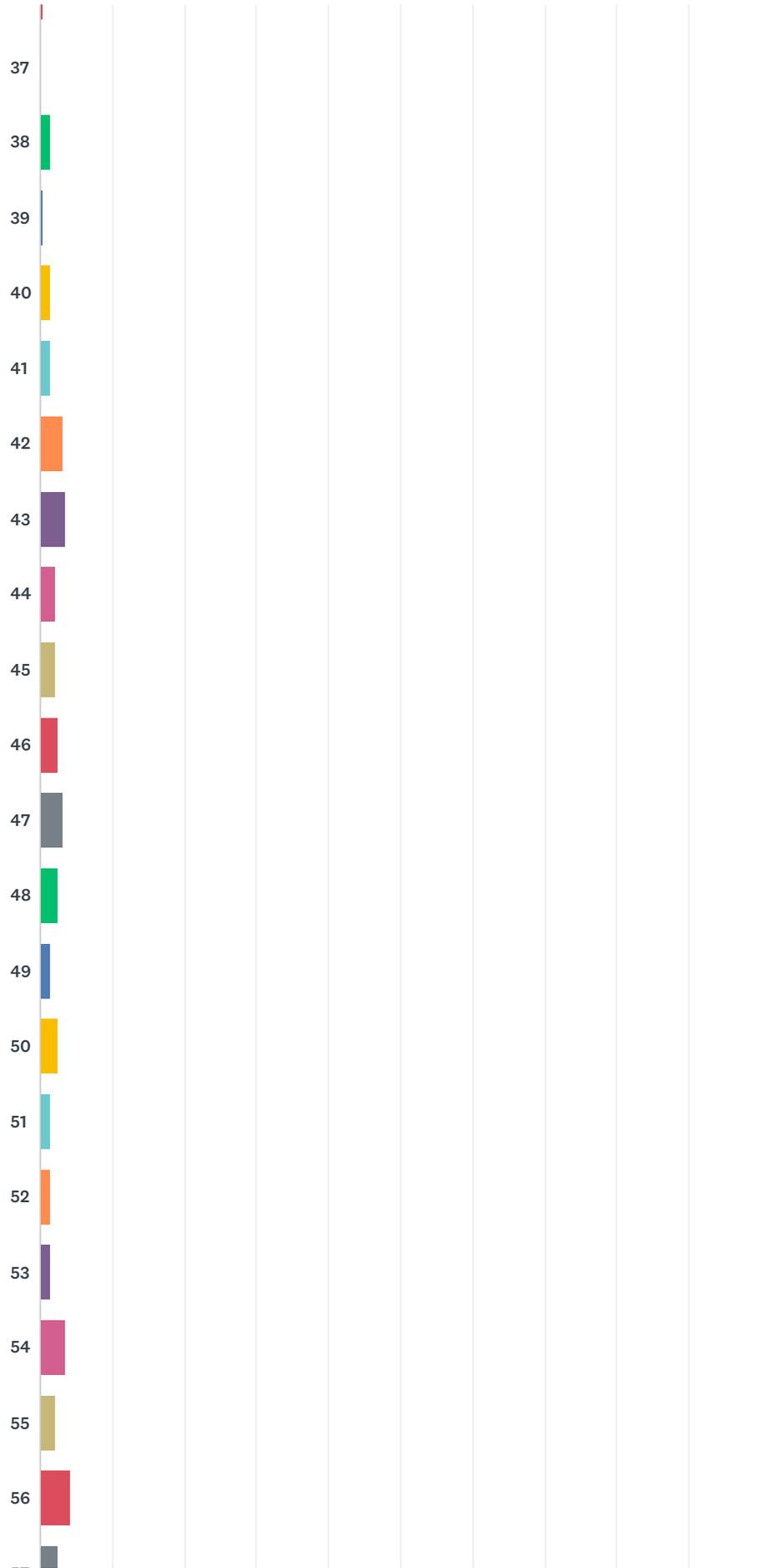
ANSWER CHOICES	RESPONSES	
Hard of hearing/Deaf	6.95%	13
Visually Impaired/Blind	1.60%	3
Mobility Issues (non-ambulatory, confined to a wheelchair, requires the use of a can or walker)	10.70%	20
Cognitive disorders (includes autism, depression, etc.)	9.09%	17
Geriatric (elderly)	6.42%	12
Requires a special medical device (such as a Ventilator, CPAP machine, or drugs that require refrigeration [I.E. insulin])	14.97%	28
None/Not Applicable	65.24%	122
Other (please specify)	4.81%	9
Total Respondents: 187		

Q18 Please provide your age

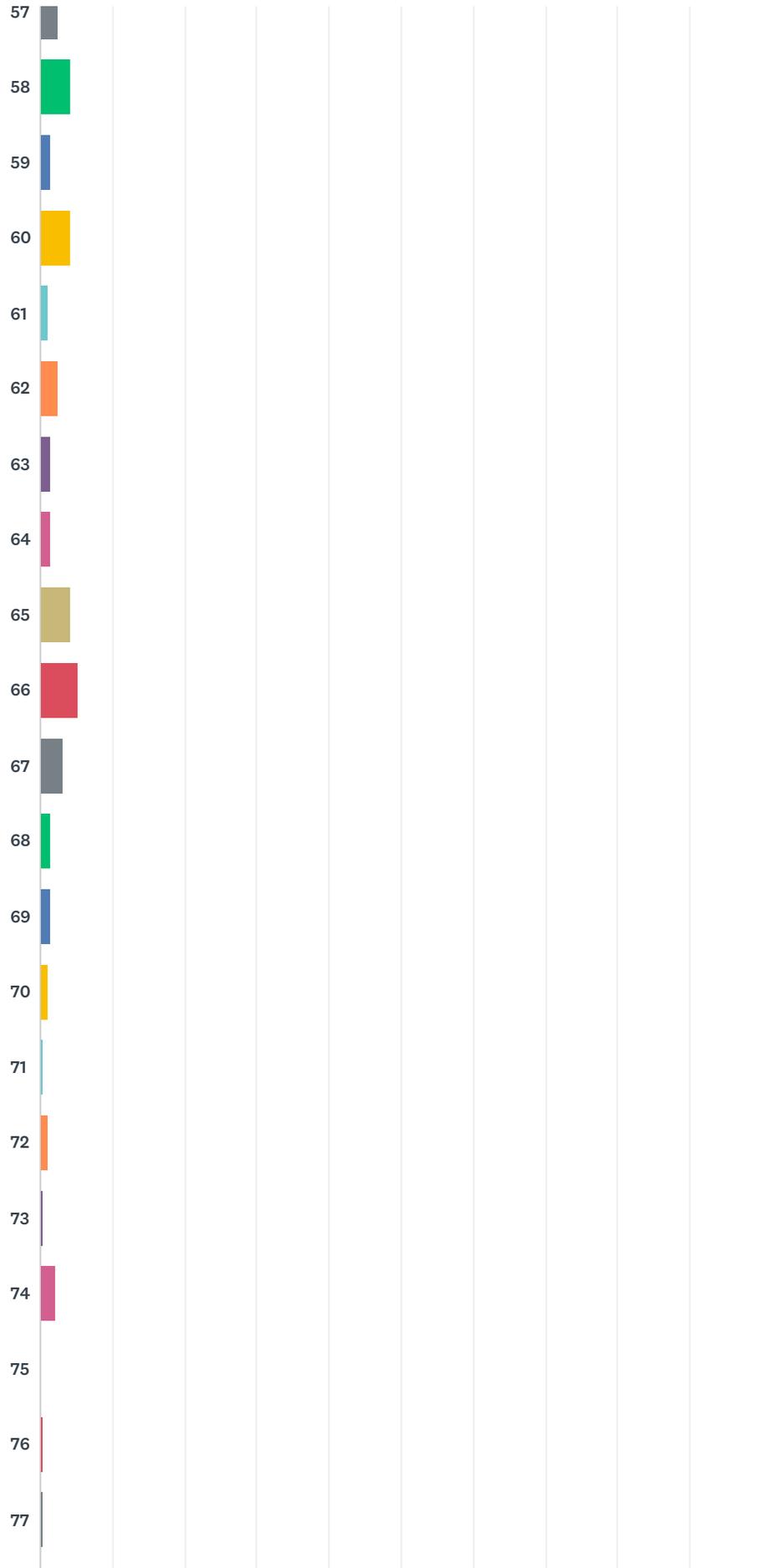
Answered: 193 Skipped: 28



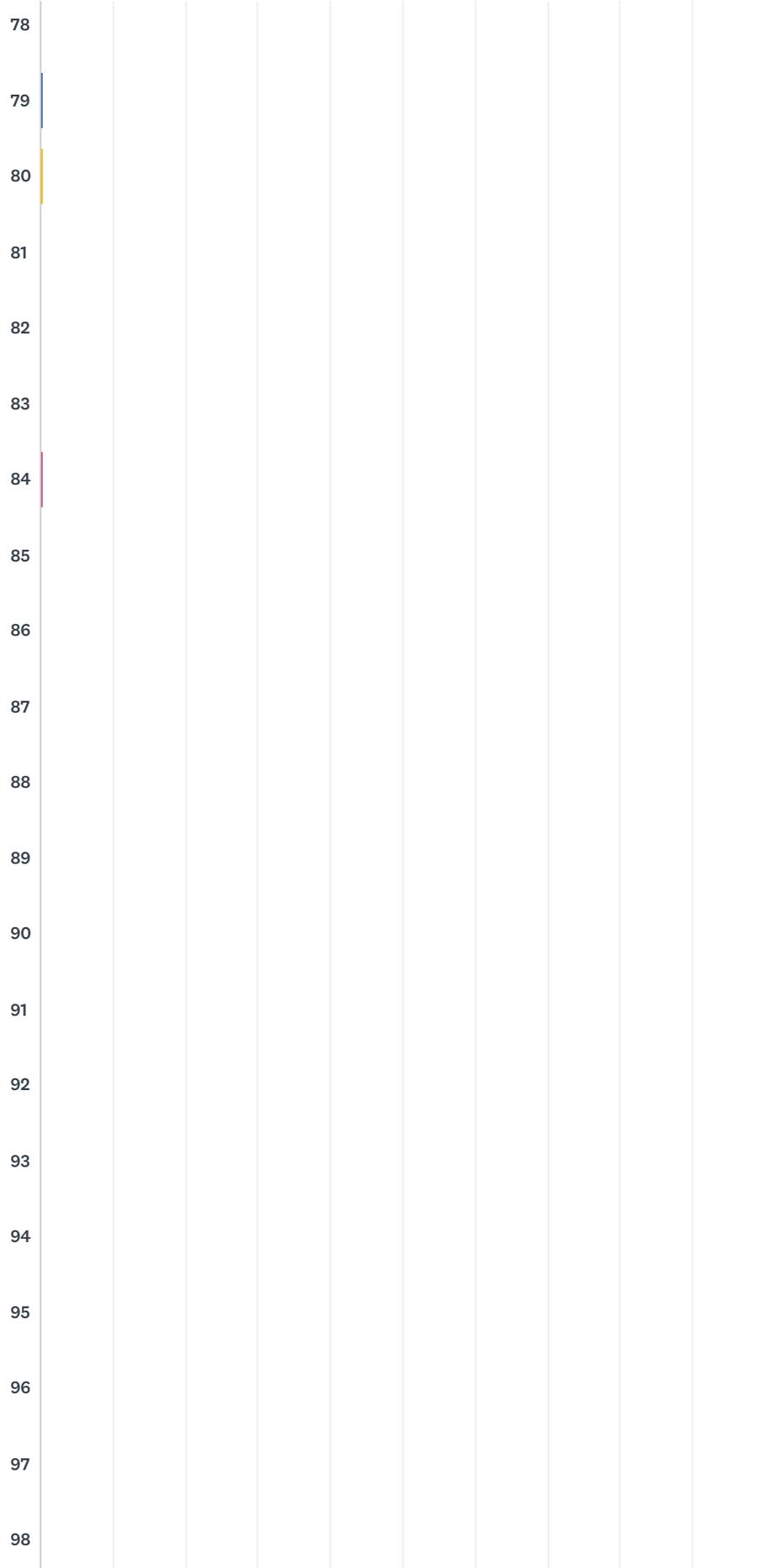
Washington County Hazard Mitigation Survey



Washington County Hazard Mitigation Survey



Washington County Hazard Mitigation Survey



Washington County Hazard Mitigation Survey



ANSWER CHOICES	RESPONSES	
18	0.52%	1
19	0.52%	1
20	0.00%	0
21	0.00%	0
22	0.00%	0
23	0.52%	1
24	0.52%	1
25	0.00%	0
26	1.04%	2
27	1.04%	2
28	0.52%	1

Washington County Hazard Mitigation Survey

29	2.07%	4
30	0.00%	0
31	0.52%	1
32	3.11%	6
33	0.52%	1
34	1.55%	3
35	1.55%	3
36	0.52%	1
37	0.00%	0
38	1.55%	3
39	0.52%	1
40	1.55%	3
41	1.55%	3
42	3.11%	6
43	3.63%	7
44	2.07%	4
45	2.07%	4
46	2.59%	5
47	3.11%	6
48	2.59%	5
49	1.55%	3
50	2.59%	5
51	1.55%	3
52	1.55%	3
53	1.55%	3
54	3.63%	7
55	2.07%	4
56	4.15%	8
57	2.59%	5
58	4.15%	8
59	1.55%	3
60	4.15%	8
61	1.04%	2
62	2.59%	5
63	1.55%	3

Washington County Hazard Mitigation Survey

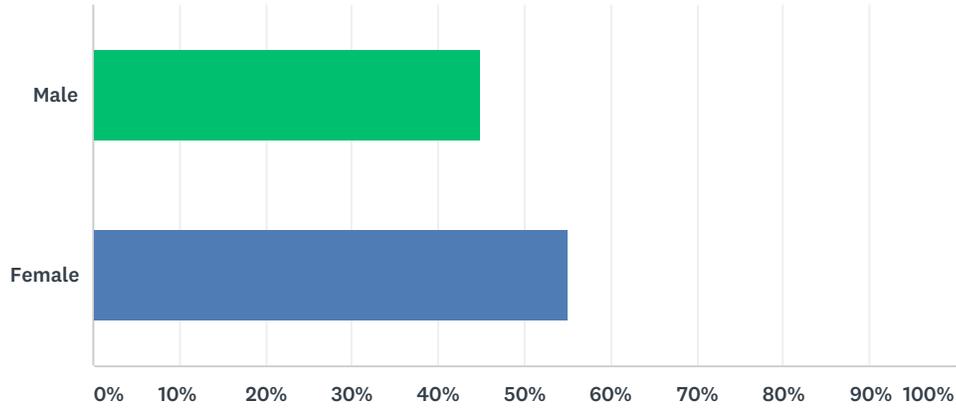
64	1.55%	3
65	4.15%	8
66	5.18%	10
67	3.11%	6
68	1.55%	3
69	1.55%	3
70	1.04%	2
71	0.52%	1
72	1.04%	2
73	0.52%	1
74	2.07%	4
75	0.00%	0
76	0.52%	1
77	0.52%	1
78	0.00%	0
79	0.52%	1
80	0.52%	1
81	0.00%	0
82	0.00%	0
83	0.00%	0
84	0.52%	1
85	0.00%	0
86	0.00%	0
87	0.00%	0
88	0.00%	0
89	0.00%	0
90	0.00%	0
91	0.00%	0
92	0.00%	0
93	0.00%	0
94	0.00%	0
95	0.00%	0
96	0.00%	0
97	0.00%	0
98	0.00%	0

Washington County Hazard Mitigation Survey

99	0.00%	0
100	0.00%	0
101	0.00%	0
102	0.00%	0
103	0.00%	0
104	0.00%	0
105	0.00%	0
106	0.00%	0
107	0.00%	0
108	0.00%	0
109	0.00%	0
110	0.00%	0
TOTAL		193

Q19 Gender

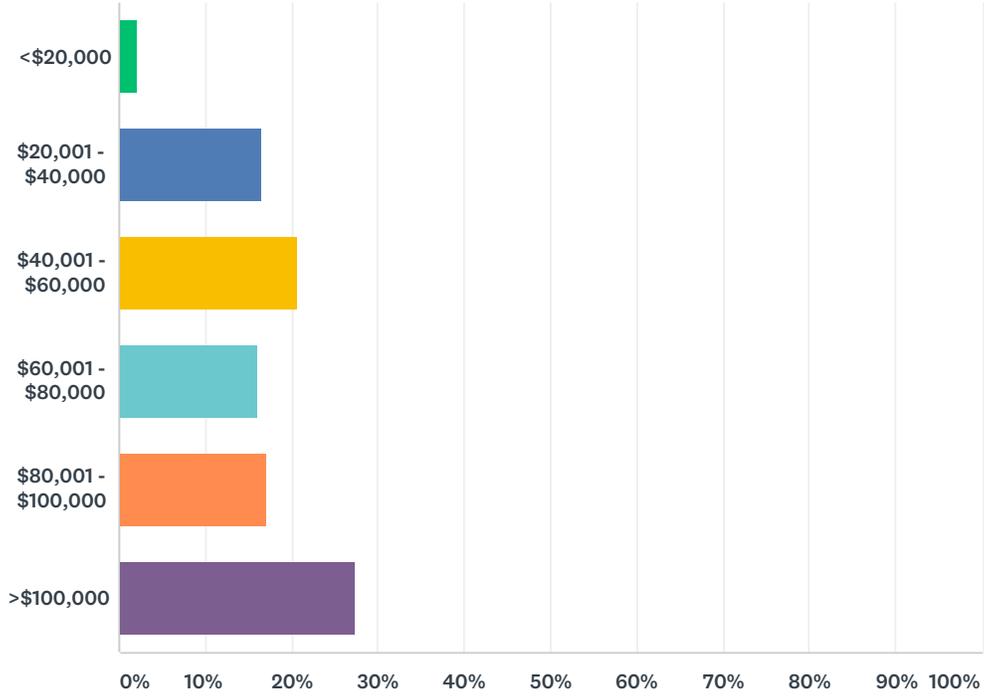
Answered: 193 Skipped: 28



ANSWER CHOICES	RESPONSES	
Male	45.08%	87
Female	54.92%	106
TOTAL		193

Q20 Please indicate your household income:

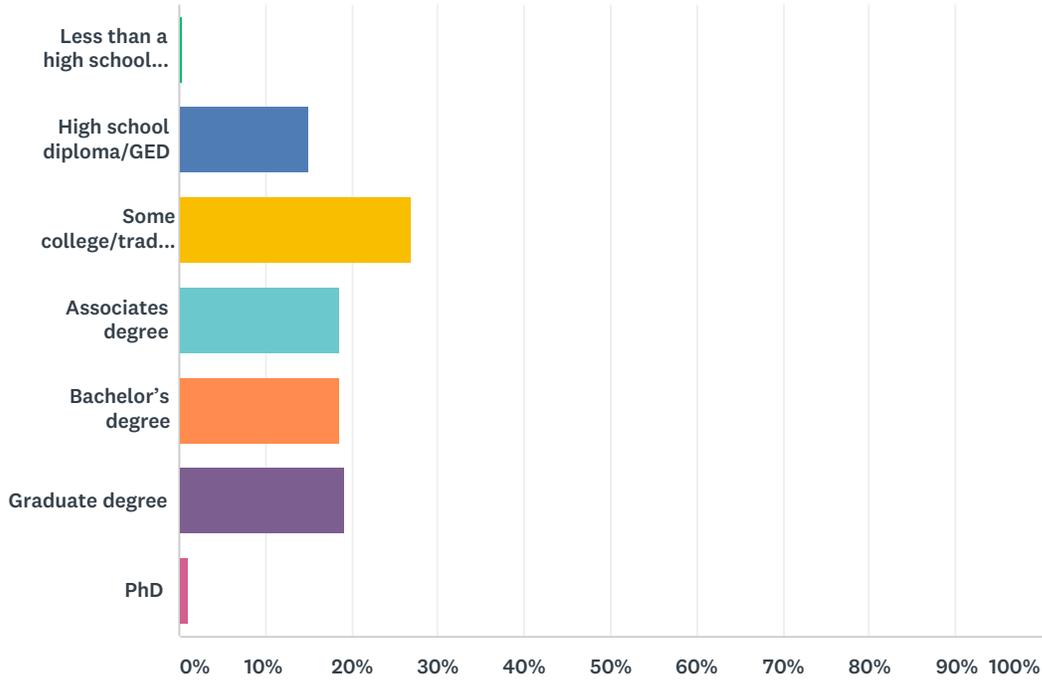
Answered: 193 Skipped: 28



ANSWER CHOICES	RESPONSES	
<\$20,000	2.07%	4
\$20,001 - \$40,000	16.58%	32
\$40,001 - \$60,000	20.73%	40
\$60,001 - \$80,000	16.06%	31
\$80,001 - \$100,000	17.10%	33
>\$100,000	27.46%	53
TOTAL		193

Q21 Please indicate your level of education

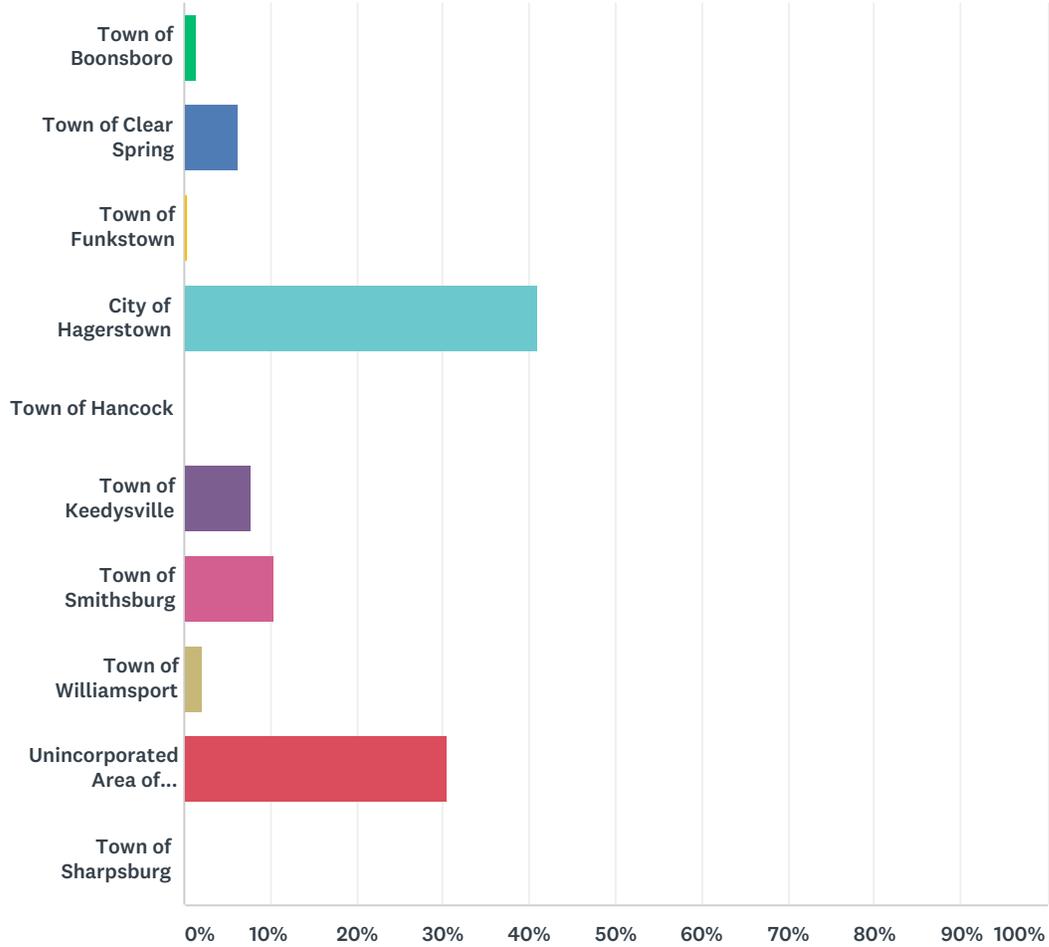
Answered: 193 Skipped: 28



ANSWER CHOICES	RESPONSES	
Less than a high school diploma	0.52%	1
High school diploma/GED	15.03%	29
Some college/trade school	26.94%	52
Associates degree	18.65%	36
Bachelor's degree	18.65%	36
Graduate degree	19.17%	37
PhD	1.04%	2
TOTAL		193

Q22 Which municipality do you reside in?

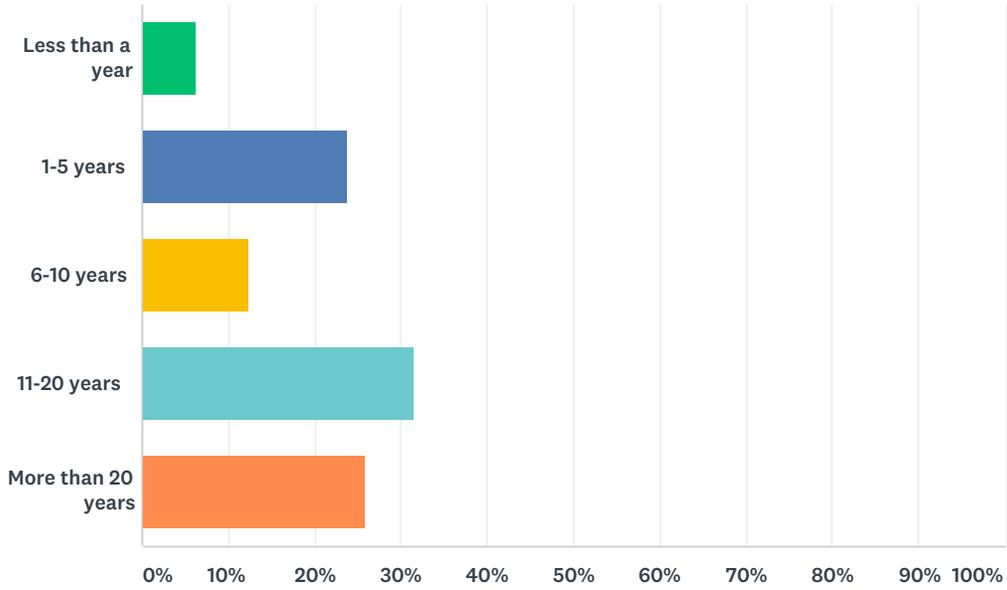
Answered: 193 Skipped: 28



ANSWER CHOICES	RESPONSES	
Town of Boonsboro	1.55%	3
Town of Clear Spring	6.22%	12
Town of Funkstown	0.52%	1
City of Hagerstown	40.93%	79
Town of Hancock	0.00%	0
Town of Keedysville	7.77%	15
Town of Smithsburg	10.36%	20
Town of Williamsport	2.07%	4
Unincorporated Area of Washington County	30.57%	59
Town of Sharpsburg	0.00%	0
TOTAL		193

Q23 How long have you resided in your community?

Answered: 193 Skipped: 28



ANSWER CHOICES	RESPONSES	
Less than a year	6.22%	12
1-5 years	23.83%	46
6-10 years	12.44%	24
11-20 years	31.61%	61
More than 20 years	25.91%	50
TOTAL		193

Q24 If you would like to take part in additional surveys regarding potential hazard mitigation projects please provide a valid email address.

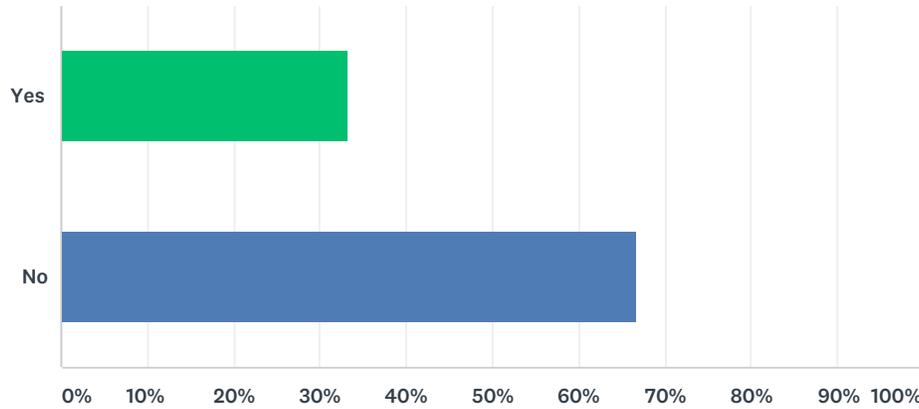
Answered: 43 Skipped: 178

Q25 Please share any other comments you have

Answered: 13 Skipped: 208

Q1 Did you respond to the previous survey about risks and vulnerabilities?

Answered: 186 Skipped: 0



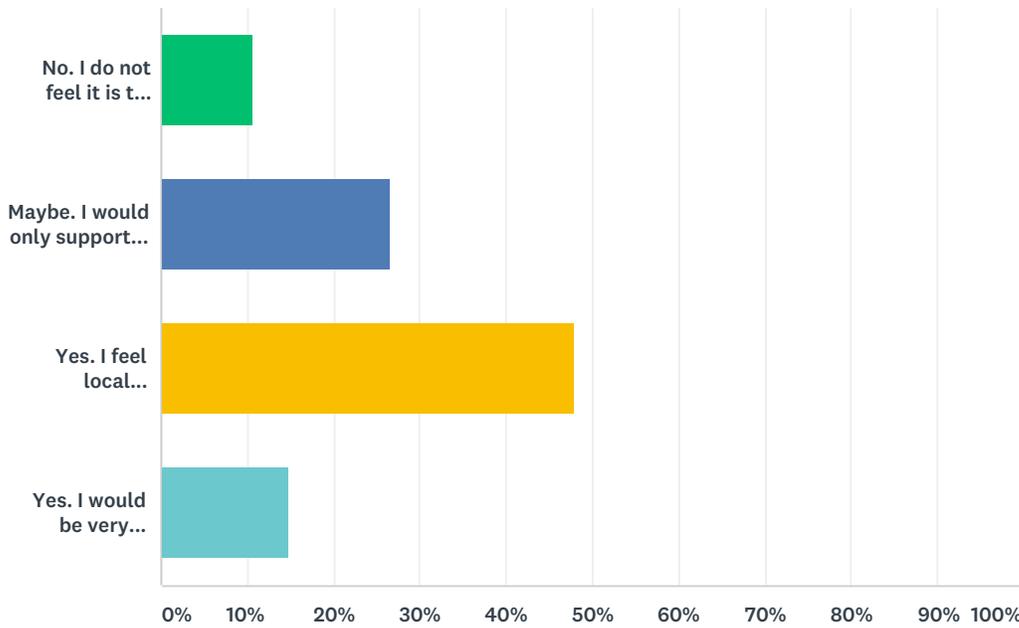
ANSWER CHOICES	RESPONSES	
Yes	33.33%	62
No	66.67%	124
TOTAL		186

Q2 Our mitigation plan seeks to outline projects to lessen our exposure to these types of hazards. What do you feel our priorities should be?

Answered: 88 Skipped: 98

Q3 Would you be supportive of additional regulatory efforts to encourage or require mitigation actions?

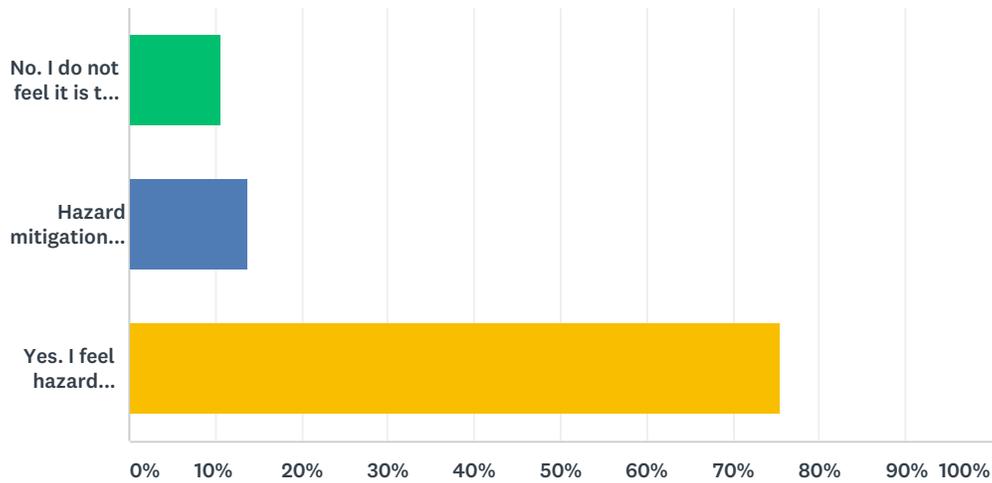
Answered: 94 Skipped: 92



ANSWER CHOICES	RESPONSES	
No. I do not feel it is the role of local government to encourage or require hazard mitigation.	10.64%	10
Maybe. I would only support encouragement of mitigation actions.	26.60%	25
Yes. I feel local government has a role in protecting publicly-owned assets and infrastructure.	47.87%	45
Yes. I would be very supportive of such efforts and feel that hazard mitigation should be mandatory.	14.89%	14
TOTAL		94

Q4 Would you be supportive of the use of tax dollars for grant programs, construction of mitigating infrastructure, etc.?

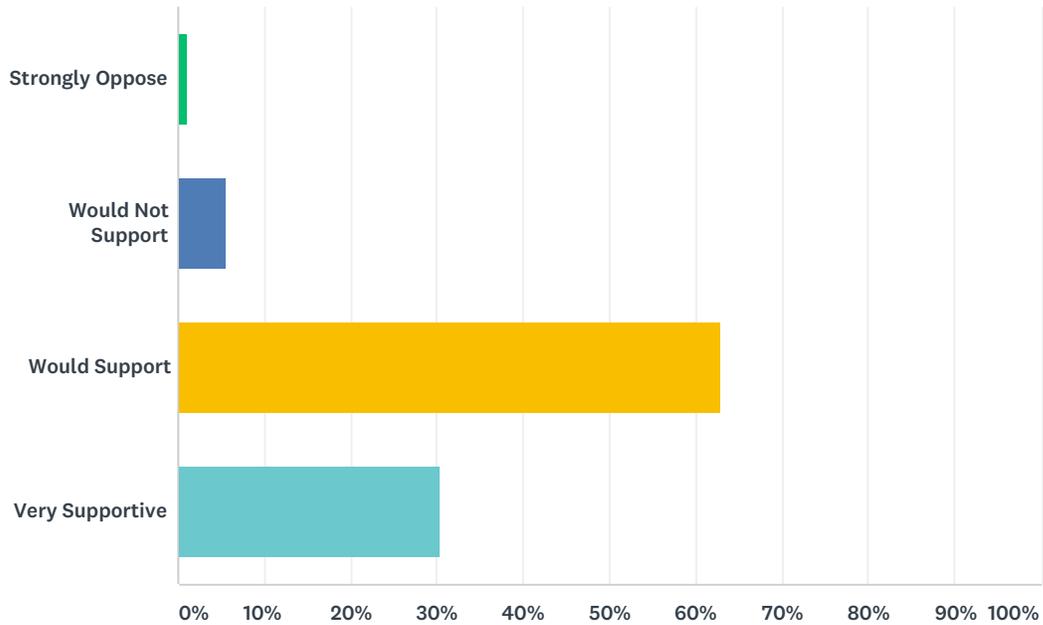
Answered: 94 Skipped: 92



ANSWER CHOICES	RESPONSES	
No. I do not feel it is the role of government to encourage or require hazard mitigation.	10.64%	10
Hazard mitigation efforts should be funded entirely by property owners, whether those owners are public or private entities or individuals.	13.83%	13
Yes. I feel hazard mitigation could be a beneficial use of tax dollars.	75.53%	71
TOTAL		94

Q5 Upgrading water systems to eliminate breaks and leaks.

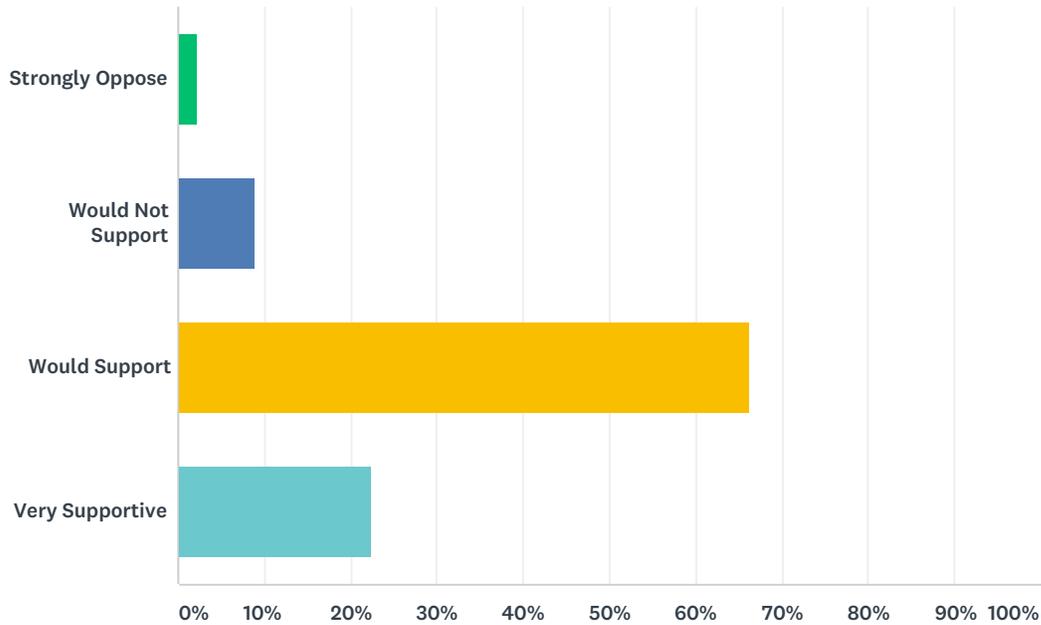
Answered: 89 Skipped: 97



ANSWER CHOICES	RESPONSES
Strongly Oppose	1.12% 1
Would Not Support	5.62% 5
Would Support	62.92% 56
Very Supportive	30.34% 27
TOTAL	89

Q6 Grant programs or regulatory efforts to address stormwater problems.

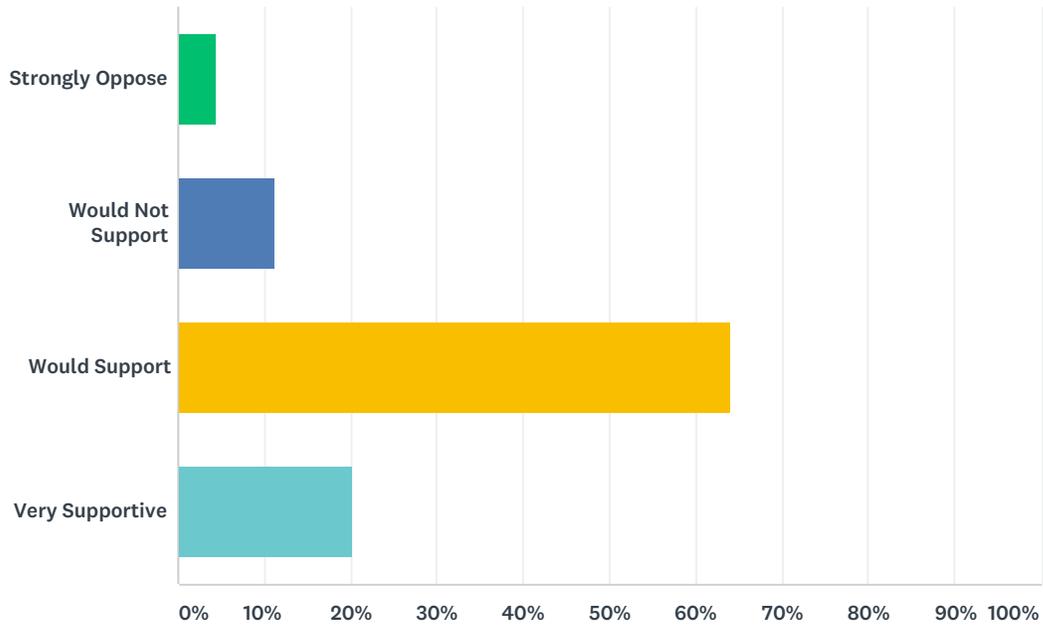
Answered: 89 Skipped: 97



ANSWER CHOICES	RESPONSES
Strongly Oppose	2.25% 2
Would Not Support	8.99% 8
Would Support	66.29% 59
Very Supportive	22.47% 20
TOTAL	89

Q7 Regulatory-driven water conservation during drought conditions.

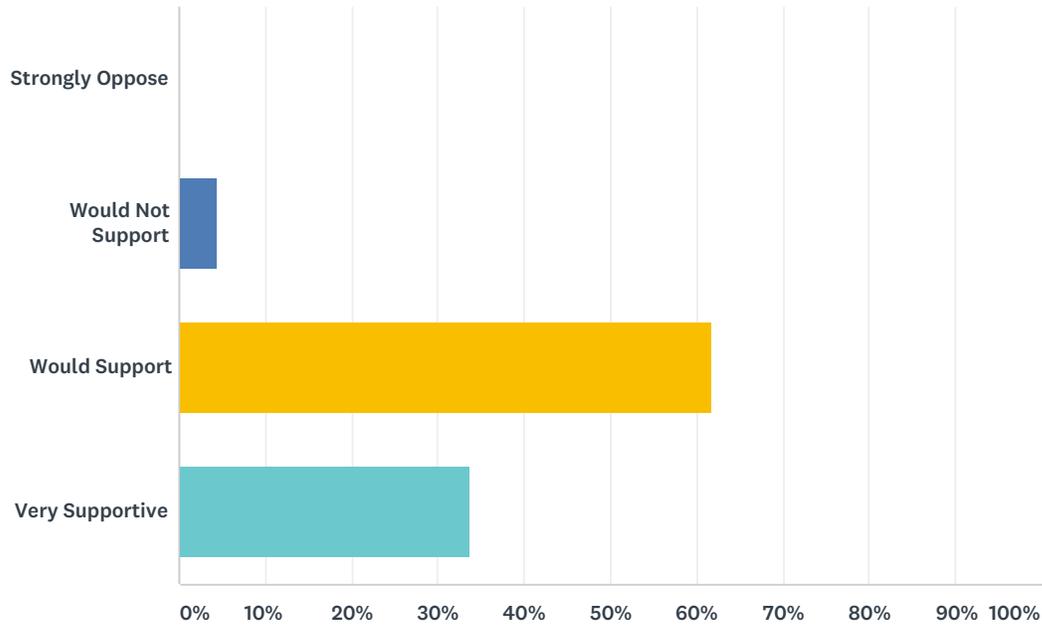
Answered: 89 Skipped: 97



ANSWER CHOICES	RESPONSES
Strongly Oppose	4.49% 4
Would Not Support	11.24% 10
Would Support	64.04% 57
Very Supportive	20.22% 18
TOTAL	89

Q8 Educate residents on personal mitigation opportunities.

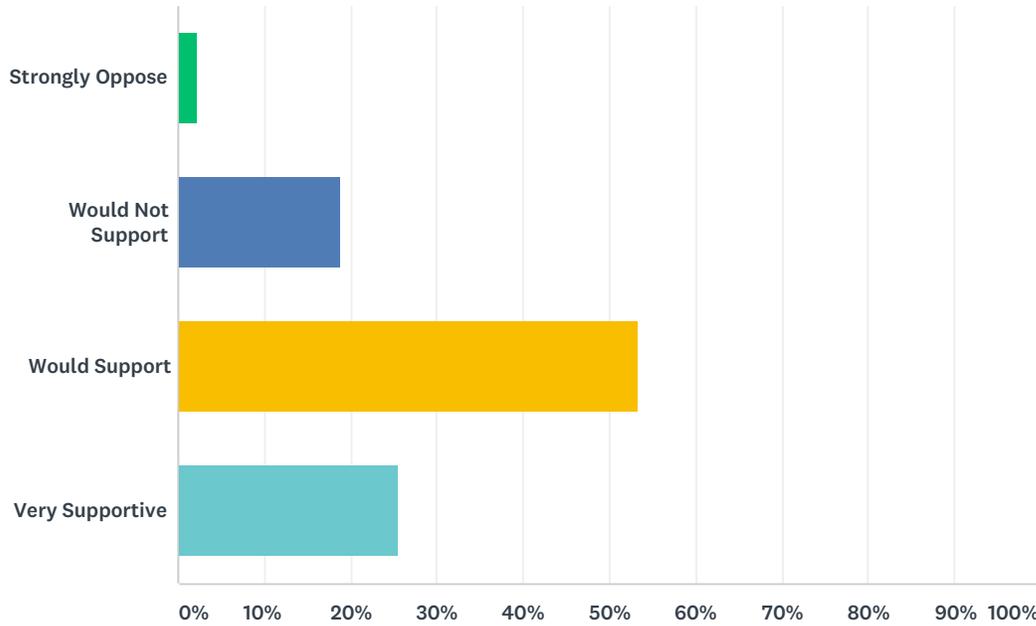
Answered: 89 Skipped: 97



ANSWER CHOICES	RESPONSES	
Strongly Oppose	0.00%	0
Would Not Support	4.49%	4
Would Support	61.80%	55
Very Supportive	33.71%	30
TOTAL		89

Q9 Provide grants or other incentive programs to encourage the installation of generators at public facilities, businesses, etc.

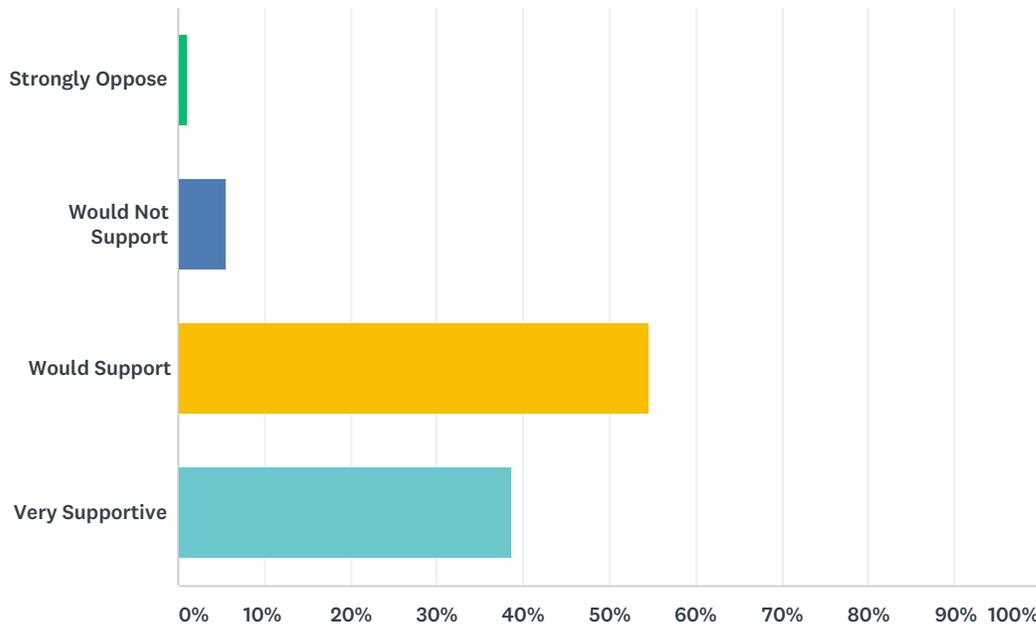
Answered: 90 Skipped: 96



ANSWER CHOICES	RESPONSES	
Strongly Oppose	2.22%	2
Would Not Support	18.89%	17
Would Support	53.33%	48
Very Supportive	25.56%	23
TOTAL		90

Q10 Regulate the types of development permitted in areas highly vulnerable to various hazards.

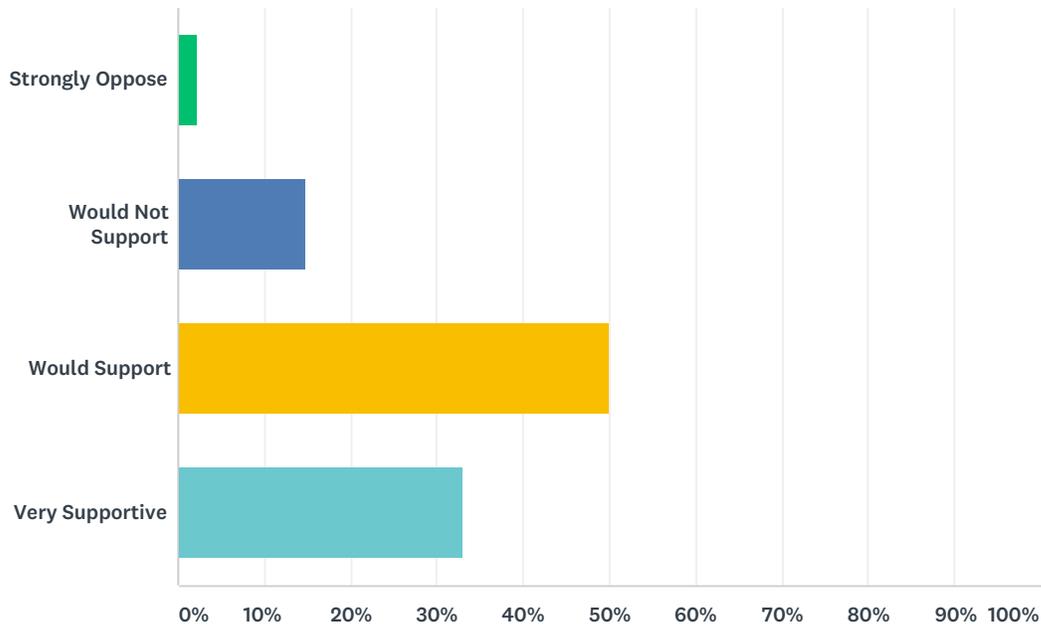
Answered: 88 Skipped: 98



ANSWER CHOICES	RESPONSES	
Strongly Oppose	1.14%	1
Would Not Support	5.68%	5
Would Support	54.55%	48
Very Supportive	38.64%	34
TOTAL		88

Q11 Provide grants or incentives to encourage tree planting in or along parking areas, streets, etc.

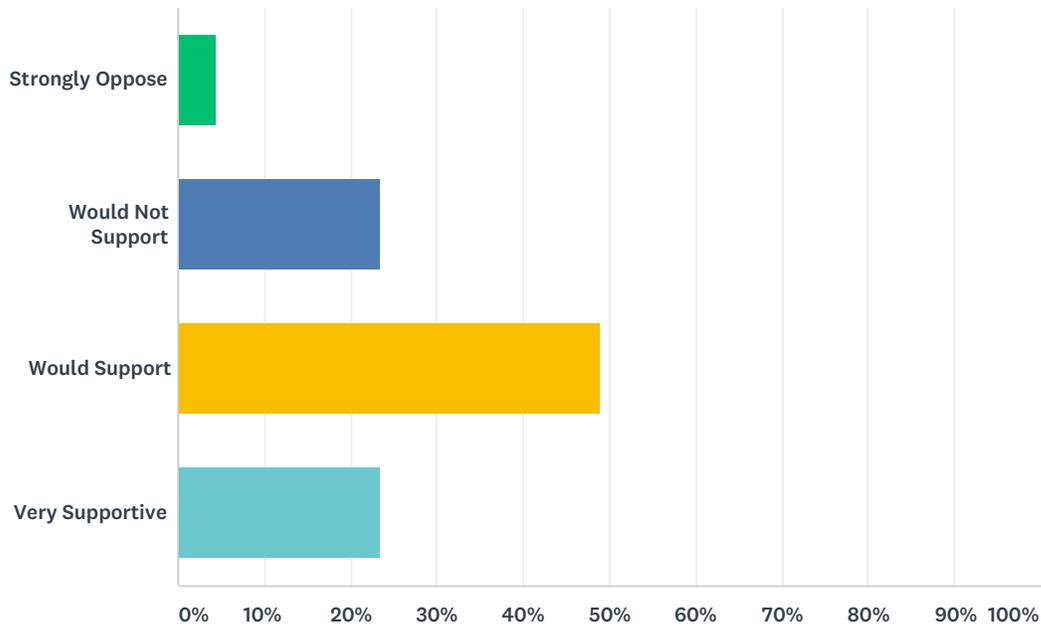
Answered: 88 Skipped: 98



ANSWER CHOICES	RESPONSES	
Strongly Oppose	2.27%	2
Would Not Support	14.77%	13
Would Support	50.00%	44
Very Supportive	32.95%	29
TOTAL		88

Q12 Provide grants or incentives to residents to encourage elevation of flood-prone homes.

Answered: 90 Skipped: 96



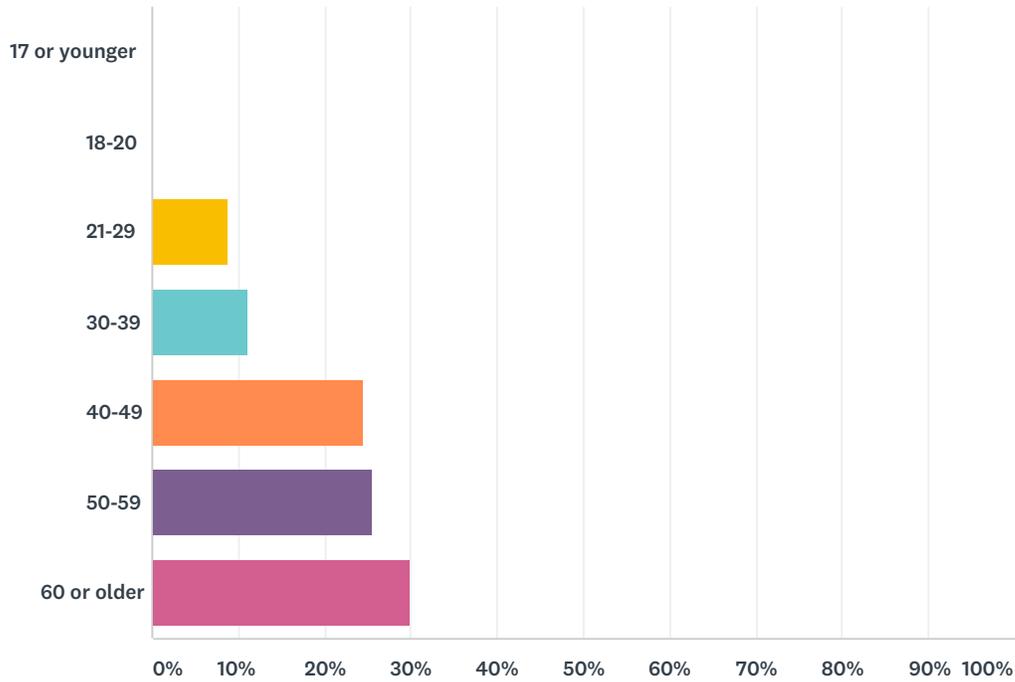
ANSWER CHOICES	RESPONSES
Strongly Oppose	4.44% 4
Would Not Support	23.33% 21
Would Support	48.89% 44
Very Supportive	23.33% 21
TOTAL	90

Q13 What other mitigation actions not mentioned above (if any) would you support?

Answered: 21 Skipped: 165

Q14 What is your age?

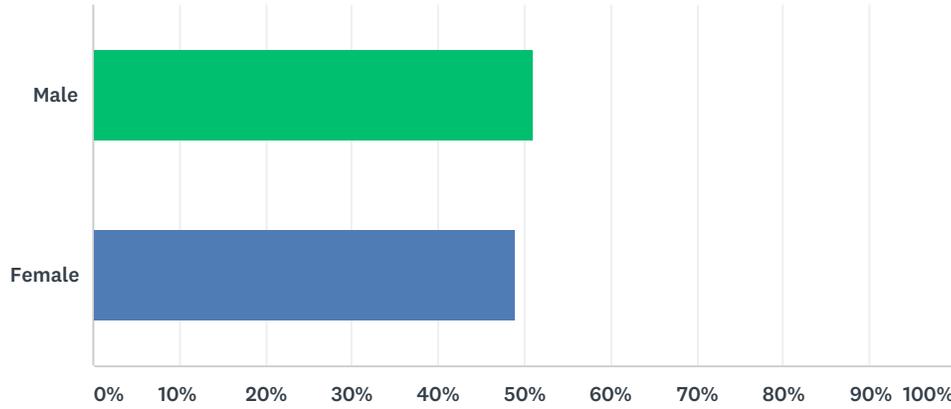
Answered: 90 Skipped: 96



ANSWER CHOICES	RESPONSES	
17 or younger	0.00%	0
18-20	0.00%	0
21-29	8.89%	8
30-39	11.11%	10
40-49	24.44%	22
50-59	25.56%	23
60 or older	30.00%	27
TOTAL		90

Q15 Are you male or female?

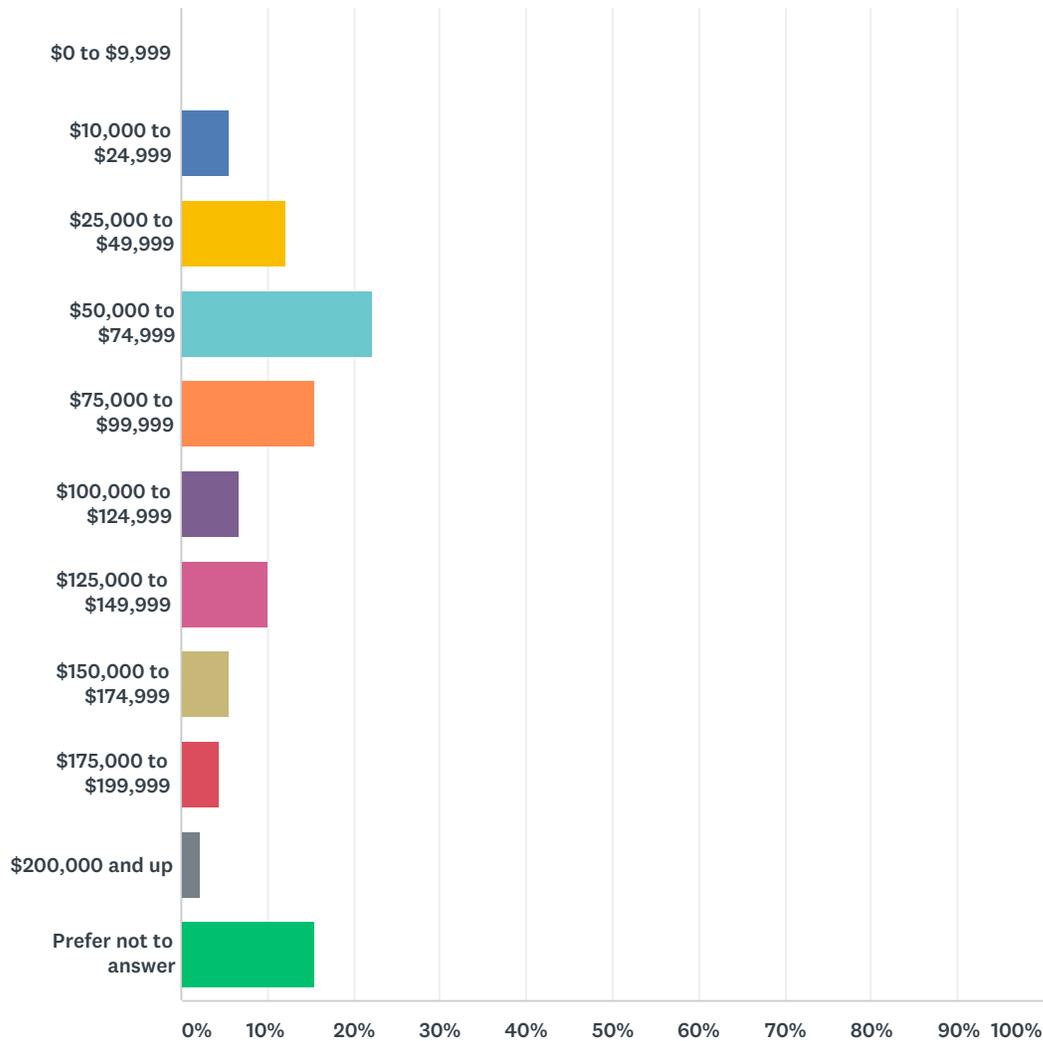
Answered: 90 Skipped: 96



ANSWER CHOICES	RESPONSES	
Male	51.11%	46
Female	48.89%	44
TOTAL		90

Q16 How much total combined money did all members of your HOUSEHOLD earn last year?

Answered: 90 Skipped: 96



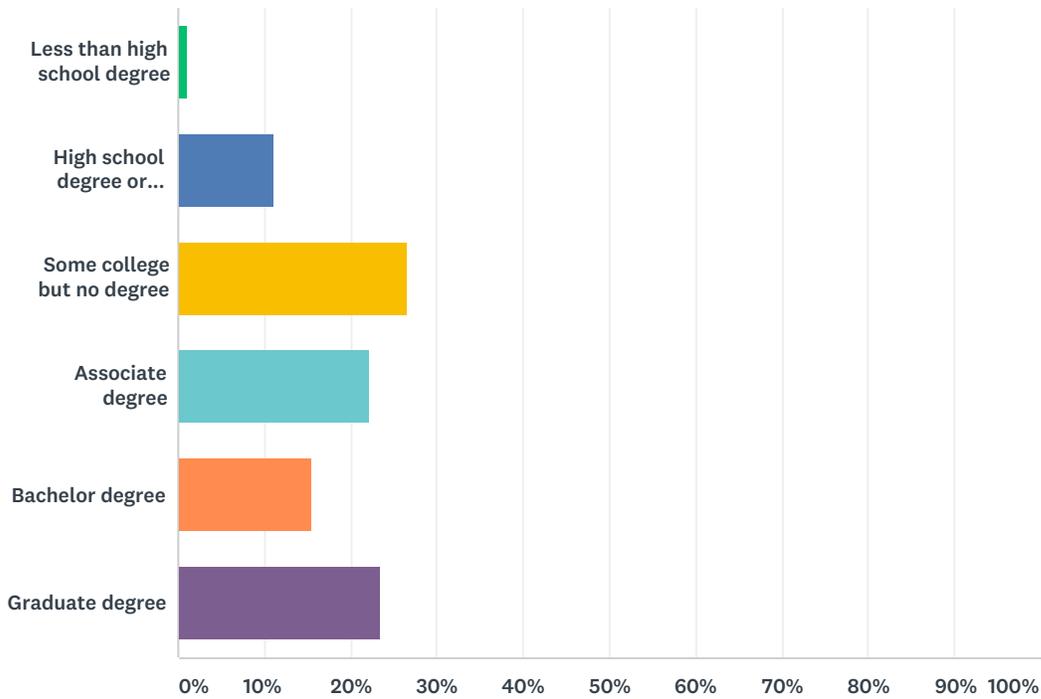
ANSWER CHOICES	RESPONSES	
\$0 to \$9,999	0.00%	0
\$10,000 to \$24,999	5.56%	5
\$25,000 to \$49,999	12.22%	11
\$50,000 to \$74,999	22.22%	20
\$75,000 to \$99,999	15.56%	14
\$100,000 to \$124,999	6.67%	6
\$125,000 to \$149,999	10.00%	9
\$150,000 to \$174,999	5.56%	5
\$175,000 to \$199,999	4.44%	4

Washington County Hazard Mitigation Survey #2 (Mitigation Actions)

\$200,000 and up	2.22%	2
Prefer not to answer	15.56%	14
TOTAL		90

Q17 What is the highest level of school you have completed or the highest degree you have received?

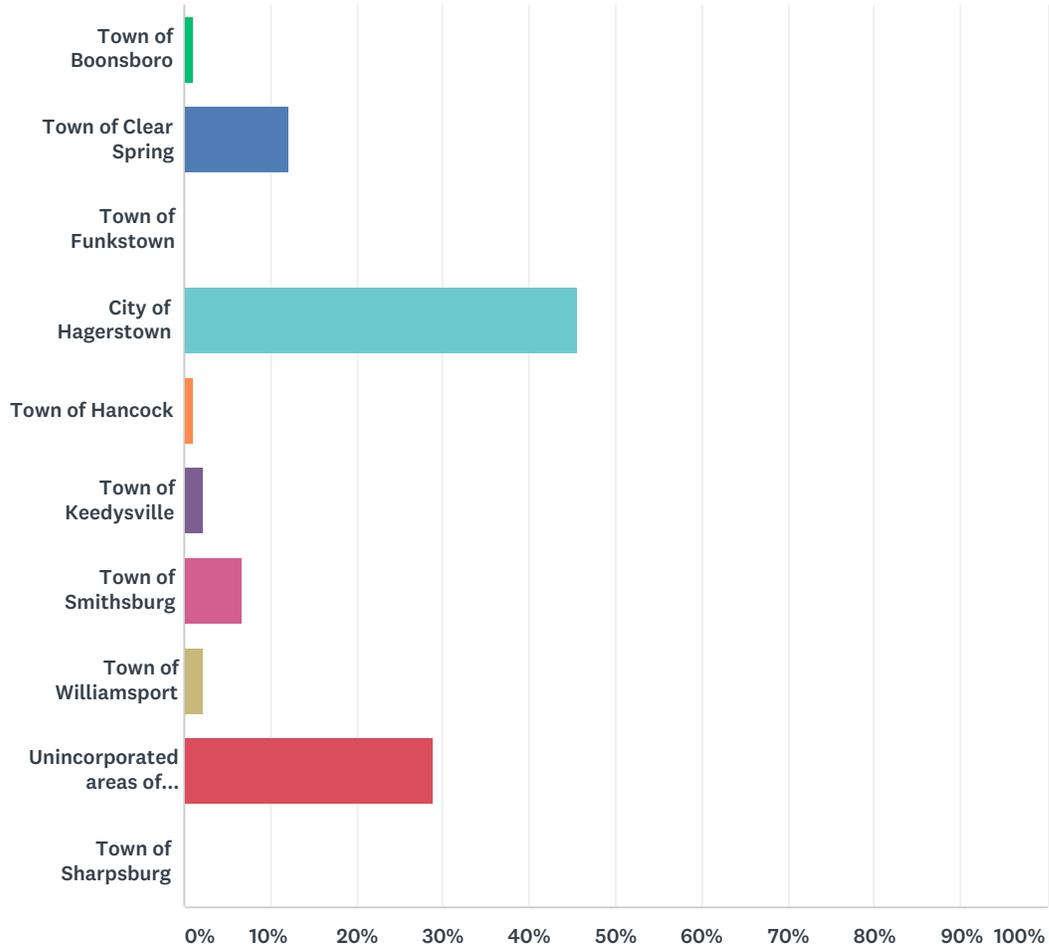
Answered: 90 Skipped: 96



ANSWER CHOICES	RESPONSES	
Less than high school degree	1.11%	1
High school degree or equivalent (e.g., GED)	11.11%	10
Some college but no degree	26.67%	24
Associate degree	22.22%	20
Bachelor degree	15.56%	14
Graduate degree	23.33%	21
TOTAL		90

Q18 Which municipality do you reside in?

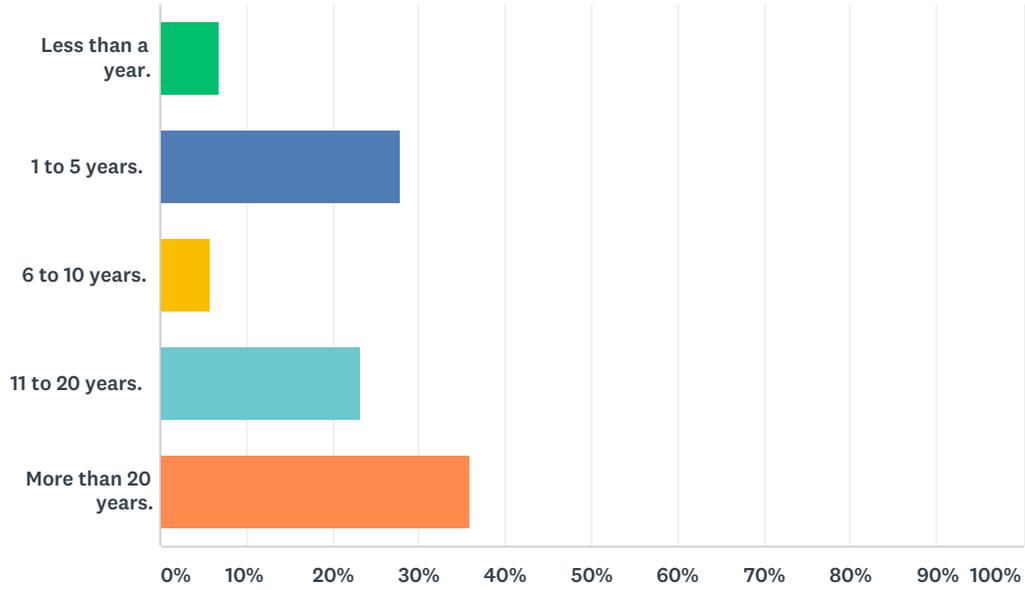
Answered: 90 Skipped: 96



ANSWER CHOICES	RESPONSES	
Town of Boonsboro	1.11%	1
Town of Clear Spring	12.22%	11
Town of Funkstown	0.00%	0
City of Hagerstown	45.56%	41
Town of Hancock	1.11%	1
Town of Keedysville	2.22%	2
Town of Smithsburg	6.67%	6
Town of Williamsport	2.22%	2
Unincorporated areas of Washington County	28.89%	26
Town of Sharpsburg	0.00%	0
TOTAL		90

Q19 How long have you resided in your community?

Answered: 86 Skipped: 100



ANSWER CHOICES	RESPONSES	
Less than a year.	6.98%	6
1 to 5 years.	27.91%	24
6 to 10 years.	5.81%	5
11 to 20 years.	23.26%	20
More than 20 years.	36.05%	31
TOTAL		86

Q20 Please share any other comments you have.

Answered: 11 Skipped: 175

When a winter wonderland...

JOIN US

**AS WE DISCUSS WINTER STORMS
AND OTHER WEATHER-RELATED
HAZARDS IN WASHINGTON COUNTY
AND WHAT WE CAN DO TO REDUCE
OUR RISK.**

WEDNESDAY, DECEMBER 20, 2017

AT 6:00 PM

**AT THE NORTH HAGERSTOWN HIGH
SCHOOL AUDITORIUM**

1200 Pennsylvania Avenue, Hagerstown, MD 21742

THIS MEETING IS PART OF THE WASHINGTON
COUNTY HAZARD MITIGATION PLAN UPDATE OF 2017.

...becomes a nightmare

WASHINGTON COUNTY HAZARD MITIGATION PLAN

Hazard Mitigation Plan 2017 Update – Public Meeting

December 20, 2017 ~ 6:00 pm

Sign In Sheet

	Name	Affiliation	Email
1.	Amy Heimberger	JH Consulting	aheimberger@jhpreparedness.com
2.	Crissenda Brown	state of MD FA - Division of Reimbursements	crissenda.brown@maryland.gov
3.	R. David Hays	Div. of Emer. Svc	dihays@washco-md.net
4.	Tim Sterling	Dept of Public Works	tsterling@washco-md.net
5.	CHARLES SUMMERS	WASHINGTON COUNTY EMERG SERVICE	csummers@washco-md.net
6.	Dave McMillon	Herald Mail	dave@herald-mail.com
7.	Adam Herbert	A/V Tech	adamb2000@msn.com
8.	Ch. T. Brown	Wash Co EM	cbrown@washco-md.net
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			

WASHINGTON COUNTY HAZARD MITIGATION PLAN PUBLIC MEETING



North Hagerstown High School Auditorium
December 20, 2017
6:00 PM
1200 Pennsylvania Avenue
Hagerstown, MD

WHAT IS A HAZARD?

DANGER

LIFE - INFRASTRUCTURE - PROPERTY




WINTER STORMS

Survey Says...



Winter storm -

Power outages -

Major transportation accident -

Karst topography -

Major fire / explosion -

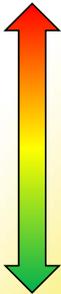
Hazardous materials -

Other natural hazards -

According to the online public survey...

24% are very concerned
37% are concerned
30% are somewhat concerned
7% are not concerned

This hazard is the **HIGHEST** concern in Washington County.




OVERVIEW OF HAZARD MITIGATION AND THE PLANNING PROCESS

The Hazard Mitigation Plan

- Planning Process
- Description of the planning area
- Risk Assessment
 - Hazard profiles
 - Assets inventory
 - Development trends
- Action plan
 - Goals
 - Strategies (projects)
- Plan maintenance
- Appendices



HAZARDS REVIEW

Hazards Analyzed in the Plan

- Drought
- Extreme Temperatures
- Fire
- Flooding
- Hazmat
- Land Subsidence
- Major Transportation Accident
- Opioid Epidemic
- Reportable Disease Epidemic
- Severe Winter Weather
- Severe Summer Weather

→

→

→

- Power Outages
- Groundwater Pollution
- Flooding
- Fires
- Hazmat
- Illness, injury and/or death
- Economic loss
- Population displacement
- Erosion
- Infrastructure decay
- Dam failure



HAZARDS REVIEW

Historical Occurrences

NCEI EVENTS IN WASHINGTON COUNTY, MD 2000-2017				
Event	# of Events	Deaths	Injuries	Damage
Extreme Temperatures	25	0	0	\$0
Cold	10	0	0	\$0
Heat	15	0	0	\$0
Drought	2	0	0	\$0
Flood	12	0	0	\$70,000
Flash Flood	11	0	0	\$20,000
Winter Weather	73	0	0	\$0
Severe Summer Weather	154	0	1	\$2,030,800
Tornado	3	0	0	\$375,000
Lightning	5	0	1	\$145,000
Hail	37	0	0	\$15,000
Heavy rain	15	0	0	\$0
Wind	94	0	0	\$1,800,800
Wildfire	1	0	0	\$0
Total	278	0	1	\$2,120,800



WINTER STORMS
What To Do??



Be Prepared!

- Know your risks.
- Build yourself or your family a 72-hour emergency kit.
- Be informed about the weather conditions.
- Check out Ready.gov for information.

Did you know?
The Washington County Highway Department
has already gotten their 38 snowplows ready for this winter!



Q & A

THANK YOU!



APPENDIX 3

DETAILED LISTS OF HAZARD EVENTS

TABLE 5.3A SEVERE WINTER WEATHER EVENTS (NCEI)	
<i>Date</i>	<i>Type</i>
January 20, 2000	Winter Storm
January 25, 2000	Winter Storm
January 30, 2000	Winter Storm
February 18, 2000	Winter Storm
December 13, 2000	Ice Storm
December 19, 2000	Winter Storm
January 5, 2001	Winter Weather
January 20, 2001	Winter Storm
February 5, 2001	Winter Weather
February 22, 2001	Winter Weather
March 4, 2001	Winter Weather
January 6, 2002	Winter Storm
January 19, 2002	Winter Weather
December 5, 2002	Winter Storm
December 11, 2002	Ice Storm
December 24, 2002	Winter Storm
January 5, 2003	Winter Weather
February 6, 2003	Winter Weather
February 14, 2003	Winter Storm
February 26, 2003	Winter Weather
March 30, 2003	Winter Storm
December 4, 2003	Winter Storm
December 5, 2003	Winter Storm
December 17, 2003	Winter Weather
January 17, 2004	Winter Weather
January 23, 2004	Winter Storm
January 25, 2004	Winter Storm
February 3, 2004	Winter Weather
February 5, 2004	Winter Weather
February 28, 2005	Winter Storm
March 8, 2005	Winter Weather
December 9, 2005	Heavy Snow
December 15, 2005	Ice Storm
February 11, 2006	Heavy Snow
February 6, 2007	Winter Weather
February 12, 2007	Winter Storm
February 24, 2007	Winter Storm
March 7, 2007	Winter Storm
March 16, 2007	Winter Storm



**TABLE 5.3A SEVERE WINTER WEATHER
EVENTS (NCEI)**

<i>Date</i>	<i>Type</i>
March 17, 2007	Winter Weather
December 5, 2007	Heavy Snow
December 13, 2007	Winter Weather
December 15, 2007	Winter Storm
December 30, 2007	Winter Weather
January 17, 2008	Winter Weather
February 1, 2008	Ice Storm
February 12, 2008	Winter Weather
February 20, 2008	Winter Weather
February 22, 2008	Winter Weather
December 23, 2008	Winter Weather
January 6, 2009	Winter Weather
January 15, 2009	Winter Weather
January 27, 2009	Winter Storm
February 2, 2009	Winter Weather
March 2, 2009	Winter Weather
December 5, 2009	Winter Weather
December 8, 2009	Winter Weather
December 13, 2009	Winter Weather
December 18, 2009	Winter Storm
January 30, 2010	Winter Weather
February 2, 2010	Winter Storm
February 5, 2010	Winter Storm
February 9, 2010	Winter Storm
December 16, 2010	Winter Weather
January 11, 2011	Winter Weather
January 17, 2011	Winter Weather
January 26, 2011	Winter Storm
February 1, 2011	Winter Weather
February 1, 2011	Winter Weather
February 5, 2011	Winter Weather
February 21, 2011	Winter Storm
March 6, 2011	Winter Weather
October 29, 2011	Winter Storm
January 20, 2012	Winter Weather
January 23, 2012	Winter Weather
February 10, 2012	Winter Weather
December 24, 2012	Winter Weather
December 26, 2012	Winter Storm
December 29, 2012	Winter Weather
January 15, 2013	Winter Weather
January 25, 2013	Winter Weather
January 28, 2013	Winter Weather
February 22, 2013	Winter Weather
March 6, 2013	Winter Storm



**TABLE 5.3A SEVERE WINTER WEATHER
EVENTS (NCEI)**

<i>Date</i>	<i>Type</i>
March 18, 2013	Winter Weather
March 24, 2013	Winter Storm
November 26, 2013	Winter Weather
December 8, 2013	Winter Storm
December 10, 2013	Winter Weather
December 14, 2013	Winter Weather
January 2, 2014	Winter Weather
January 5, 2014	Winter Weather
January 10, 2014	Winter Weather
January 21, 2014	Winter Storm
February 3, 2014	Winter Weather
February 4, 2014	Winter Storm
February 12, 2014	Winter Storm
February 17, 2014	Winter Weather
February 19, 2014	Winter Weather
March 2, 2014	Winter Storm
March 16, 2014	Winter Weather
March 19, 2014	Winter Weather
March 25, 2014	Winter Weather
March 30, 2014	Winter Weather
November 26, 2014	Winter Storm
December 2, 2014	Winter Weather
December 8, 2014	Winter Weather
December 22, 2014	Winter Weather
January 3, 2015	Winter Weather
January 6, 2015	Winter Weather
January 11, 2015	Winter Weather
January 21, 2015	Winter Weather
January 23, 2015	Winter Weather
January 26, 2015	Winter Weather
February 16, 2015	Winter Weather
February 21, 2015	Winter Storm
March 1, 2015	Winter Weather
March 5, 2015	Winter Storm
March 20, 2015	Winter Storm
March 25, 2015	Winter Weather
January 22, 2016	Winter Storm
January 26, 2016	Winter Weather
February 9, 2016	Winter Weather
February 14, 2016	Ice Storm
December 11, 2016	Winter Weather
December 17, 2016	Winter Storm
December 29, 2016	Winter Weather
January 10, 2017	Winter Weather
January 14, 2017	Winter Weather



**TABLE 5.3A SEVERE WINTER WEATHER
EVENTS (NCEI)**

<i>Date</i>	<i>Type</i>
January 14, 2017	Winter Weather
March 13, 2017	Winter Storm
March 24, 2017	Winter Weather

TABLE 5.3.B EXTREME TEMPERATURE EVENTS

<i>Date</i>	<i>Type</i>
January 2, 2000	Excessive Heat
January 21, 2000	Extreme Cold/Wind Chill
January 22, 2000	Extreme Cold/Wind Chill
January 27, 2000	Extreme Cold/Wind Chill
March 8, 2000	Heat
May 6, 2000	Heat
June 10, 2000	Heat
June 25, 2000	Heat
December 22, 2000	Extreme Cold/Wind Chill
April 19, 2001	Extreme Cold/Wind Chill
June 12, 2001	Heat
June 27, 2001	Heat
August 6, 2001	Heat
July 2, 2002	Heat
July 28, 2002	Heat
August 1, 2002	Heat
August 12, 2002	Heat
August 22, 2002	Heat
December 7, 2002	Cold/Wind Chill
January 10, 2004	Cold/Wind Chill
January 15, 2004	Cold/Wind Chill
January 23, 2004	Cold/Wind Chill
January 31, 2004	Cold/Wind Chill
July 17, 2006	Heat
August 1, 2006	Heat
July 22, 2011	Excessive Heat
June 29, 2012	Heat
July 7, 2012	Heat
January 7, 2014	Extreme Cold/Wind Chill
July 25, 2016	Heat
August 13, 2016	Heat



TABLE 5.3.C FLOOD EVENTS		
<i>Date</i>	<i>Event Type</i>	<i>Property Damage</i>
March 21, 2000	Flash Flood	\$0
March 22, 2000	Flood	\$0
January 1, 2003	Flood	\$0
January 1, 2003	Flood	\$0
March 20, 2003	Flood	\$0
May 16, 2003	Flood	\$0
May 16, 2003	Flood	\$0
June 3, 2003	Flash Flood	\$0
June 3, 2003	Flood	\$0
June 7, 2003	Flood	\$0
June 13, 2003	Flash Flood	\$0
September 3, 2003	Flash Flood	\$20,000
September 4, 2003	Flood	\$0
December 11, 2003	Flood	\$0
June 14, 2004	Flash Flood	\$0
September 8, 2004	Flash Flood	\$25,000
September 17, 2004	Flash Flood	\$0
September 28, 2004	Flash Flood	\$0
September 28, 2004	Flood	\$0
March 28, 2005	Flash Flood	\$0
June 25, 2006	Flash Flood	\$0
June 27, 2006	Flash Flood	\$25,000
May 12, 2008	Flood	\$20,000
April 28, 2011	Flash Flood	\$0
April 28, 2011	Flash Flood	\$0
April 28, 2011	Flash Flood	\$0
April 28, 2011	Flood	\$0
May 29, 2012	Flash Flood	\$0
May 29, 2012	Flash Flood	\$0
October 30, 2012	Flood	\$0
May 16, 2014	Flood	\$0
May 16, 2014	Flash Flood	\$0
May 16, 2014	Flood	\$0
June 12, 2014	Flash Flood	\$0
June 12, 2014	Flash Flood	\$0
June 25, 2014	Flash Flood	\$0
June 25, 2014	Flash Flood	\$0
July 1, 2014	Flash Flood	\$0
July 1, 2014	Flash Flood	\$0
July 1, 2014	Flash Flood	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
January 11, 2000	High Wind	N/A	0	\$2,000	\$0
April 21, 2000	Hail	1	0	\$0	\$0
May 10, 2000	Hail	0.75	0	\$0	\$0
May 10, 2000	Thunderstorm Wind	52	0	\$2,000	\$0
May 13, 2000	Hail	0.75	0	\$0	\$0
May 13, 2000	Thunderstorm Wind	N/A	0	\$2,000	\$0
May 24, 2000	Hail	0.75	0	\$0	\$0
May 24, 2000	Hail	0.75	0	\$0	\$0
June 15, 2000	Heavy Rain	N/A	0	\$0	\$0
June 15, 2000	Thunderstorm Wind	N/A	0	\$15,000	\$0
June 17, 2000	Heavy Rain	N/A	0	\$0	\$0
June 29, 2000	Thunderstorm Wind	N/A	0	\$1,000	\$0
July 14, 2000	Heavy Rain	N/A	0	\$0	\$0
July 14, 2000	Thunderstorm Wind	N/A	0	\$1,000	\$0
July 28, 2000	Thunderstorm Wind	N/A	0	\$500	\$0
July 30, 2000	Heavy Rain	N/A	0	\$0	\$0
September 19, 2000	Heavy Rain	N/A	0	\$0	\$0
September 24, 2000	Heavy Rain	N/A	0	\$0	\$0
November 10, 2000	Thunderstorm Wind	N/A	0	\$2,000	\$0
December 12, 2000	High Wind	51	0	\$10,000	\$0
December 17, 2000	Strong Wind	N/A	0	\$0	\$0
January 27, 2001	Strong Wind	N/A	0	\$0	\$0
February 9, 2001	Strong Wind	N/A	0	\$0	\$0
March 6, 2001	Strong Wind	N/A	0	\$0	\$0
March 13, 2001	Thunderstorm Wind	56	0	\$5,000	\$0
March 21, 2001	Strong Wind	N/A	0	\$0	\$0
March 29, 2001	Heavy Rain	N/A	0	\$0	\$0
April 9, 2001	Thunderstorm Wind	N/A	0	\$5,000	\$0
June 7, 2001	Heavy Rain	N/A	0	\$0	\$0
June 22, 2001	Heavy Rain	N/A	0	\$0	\$0
February 1, 2002	Strong Wind	N/A	0	\$0	\$0
March 9, 2002	Strong Wind	N/A	0	\$0	\$0
March 21, 2002	Strong Wind	N/A	0	\$0	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
May 12, 2002	Hail	0.75	0	\$0	\$0
May 12, 2002	Thunderstorm Wind	N/A	0	\$1,000	\$0
May 13, 2002	Thunderstorm Wind	N/A	0	\$5,000	\$0
May 13, 2002	Thunderstorm Wind	N/A	0	\$5,000	\$0
May 14, 2002	Thunderstorm Wind	N/A	0	\$20,000	\$0
June 5, 2002	Hail	1.5	0	\$0	\$0
June 5, 2002	Thunderstorm Wind	N/A	0	\$5,000	\$0
June 5, 2002	Thunderstorm Wind	57	0	\$15,000	\$0
June 5, 2002	Thunderstorm Wind	N/A	0	\$50,000	\$0
June 27, 2002	Hail	0.75	0	\$0	\$0
June 27, 2002	Thunderstorm Wind	52	0	\$3,000	\$0
June 27, 2002	Thunderstorm Wind	71	0	\$9,000	\$0
July 9, 2002	Thunderstorm Wind	53	0	\$0	\$0
January 8, 2003	Strong Wind	44	0	\$500	\$0
February 22, 2003	Heavy Rain	N/A	0	\$0	\$0
February 23, 2003	Strong Wind	30	0	\$100	\$0
March 20, 2003	Heavy Rain	N/A	0	\$0	\$0
May 31, 2003	Thunderstorm Wind	50	0	\$5,000	\$0
June 1, 2003	Strong Wind	37	0	\$500	\$0
July 21, 2003	Thunderstorm Wind	50	0	\$2,000	\$0
July 21, 2003	Thunderstorm Wind	53	0	\$0	\$0
July 23, 2003	Lightning	N/A	0	\$50,000	\$0
August 16, 2003	Hail	0.75	0	\$0	\$0
August 16, 2003	Heavy Rain	N/A	0	\$0	\$0
August 16, 2003	Lightning	N/A	0	\$70,000	\$0
August 16, 2003	Thunderstorm Wind	50	0	\$1,000	\$0
August 26, 2003	Lightning	N/A	0	\$0	\$0
August 26, 2003	Thunderstorm Wind	55	0	\$20,000	\$0
August 26, 2003	Thunderstorm Wind	56	0	\$0	\$0
September 18, 2003	High Wind	50	0	\$30,000	\$100,000
September 23, 2003	Heavy Rain	N/A	0	\$0	\$0
October 15, 2003	Strong Wind	45	0	\$5,000	\$0
November 13, 2003	Strong Wind	55	0	\$5,000	\$0
April 26, 2004	Heavy Rain	N/A	0	\$0	\$0
May 14, 2004	Thunderstorm Wind	55	0	\$4,000	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
May 18, 2004	Thunderstorm Wind	50	0	\$1,000	\$0
May 25, 2004	Hail	0.75	0	\$0	\$0
May 25, 2004	Hail	1.75	0	\$10,000	\$0
May 25, 2004	Thunderstorm Wind	52	0	\$0	\$0
May 25, 2004	Thunderstorm Wind	70	0	\$5,000	\$0
May 25, 2004	Tornado	F1	0	\$250,000	\$0
June 15, 2004	Thunderstorm Wind	60	0	\$2,000	\$0
June 15, 2004	Thunderstorm Wind	60	0	\$5,000	\$0
July 5, 2004	Hail	1.5	0	\$0	\$0
August 4, 2004	Thunderstorm Wind	55	0	\$2,000	\$0
August 4, 2004	Thunderstorm Wind	55	0	\$2,000	\$0
September 17, 2004	Tornado	F0	0	\$120,000	\$0
September 17, 2004	Tornado	F0	0	\$5,000	\$0
December 1, 2004	High Wind	50	0	\$0	\$0
December 23, 2004	High Wind	63	0	\$0	\$0
May 14, 2005	Thunderstorm Wind	55	0	\$12,000	\$0
June 6, 2005	Thunderstorm Wind	55	0	\$0	\$0
July 7, 2005	Heavy Rain	N/A	0	\$0	\$0
July 19, 2005	Thunderstorm Wind	50	0	\$0	\$0
July 27, 2005	Thunderstorm Wind	50	0	\$0	\$0
November 22, 2005	Strong Wind	38	0	\$200,000	\$0
November 29, 2005	Thunderstorm Wind	55	0	\$50,000	\$0
January 14, 2006	High Wind	50	0	\$100,000	\$0
February 17, 2006	High Wind	55	0	\$120,000	\$0
April 3, 2006	Hail	0.75	0	\$0	\$0
April 3, 2006	Hail	0.88	0	\$0	\$0
April 3, 2006	Thunderstorm Wind	50	0	\$15,000	\$0
July 11, 2006	Thunderstorm Wind	50	0	\$10,000	\$0
July 18, 2006	Thunderstorm Wind	50	0	\$0	\$0
July 18, 2006	Thunderstorm Wind	50	0	\$20,000	\$0
October 28, 2006	Strong Wind	45	0	\$15,000	\$0
December 1, 2006	High Wind	59	0	\$12,000	\$0
February 22, 2007	Strong Wind	40	0	\$1,000	\$0
June 8, 2007	Thunderstorm Wind	53	0	\$4,000	\$0
June 13, 2007	Thunderstorm Wind	50	0	\$1,000	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
June 19, 2007	Thunderstorm Wind	50	0	\$3,000	\$0
June 21, 2007	Thunderstorm Wind	50	0	\$0	\$0
July 28, 2007	Thunderstorm Wind	50	0	\$1,000	\$0
July 29, 2007	Thunderstorm Wind	50	0	\$1,000	\$0
August 9, 2007	Thunderstorm Wind	50	0	\$1,000	\$0
August 25, 2007	Hail	0.75	0	\$0	\$0
August 25, 2007	Lightning	N/A	1	\$0	\$0
September 26, 2007	Lightning	N/A	0	\$25,000	\$0
September 26, 2007	Thunderstorm Wind	50	0	\$25,000	\$0
December 16, 2007	High Wind	50	0	\$10,000	\$0
February 6, 2008	Thunderstorm Wind	50	0	\$1,000	\$0
February 10, 2008	High Wind	50	0	\$10,000	\$0
June 4, 2008	Thunderstorm Wind	87	0	\$500,000	\$0
June 4, 2008	Thunderstorm Wind	50	0	\$50,000	\$0
June 4, 2008	Thunderstorm Wind	50	0	\$50,000	\$0
June 23, 2008	Hail	0.75	0	\$0	\$0
June 23, 2008	Hail	1	0	\$0	\$0
June 23, 2008	Hail	1	0	\$0	\$0
June 23, 2008	Hail	1.25	0	\$0	\$5,000
June 23, 2008	Thunderstorm Wind	50	0	\$5,000	\$0
June 28, 2008	Thunderstorm Wind	50	0	\$3,000	\$0
June 28, 2008	Thunderstorm Wind	50	0	\$3,000	\$0
June 28, 2008	Thunderstorm Wind	50	0	\$3,000	\$0
June 28, 2008	Thunderstorm Wind	50	0	\$3,000	\$0
June 29, 2008	Thunderstorm Wind	50	0	\$3,000	\$0
July 23, 2008	Hail	1	0	\$0	\$0
July 26, 2008	Thunderstorm Wind	50	0	\$5,000	\$0
July 26, 2008	Thunderstorm Wind	50	0	\$5,000	\$0
July 26, 2008	Thunderstorm Wind	50	0	\$5,000	\$0
July 26, 2008	Thunderstorm Wind	50	0	\$5,000	\$0
August 2, 2008	Hail	0.75	0	\$0	\$0
August 10, 2008	Hail	0.75	0	\$0	\$0
August 10, 2008	Hail	0.88	0	\$0	\$0
October 28, 2008	High Wind	50	0	\$0	\$0
December 31, 2008	High Wind	56	0	\$0	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
February 12, 2009	High Wind	57	0	\$0	\$0
March 29, 2009	Hail	0.75	0	\$0	\$0
June 9, 2009	Hail	0.88	0	\$0	\$0
June 9, 2009	Hail	1	0	\$0	\$0
June 9, 2009	Hail	0.75	0	\$0	\$0
June 9, 2009	Hail	0.75	0	\$0	\$0
June 9, 2009	Hail	1	0	\$0	\$0
June 26, 2009	Hail	0.88	0	\$0	\$0
June 26, 2009	Hail	1	0	\$0	\$0
June 26, 2009	Hail	0.88	0	\$0	\$0
June 26, 2009	Hail	0.88	0	\$0	\$0
June 26, 2009	Hail	0.75	0	\$0	\$0
June 26, 2009	Hail	0.75	0	\$0	\$0
June 26, 2009	Hail	0.75	0	\$0	\$0
June 26, 2009	Hail	0.75	0	\$0	\$0
July 24, 2009	Thunderstorm Wind	50	0	\$0	\$0
January 24, 2010	Strong Wind	45	0	\$500	\$0
February 26, 2010	High Wind	55	0	\$0	\$0
April 8, 2010	Thunderstorm Wind	50	0	\$3,000	\$0
April 16, 2010	Thunderstorm Wind	52	0	\$0	\$0
August 12, 2010	Thunderstorm Wind	50	0	\$0	\$0
September 16, 2010	Thunderstorm Wind	50	0	\$2,000	\$0
February 19, 2011	High Wind	54	0	\$0	\$0
February 25, 2011	High Wind	50	0	\$0	\$0
May 17, 2011	Tornado	EF1	0	\$300,000	\$0
May 18, 2011	Thunderstorm Wind	51	0	\$0	\$0
May 26, 2011	Hail	2.75	0	\$0	\$0
May 26, 2011	Hail	1.75	0	\$0	\$0
May 26, 2011	Hail	1	0	\$0	\$0
May 26, 2011	Hail	1	0	\$0	\$0
May 27, 2011	Thunderstorm Wind	52	0	\$0	\$0
May 27, 2011	Thunderstorm Wind	52	0	\$0	\$0
June 12, 2011	Thunderstorm Wind	52	0	\$2,000	\$0
July 3, 2011	Hail	1	0	\$0	\$0
July 7, 2011	Thunderstorm Wind	66	0	\$40,000	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
July 19, 2011	Thunderstorm Wind	61	0	\$40,000	\$0
July 19, 2011	Thunderstorm Wind	56	0	\$3,000	\$0
July 22, 2011	Thunderstorm Wind	56	0	\$2,000	\$0
July 22, 2011	Thunderstorm Wind	56	0	\$2,000	\$0
July 22, 2011	Thunderstorm Wind	61	0	\$5,000	\$0
July 22, 2011	Thunderstorm Wind	52	0	\$1,000	\$0
July 22, 2011	Thunderstorm Wind	56	0	\$3,000	\$0
July 22, 2011	Thunderstorm Wind	61	0	\$1,000	\$0
July 22, 2011	Thunderstorm Wind	52	0	\$0	\$0
July 22, 2011	Thunderstorm Wind	52	0	\$2,000	\$0
July 22, 2011	Thunderstorm Wind	50	0	\$1,000	\$0
July 22, 2011	Thunderstorm Wind	56	0	\$5,000	\$0
July 22, 2011	Thunderstorm Wind	40	0	\$500	\$0
August 14, 2011	Thunderstorm Wind	61	0	\$2,000	\$0
August 18, 2011	Hail	1	0	\$0	\$0
August 18, 2011	Thunderstorm Wind	52	0	\$0	\$0
August 18, 2011	Hail	1	0	\$0	\$0
August 18, 2011	Thunderstorm Wind	56	0	\$5,000	\$0
August 18, 2011	Thunderstorm Wind	56	0	\$2,000	\$0
August 18, 2011	Hail	1	0	\$0	\$0
August 19, 2011	Thunderstorm Wind	50	0	\$2,000	\$0
August 19, 2011	Hail	1	0	\$0	\$0
September 14, 2011	Thunderstorm Wind	52	0	\$1,000	\$0
September 14, 2011	Thunderstorm Wind	52	0	\$1,000	\$0
May 3, 2012	Hail	1	0	\$0	\$0
May 27, 2012	Thunderstorm Wind	52	0	\$5,000	\$0
May 27, 2012	Thunderstorm Wind	52	0	\$5,000	\$0
May 27, 2012	Thunderstorm Wind	52	0	\$5,000	\$0
May 27, 2012	Thunderstorm Wind	52	0	\$5,000	\$0
May 29, 2012	Thunderstorm Wind	52	0	\$0	\$0
May 29, 2012	Thunderstorm Wind	52	0	\$0	\$0
June 1, 2012	Thunderstorm Wind	50	0	\$500	\$0
June 22, 2012	Thunderstorm Wind	57	0	\$2,000	\$0
June 29, 2012	Hail	1	0	\$0	\$0
June 29, 2012	Thunderstorm Wind	57	0	\$5,000	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
July 3, 2012	Thunderstorm Wind	52	0	\$1,000	\$0
July 3, 2012	Thunderstorm Wind	52	0	\$0	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$1,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$2,000	\$0
July 18, 2012	Thunderstorm Wind	52	0	\$1,000	\$0
August 10, 2012	Thunderstorm Wind	52	0	\$1,500	\$0
August 10, 2012	Thunderstorm Wind	56	0	\$1,000	\$0
September 8, 2012	Thunderstorm Wind	50	0	\$500	\$0
September 8, 2012	Thunderstorm Wind	50	0	\$500	\$0
September 8, 2012	Thunderstorm Wind	50	0	\$500	\$0
September 8, 2012	Thunderstorm Wind	50	0	\$500	\$0
September 8, 2012	Thunderstorm Wind	50	0	\$0	\$0
September 8, 2012	Thunderstorm Wind	50	0	\$1,000	\$0
October 29, 2012	High Wind	50	0	\$693,820	\$0
May 22, 2013	Hail	1	0	\$0	\$0
May 22, 2013	Hail	1	0	\$0	\$0
June 2, 2013	Thunderstorm Wind	56	0	\$0	\$12,000
June 2, 2013	Thunderstorm Wind	52	0	\$0	\$500
June 13, 2013	Thunderstorm Wind	52	0	\$0	\$500
June 25, 2013	Thunderstorm Wind	52	0	\$1,000	\$500
July 19, 2013	Thunderstorm Wind	52	0	\$0	\$2,000
July 19, 2013	Thunderstorm Wind	52	0	\$0	\$250
November 18, 2013	Thunderstorm Wind	52	0	\$0	\$250
May 16, 2014	Thunderstorm Wind	52	0	\$10,000	\$1,000
May 16, 2014	Thunderstorm Wind	52	0	\$0	\$2,000
May 16, 2014	Thunderstorm Wind	52	0	\$4,000	\$500
May 22, 2014	Thunderstorm Wind	52	0	\$0	\$500
May 22, 2014	Thunderstorm Wind	52	0	\$0	\$250
May 22, 2014	Thunderstorm Wind	52	0	\$0	\$500



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS

<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
May 22, 2014	Hail	1	0	\$0	\$0
May 22, 2014	Hail	1	0	\$0	\$0
May 22, 2014	Hail	1	0	\$0	\$0
June 16, 2014	Hail	1	0	\$0	\$0
July 1, 2014	Thunderstorm Wind	52	0	\$0	\$250
July 1, 2014	Thunderstorm Wind	52	0	\$0	\$500
July 1, 2014	Thunderstorm Wind	52	0	\$1,000	\$0
July 2, 2014	Thunderstorm Wind	52	0	\$0	\$1,000
July 8, 2014	Thunderstorm Wind	52	0	\$0	\$1,000
July 8, 2014	Thunderstorm Wind	52	0	\$5,000	\$0
July 8, 2014	Thunderstorm Wind	52	0	\$0	\$1,000
July 13, 2014	Thunderstorm Wind	52	0	\$2,000	\$1,000
July 13, 2014	Thunderstorm Wind	52	0	\$0	\$250
July 13, 2014	Thunderstorm Wind	52	0	\$0	\$250
July 13, 2014	Thunderstorm Wind	52	0	\$2,000	\$500
July 13, 2014	Thunderstorm Wind	52	0	\$2,000	\$500
July 13, 2014	Thunderstorm Wind	52	0	\$2,000	\$500
July 23, 2014	Hail	1	0	\$0	\$0
September 2, 2014	Thunderstorm Wind	52	0	\$2,000	\$250
September 2, 2014	Thunderstorm Wind	52	0	\$0	\$250
September 6, 2014	Thunderstorm Wind	52	0	\$0	\$250
April 20, 2015	Hail	1.25	0	\$0	\$0
June 8, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
June 20, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
August 4, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
August 4, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
August 4, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
August 4, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
August 4, 2015	Thunderstorm Wind	54	0	\$0	\$0
August 4, 2015	Thunderstorm Wind	52	0	\$1,000	\$0
September 4, 2015	Thunderstorm Wind	61	0	\$3,000	\$0
April 3, 2016	High Wind	50	0	\$0	\$0
June 5, 2016	Thunderstorm Wind	50	0	\$0	\$0
June 16, 2016	Hail	1.5	0	\$0	\$0
June 16, 2016	Thunderstorm Wind	50	0	\$0	\$0



TABLE 5.3.D SEVERE SUMMER WEATHER EVENTS					
<i>Date</i>	<i>Event Type</i>	<i>Magnitude</i>	<i>Injuries</i>	<i>Damage to Property</i>	<i>Damage to Crops</i>
June 21, 2016	Thunderstorm Wind	50	0	\$0	\$0
June 21, 2016	Hail	1.25	0	\$0	\$0
June 21, 2016	Hail	1.25	0	\$0	\$0
August 13, 2016	Thunderstorm Wind	50	0	\$0	\$0
August 13, 2016	Thunderstorm Wind	50	0	\$0	\$0
August 13, 2016	Thunderstorm Wind	50	0	\$0	\$0
August 16, 2016	Thunderstorm Wind	52	0	\$0	\$0
August 16, 2016	Thunderstorm Wind	52	0	\$0	\$0
February 12, 2017	Thunderstorm Wind	50	0	\$0	\$0
February 12, 2017	High Wind	52	0	\$0	\$0
February 12, 2017	Thunderstorm Wind	52	0	\$0	\$0
February 12, 2017	Thunderstorm Wind	50	0	\$0	\$0
TOTALS			1	\$3,241,420	\$133,250

TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS							
<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	1/4/2000	15	Lga	Un1170	\$1,160	Highway	Punctured
Hagerstown	1/24/2000	0.5	Lga	Un1719	\$125	Highway	Burst or ruptured; ripped or torn
Hagerstown	2/23/2000	1	Lga	Un1805	\$160	Highway	Crushed
Williamsport	2/23/2000	3	Lga	Un1866	\$25	Highway	
Hagerstown	3/8/2000	0.1875	Lga	Un1719	\$125	Highway	
Hagerstown	3/8/2000	3	Lga	Un1805	\$125	Highway	Burst or ruptured; ripped or torn
Hagerstown	3/8/2000	5	Lga	Un3017	\$50	Highway	Crushed
Hagerstown	3/22/2000	0.25	Lga	Un1263	\$175	Highway	Punctured
Hagerstown	3/30/2000	0.5	Lga	Un1866	\$125	Highway	Punctured
Hagerstown	4/14/2000	3	Lga	Un1992	\$275	Highway	Punctured
Hagerstown	5/9/2000	3	Lga	Un1760	\$375	Highway	Crushed;
Hagerstown	5/10/2000	0.125	Lga	Un2922	\$200	Highway	
Hagerstown	5/16/2000	0.125	Lga	Un1789	\$100	Highway	Crushed
Hagerstown	5/16/2000	5	Lga	Un2581	\$360	Highway	Punctured
Hagerstown	5/26/2000	0.0625	Lga	Un1999	\$115	Highway	Crushed
Hagerstown	6/13/2000	0.015625	Lga	Un1263	\$90	Highway	Crushed
Hagerstown	6/15/2000	0.25	Lga	Un2735	\$120	Highway	Crushed



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	6/16/2000	0.125	Lga	Un2289	\$120	Highway	
Hagerstown	7/5/2000	0.046875	Lga	Un1219	\$22	Highway	Punctured
Hagerstown	7/7/2000	2	Lga	Un1263	\$200	Highway	
Hagerstown	7/10/2000	0.125	Lga	Un1197	\$170	Highway	Crushed
Hagerstown	7/11/2000	1	Slb	Un2757	\$2,600	Highway	Punctured; crushed
Hagerstown	7/15/2000	0.0625	Lga	Un1133	\$100	Highway	Crushed
Hagerstown	7/15/2000	0.125	Lga	Un2810	\$225	Highway	Crushed
Hagerstown	7/18/2000	0.015625	Lga	Na1760	\$1	Highway	
Hagerstown	7/19/2000	5	Lga	Un3082	\$1,900	Highway	Burst or ruptured
Hagerstown	7/19/2000	5	Lga	Un3082	\$300	Highway	Punctured; crushed
Hagerstown	7/20/2000	3	Slb	Un3077	\$360	Highway	Ripped or torn; crushed
Hagerstown	7/21/2000	0.5	Lga	Un1999	\$180	Highway	Crushed
Hagerstown	7/23/2000	0.5	Lga	Un1139	\$85	Highway	Crushed
Hagerstown	7/27/2000	0.0625	Lga	Un1760	\$175	Highway	Crushed
Hagerstown	8/5/2000	1.13	Slb	Un1486	\$350	Highway	Punctured
Hagerstown	8/8/2000	0.5	Lga	Un1719	\$350	Highway	Punctured
Hagerstown	8/10/2000	0.5	Slb	Un3077	\$1,530	Highway	Ripped or torn
Hagerstown	8/16/2000	1	Lga	Un1170	\$170	Highway	
Hagerstown	8/16/2000	0.003906	Lga	Un2922	\$440	Highway	
Hagerstown	8/29/2000	0.5	Lga	Un1993	\$300	Highway	Ripped or torn; abraded;
Hagerstown	9/6/2000	1	Lga	Un1760	\$1,925	Highway	Crushed
Hagerstown	9/19/2000	0.039063	Lga	Un3266	\$365	Highway	Burst or ruptured
Hagerstown	9/20/2000	5	Lga	Un3267	\$400	Highway	Punctured; crushed
Hagerstown	9/27/2000	1.5	Lga	Un2735	\$325	Highway	Crushed
Hagerstown	10/6/2000	0.5	Lga	Un1170	\$175	Highway	
Hagerstown	10/11/2000	5	Lga	Un1197	\$140	Highway	Burst or ruptured
Hagerstown	10/11/2000	0.09375	Lga	Un2735	\$500	Highway	Burst or ruptured
Hagerstown	10/16/2000	30	Lga	Na1993	\$1,530	Highway	
Hagerstown	10/17/2000	0		Un1325	\$0	Highway	
Hagerstown	10/26/2000	0.125	Lga	Un3265	\$140	Highway	
Hagerstown	11/8/2000	0.25	Lga	Un2903	\$275	Highway	Burst or ruptured
Hagerstown	11/14/2000	0.3125	Slb	Un1499	\$300	Highway	Crushed;
Hagerstown	11/28/2000	3	Lga	Un1170	\$825	Highway	
Hagerstown	11/28/2000	1	Lga	Un1993	\$1,181	Highway	
Hagerstown	11/30/2000	0		Un2319	\$150	Highway	Burst or ruptured
Hagerstown	12/1/2000	0.351563	Lga	Un1993	\$170	Highway	Crushed
Hagerstown	12/11/2000	0.25	Lga	Un1719	\$275	Highway	Punctured
Hagerstown	1/3/2001	1	Lga	Un1307	\$450	Highway	Burst or ruptured;



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	1/5/2001	1.5	Lga	Un1263	\$130	Highway	Punctured;
Hagerstown	1/14/2001	12	Lga	Un1307	\$600	Highway	Crushed
Hagerstown	1/15/2001	0.03125	Lga	Un1866	\$100	Highway	
Hagerstown	1/22/2001	2	Slb	Un2783	\$2,300	Highway	Punctured
Hagerstown	1/24/2001	0		Un3267	\$200	Highway	Crushed
Hagerstown	1/25/2001	0.5	Slb	Un1690	\$200	Highway	Punctured
Hagerstown	2/1/2001	2	Slb	Un2783	\$1,850	Highway	Punctured
Hagerstown	2/2/2001	0.25	Slb	Un2291	\$1,325	Highway	Punctured
Hagerstown	2/13/2001	5	Lga	Un1760	\$400	Highway	Crushed
Hagerstown	3/20/2001	0.5	Lga	Na1993	\$26	Highway	
Hagerstown	3/21/2001	5	Lga	Un1789	\$450	Highway	Crushed
Williamsport	3/22/2001	0.25	Lga	Un1824	\$300	Highway	Punctured
Hagerstown	4/10/2001	1	Lga	Un2289	\$2,000	Highway	Punctured
Hagerstown	4/12/2001	0.125	Lga	Un1788	\$2,050	Highway	
Hagerstown	4/13/2001	0.375	Slb	Un2811	\$1,550	Highway	Abraded
Hagerstown	4/20/2001	40	Lga	Un3267	\$2,500	Highway	
Hagerstown	4/26/2001	0.09375	Lga	Na1993	\$355	Highway	Punctured
Hagerstown	5/1/2001	0.046875	Lga	Un2735	\$200	Highway	Punctured
Hagerstown	5/1/2001	0.046875	Lga	Un2735	\$550	Highway	Punctured
Hagerstown	5/2/2001	0.0625	Lga	Un1760	\$275	Highway	
Hagerstown	5/4/2001	2	Lga	Un3267	\$200	Highway	Punctured
Hagerstown	5/5/2001	1	Slb	Un3077	\$150	Highway	Punctured
Hagerstown	5/10/2001	1	Slb	Un2783	\$1,850	Highway	Punctured
Hagerstown	5/12/2001	0.5	Lga	Un1993	\$150	Highway	
Hagerstown	5/12/2001	0.5	Lga	Un1993	\$350	Highway	
Hagerstown	5/19/2001	0.039063	Lga	Un1993	\$220	Highway	
Hagerstown	5/21/2001	5	Lga	Un1263	\$400	Highway	Punctured
Hagerstown	5/26/2001	0.003906	Lga	Un1992	\$0	Highway	
Hagerstown	5/30/2001	0.0625	Lga	Un1824	\$200	Highway	Punctured
Hagerstown	5/30/2001	0.125	Lga	Un2581	\$2,875	Highway	
Hagerstown	6/6/2001	0.015625	Lga	Un1249	\$1	Highway	
Hagerstown	6/13/2001	1	Lga	Na1760	\$200	Highway	Punctured
Hagerstown	6/25/2001	0		Un1830	\$550	Highway	Punctured
Hagerstown	7/4/2001	0.1875	Lga	Un2651	\$200	Highway	Abraded
Hagerstown	7/6/2001	1	Lga	Un1805	\$125	Highway	
Hagerstown	7/12/2001	5	Lga	Un1197	\$450	Highway	Punctured
Hagerstown	7/19/2001	2	Lga	Un1210	\$150	Highway	Cracked
Hagerstown	7/26/2001	0.015625	Lga	Un2681	\$330	Highway	Crushed



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	8/4/2001	0.015625	Lga	Un2834	\$350	Highway	Punctured
Hagerstown	8/14/2001	0.0625	Lga	Un2810	\$2,000	Highway	Punctured;
Hagerstown	8/20/2001	0.25	Lga	Un3149	\$450	Highway	
Hagerstown	8/21/2001	0.03125	Lga	Un1197	\$85	Highway	Punctured
Hagerstown	8/21/2001	0.03125	Lga	Un2031	\$200	Highway	Burst or ruptured;
Hagerstown	8/23/2001	1	Lga	Un1197	\$150	Highway	Punctured
Hagerstown	8/24/2001	0.528344	Lga	Un3266	\$225	Highway	Punctured
Hagerstown	8/28/2001	0		Un1977	\$1,200	Highway	
Hagerstown	8/31/2001	0.125	Lga	Un2021	\$1,850	Highway	
Hagerstown	9/5/2001	0.375	Slb	Un2811	\$1,875	Highway	Abraded
Hagerstown	9/6/2001	2	Lga	Un1866	\$150	Highway	Punctured
Hagerstown	9/7/2001	0.023438	Lga	Un3265	\$140	Highway	
Hagerstown	9/12/2001	0.125	Lga	Un1993	\$200	Highway	
Hagerstown	9/18/2001	0.03125	Lga	Un2735	\$200	Highway	Abraded; abraded
Williamsport	9/20/2001	5	Lga	Un2672	\$2,700	Highway	
Hagerstown	9/21/2001	0.125	Lga	Un1760	\$200	Highway	
Hagerstown	10/4/2001	0.0625	Lga	Na1760	\$600	Highway	
Hagerstown	10/5/2001	0.25	Lga	Un3264	\$225	Highway	Crushed
Hagerstown	10/11/2001	0.0625	Lga	Un1866	\$125	Highway	Crushed
Hagerstown	10/11/2001	0.003905	Lga	Un1993	\$140	Highway	
Hagerstown	10/13/2001	0.078125	Lga	Na1760	\$350	Highway	
Hagerstown	10/30/2001	1	Lga	Un3105	\$450	Highway	Punctured
Hagerstown	11/8/2001	1	Lga	Un3103	\$750	Highway	Crushed
Hagerstown	11/10/2001	2	Slb	Un3077	\$250	Highway	Punctured
Hagerstown	11/13/2001	24	Slb	Un1044	\$1,700	Highway	Burst or ruptured
Hagerstown	11/13/2001	0.5	Lga	Un1866	\$150	Highway	
Hagerstown	11/13/2001	0.0625	Lga	Un1866	\$150	Highway	
Hagerstown	11/15/2001	0		Un1044	\$200	Highway	Crushed
Hagerstown	12/14/2001	0.0625	Lga	Un1133	\$225	Highway	Crushed
Hagerstown	1/10/2002	6	Lga	Na1993	\$56	Highway	
Hagerstown	1/17/2002	2	Slb	Un3226	\$3,100	Highway	Ripped or torn
Hagerstown	2/1/2002	0.5	Lga	Un1866	\$900	Highway	
Hagerstown	2/7/2002	0.264172	Lga	Un2735	\$225	Highway	Punctured
Hagerstown	2/7/2002	1.5	Slb	Un2876	\$1,830	Highway	Ripped or torn
Hagerstown	2/7/2002	10	Slb	Un2876	\$1,825	Highway	Punctured
Hagerstown	2/8/2002	1	Slb	Un3077	\$695	Highway	
Hagerstown	2/18/2002	0.046875	Lga	Un1830	\$352	Highway	
Hagerstown	2/20/2002	0.5	Slb	Un2651	\$200	Highway	Punctured;



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	2/21/2002	1.06	Lga	Un1263	\$0	Air	Crushed
Hagerstown	3/2/2002	2	Lga	Un1760	\$500	Highway	
Hagerstown	3/5/2002	3	Lga	Na1993	\$3	Highway	
Hagerstown	3/7/2002	0.0625	Slb	Un2651	\$200	Highway	Punctured
Hagerstown	3/12/2002	3	Lga	Un3266	\$650	Highway	
Hagerstown	3/15/2002	0.007813	Lga	Un1789	\$175	Highway	
Hagerstown	4/6/2002	0.007809	Lga	Un1219	\$125	Highway	
Hagerstown	4/6/2002	50	Slb	Un2588	\$2,250	Highway	Ripped or torn
Hagerstown	4/9/2002	20	Slb	Un2783	\$2,000	Highway	Ripped or torn
Hagerstown	4/9/2002	1	Lga	Un3082	\$400	Highway	Punctured
Hagerstown	4/10/2002	4	Lga	Un1866	\$375	Highway	Punctured
Hagerstown	4/18/2002	0.125	Slb	Un2430	\$250	Highway	Ripped or torn
Hagerstown	4/24/2002	0.25	Lga	Un2922	\$250	Highway	Crushed
Hagerstown	5/2/2002	0.25	Lga	Un1133	\$140	Highway	Punctured
Hagerstown	5/7/2002	5	Lga	Un2924	\$250	Highway	Punctured; crushed;
Hagerstown	5/8/2002	2	Lga	Un1993	\$125	Highway	Crushed
Hagerstown	5/30/2002	0.125	Lga	Un3264	\$250	Highway	Crushed
Hagerstown	6/4/2002	0.5	Lga	Un1993	\$675	Highway	
Hagerstown	6/5/2002	2	Lga	Un1814	\$450	Highway	Punctured
Hagerstown	6/8/2002	0.046875	Lga	Un1307	\$1,625	Highway	
Hagerstown	6/14/2002	0.023438	Lga	Na1993	\$50	Highway	
Hagerstown	6/20/2002	0.5	Lga	Un3082	\$1,915	Highway	
Hagerstown	6/29/2002	1	Lga	Un1090	\$750	Highway	Punctured
Hagerstown	6/29/2002	2	Slb	Un2783	\$1,650	Highway	Ripped or torn
Hagerstown	7/17/2002	0.25	Lga	Un2735	\$750	Highway	Punctured
Hagerstown	7/17/2002	1	Lga	Un2735	\$750	Highway	
Hagerstown	7/30/2002	0.5	Lga	Un1824	\$185	Highway	Punctured
Hagerstown	8/6/2002	1	Lga	Un1993	\$100	Highway	Crushed
Hagerstown	8/7/2002	0.015625	Lga	Un1824	\$105	Highway	
Hagerstown	8/24/2002	0.0625	Lga	Un1268	\$185	Highway	
Hagerstown	8/24/2002	0.125	Lga	Un1908	\$300	Highway	Crushed
Hagerstown	9/7/2002	112	Slb	Un3226	\$750	Highway	Punctured
Hagerstown	9/13/2002	0.125	Lga	Un3265	\$750	Highway	
Hagerstown	9/15/2002	0.09375	Lga	Un1090	\$225	Highway	Crushed
Hagerstown	9/18/2002	0.25	Lga	Un1908	\$200	Highway	
Hagerstown	9/21/2002	10	Lga	Un1263	\$400	Highway	Punctured
Hagerstown	9/23/2002	2	Lga	Un1219	\$375	Highway	Crushed
Hagerstown	9/25/2002	0.5	Lga	Un1307	\$230	Highway	Crushed



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Hagerstown	9/30/2002	0.0625	Lga	Un1824	\$0	Highway	
Hagerstown	10/4/2002	0.0625	Lga	Un1790	\$1,425	Highway	
Hagerstown	10/8/2002	2	Slb	Un2430	\$200	Highway	Burst or ruptured
Hagerstown	10/10/2002	0.0625	Lga	Un1263	\$310	Highway	
Hagerstown	10/11/2002	0.007813	Lga	Un1790	\$1,950	Highway	
Hagerstown	10/11/2002	0.007813	Lga	Un2014	\$225	Highway	
Hagerstown	10/16/2002	200	Lga	Na1993	\$200	Highway	
Hagerstown	11/5/2002	0.015625	Lga	Un3265	\$130	Highway	
Hagerstown	11/13/2002	20	Lga	Na1993	\$20	Highway	
Hagerstown	11/13/2002	0.375	Lga	Un3265	\$335	Highway	
Hagerstown	11/15/2002	0.015625	Lga	Un1719	\$100	Highway	Punctured
Hagerstown	11/15/2002	0.0625	Lga	Un2079	\$215	Highway	
Hagerstown	11/21/2002	1	Slb	Un2659	\$225	Highway	Ripped or torn
Hagerstown	11/22/2002	0.5	Slb	Un2659	\$1,525	Highway	Punctured
Hagerstown	12/6/2002	0.0625	Lga	Un1993	\$100	Highway	Cracked
Hagerstown	12/7/2002	1	Slb	Un1727	\$240	Highway	Punctured
Hagerstown	1/8/2003	0	Lga	Un1755	\$0	Highway	
Hagerstown	1/16/2003	50	Lga	Na1993	\$6,075	Highway	Cracked
Hagerstown	1/19/2003	1	Lga	Un3266	\$350	Highway	Punctured
Hagerstown	3/5/2003	0.125	Lga	Un1170	\$95	Highway	Cracked
Hagerstown	3/5/2003	0.125	Lga	Un2789	\$340	Highway	Crushed
Hagerstown	3/6/2003	5	Lga	Un1307	\$115	Highway	Crushed
Hagerstown	3/8/2003	0.375	Slb	Un3226	\$160	Highway	Punctured
Hagerstown	3/21/2003	0.125	Lga	Un2014	\$600	Highway	Burst or ruptured
Hagerstown	3/27/2003	0.03125	Lga	Un2735	\$105	Highway	Crushed
Hagerstown	4/2/2003	0.015625	Lga	Un3098	\$140	Highway	
Hancock	4/10/2003	5	Lga	Un3109	\$0	Highway	Burst or ruptured
Hagerstown	4/19/2003	0.0625	Lga	Un3265	\$650	Highway	Punctured
Hagerstown	4/23/2003	0.046875	Lga	Un3266	\$105	Highway	
Hagerstown	5/3/2003	0.25	Slb	Un2213	\$260	Highway	Punctured
Hagerstown	5/11/2003	0.015625	Lga	Un1986	\$85	Highway	
Hagerstown	5/13/2003	0.5	Slb	Un1564	\$3,565	Highway	Punctured
Hagerstown	5/16/2003	0.0625	Lga	Un1719	\$850	Highway	
Hagerstown	5/20/2003	0.039063	Lga	Un1902	\$350	Highway	Crushed
Hagerstown	5/23/2003	1	Slb	Un1727	\$80	Highway	Ripped or torn
Hagerstown	5/23/2003	1	Slb	Un3077	\$275	Highway	Ripped or torn
Hagerstown	5/29/2003	1.25	Slb	Un3077	\$300	Highway	Ripped or torn
Hagerstown	6/4/2003	1	Lga	Un1263	\$950	Highway	Punctured



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Hagerstown	6/4/2003	7	Slb	Un3077	\$525	Highway	Punctured
Hagerstown	6/10/2003	0.3125	Slb	Un2213	\$150	Highway	Punctured;
Hagerstown	6/11/2003	0.046875	Lga	Un1197	\$205	Highway	Crushed;
Hagerstown	6/11/2003	0.039063	Lga	Un1760	\$195	Highway	Crushed;
Hagerstown	6/12/2003	7	Lga	Un3264	\$550	Highway	Punctured
Hagerstown	6/19/2003	0.0625	Lga	Un3105	\$600	Highway	Crushed
Hagerstown	7/1/2003	3	Slb	Un3077	\$3,565	Highway	Ripped or torn
Hagerstown	7/3/2003	1.5	Slb	Un3077	\$240	Highway	Crushed
Hagerstown	7/8/2003	1	Lga	Un1789	\$210	Highway	Crushed
Hagerstown	7/8/2003	0.125	Lga	Un3266	\$205	Highway	
Hagerstown	7/10/2003	0.015625	Lga	Un1263	\$205	Highway	Cracked
Hagerstown	7/12/2003	2	Slb	Un2430	\$220	Highway	Punctured
Hagerstown	7/14/2003	0.007813	Lga	Un2927	\$210	Highway	Punctured
Hagerstown	7/15/2003	0.03125	Lga	Un1791	\$202	Highway	
Hagerstown	7/24/2003	0.125	Lga	Un1986	\$380	Highway	Crushed
Hagerstown	7/26/2003	15	Lga	Un1231	\$3,750	Highway	Punctured
Hagerstown	8/4/2003	0.5	Slb	Un3077	\$115	Highway	Ripped or torn
Hagerstown	8/5/2003	0.0625	Lga	Un3267	\$85	Highway	Crushed
Hagerstown	8/22/2003	0.015625	Lga	Na1993	\$201	Highway	
Hagerstown	8/23/2003	0.125	Lga	Un1993	\$470	Highway	Crushed
Williamsport	9/4/2003	1	Lga	Un1779	\$5	Highway	
Hagerstown	9/9/2003	0.046875	Lga	Un3266	\$145	Highway	Punctured
Hagerstown	9/12/2003	0.125	Lga	Un2991	\$3,850	Highway	
Hagerstown	9/16/2003	0.5	Slb	Un1727	\$170	Highway	Ripped or torn
Hagerstown	10/3/2003	0.0625	Lga	Un1866	\$85	Highway	Punctured
Hagerstown	10/4/2003	0.25	Lga	Un1830	\$205	Highway	Crushed
Hagerstown	10/9/2003	0.125	Lga	Un1133	\$525	Highway	
Hagerstown	10/9/2003	0.5	Slb	Un3288	\$300	Highway	Ripped or torn
Hagerstown	10/11/2003	1	Slb	Un1486	\$135	Highway	Ripped or torn
Hagerstown	10/27/2003	1	Lga	Un3267	\$525	Highway	
Hagerstown	11/5/2003	0.09375	Lga	Un1866	\$275	Highway	Crushed
Williamsport	11/24/2003	2	Lga	Na1993	\$2	Highway	
Hagerstown	12/16/2003	1	Lga	Un1090	\$525	Highway	
Hagerstown	12/16/2003	0.28125	Lga	Un1950	\$75	Highway	Crushed;
Hagerstown	1/13/2004	0.007813	Lga	Un1993	\$105	Highway	Punctured
Hagerstown	1/28/2004	0.046875	Lga	Un1197	\$266	Highway	Punctured;
Hagerstown	2/20/2004	0.0625	Lga	Un1897	\$3,502	Highway	
Hagerstown	3/13/2004	30	Lga	Un1755	\$2,300	Highway	Punctured



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Hagerstown	4/29/2004	1.25	Slb	Un3242	\$145	Highway	Punctured
Hagerstown	5/8/2004	5	Lga	Un2734	\$225	Highway	Crushed
Hagerstown	5/10/2004	0.25	Lga	Un1133	\$125	Highway	Punctured
Hagerstown	5/14/2004	50	Lga	Un2922	\$5,150	Highway	Punctured
Hagerstown	5/20/2004	0.625	Slb	Un2783	\$1,285	Highway	Punctured
Hagerstown	5/21/2004	5	Slb	Un1459	\$170	Highway	Ripped or torn
Hagerstown	5/26/2004	1	Lga	Un1219	\$110	Highway	Crushed
Hagerstown	6/2/2004	0.0625	Slb	Un2878	\$500	Highway	Punctured
Hagerstown	6/4/2004	0.03125	Lga	Un1219	\$105	Highway	Crushed
Hagerstown	6/9/2004	5	Lga	Un1219	\$330	Highway	Crushed
Hagerstown	6/15/2004	3	Lga	Un1866	\$125	Highway	Crushed;
Hagerstown	6/15/2004	5	Slb	Un2783	\$3,350	Highway	Crushed
Hagerstown	6/18/2004	1	Lga	Un1170	\$110	Highway	Punctured
Hagerstown	6/18/2004	0.5	Slb	Un3077	\$240	Highway	Ripped or torn
Hagerstown	7/3/2004	0.125	Lga	Un1999	\$138	Highway	Punctured
Hagerstown	7/18/2004	0.03125	Lga	Un2967	\$160	Highway	Ripped or torn
Hagerstown	7/22/2004	5.25	Lga	Na1760	\$475	Highway	Crushed
Hagerstown	7/27/2004	0.125	Lga	Un2810	\$61	Highway	
Hagerstown	8/3/2004	0.03125	Slb	Un2588	\$2,750	Highway	Punctured
Hagerstown	8/6/2004	25	Lga	Un2290	\$4,150	Highway	Punctured
Hagerstown	8/7/2004	0.75	Lga	Un1993	\$95	Highway	Crushed
Hagerstown	8/11/2004	0.25	Lga	Un2874	\$401	Highway	
Hagerstown	8/12/2004	0.375	Slb	Un3077	\$135	Highway	Punctured
Hagerstown	8/26/2004	0.023438	Lga	Un1992	\$85	Highway	Crushed
Hagerstown	8/26/2004	1	Lga	Un2735	\$105	Highway	Crushed
Hagerstown	8/29/2004	0.5	Lga	Un3082	\$450	Highway	Punctured
Hagerstown	9/1/2004	0.023438	Lga	Un1760	\$425	Highway	
Hagerstown	9/2/2004	5	Lga	Un1263	\$910	Highway	Punctured
Hagerstown	9/9/2004	0.046875	Lga	Un3266	\$105	Highway	Crushed
Hagerstown	9/22/2004	0.5	Lga	Un1170	\$95	Highway	Crushed
Hagerstown	9/29/2004	0.15	Lga	Un2735	\$85	Highway	
Hagerstown	10/4/2004	0.5	Lga	Na1993	\$1	Highway	
Hagerstown	10/20/2004	14.2	Lga	Na1993	\$25,025	Highway	
Hagerstown	10/25/2004	1	Lga	Un1263	\$650	Highway	Crushed
Hagerstown	10/27/2004	0.015625	Lga	Un1848	\$61	Highway	
Hagerstown	10/29/2004	0.375	Slb	Un3077	\$115	Highway	Ripped or torn
Hagerstown	11/9/2004	0.039063	Lga	Un1866	\$650	Highway	Crushed
Hagerstown	11/12/2004	0.5	Lga	Un1170	\$95	Highway	Crushed



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Hagerstown	11/15/2004	0.25	Lga	Na1993	\$0	Highway	
Hagerstown	11/16/2004	0.5	Lga	Na1993	\$1	Highway	
Hagerstown	11/17/2004	0.625	Slb	Un2811	\$135	Highway	Ripped or torn
Hagerstown	11/19/2004	0.125	Lga	Na1993	\$0	Highway	
Hagerstown	11/19/2004	0.125	Lga	Un2810	\$105	Highway	Punctured
Hagerstown	12/2/2004	2.5	Lga	Un3264	\$2,565	Highway	
Hagerstown	12/11/2004	0.023438	Lga	Un3082	\$61	Highway	
Hagerstown	12/18/2004	50	Slb	Un3077	\$105	Highway	Punctured
Hagerstown	12/21/2004	0.015625	Lga	Un1170	\$125	Highway	Crushed
Hagerstown	12/22/2004	2	Lga	Na1993	\$2	Highway	
Hagerstown	1/13/2005	30	Lga	Un1263	\$19,000	Highway	Crushed
Hagerstown	2/10/2005	0.0625	Lga	Na1760	\$0	Highway	Leaked
Hagerstown	2/12/2005	1	Lga	Un1760	\$650	Highway	Punctured
Hagerstown	2/22/2005	1.5	Lga	Un2319	\$650	Highway	Punctured
Hagerstown	2/26/2005	1	Lga	Un1197	\$0	Highway	Punctured
Hagerstown	3/4/2005	0.25	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	3/12/2005	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	3/22/2005	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	3/23/2005	0.125	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	3/30/2005	0.125	Lga	Un3264	\$0	Highway	Punctured
Hagerstown	4/1/2005	0.015625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	4/6/2005	0.023438	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	4/13/2005	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	4/19/2005	0.125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	4/26/2005	0.0625	Lga	Un1219	\$0	Highway	Punctured
Hagerstown	4/26/2005	1	Lga	Un3082	\$0	Highway	Leaked
Hagerstown	6/16/2005	10	Lga	Un3266	\$3,050	Highway	Leaked
Hagerstown	6/18/2005	1	Lga	Un1139	\$0	Highway	Crushed
Hagerstown	6/21/2005	0.0625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	6/21/2005	4	Lga	Un1866	\$2,600	Highway	Punctured
Hagerstown	6/24/2005	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	6/25/2005	5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/1/2005	0.03125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/1/2005	0.039062	Lga	Un2319	\$0	Highway	Leaked
Hagerstown	8/2/2005	1	Lga	Un1210	\$0	Highway	Crushed
Hagerstown	8/2/2005	0.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/5/2005	0.03125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/10/2005	0.5	Lga	Un1263	\$650	Highway	Punctured



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	8/11/2005	0.007812	Lga	Un3098	\$0	Highway	Leaked
Hagerstown	8/17/2005	0.33	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	8/18/2005	1	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	8/18/2005	0.125	Lga	Un1263	\$0	Highway	Cracked
Hagerstown	8/20/2005	3	Lga	Un1993	\$0	Highway	Crushed
Hagerstown	8/22/2005	0.023438	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/22/2005	0.039062	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/26/2005	0.25	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	8/26/2005	0.25	Lga	Un1903	\$0	Highway	Cracked
Hagerstown	8/30/2005	0.625	Slb	Un1494	\$0	Highway	Punctured
Hagerstown	8/30/2005	0.007812	Lga	Un1954	\$0	Highway	Leaked
Hagerstown	8/31/2005	0.25	Slb	Un1463	\$0	Highway	Crushed
Hagerstown	9/13/2005	1	Lga	Na1993	\$3,000	Rail	Leaked
Hagerstown	9/14/2005	0.023438	Lga	Un1866	\$0	Highway	Crushed
Hagerstown	10/10/2005	0.125	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	10/12/2005	0.5	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	10/12/2005	0.25	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	10/25/2005	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	11/1/2005	0.5	Lga	Un1219	\$0	Highway	Punctured
Hagerstown	11/5/2005	0.125	Lga	Na1760	\$0	Highway	Leaked
Hagerstown	11/10/2005	1	Lga	Un1263	\$0	Highway	Burst or ruptured
Hagerstown	11/15/2005	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	11/18/2005	2	Slb	Un2783	\$2,150	Highway	Crushed
Hagerstown	11/22/2005	0.125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	11/23/2005	5	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	12/5/2005	5	Lga	Un1719	\$0	Highway	Cracked
Hagerstown	12/14/2005	0.75	Lga	Un1824	\$0	Highway	Crushed
Hagerstown	12/20/2005	0.015625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/27/2005	0.25	Lga	Un2924	\$0	Highway	Leaked
Hagerstown	1/3/2006	0.125	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	1/3/2006	0.023438	Lga	Un3266	\$0	Highway	Failed to operate
Hagerstown	1/4/2006	0.125	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	1/11/2006	0.023438	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	1/14/2006	0.023438	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	1/17/2006	0.25	Lga	Un3266	\$0	Highway	Punctured
Hagerstown	1/30/2006	0.25	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	1/30/2006	0.0625	Lga	Un1814	\$0	Highway	Leaked
Williamsport	2/3/2006	1	Lga	Un2810	\$0	Highway	Punctured



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	2/16/2006	2	Lga	Un1866	\$650	Highway	Crushed
Hagerstown	2/21/2006	0.125	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	2/26/2006	15	Lga	Na1993	\$0	Highway	Torn off or damaged
Hagerstown	3/14/2006	0.015625	Lga	Un3265	\$0	Highway	Punctured
Hagerstown	4/10/2006	0.5	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	4/24/2006	0.079251	Lga	Un2664	\$0	Air	Leaked
Hagerstown	4/26/2006	0.5	Slb	Un1446	\$2,600	Highway	Punctured
Hagerstown	5/5/2006	1	Lga	Un1263	\$750	Highway	Punctured
Hagerstown	5/8/2006	0.000264	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/11/2006	0.007812	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	5/16/2006	1	Lga	Un1866	\$750	Highway	Crushed
Hagerstown	6/16/2006	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	6/19/2006	1	Lga	Un1760	\$0	Highway	Leaked
Hancock	6/19/2006	1	Lga	Un2810	\$0	Highway	
Hagerstown	6/24/2006	110	Slb	Un2662	\$2,950	Highway	Crushed
Hagerstown	7/1/2006	2	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/1/2006	1	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	7/5/2006	0.078125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/7/2006	0.25	Lga	Un1789	\$0	Highway	Cracked
Hagerstown	7/11/2006	1	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	7/18/2006	1	Slb	Un1325	\$0	Highway	Crushed
Hagerstown	7/21/2006	0.13368	Gcf	Un1002	\$0	Highway	Leaked
Hagerstown	8/2/2006	1	Lga	Un1219	\$0	Highway	Punctured
Hagerstown	8/2/2006	1	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	8/2/2006	8	Slb	Un2880	\$0	Highway	Leaked
Hagerstown	8/31/2006	4	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/1/2006	0.125	Lga	Un3109	\$0	Highway	Crushed
Hagerstown	9/5/2006	2	Lga	Un1993	\$0	Highway	Cracked
Hagerstown	9/14/2006	2.204623	Slb	Un1044	\$0	Highway	Leaked
Hagerstown	9/20/2006	0.125	Lga	Na1993	\$0	Highway	Crushed
Hagerstown	9/28/2006	0.078125	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	9/28/2006	1	Lga	Un3103	\$3,450	Highway	Crushed
Hagerstown	9/28/2006	1	Lga	Un3265	\$0	Highway	Cracked
Hagerstown	9/29/2006	2	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	10/10/2006	0.000035	Gcf	Un3164	\$0	Highway	Bent
Hagerstown	10/11/2006	1	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	10/12/2006	0.39627	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	10/13/2006	0.125	Lga	Un1263	\$0	Highway	Crushed



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Hagerstown	10/17/2006	0.0625	Lga	Un1760	\$750	Highway	Crushed
Hagerstown	10/18/2006	0.26418	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	10/21/2006	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	11/6/2006	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	11/9/2006	1	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	11/10/2006	0.25	Lga	Na1760	\$2,001	Highway	Leaked
Hagerstown	11/28/2006	2	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	11/28/2006	1	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	11/29/2006	0.09375	Lga	Na1760	\$750	Highway	Crushed
Hagerstown	11/29/2006	1	Lga	Un1824	\$0	Highway	Punctured
Hagerstown	11/29/2006	1	Lga	Un2922	\$0	Highway	Leaked
Hagerstown	12/27/2006	8	Slb	Un1479	\$0	Highway	Leaked
Hagerstown	12/30/2006	2	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	1/3/2007	1	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	1/3/2007	1	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	1/8/2007	0.03125	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	1/8/2007	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	1/8/2007	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	1/9/2007	1.05672	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	1/23/2007	0.000264	Lga	Un1760	\$0	Highway	Cracked
Hagerstown	1/25/2007	0.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	2/9/2007	0.033021	Lga	Un1090	\$0	Highway	Cracked
Hagerstown	2/13/2007	1	Lga	Un3264	\$0	Highway	Leaked
Williamsport	2/16/2007	5	Lga	Un2618	\$5,000	Highway	Leaked
Hagerstown	2/20/2007	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	2/23/2007	0.0625	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	2/23/2007	0.03125	Slb	Un2794	\$0	Highway	Leaked
Hagerstown	3/2/2007	1	Slb	Na3178	\$0	Highway	Crushed
Hagerstown	3/2/2007	1	Lga	Un1719	\$0	Highway	Cracked
Hagerstown	3/6/2007	0.5	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	3/6/2007	0.5	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	3/13/2007	1	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	3/14/2007	0.054688	Lga	Un1057	\$0	Highway	Punctured
Hagerstown	3/14/2007	10	Slb	Un3106	\$3,800	Highway	Punctured
Hagerstown	3/30/2007	1	Lga	Un1197	\$0	Highway	Crushed
Hagerstown	4/27/2007	1	Slb	Un2880	\$0	Highway	Punctured
Hagerstown	5/15/2007	55	Lga	Un1263	\$3,220	Highway	Punctured
Hagerstown	5/18/2007	1	Lga	Un1263	\$0	Highway	Leaked



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	5/25/2007	0.26418	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	5/31/2007	2.5	Lga	Un2922	\$0	Highway	Crushed
Hagersown	5/31/2007	1	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	6/4/2007	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/13/2007	0.015625	Lga	Un1760	\$0	Highway	Failed to operate
Hagerstown	6/19/2007	20	Lga	Un2582	\$4,000	Highway	Leaked
Hagerstown	6/20/2007	5	Lga	Un1133	\$0	Highway	Punctured
Hagerstown	6/20/2007	3	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	6/25/2007	0.25	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	6/25/2007	0.75	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/27/2007	1	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	7/2/2007	8	Lga	Un1993	\$550	Highway	Punctured
Hagerstown	7/2/2007	0.039062	Lga	Un2927	\$0	Highway	Crushed
Hagerstown	7/9/2007	0.125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/16/2007	0.015625	Lga	Un1210	\$0	Highway	Leaked
Williamsport	7/18/2007	10	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	7/19/2007	0.015625	Lga	Un2922	\$0	Highway	Leaked
Hagerstown	7/19/2007	0.125	Lga	Un3107	\$0	Highway	Leaked
Hagerstown	7/25/2007	0.03125	Lga	Un1789	\$0	Highway	Crushed
Hagerstown	7/26/2007	1	Lga	Un1263	\$0	Highway	Bent
Hagerstown	8/3/2007	0.013209	Lga	Un2248	\$0	Highway	Leaked
Hagerstown	8/8/2007	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/11/2007	0.007812	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/14/2007	0.25	Lga	Un1197	\$0	Highway	Punctured
Hagerstown	8/14/2007	3	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/15/2007	2	Slb	Un1044	\$0	Highway	Bent
Hagerstown	8/20/2007	10	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	8/23/2007	2	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	8/29/2007	0.015625	Lga	Un1814	\$0	Highway	Leaked
Hagerstown	9/10/2007	0.007812	Lga	Un1206	\$0	Highway	Punctured
Hagerstown	9/18/2007	0.25	Lga	Un1193	\$0	Highway	
Hagerstown	9/25/2007	0.052836	Lga	Un3265	\$0	Highway	Punctured
Hagerstown	10/1/2007	0.5	Lga	Un1903	\$0	Highway	Cracked
Hagerstown	10/3/2007	5	Slb	Un2880	\$0	Highway	Ripped or torn
Hagerstown	10/15/2007	0.25	Lga	Un1133	\$0	Highway	Crushed
Hagerstown	10/24/2007	0.1	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	10/26/2007	0.5	Lga	Un1805	\$0	Highway	Leaked
Hagerstown	10/31/2007	0.09375	Lga	Un1294	\$0	Highway	Leaked



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Hagerstown	11/2/2007	1.5	Slb	Un3262	\$0	Highway	Burst or ruptured
Hagerstown	11/15/2007	0.015625	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	11/15/2007	0.015625	Lga	Un2073	\$0	Highway	Leaked
Hagerstown	11/22/2007	0.007812	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	11/27/2007	0.0625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/13/2007	0.0625	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	12/14/2007	15	Slb	Un3242	\$0	Highway	Ripped or torn
Hagerstown	12/15/2007	0.023438	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	12/18/2007	190	Lga	Na1760	\$3,300	Highway	Cracked
Hagerstown	1/8/2008	0.046875	Lga	Un2644	\$1,600	Highway	Crushed
Hagerstown	1/9/2008	2	Lga	Un1208	\$0	Highway	Crushed
Hagerstown	1/15/2008	0.125	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	1/22/2008	2.5	Lga	Un1719	\$0	Highway	Cracked
Hagerstown	1/22/2008	0.0625	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	1/23/2008	0.125	Lga	Un1139	\$0	Highway	Punctured
Hagerstown	2/4/2008	0.023438	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	2/8/2008	0.026418	Lga	Un1719	\$0	Highway	Leaked
Hagerstown	2/11/2008	10	Slb	Un1044	\$0	Highway	Burst or ruptured
Hagerstown	2/19/2008	1	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	3/5/2008	0.003906	Lga	Un1775	\$0	Highway	Leaked
Hagerstown	3/6/2008	3	Slb	Un3262	\$0	Highway	Ripped or torn
Hagerstown	3/12/2008	0.125	Lga	Un1866	\$0	Highway	Punctured
Hagerstown	3/14/2008	0.003906	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	3/24/2008	0.105668	Lga	Un1307	\$0	Highway	Leaked
Hagerstown	3/28/2008	10	Slb	Un1044	\$0	Highway	Ripped or torn
Hagerstown	3/28/2008	0.26418	Lga	Un1993	\$0	Highway	Structural
Hagerstown	3/29/2008	0.078125	Lga	Un1247	\$0	Highway	Punctured
Hagerstown	4/10/2008	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	4/26/2008	8	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	4/27/2008	35	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	5/6/2008	0.007812	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/13/2008	0.0625	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	5/20/2008	0.125	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	5/23/2008	0.023438	Lga	Un1230	\$0	Highway	Leaked
Hagerstown	5/27/2008	4	Lga	Un1133	\$0	Highway	Punctured
Hagerstown	5/30/2008	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/4/2008	0.125	Lga	Un1230	\$0	Highway	Leaked
Hagerstown	6/19/2008	0.5	Lga	Un3264	\$0	Highway	Leaked



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Hagerstown	7/15/2008	0.5	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/23/2008	4	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/23/2008	0.125	Lga	Un1993	\$0	Highway	Cracked
Hagerstown	9/2/2008	3.76155	Gcf	Un1072	\$0	Highway	Leaked
Hagerstown	9/9/2008	0.007812	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	9/16/2008	0.5	Slb	Un1044	\$0	Highway	Leaked
Hagerstown	9/23/2008	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	9/25/2008	0.007812	Lga	Un1830	\$0	Highway	Leaked
Hagerstown	10/10/2008	0.125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	10/13/2008	0.007812	Lga	Un2796	\$0	Highway	Leaked
Hagerstown	10/21/2008	0.015625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	10/24/2008	0.21875	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	10/28/2008	0.003906	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	11/5/2008	0.007812	Lga	Un1210	\$0	Highway	Cracked
Hagerstown	11/5/2008	0.007812	Lga	Un1210	\$0	Highway	Cracked
Hagerstown	11/6/2008	10	Slb	Un1044	\$0	Highway	Torn off or damaged
Hagerstown	11/6/2008	16	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	12/3/2008	0.09375	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	12/30/2008	2	Lga	Un1210	\$0	Highway	Punctured
Hagerstown	1/8/2009	1	Slb	Un1485	\$0	Highway	Punctured
Hagerstown	1/15/2009	0.085938	Lga	Un1950	\$0	Highway	Cracked
Hagerstown	1/22/2009	0.5	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	1/23/2009	0.5	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	1/23/2009	0.5	Slb	Un3110	\$0	Highway	Ripped or torn
Hagerstown	1/26/2009	1	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	2/2/2009	30	Slb	Un1044	\$0	Highway	Leaked
Hagerstown	2/10/2009	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	2/28/2009	0.25	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	3/3/2009	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	3/20/2009	2	Lga	Un1172	\$0	Highway	Punctured
Hagerstown	4/14/2009	0.0625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	4/18/2009	0.039062	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	4/20/2009	0.125	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	4/27/2009	0.125	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	4/29/2009	0.25	Lga	Un1786	\$0	Highway	Leaked
Hagerstown	5/1/2009	0.1875	Lga	Un2796	\$0	Highway	Cracked
Hagerstown	5/13/2009	1	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	5/21/2009	0.25	Lga	Un1203	\$0	Highway	Leaked



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Hagerstown	5/21/2009	0.25	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	5/23/2009	0.5	Lga	Un3093	\$0	Highway	Punctured
Hagerstown	5/28/2009	0.125	Lga	Un2014	\$0	Highway	Torn off or damaged
Hagerstown	5/28/2009	2	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/2/2009	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/3/2009	0.007812	Lga	Un1274	\$0	Highway	Leaked
Hagerstown	6/3/2009	1	Lga	Un2788	\$0	Highway	Leaked
Hagerstown	6/13/2009	0.1875	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	6/16/2009	0.25	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/22/2009	0.125	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	6/24/2009	0.125	Lga	Un1824	\$0	Highway	Punctured
Hagerstown	6/29/2009	0.0625	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	6/30/2009	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/6/2009	0.007812	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	7/23/2009	1	Lga	Un3265	\$0	Highway	Cracked
Hagerstown	7/24/2009	0.3125	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	7/30/2009	0.001308	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/5/2009	0.0625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/7/2009	0.125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	8/18/2009	0.125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/19/2009	0.0625	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	8/21/2009	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/24/2009	0.75	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	8/25/2009	0.0625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	8/27/2009	0.5	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/8/2009	0.066042	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	9/17/2009	0.125	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	9/23/2009	0.0625	Lga	Un1133	\$0	Highway	Crushed
Hagerstown	9/24/2009	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/29/2009	11	Slb	Un1044	\$0	Highway	Leaked
Hagerstown	10/2/2009	0.015625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	10/7/2009	0.26418	Lga	Un2796	\$0	Highway	Leaked
Hagerstown	10/12/2009	10	Lga	Un1866	\$6,433	Highway	
Hagerstown	10/13/2009	0.043588	Lga	Un1307	\$0	Highway	Gouged or cut
Hagerstown	10/16/2009	0.09375	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/16/2009	5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/21/2009	0.015625	Lga	Un1206	\$0	Highway	Leaked
Hagerstown	10/22/2009	1	Lga	Un1263	\$0	Highway	Leaked



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	11/2/2009	1	Lga	Un1719	\$0	Highway	Punctured
Hagerstown	11/3/2009	0.0625	Lga	Un3264	\$0	Highway	Failed to operate
Hagerstown	11/25/2009	0.0625	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	1/5/2010	0.0625	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	1/12/2010	0.015625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	2/2/2010	25	Lga	Un1263	\$3,000	Highway	Punctured
Hagerstown	2/2/2010	0.0625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	2/12/2010	1	Lga	Un1263	\$0	Highway	Punctured
Williamsport	2/15/2010	5	Lga	Un1866	\$0	Highway	Leaked
Hagerstown	2/16/2010	0.0625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	2/17/2010	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	2/18/2010	0.125	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	2/23/2010	0.0625	Lga	Un1230	\$0	Highway	Crushed
Hagerstown	3/3/2010	0.5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	3/12/2010	0.036984	Lga	Un1230	\$0	Highway	Gouged or cut
Hagerstown	3/24/2010	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	3/27/2010	3	Slb	Un2783	\$2,500	Highway	Leaked
Hagerstown	4/7/2010	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	4/8/2010	0.039062	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	4/13/2010	0.3125	Slb	Un1849	\$0	Highway	Ripped or torn
Hagerstown	4/29/2010	0.5	Lga	Un1294	\$0	Rail	Leaked
Hagerstown	5/1/2010	0.15625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/5/2010	0.007809	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/11/2010	0.25	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/20/2010	0		Un1057	\$0	Air	
Hagerstown	5/21/2010	2	Lga	Un1210	\$0	Highway	Crushed
Hagerstown	5/25/2010	1.25	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/28/2010	0.007812	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	6/2/2010	1	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	6/3/2010	0.75	Slb	Un1849	\$0	Highway	Crushed
Hagerstown	6/3/2010	0.5	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/5/2010	10	Slb	Un1485	\$0	Highway	Crushed
Hagerstown	6/14/2010	0.011713	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	6/15/2010	0.25	Lga	Un1814	\$525	Highway	Punctured
Hagerstown	6/17/2010	4	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	6/21/2010	0.0625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	6/23/2010	0.015625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	6/25/2010	10	Lga	Un1197	\$0	Highway	Punctured



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	6/25/2010	0.09375	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	6/25/2010	0.0625	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	6/29/2010	4	Lga	Un3105	\$0	Highway	Crushed
Hagerstown	7/2/2010	3	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/3/2010	0.0625	Lga	Un3066	\$0	Highway	Crushed
Hagerstown	7/6/2010	1	Lga	Un1230	\$0	Highway	Cracked
Hagerstown	7/6/2010	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/6/2010	0.125	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	7/6/2010	0.0625	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	7/13/2010	0.007812	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/13/2010	5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/13/2010	0.000521	Slb	Un3260	\$0	Highway	Gouged or cut
Hagerstown	7/15/2010	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	7/17/2010	0.1875	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	7/20/2010	0.015625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/22/2010	5	Lga	Un1824	\$0	Highway	Punctured
Hagerstown	8/7/2010	10	Slb	Un3190	\$0	Highway	Punctured
Hagerstown	8/9/2010	1	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	8/12/2010	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/12/2010	5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/25/2010	3	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/27/2010	0.046875	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/30/2010	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	9/4/2010	2	Lga	Un1760	\$0	Highway	Crushed
Hagerstown	9/9/2010	20.2545	Gcf	Un1002	\$0	Highway	Vented
Hagerstown	9/18/2010	1.3	Gcf	Un1013	\$0	Highway	Structural
Hagerstown	9/23/2010	0.5	Lga	Un1210	\$0	Highway	Cracked
Hagerstown	9/25/2010	1	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	9/28/2010	0.625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	9/30/2010	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/4/2010	1	Slb	Un3178	\$0	Highway	Gouged or cut
Hagerstown	10/11/2010	20.2545	Gcf	Un1002	\$0	Highway	Vented
Hagerstown	10/13/2010	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/15/2010	0.13209	Lga	Un1263	\$0	Highway	Bent
Hagerstown	10/20/2010	0.1875	Slb	Un1436	\$0	Highway	Crushed
Hagerstown	10/23/2010	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/28/2010	0.0625	Lga	Un1230	\$0	Highway	Leaked
Hagerstown	11/3/2010	0.0625	Lga	Un1824	\$0	Highway	Leaked



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Hagerstown	11/6/2010	0.75	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	11/13/2010	0.039062	Lga	Un1263	\$0	Highway	Punctured
Williamsport	11/19/2010	12	Lga	Un1263	\$0	Highway	Burst or ruptured
Hagerstown	11/30/2010	0.25	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	12/3/2010	0.125	Lga	Un1824	\$0	Highway	Cracked
Hagerstown	12/13/2010	0.01671	Gcf	Un1021	\$0	Highway	Torn off or damaged
Hagerstown	12/16/2010	0.0625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/21/2010	0.75	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	1/8/2011	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	1/13/2011	0.25	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	1/13/2011	0.03125	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	1/18/2011	0.039062	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	2/5/2011	0.375	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	2/10/2011	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	2/10/2011	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	2/19/2011	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	3/2/2011	0.75	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	3/5/2011	0.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	3/5/2011	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	3/15/2011	0.023438	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	3/19/2011	0.375	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	3/19/2011	0.625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	3/23/2011	0.75	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	3/24/2011	0.023438	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	3/31/2011	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	4/1/2011	0.0625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	4/21/2011	0.125	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	4/28/2011	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	4/30/2011	0.007812	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/6/2011	0.0625	Lga	Un1090	\$700	Rail	Leaked
Hagerstown	5/6/2011	0.5	Lga	Un3264	\$0	Highway	Punctured
Hagerstown	5/10/2011	0.007812	Lga	Un1789	\$0	Highway	Crushed
Hagerstown	5/11/2011	0.078125	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	5/12/2011	0.25	Lga	Un2995	\$0	Highway	Punctured
Hagerstown	5/23/2011	20	Lga	Na1993	\$0	Highway	Failed to operate
Hagerstown	5/23/2011	0.078125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/24/2011	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/26/2011	0.2625	Lga	Un3264	\$0	Highway	Leaked



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	5/26/2011	0.0125	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	6/7/2011	40	Lga	Un1263	\$4,000	Highway	Punctured
Hagerstown	6/10/2011	0.046875	Lga	Un1075	\$0	Highway	Leaked
Hagerstown	6/14/2011	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	6/14/2011	0.03125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/16/2011	0.03125	Lga	Un1814	\$0	Highway	Crushed
Hagerstown	6/17/2011	0		Un1950	\$0	Highway	
Williamsport	6/20/2011	7	Lga	Un1866	\$0	Highway	Burst or ruptured
Hagerstown	6/29/2011	0.03125	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	7/6/2011	0.5	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	7/6/2011	0.25	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/8/2011	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/13/2011	0.015618	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/22/2011	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	7/26/2011	0.03125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	8/3/2011	0.5	Lga	Un1760	\$0	Highway	Crushed
Hagerstown	8/10/2011	1	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	8/11/2011	5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/18/2011	0.15625	Lga	Un1760	\$0	Highway	Crushed
Hagerstown	8/24/2011	0.125	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	9/10/2011	0.8355	Gcf	Un1013	\$0	Highway	Crushed
Hagerstown	9/12/2011	0.125	Lga	Un3098	\$0	Highway	Leaked
Hagerstown	9/15/2011	0.25	Lga	Un3082	\$0	Highway	Crushed
Hagerstown	9/20/2011	0.15625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/22/2011	0.0625	Lga	Un1987	\$0	Highway	Leaked
Hagerstown	9/23/2011	1.25	Lga	Un3098	\$0	Highway	Gouged or cut
Hagerstown	9/26/2011	4	Lga	Un3098	\$0	Highway	Leaked
Hagerstown	9/29/2011	4	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	9/30/2011	2	Lga	Un3163	\$0	Highway	Leaked
Hagerstown	10/8/2011	0.15625	Lga	Un1993	\$0	Highway	Crushed
Hagerstown	10/14/2011	0.25	Lga	Un1090	\$0	Highway	Leaked
Hagerstown	10/20/2011	0.039062	Lga	Un1197	\$0	Highway	Crushed
Hagerstown	10/25/2011	3.5	Lga	Un1090	\$0	Highway	Punctured
Hagerstown	10/25/2011	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	10/26/2011	0.125	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	11/4/2011	15	Lga	Un1993	\$2,500	Highway	Leaked
Hagerstown	11/10/2011	0.0625	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	11/11/2011	0.26418	Lga	Un1263	\$0	Highway	Leaked



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Hagerstown	11/14/2011	7	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	11/15/2011	0.15625	Lga	Un1133	\$0	Highway	Crushed
Hagerstown	11/15/2011	1	Lga	Un2014	\$0	Highway	Torn off or damaged
Hagerstown	12/1/2011	0.0625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	12/1/2011	2.6418	Lga	Un1789	\$0	Highway	Crushed
Hagerstown	12/7/2011	50	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	12/8/2011	0.078125	Lga	Un3266	\$0	Highway	Punctured
Hagerstown	12/18/2011	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	1/4/2012	5	Slb	Un3262	\$0	Highway	Leaked
Hagerstown	1/10/2012	0.007812	Lga	Un1263	\$0	Highway	
Hagerstown	1/20/2012	0.117188	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	1/20/2012	1	Lga	Un1824	\$0	Highway	Cracked
Hagerstown	2/3/2012	0.25	Lga	Un2796	\$0	Highway	Leaked
Hagerstown	2/13/2012	1	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	2/15/2012	0.046875	Lga	Un1230	\$0	Highway	Cracked
Hagerstown	2/16/2012	5	Slb	Un1823	\$0	Highway	Punctured
Hagerstown	3/3/2012	0.25	Lga	Un1866	\$0	Highway	Leaked
Hagerstown	3/9/2012	0.6684	Gcf	Un1956	\$0	Highway	Punctured
Hagerstown	4/7/2012	0.039062	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	4/11/2012	0.03125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	4/12/2012	0.003906	Lga	Un1230	\$0	Highway	Crushed
Hagerstown	4/13/2012	0.003904	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	4/17/2012	0.0625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	4/18/2012	0.25	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	4/27/2012	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/2/2012	0.26418	Lga	Un1648	\$0	Highway	Leaked
Hagerstown	5/4/2012	0.039062	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/8/2012	3	Slb	Un3262	\$0	Highway	Ripped or torn
Hagerstown	5/11/2012	25	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	5/22/2012	5	Lga	Un1993	\$0	Highway	Punctured
Hagerstown	5/23/2012	0.0625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/23/2012	0.125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/24/2012	0.5	Lga	Un1206	\$0	Highway	Leaked
Hagerstown	5/26/2012	10	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	5/29/2012	0.03125	Lga	Un2735	\$0	Highway	Leaked
Hagerstown	5/31/2012	1.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	6/2/2012	0.75	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/7/2012	0.375	Slb	Un2794	\$0	Highway	Crushed



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	6/16/2012	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	6/18/2012	0.039062	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	6/19/2012	300	Slb	Un3377	\$0	Highway	Ripped or torn
Hagerstown	6/22/2012	1	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	6/23/2012	0.75	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	6/25/2012	2	Slb	Un3106	\$0	Highway	Crushed
Hagerstown	6/29/2012	0.234375	Lga	Un1593	\$0	Highway	Punctured
Hagerstown	7/6/2012	0.25	Lga	Un1139	\$0	Highway	Leaked
Hagerstown	7/7/2012	1	Lga	Un1197	\$0	Highway	Punctured
Hagerstown	7/7/2012	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	7/9/2012	0.039062	Lga	Un1814	\$0	Highway	Crushed
Hagerstown	7/12/2012	0.015625	Lga	Un3149	\$0	Highway	Punctured
Hagerstown	7/14/2012	2.5	Lga	Un1133	\$0	Highway	Crushed
Hagerstown	7/17/2012	0.03125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/19/2012	0.125	Lga	Un2735	\$0	Highway	Leaked
Hagerstown	7/21/2012	0.0625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	7/23/2012	1	Lga	Un2699	\$0	Highway	Crushed
Hagerstown	7/28/2012	0.015625	Lga	Un1139	\$0	Highway	Leaked
Hagerstown	7/28/2012	0.03125	Lga	Un1139	\$0	Highway	Leaked
Hagerstown	7/30/2012	0.25	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/2/2012	1	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/6/2012	0.25	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	8/9/2012	0.125	Lga	Un3266	\$0	Highway	Leaked
Clear spring	8/10/2012	50	Slb	Un0332	\$5,000	Highway	
Hagerstown	8/11/2012	1	Lga	Un1210	\$0	Highway	Punctured
Hagerstown	8/13/2012	0.25	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	8/15/2012	0.125	Lga	Un2564	\$0	Highway	Leaked
Hagerstown	8/16/2012	0.0625	Lga	Un1139	\$0	Highway	Bent
Hagerstown	8/16/2012	0.078125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/16/2012	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/17/2012	3	Slb	Un1479	\$0	Highway	Ripped or torn
Hagerstown	8/17/2012	55	Lga	Un1791	\$0	Highway	Punctured
Hagerstown	8/18/2012	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/21/2012	0.125	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/21/2012	0.0625	Lga	Un1760	\$0	Highway	Failed to operate
Hagerstown	8/23/2012	0.0625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/27/2012	0.03125	Lga	Un1139	\$0	Highway	Bent
Hagerstown	8/31/2012	0.5	Lga	Un1263	\$0	Highway	Crushed



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	9/6/2012	1.05672	Lga	Un1648	\$0	Highway	Cracked
Hagerstown	9/7/2012	2	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/11/2012	0.75	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	9/11/2012	1	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	9/25/2012	2.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/28/2012	5	Lga	Un1993	\$0	Highway	Punctured
Hagerstown	10/9/2012	0.375	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	10/11/2012	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	10/12/2012	0.03125	Lga	Un2031	\$0	Highway	Leaked
Hagerstown	10/15/2012	0.26418	Lga	Un1764	\$0	Highway	Cracked
Hagerstown	10/29/2012	0.25	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	11/1/2012	0.15625	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	11/6/2012	0.007812	Lga	Un1090	\$0	Highway	Punctured
Hagerstown	11/6/2012	0.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/4/2012	10	Lga	Un1866	\$0	Highway	Punctured
Hagerstown	12/7/2012	1	Lga	Un1075	\$0	Highway	Leaked
Hagerstown	12/11/2012	1	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	12/12/2012	16	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/13/2012	3	Lga	Un2259	\$0	Highway	Punctured
Hagerstown	12/17/2012	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	12/28/2012	0.75	Lga	Un1219	\$0	Highway	Cracked
Hagerstown	12/28/2012	2.5	Lga	Un1719	\$0	Highway	Cracked
Hagerstown	1/2/2013	0.125	Lga	Un1760	\$0	Highway	Cracked
Hagerstown	1/4/2013	0.25	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	1/12/2013	0.211336	Lga	Un1987	\$0	Highway	Cracked
Hagerstown	1/16/2013	0.125	Lga	Un1210	\$0	Highway	Cracked
Hagerstown	1/17/2013	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	1/21/2013	0.26417	Lga	Un1987	\$0	Highway	Cracked
Hagerstown	1/22/2013	0.15625	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	1/30/2013	55	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	2/22/2013	0.125	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	3/8/2013	30	Lga	Un1123	\$0	Highway	Crushed
Hagerstown	3/14/2013	0.03125	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	3/25/2013	0.03125	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	4/3/2013	0.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	4/5/2013	0.25	Lga	Un1791	\$0	Highway	Leaked
Hagerstown	4/9/2013	1	Lga	Un1789	\$0	Highway	Crushed
Hagerstown	4/18/2013	4	Lga	Un1197	\$0	Highway	Leaked



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Hagerstown	4/19/2013	2	Lga	Un1090	\$0	Highway	Crushed
Hagerstown	4/19/2013	0.125	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	4/23/2013	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	4/24/2013	50.7	Slb	Un1845	\$0	Highway	Crushed
Hagerstown	4/25/2013	0.5	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/3/2013	0.023438	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	5/3/2013	5	Slb	Un1813	\$2,500	Highway	Punctured
Hagerstown	5/6/2013	0.184919	Lga	Un3109	\$0	Highway	Leaked
Hagerstown	5/15/2013	0.625	Lga	Un1263	\$0	Highway	Failed to operate
Hagerstown	5/20/2013	1	Lga	Un1830	\$0	Highway	Crushed
Hagerstown	5/21/2013	0.0625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/23/2013	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	5/29/2013	0.0625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/3/2013	0.03125	Lga	Un1789	\$0	Highway	Bent
Hagerstown	6/10/2013	0.007812	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	6/11/2013	55	Lga	Un2790	\$5,000	Highway	Crushed
Hagerstown	6/13/2013	0.03125	Lga	Un1139	\$0	Highway	Leaked
Hagerstown	6/17/2013	0.0625	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	6/18/2013	0.0625	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	6/18/2013	0.023438	Lga	Un2796	\$0	Highway	Leaked
Hagerstown	6/25/2013	0.25	Lga	Un1263	\$0	Highway	Bent
Hagerstown	6/26/2013	0.26418	Lga	Un1789	\$0	Highway	Cracked
Hagerstown	6/26/2013	1	Lga	Un1814	\$0	Highway	Cracked
Hagerstown	6/27/2013	1	Lga	Un3082	\$0	Highway	Crushed
Hagerstown	7/3/2013	1	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	7/10/2013	5	Lga	Un1197	\$0	Highway	Crushed
Hagerstown	7/11/2013	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/13/2013	0.0625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/16/2013	0.25	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/16/2013	0.25	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	7/19/2013	0.03125	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	7/22/2013	0.03125	Lga	Un1791	\$0	Highway	Leaked
Hagerstown	7/25/2013	0.26418	Lga	Un1764	\$0	Highway	Leaked
Hagerstown	8/12/2013	0.0625	Lga	Un2672	\$0	Highway	Leaked
Hagerstown	8/20/2013	0.015625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/21/2013	0.5	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	8/23/2013	0.195312	Lga	Un1789	\$0	Highway	Cracked
Hagerstown	8/24/2013	0.023438	Lga	Un2014	\$0	Highway	Leaked



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Hagerstown	8/28/2013	0.25	Lga	Un3105	\$0	Highway	Leaked
Hagerstown	8/30/2013	0.01671	Gcf	Un1013	\$0	Highway	
Hagerstown	9/3/2013	1.05672	Lga	Un1230	\$0	Highway	Cracked
Hagerstown	9/10/2013	0.078125	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	9/13/2013	1	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	9/18/2013	1	Lga	Un1263	\$0	Highway	Bent
Hagerstown	9/23/2013	0.0625	Lga	Un1090	\$0	Highway	Leaked
Hagerstown	9/30/2013	0.015625	Lga	Un1830	\$0	Highway	Leaked
Hagerstown	10/2/2013	0.03125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/8/2013	0.023438	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	10/10/2013	2	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	10/10/2013	0.75	Lga	Un1268	\$0	Highway	Punctured
Hagerstown	10/15/2013	0.0625	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	10/24/2013	0.003904	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	10/31/2013	0.03125	Lga	Un3286	\$4,000	Highway	Leaked
Hagerstown	11/7/2013	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	11/8/2013	0.023438	Lga	Un1245	\$0	Highway	Punctured
Hagerstown	11/18/2013	0.125	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	11/23/2013	0.125	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	11/25/2013	5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	11/30/2013	0.125	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	12/5/2013	0.0625	Lga	Na1993	\$0	Highway	Leaked
Hagerstown	12/5/2013	2	Slb	Un3089	\$0	Highway	Crushed
Hagerstown	12/6/2013	0.195312	Lga	Un3105	\$0	Highway	Leaked
Hagerstown	12/6/2013	0.15625	Lga	Un3267	\$0	Highway	Crushed
Hagerstown	12/11/2013	0.875	Lga	Un1814	\$0	Highway	Cracked
Hagerstown	12/11/2013	2	Lga	Un3092	\$0	Highway	Crushed
Hagerstown	12/31/2013	0.5	Lga	Un1791	\$0	Highway	Leaked
Hagerstown	1/6/2014	0.1875	Lga	Un1203	\$0	Highway	Leaked
Hagerstown	1/6/2014	0.0625	Lga	Un1203	\$0	Highway	Leaked
Hagerstown	1/16/2014	0.015625	Lga	Un1824	\$0	Highway	Punctured
Hagerstown	1/18/2014	0.03125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	1/21/2014	0.0625	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	1/24/2014	0.0625	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	1/27/2014	0.015625	Lga	Un1090	\$0	Highway	Leaked
Hagerstown	2/6/2014	0.0625	Lga	Un1170	\$0	Highway	Bent
Hagerstown	2/7/2014	0.25	Lga	Un1230	\$0	Highway	Cracked
Hagerstown	2/18/2014	0.1875	Lga	Un3105	\$0	Highway	Leaked



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Hagerstown	2/24/2014	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	2/27/2014	0.26418	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	3/1/2014	0.0625	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	3/5/2014	1	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	3/13/2014	1	Lga	Un3266	\$0	Highway	
Hagerstown	3/13/2014	1	Lga	Un3266	\$3,000	Highway	Punctured
Hagerstown	3/17/2014	0.03125	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	3/17/2014	0.03125	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	4/3/2014	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	4/3/2014	0.26418	Lga	Un1220	\$0	Highway	Leaked
Hagerstown	4/8/2014	0.125	Lga	Na1760	\$0	Highway	Leaked
Hagerstown	4/10/2014	0.26418	Lga	Un1249	\$0	Highway	Leaked
Hagerstown	4/11/2014	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	4/23/2014	0.03125	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	5/2/2014	1	Lga	Un1993	\$0	Highway	Cracked
Hagerstown	5/5/2014	8	Lga	Un1263	\$675	Highway	Burst or ruptured
Hagerstown	5/14/2014	0.03125	Lga	Un1814	\$0	Highway	Crushed
Hagerstown	5/21/2014	1.875	Lga	Un2381	\$0	Highway	Crushed
Hagerstown	5/23/2014	0.023438	Lga	Un1791	\$0	Highway	Leaked
Hagerstown	5/23/2014	1	Lga	Un1993	\$0	Highway	Crushed
Hagerstown	5/24/2014	1	Lga	Un1263	\$0	Highway	Bent
Hagerstown	5/27/2014	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/27/2014	2	Slb	Un3242	\$0	Highway	Punctured
Hagerstown	5/28/2014	2	Lga	Un1789	\$0	Highway	Crushed
Hagerstown	5/29/2014	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/30/2014	1	Lga	Un1219	\$0	Highway	Punctured
Hagerstown	5/30/2014	0.75	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/31/2014	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/31/2014	0.0625	Lga	Un1263	\$0	Highway	Bent
Hagerstown	6/3/2014	1.2	Lga	Un1992	\$0	Highway	Punctured
Hagerstown	6/4/2014	0.0625	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	6/10/2014	0.03125	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	6/10/2014	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/10/2014	0.039062	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	6/13/2014	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/16/2014	0.25	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	6/19/2014	0.5	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	6/20/2014	0.25	Lga	Un1263	\$0	Highway	Leaked



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Hagerstown	6/23/2014	0.25	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/23/2014	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/26/2014	1.05672	Lga	Un1230	\$0	Highway	Cracked
Hagerstown	6/26/2014	0.007812	Lga	Un1830	\$0	Highway	Leaked
Hagerstown	6/27/2014	4.22688	Lga	Un1230	\$0	Highway	Leaked
Hagerstown	7/1/2014	0.0625	Lga	Un1263	\$0	Highway	Bent
Hagerstown	7/1/2014	0.023438	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/2/2014	0.25	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	7/3/2014	0.023438	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/9/2014	5	Lga	Un1992	\$0	Highway	Punctured
Hagerstown	7/15/2014	2	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	7/16/2014	0.0625	Lga	Un1897	\$0	Highway	Leaked
Hagerstown	7/18/2014	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/1/2014	20	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	8/1/2014	20	Lga	Un1268	\$0	Highway	Punctured
Hagerstown	8/5/2014	0.0625	Lga	Un1830	\$0	Highway	Leaked
Hagerstown	8/6/2014	0.0625	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	8/7/2014	30	Lga	Na1993	\$0	Highway	Punctured
Hagerstown	8/7/2014	0.0625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/9/2014	0.0625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/9/2014	0.015625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/12/2014	0.5	Slb	Na0027	\$0	Highway	Cracked
Hagerstown	8/12/2014	0.0625	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	8/14/2014	0.046875	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/14/2014	0.125	Lga	Un3149	\$0	Highway	Failed to operate
Hagerstown	8/19/2014	0.25	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/20/2014	1	Lga	Un1170	\$0	Highway	Failed to operate
Hagerstown	8/20/2014	0.039062	Lga	Un1987	\$0	Highway	Leaked
Hagerstown	8/21/2014	0.25	Lga	Un1263	\$0	Highway	Crushed
Williamsport	8/22/2014	3	Lga	Un1830	\$0	Highway	Leaked
Hagerstown	8/26/2014	0.5	Lga	Un1090	\$0	Highway	Punctured
Hagerstown	8/27/2014	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/28/2014	0.03125	Lga	Un1789	\$0	Highway	Punctured
Hagerstown	8/29/2014	0.0625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/29/2014	0.125	Lga	Un1866	\$0	Highway	Leaked
Hagerstown	9/3/2014	0.5	Lga	Na1987	\$0	Highway	Punctured
Hagerstown	9/3/2014	2	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	9/10/2014	0.25	Lga	Un1263	\$0	Highway	Leaked



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Hagerstown	9/12/2014	3	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/15/2014	2	Slb	Un3288	\$0	Highway	Punctured
Hagerstown	9/16/2014	0.0625	Lga	Un1903	\$0	Highway	Leaked
Hagerstown	9/18/2014	0.25	Lga	Un1090	\$0	Highway	Crushed
Hagerstown	9/18/2014	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	9/19/2014	0.25	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	9/20/2014	0.3125	Slb	Un2794	\$0	Highway	Cracked
Hagerstown	9/22/2014	0.26418	Lga	Un3082	\$0	Highway	Gouged or cut
Hagerstown	9/24/2014	0.0625	Lga	Un1267	\$0	Highway	Leaked
Hagerstown	9/30/2014	0.0625	Lga	Un1263	\$0	Highway	Bent
Hagerstown	9/30/2014	0.039062	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	10/3/2014	0.625	Lga	Un1210	\$0	Highway	Punctured
Hagerstown	10/16/2014	55	Lga	Un2586	\$0	Highway	Crushed
Hagerstown	10/22/2014	0.052834	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	10/25/2014	35	Lga	Un1169	\$0	Highway	Punctured
Hagerstown	11/1/2014	2	Lga	Un1197	\$0	Highway	Punctured
Hagerstown	11/5/2014	0.007809	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	11/8/2014	10	Lga	Un2735	\$0	Highway	Punctured
Hagerstown	11/10/2014	0.015625	Lga	Un1090	\$0	Highway	
Hagerstown	11/11/2014	0.011713	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	11/11/2014	0.5	Lga	Un1987	\$0	Highway	
Hagerstown	11/12/2014	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	11/12/2014	0.125	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	11/13/2014	0.011713	Lga	Un3093	\$0	Highway	Leaked
Hagerstown	11/13/2014	330	Lga	Un3267	\$0	Highway	Punctured
Hagerstown	11/18/2014	0.0625	Lga	Un3093	\$0	Highway	Leaked
Hagerstown	11/19/2014	0.0625	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	11/26/2014	0.75	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	12/8/2014	0.125	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	1/7/2015	2.204623	Slb	Un1485	\$0	Highway	
Hagerstown	1/8/2015	0.105668	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	1/17/2015	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	1/21/2015	0.0625	Lga	Un3082	\$0	Highway	Leaked
Hagerstown	1/22/2015	0.25	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	2/5/2015	0.0625	Lga	Un1263	\$0	Highway	Bent
Hagerstown	2/23/2015	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	2/24/2015	10	Lga	Un1274	\$0	Highway	Punctured
Hagerstown	2/24/2015	3.5	Slb	Un3260	\$0	Highway	Leaked



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	2/26/2015	0.0625	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	2/27/2015	0.003906	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	3/6/2015	1	Lga	Un1263	\$0	Highway	Bent
Hagerstown	3/9/2015	2	Lga	Un1133	\$0	Highway	Punctured
Hagerstown	3/12/2015	0.26418	Lga	Un1193	\$0	Highway	Punctured
Hagerstown	3/21/2015	1	Slb	Un3288	\$0	Highway	Punctured
Hagerstown	3/31/2015	55	Lga	Un2735	\$5,000	Highway	Punctured
Hagerstown	4/3/2015	0.0625	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	4/6/2015	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	4/6/2015	0.0625	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	4/16/2015	100	Lga	Un3109	\$0	Highway	Crushed
Hagerstown	4/22/2015	0.0625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	4/22/2015	0.09375	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	4/27/2015	0.003904	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/6/2015	2.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/7/2015	0.007812	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	5/13/2015	1.3209	Lga	Un1263	\$0	Highway	Torn off or damaged
Hagerstown	5/14/2015	0.0625	Lga	Un1987	\$0	Highway	Leaked
Hagerstown	5/18/2015	0.000044	Slb	Un2794	\$0	Highway	Leaked
Hagerstown	5/18/2015	0.000022	Slb	Un2794	\$0	Highway	Leaked
Hagerstown	5/21/2015	0.0625	Lga	Un2810	\$0	Highway	Leaked
Hagerstown	6/3/2015	10	Slb	Un2468	\$0	Highway	Punctured
Hagerstown	6/4/2015	0.00013	Slb	Un2794	\$0	Highway	Leaked
Hagerstown	6/4/2015	20	Slb	Un3378	\$0	Highway	Punctured
Hagerstown	6/11/2015	0	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	6/11/2015	0.078089	Lga	Un1830	\$0	Highway	Leaked
Hagerstown	6/15/2015	0.015625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	6/16/2015	0.078125	Lga	Un2810	\$0	Highway	Crushed
Hagerstown	6/16/2015	0.03125	Lga	Un3266	\$0	Highway	Punctured
Hagerstown	6/17/2015	20	Lga	Un2924	\$0	Highway	Crushed
Hagerstown	6/18/2015	0.45	Lga	Un1993	\$0	Highway	Bent
Hagerstown	6/18/2015	0.003904	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/25/2015	0.25	Lga		\$0	Highway	Leaked
Hagerstown	6/26/2015	2	Slb	Un3378	\$0	Highway	Punctured
Hagerstown	6/30/2015	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/2/2015	6	Slb	Un3108	\$0	Highway	Crushed
Hagerstown	7/7/2015	0.03125	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	7/9/2015	0.125	Lga	Un1778	\$0	Highway	Leaked



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	7/9/2015	0.26418	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	7/10/2015	0.125	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	7/11/2015	0.25	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	7/11/2015	0.25	Lga	Un1987	\$0	Highway	Leaked
Hagerstown	7/14/2015	8	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	7/17/2015	0.125	Lga	Un1993	\$0	Highway	Punctured
Hagerstown	7/28/2015	0.015625	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	7/29/2015	0.03125	Lga	Un1219	\$0	Highway	Leaked
Hagerstown	7/31/2015	3	Lga	Un1760	\$0	Highway	Crushed
Hagerstown	7/31/2015	1	Lga	Un1866	\$0	Highway	Crushed
Hagerstown	7/31/2015	0.5	Lga	Un1993	\$0	Highway	Structural
Hagerstown	8/4/2015	0.015625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	8/5/2015	0.023438	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	8/7/2015	0.25	Lga	Un1210	\$0	Highway	Leaked
Hagerstown	8/7/2015	0.25	Slb	Un2794	\$0	Highway	Leaked
Hagerstown	8/7/2015	1	Lga	Un3105	\$0	Highway	Crushed
Hagerstown	8/8/2015	0.007812	Lga	Un1789	\$0	Highway	Crushed
Hagerstown	8/19/2015	0.5	Lga	Un3265	\$0	Highway	Crushed
Hagerstown	8/19/2015	8	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	8/20/2015	0.007812	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	8/22/2015	0.0625	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	8/27/2015	0.046875	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	8/27/2015	0.046875	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	8/28/2015	55	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	8/28/2015	3	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	8/28/2015	0.003904	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/1/2015	0.0625	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	9/14/2015	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/15/2015	0.9375	Lga	Un1824	\$0	Highway	Cracked
Hagerstown	9/18/2015	0.03125	Lga	Un1760	\$0	Highway	Leaked
Williamsport	9/23/2015	5	Lga	Un1866	\$0	Highway	Burst or ruptured
Hagerstown	9/24/2015	0.125	Lga	Un2924	\$0	Highway	Punctured
Hagerstown	9/25/2015	0.001308	Lga	Un3265	\$0	Highway	Leaked
Williamsport	10/15/2015	12	Lga	Un1866	\$0	Highway	
Hagerstown	10/15/2015	0.003904	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	10/15/2015	5	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	10/27/2015	0.002615	Lga	Un3265	\$0	Highway	Leaked
Hagerstown	10/27/2015	2	Lga	Un3266	\$0	Highway	Punctured



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	11/4/2015	0.03125	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	11/6/2015	0.125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	11/14/2015	20	Lga	Un3145	\$0	Highway	Punctured
Hagerstown	12/1/2015	0.25	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	12/4/2015	10	Lga	Un3267	\$0	Highway	Punctured
Hagerstown	12/8/2015	1	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/10/2015	0.015625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	12/15/2015	0.0625	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	12/22/2015	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	1/7/2016	0.023438	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	1/11/2016	0.023438	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	1/13/2016	55	Lga	Un1181	\$0	Highway	Punctured
Hagerstown	1/14/2016	1	Lga	Un1993	\$0	Highway	Crushed
Hagerstown	1/14/2016	10	Lga	Un3470	\$3,500	Highway	Leaked
Hagerstown	1/26/2016	0.000528	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	1/28/2016	0.03125	Lga	Un3265	\$0	Highway	Leaked
Hagerstown	1/30/2016	5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	1/30/2016	0.1	Lga	Un1993	\$0	Highway	Punctured
Hagerstown	1/31/2016	0.5	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	2/2/2016	39	Lga	Un1058	\$1,200	Highway	Leaked
Hagerstown	2/3/2016	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	2/3/2016	1	Lga	Un3295	\$0	Highway	Punctured
Hagerstown	2/4/2016	0.25	Lga	Un1220	\$0	Highway	Punctured
Hagerstown	2/11/2016	0.03125	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	2/12/2016	0.015625	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	2/23/2016	0.01	Lga	Un1993	\$0	Highway	Punctured
Hagerstown	2/25/2016	0.0625	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	2/25/2016	0.015625	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	3/2/2016	0.0625	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	3/5/2016	1	Lga	Un1824	\$0	Highway	Cracked
Hagerstown	3/12/2016	0.75	Lga	Un3265	\$0	Highway	Crushed
Hagerstown	3/17/2016	0.09375	Lga	Un1950	\$3,500	Highway	Crushed
Hagerstown	3/21/2016	0.039062	Lga	Un1294	\$0	Highway	Punctured
Hagerstown	3/22/2016	55	Lga	Un2398	\$0	Highway	Punctured
Hagerstown	4/1/2016	0.03125	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	4/1/2016	0.125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	4/4/2016	0.046875	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	4/13/2016	0.03125	Lga	Un3265	\$0	Highway	Leaked



TABLE 5.3.E HAZARDOUS MATERIALS INCIDENTS

<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	4/21/2016	0.000033	Slb	Un3260	\$0	Highway	Leaked
Hagerstown	4/21/2016	0.03125	Lga	Un3265	\$0	Highway	Leaked
Hagerstown	4/24/2016	0.015625	Lga	Un3265	\$0	Highway	Leaked
Hagerstown	4/25/2016	1	Lga	Na1760	\$0	Highway	Burst or ruptured
Hagerstown	4/27/2016	0.25	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	4/29/2016	0.078125	Lga	Un1824	\$0	Highway	Cracked
Hagerstown	4/29/2016	0.007812	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	5/2/2016	1	Lga	Un1224	\$0	Highway	Punctured
Hagerstown	5/2/2016	0.003904	Lga	Un3265	\$0	Highway	Vented
Hagerstown	5/4/2016	1	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	5/10/2016	0.0625	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	5/11/2016	1	Lga	Un3265	\$0	Highway	Leaked
Hagerstown	5/12/2016	0.015625	Lga	Un1263	\$0	Highway	Bent
Hagerstown	5/17/2016	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	5/17/2016	0.015625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	5/18/2016	2	Lga	Un3066	\$0	Highway	Crushed
Hagerstown	5/19/2016	0.5	Lga	Un1263	\$0	Highway	Bent
Hagerstown	5/20/2016	0.015625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	5/20/2016	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	5/28/2016	3	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	5/29/2016	1	Lga	Un2924	\$0	Highway	Leaked
Hagerstown	6/6/2016	0.0625	Lga	Un1719	\$0	Highway	Leaked
Hagerstown	6/6/2016	0.046875	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	6/8/2016	2	Lga	Un1170	\$0	Highway	Gouged or cut
Hagerstown	6/16/2016	0.25	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	6/16/2016	0.0625	Lga	Un2789	\$0	Highway	Leaked
Hagerstown	6/23/2016	5	Lga	Un1210	\$0	Highway	Gouged or cut
Hagerstown	6/23/2016	0.234375	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/27/2016	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	6/28/2016	0.15625	Lga	Un3105	\$0	Highway	Leaked
Hagerstown	7/5/2016	0.5	Lga	Un3266	\$0	Highway	Failed to operate
Hagerstown	7/9/2016	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	7/14/2016	1	Lga	Un1263	\$3,500	Highway	Crushed
Hagerstown	7/18/2016	0.003904	Lga	Un3266	\$0	Highway	Punctured
Hagerstown	7/20/2016	0.046875	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	7/26/2016	1	Lga	Un1219	\$0	Highway	Cracked
Hagerstown	7/26/2016	0.007809	Lga	Un1866	\$0	Highway	Leaked
Hagerstown	7/27/2016	0.007809	Lga	Un2014	\$0	Highway	Leaked



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Hagerstown	8/1/2016	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	8/2/2016	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	8/5/2016	0.002615	Lga	Un3098	\$0	Highway	Leaked
Hagerstown	8/11/2016	0.25	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	8/12/2016	0.03125	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	8/13/2016	0.03125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	8/16/2016	0.023438	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	8/16/2016	0.0625	Lga	Un1719	\$0	Highway	Leaked
Hagerstown	8/16/2016	0.001308	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	8/24/2016	0.000033	Slb	Na3178	\$0	Highway	Leaked
Hagerstown	8/27/2016	1.5	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	8/27/2016	0.25	Lga	Un1993	\$0	Highway	Cracked
Hagerstown	8/30/2016	10	Slb	Un2880	\$0	Highway	Ripped or torn
Hagerstown	9/1/2016	2	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	9/6/2016	0.011713	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/9/2016	3	Lga	Un2582	\$2,520	Highway	Leaked
Hagerstown	9/16/2016	0.5	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	9/19/2016	1	Lga	Un1230	\$0	Highway	Punctured
Hagerstown	9/19/2016	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/23/2016	0.125	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	9/24/2016	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	9/24/2016	0.0625	Lga	Un1268	\$0	Highway	Leaked
Hagerstown	9/30/2016	1	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	9/30/2016	0.09375	Lga	Un1866	\$0	Highway	Punctured
Hagerstown	10/4/2016	0.125	Lga	Un3109	\$0	Highway	Leaked
Hagerstown	10/7/2016	0.25	Lga	Un1866	\$0	Highway	Punctured
Hagerstown	10/18/2016	0.125	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	10/19/2016	10	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	10/20/2016	0.125	Lga		\$0	Highway	Leaked
Hagerstown	10/24/2016	0.003904	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	10/28/2016	35	Lga	Un3082	\$0	Highway	Punctured
Hagerstown	11/3/2016	2.5	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	11/3/2016	10	Slb	Un1823	\$0	Highway	Punctured
Hagerstown	11/8/2016	0.75	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	11/11/2016	40	Slb	Un3189	\$0	Highway	Punctured
Hagerstown	11/12/2016	0.125	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	11/17/2016	0.03125	Lga	Un1263	\$1,000	Highway	Crushed
Hagerstown	11/18/2016	0.0625	Lga	Un1230	\$0	Highway	Punctured



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	11/19/2016	0.0625	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	11/30/2016	0.234375	Lga	Un1263	\$0	Highway	Crushed
Hagerstown	12/2/2016	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	12/13/2016	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	12/19/2016	2	Slb	Un3077	\$0	Highway	Punctured
Hagerstown	12/20/2016	0.1875	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	12/20/2016	0.25	Lga	Un1993	\$3,500	Highway	Punctured
Hagerstown	12/22/2016	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	12/29/2016	0.003904	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	12/29/2016	5	Lga	Un3265	\$0	Highway	Punctured
Hagerstown	1/5/2017	1	Lga	Un1197	\$0	Highway	Leaked
Hagerstown	1/23/2017	0.125	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	2/9/2017	0.003904	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	2/10/2017	0.0625	Lga	Un3149	\$0	Highway	Leaked
Hagerstown	2/11/2017	0.0625	Lga	Un1760	\$0	Highway	Leaked
Hagerstown	2/13/2017	0.125	Lga	Un3098	\$0	Highway	Leaked
Hagerstown	2/21/2017	0.316406	Lga	Un1170	\$0	Highway	Cracked
Hagerstown	2/24/2017	0.5	Lga	Na1760	\$0	Highway	Crushed
Hagerstown	2/24/2017	5	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	2/27/2017	20	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	2/27/2017	0.5	Lga	Un1293	\$0	Highway	Crushed
Hagerstown	2/28/2017	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	3/1/2017	0.125	Lga	Un1230	\$0	Highway	Leaked
Hagerstown	3/3/2017	0.125	Lga	Un1824	\$0	Highway	Leaked
Williamsport	3/7/2017	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	3/13/2017	1	Lga	Un1791	\$4,500	Highway	Leaked
Hagerstown	3/18/2017	1	Lga	Un3266	\$0	Highway	Leaked
Hagerstown	3/22/2017	1	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	3/24/2017	5	Lga	Un1789	\$0	Highway	Punctured
Hagerstown	3/25/2017	0.007812	Lga	Un1263	\$0	Highway	
Hagerstown	3/27/2017	0.039062	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	4/7/2017	0.0625	Lga	Un1789	\$0	Highway	Leaked
Hagerstown	4/11/2017	3	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	4/12/2017	0.09375	Lga	Un1263	\$0	Highway	
Hagerstown	4/12/2017	0.0625	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	4/12/2017	0.25	Lga	Un2052	\$0	Highway	Punctured
Hagerstown	4/14/2017	0.0625	Lga	Un1993	\$0	Highway	Punctured
Hagerstown	4/14/2017	0.25	Lga	Un1993	\$0	Highway	Leaked



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<i>Incident City</i>	<i>Date of incident</i>	<i>Quantity released</i>	<i>Unit of measure</i>	<i>Identification number</i>	<i>Damages</i>	<i>Mode of transportation</i>	<i>Failure mode</i>
Hagerstown	4/14/2017	0.0625	Lga	Un3412	\$0	Highway	Failed to operate
Hagerstown	4/21/2017	0.007809	Lga	Un1263	\$0	Highway	Bent
Hagerstown	4/25/2017	0.046875	Lga	Un2920	\$0	Highway	Leaked
Hagerstown	4/28/2017	0.0625	Lga	Un3264	\$0	Highway	Punctured
Hagerstown	5/1/2017	2	Lga	Un1263	\$4,800	Highway	
Hagerstown	5/2/2017	0.039062	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	5/9/2017	0.011713	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	5/10/2017	0.25	Lga	Un1263	\$0	Highway	Failed to operate
Hagerstown	5/18/2017	10	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	5/23/2017	1	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	5/23/2017	0.5	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	5/24/2017	4	Lga	Un3266	\$0	Highway	Punctured
Hagerstown	6/5/2017	0.039062	Lga	Un2582	\$0	Highway	Failed to operate
Hagerstown	6/5/2017	5	Slb	Un3077	\$0	Highway	Failed to operate
Hagerstown	6/9/2017	5	Lga	Un1719	\$0	Highway	Punctured
Hagerstown	6/9/2017	5	Lga	Un1719	\$0	Highway	Punctured
Hagerstown	6/13/2017	0.125	Lga	Un2014	\$0	Highway	Leaked
Hagerstown	6/14/2017	10	Lga	Un3352	\$0	Highway	Crushed
Hagerstown	6/16/2017	1	Lga	Un1789	\$0	Highway	Punctured
Hagerstown	6/20/2017	0.0625	Lga	Un1170	\$0	Highway	Leaked
Hagerstown	6/23/2017	1.75	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	6/29/2017	0.25	Lga	Un1993	\$0	Highway	Leaked
Hagerstown	7/3/2017	0.0625	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	7/6/2017	2	Lga	Un1263	\$0	Highway	Punctured
Hagerstown	7/11/2017	2	Lga	Un1719	\$0	Highway	Crushed
Hagerstown	7/18/2017	5	Lga	Un1170	\$0	Highway	Punctured
Hagerstown	7/26/2017	0.125	Lga	Un1814	\$0	Highway	Leaked
Hagerstown	7/26/2017	20	Lga	Un3266	\$0	Highway	Crushed
Hagerstown	7/31/2017	1	Lga	Un1719	\$0	Highway	Leaked
Hagerstown	7/31/2017	1	Lga	Un3264	\$0	Highway	Leaked
Hagerstown	8/3/2017	0.5	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/3/2017	0.75	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/21/2017	0.007812	Lga	Un1263	\$0	Highway	Leaked
Hagerstown	8/25/2017	0.015625	Lga	Un1760	\$0	Highway	Punctured
Hagerstown	8/28/2017	0.25	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/8/2017	0.007809	Lga	Un1824	\$0	Highway	Leaked
Hagerstown	9/9/2017	5	Lga	Un1263	\$0	Highway	Crushed



TABLE 5.3.F U.S. WILDFIRE DATA			
<i>Year</i>	<i>Total Fires</i>	<i>Acres Burned</i>	<i>Total Cost (Forest Service & DOI Agencies)</i>
2000	92,250	7,383,911	\$1,410,802,000
2001	84,079	3,570,911	\$952,696,000
2002	73,457	7,184,712	\$1,674,040,000
2003	63,629	3,960	\$1,327,138,000
2004	65,461	8,097,880	\$1,007,244,000
2005	66,753	8,689,389	\$818,954,000
2006	96,385	9,873,745	\$1,704,477,000
2007	85,705	9,328,045	\$1,620,145,000
2008	78,979	5,292,468	\$1,585,856,000
2009	78,792	5,921,786	\$920,529,000
2010	71,971	3,422,724	\$809,499,000
2011	74,126	8,711,367	\$1,374,525,000
2012	67,774	9,326,238	\$1,902,446,000
2013	47,579	4,319,546	\$1,740,934,000
2014	63,312	3,595,613	\$1,522,149,000
2015	68,151	10,125,149	\$2,130,543,000
2016	67,743	5,509,995	\$1,975,545,000
Total	1,246,146	110,357,439	\$24,477,522,000
Annual Average	73,303	6,491,614	\$1,439,854,235.29

Source: National Interagency Fire Center

TABLE 5.3.G NATIONAL RESPONSE CENTER INCIDENT REPORT 2000-2017			
<i>Type of Incident</i>	<i>Incident Cause</i>	<i>Incident Date & Time</i>	<i>Incident Nearest City</i>
Fixed	Other	1/4/2000 12:00	Hagerstown
Continuous	Other	5/3/2000 9:30	Williamsport
Mobile	Other	5/17/2000 6:30	Williamsport
Continuous	Other	5/24/2000 15:12	Boonsboro
Continuous	Other	5/24/2000 15:22	Williamsport
Fixed	Dumping	6/15/2000 15:25	Hagerstown
Fixed	Operator error	7/19/2000 3:00	Hagerstown
Mobile	Dumping	9/12/2000 12:00	Hagerstown
Fixed	Unknown	11/3/2000 0:00	Boonsboro
Pipeline	Operator error	12/9/2000 10:40	Hagerstown



TABLE 5.3.G NATIONAL RESPONSE CENTER INCIDENT REPORT 2000-2017

<i>Type of Incident</i>	<i>Incident Cause</i>	<i>Incident Date & Time</i>	<i>Incident Nearest City</i>
Storage tank	Operator error	1/11/2001 11:40	Hagerstown
Fixed	Dumping	2/26/2001 16:30	Hagerstown
Fixed	Dumping	3/14/2001 14:15	Sharpsburg
Mobile	Equipment failure	8/21/2001 15:50	Hagerstown
Mobile	Dumping	10/3/2001 8:30	Hagerstown
Fixed	Dumping	10/15/2001 12:30	Hagerstown
Mobile	Unknown	1/10/2002 16:30	Brownsville
Fixed	Other	2/9/2002 11:00	Hagerstown
Fixed	Dumping	3/26/2002 12:00	Hagerstown
Railroad	Unknown	4/13/2002 16:30	Brunswick
Mobile	Other	4/22/2002 9:00	Hancock
Fixed	Equipment failure	5/20/2002 12:00	Williamsport
Mobile	Other	7/17/2002 20:00	Hagerstown
Fixed	Dumping	10/10/2002 16:40	Hagerstown
Storage tank	Other	3/19/2003 6:30	Williamsport
Fixed	Other	6/18/2003 15:00	Hagerstown
Fixed	Dumping	6/26/2003 12:00	Hagerstown
Railroad non-release	Other	7/7/2003 0:05	Antietam
Railroad	Other	7/19/2003 6:40	Brunswick
Railroad	Equipment failure	8/23/2003 23:45	Hagerstown
Fixed	Equipment failure	9/3/2003 21:00	Hagerstown
Fixed	Equipment failure	11/11/2003 5:00	Williamsport
Mobile	Unknown	1/9/2004 3:30	Williamsport
Railroad	Unknown	1/17/2004 21:15	Williamsport
Mobile	Unknown	3/13/2004 10:30	Hagerstown
Mobile	Equipment failure	9/15/2004 15:00	Hagerstown
Mobile	Equipment failure	1/27/2005 15:18	Hagerstown
Storage tank	Unknown	2/17/2005 0:00	Clear spring
Railroad	Equipment failure	3/13/2005 3:25	Hagerstown
Railroad	Equipment failure	8/24/2005 17:00	Hagerstown
Railroad	Other	9/7/2005 17:09	Weaverton
Mobile	Transport accident	9/19/2005 18:38	Hagerstown
Railroad	Unknown	9/26/2005 16:45	Hagerstown
Railroad	Equipment failure	10/2/2005 19:15	Hagerstown
Railroad	Equipment failure	11/30/2005 23:45	Hagerstown
Mobile	Unknown	5/17/2006 19:00	Hagerstown
Mobile	Operator error	6/19/2006 21:56	Hancock
Fixed	Dumping	6/21/2006 9:30	Big Pool



TABLE 5.3.G NATIONAL RESPONSE CENTER INCIDENT REPORT 2000-2017			
<i>Type of Incident</i>	<i>Incident Cause</i>	<i>Incident Date & Time</i>	<i>Incident Nearest City</i>
Railroad	Equipment failure	7/9/2006 10:55	Hagerstown
Railroad	Unknown	10/3/2006 7:00	Hagerstown
Fixed	Unknown	12/9/2006 10:00	Williamsport
Mobile	Transport accident	5/24/2007 9:02	Indian Springs
Pipeline	Equipment failure	5/26/2007 19:00	Cambridge
Railroad	Unknown	8/28/2007 18:01	Hagerstown
Fixed	Other	9/1/2007 15:55	Hagerstown
Fixed	Dumping	9/11/2007 11:00	Hagerstown
Mobile	Dumping	12/20/2007 13:14	Hagerstown
Railroad	Equipment failure	1/2/2008 14:00	Weaverton
Fixed	Dumping	2/12/2008 22:00	Williamsport
Mobile	Unknown	4/27/2008 16:00	Hagerstown
Fixed	Unknown	5/21/2009 18:30	Hagerstown
Railroad	Equipment failure	6/27/2009 10:00	Hagerstown
Mobile	Transport accident	7/6/2009 18:00	Maugansville
Fixed	Dumping	8/22/2009 10:00	Hagerstown
Railroad	Other	8/31/2009 20:00	Hagerstown
Railroad	Unknown	5/4/2010 11:25	Hagerstown
Railroad	Unknown	6/8/2010 14:35	Smithsburg
Mobile	Transport accident	7/3/2010 4:05	Hancock
Mobile	Transport accident	9/20/2010 23:40	Williamsport
Railroad	Equipment failure	12/10/2010 16:00	Hagerstown
Railroad	Unknown	12/16/2010 20:40	Hagerstown
Fixed	Unknown	1/15/2011 14:46	Brunswick
Fixed	Dumping	2/11/2011 10:00	Hagerstown
Pipeline	Unknown	3/1/2011 9:00	Williamsport
Railroad	Equipment failure	5/6/2011 17:20	Hagerstown
Mobile	Equipment failure	9/7/2011 15:30	Hagerstown
Railroad	Equipment failure	12/30/2011 16:00	Hagerstown
Railroad	Equipment failure	3/4/2012 0:30	Hagerstown
Fixed	Other	3/6/2012 20:00	Hagerstown
Fixed	Unknown	4/4/2012 12:00	Hagerstown
Fixed	Equipment failure	4/16/2012 10:00	Hancock
Fixed	Equipment failure	4/16/2012 10:00	Hancock
Railroad non-release	Derailment	7/24/2012 23:00	Hagerstown
Mobile	Unknown	8/10/2012 10:00	Clear Spring
Mobile	Unknown	8/10/2012 11:30	Clear Spring
Fixed	Equipment failure	11/14/2012 14:42	



TABLE 5.3.G NATIONAL RESPONSE CENTER INCIDENT REPORT 2000-2017			
<i>Type of Incident</i>	<i>Incident Cause</i>	<i>Incident Date & Time</i>	<i>Incident Nearest City</i>
Mobile	Operator error	2/20/2013 19:30	Williamsport
Railroad	Derailment	4/15/2013 9:30	Hagerstown
Mobile	Trespasser	4/26/2013 23:47	Brunswick
Storage tank	Unknown	7/30/2013 17:01	Hancock
Storage tank	Unknown	8/14/2013 15:50	Hagerstown
Mobile	Equipment failure	9/17/2013 8:07	Hagerstown
Storage tank	Unknown	11/14/2013 10:43	Hagerstown
Railroad	Other	12/2/2013 13:19	Hagerstown
Fixed	Dumping	3/18/2014 21:14	Hagerstown
Storage tank	Other	5/10/2014 12:00	Hagerstown
Fixed	Dumping	5/27/2014 9:30	Hagerstown
Fixed	Natural phenomenon	6/13/2014 1:00	Clear Spring
Fixed	Other	8/6/2014 16:30	Boonsboro
Fixed	Unknown	9/17/2014 14:00	Hagerstown
Fixed	Unknown	10/17/2014 14:00	Williamsport
Storage tank	Unknown	12/13/2014 14:55	Boonsboro
Fixed	Other	12/26/2014 10:30	Hagerstown
Fixed	Equipment failure	1/12/2015 11:00	Hagerstown
Railroad	Unknown	1/28/2015 4:30	Maugensville
Railroad non-release	Derailment	2/9/2015 16:10	Hagerstown
Railroad	Unknown	4/2/2015 16:18	Hagerstown
Fixed	Other	7/21/2015 16:00	Smithsburg
Fixed	Unknown	8/11/2015 7:00	Hagerstown
Fixed	Dumping	9/16/2015 11:00	Sharpsburg
Mobile	Other	11/18/2015 17:10	Hagerstown
Railroad	Equipment failure	12/5/2015 15:55	Hagerstown
Mobile	Unknown	12/11/2015 10:00	Boonsboro
Unknown sheen	Unknown	1/10/2016 11:00	Sharpsburg
Fixed	Operator error	1/14/2016 13:40	Funkstown
Railroad	Other	2/12/2016 12:30	Boonsboro
Fixed	Unknown	3/29/2016 11:30	Hagerstown
Railroad non-release	Trespasser	6/6/2016 13:06	Smithsburg
Railroad	Unknown	7/7/2016 9:13	Hagerstown
Mobile	Unknown	9/30/2016 0:57	Hancock
Mobile	Other	9/30/2016 10:45	Hancock
Railroad	Unknown	11/13/2016 10:30	Hagerstown
Fixed	Unknown	3/25/2017 17:30	Williamsport
Railroad non-	Operator error	3/27/2017 0:39	Hagerstown



TABLE 5.3.G NATIONAL RESPONSE CENTER INCIDENT REPORT 2000-2017			
<i>Type of Incident</i>	<i>Incident Cause</i>	<i>Incident Date & Time</i>	<i>Incident Nearest City</i>
release			
Unknown sheen	Unknown	4/2/2017 10:20	Hagerstown
Railroad	Equipment failure	8/16/2017 17:44	Hagerstown
Mobile	Unknown	8/17/2017 22:30	Hancock
Fixed	Dumping	9/23/2017 19:00	Boonsboro
Fixed	Unknown	10/17/2017 7:00	Sabillasville

Source: National Response Center Annual Reports



APPENDIX 4

2012 PROJECT STATUS UPDATE

The following table outlines the projects that were identified in the 2012 plan update. The Washington County Division of Emergency services provided the status narrative.

TABLE 5.4.A WASHINGTON COUNTY PROJECT STATUS (2017)							
<i>Goals</i>	<i>Objectives</i>	<i>Type</i>	<i>Action</i>	<i>Hazard</i>	<i>Timing</i>	<i>Status Narrative</i>	
2 4 5 6	2.1 4.1 4.3 5.1 5.2 5.6 6.1	Prevention	1 * CRS Consider placing development restrictions on land use for vacant parcels within hazard areas.	All	Long-term	No. Only as part of an acquisition of a flood prone property.	
2 4 5 6	2.2 4.3 5.15.3 5.4 6.3	Public Education and Awareness	2 * CRS Consider purchasing repetitive loss properties in the county. Develop a volunteer distribution buy-out program letter of interest.	Flood	Long-term	Yes. There are two repetitive loss properties interested in the FEMA/MEMA Hazard Mitigation Grant Program. One in Hancock and one in Funkstown. Both are considering application for a HMGP assistance.	
1 2 4 5	1.3 1.4 2.3 4.1 5.1	Structural Projects	3 * CRS Identify older homes and Pre-FIRM residential structures in the floodplain that are in need of mitigation measures in order to bring them into compliance when funding is available. Parcel layer is needed within GIS to adequately identify.	Flood	Long-term	No. We have no process in place.	
4 6 9	4.1 4.3 6.2 9.1 9.2 9.3	Structural Projects	4 * CRS Mitigate and upgrade flooded roads when funding is available specifically based on areas that the HMPC identified as "high" in the following table.	Flood	Long-term	Contact Scott Hobbs, Engineering and Construction Management for this information.	



TABLE 5.4.A WASHINGTON COUNTY PROJECT STATUS (2017)

Goals	Objectives	Type	Action	Hazard	Timing	Status Narrative
1 2 4 5	1.3 2.3 4.1 5.1	Property Protection	5 * CRS Perform a detailed analysis of structures in the floodplain for all municipalities, and to determine first floor elevation for mitigation project purposes.	Flood	Long-term	Partially, yes.. In 2014, we did determine first floor elevations for approximately 12 of the houses that were flooded in the Town of Clear Spring. The purpose was to assist in determining the feasibility of meeting Floodplain Ordinance requirements during renovation.
4 6 7	4.2 4.3 6.3 6.5 7.3	Public Education and Awareness	6 * CRS Provide citizens with easy access to important hazard related documents such as FEMA’s “The Homeowner’s Guide to Retrofitting”, “Answers to Questions about the NFIP”, “How to Use a Flood Map to Determine Flood Risk for a Property”, “Repairing your Flooded Home”, “Reduce Your Risk from Natural Disasters”, “Taking Shelter from the Storm”, etc.	All	Short-term	Partially, yes. The County Floodplain Management webpage provides links to most FEMA documents and other information relating to flood hazards.
4 6 7	4.2 4.3 6.3 6.5 7.3	Public Education and Awareness	7 * CRS Target residents for public outreach campaign preparedness in high hazard areas such as the 100 yr floodplain.	Flood	Short-term	Yes. In 2016, the County contacted over 4400 citizens via mail regarding the impact of the new FEMA flood maps on their properties. We also hosted an open house for those affected by the new maps to discuss map changes and insurance implications with FEMA, State and County representatives.
2 4	2.1 2.3 4.1 4.2 4.3	Prevention	8 * CRS Update and continue the Flood Mitigation Task Force for Western Maryland.	Flood	Long-term	No.
2 6	2.2 6.2 6.3	Prevention	9 * CRS Use the selected actions to help join the National Flood Insurance – Community Rating System (CRS).	Flood	Short-term	No.



TABLE 5.4.A WASHINGTON COUNTY PROJECT STATUS (2017)

Goals	Objectives	Type	Action	Hazard	Timing	Status Narrative	
4 5 7	4.3 5.2 5.5 7.2	Natural Resource Protection	10	Apply the concepts from the 2009 Washington County Water and Sewer Plan, to improve groundwater qualities which are: well depth, length of well casing, isolation distances, soils and hydrogeological conditions, depth to static water level, and wells drilled in the Beekmantown and Metamorphic Aquifer Units. Regulatory recommendations are within the 2009 Washington County Water and Sewer Plan.	Karst	Long-term	N/A
2 4 5	2.3 4.1 4.3 5.2	Structural Projects	11	Asses existing multilevel structures such as hospitals and apartment complexes for their wind load capacities.	Tornado Hurricane Thunderstorm (Severe Weather)	Short-term	N/A
1 3 5	1.3 3.3 5.2	Structural Projects	12	Assess all shelters and their ability to sustain damage for specific hazard types and identify retrofitting projects based on this assessment.	All	Long-term	N/A
5 6 7	5.2 6.1 7.2	Natural Resource Protection	13	Clean up the Central Chemical Corporation site and remove it from the EPA's superfund sites.	Hazmat	Long-term	N/A
1 4 5	1.3 1.4 4.1 5.6	Prevention	14	Create a parcels layer for hazard areas based on changing development using GIS.	All	Short-term	N/A
3 4	3.1 4.1 4.2 4.3 4.4	Public Education and Awareness	15	Develop and administer outreach programs to identified business organizations that should prepare for flood events. Status: Not completed.	Flood	Short-term	No.
4 5	4.1 4.3 5.2	Natural Resource Protection	16	Develop mitigation strategies for new construction on expandable soils, especially in the municipality of Hagerstown.	Soil Movement (Land Subsidence)	Short-term	N/A



TABLE 5.4.A WASHINGTON COUNTY PROJECT STATUS (2017)

Goals	Objectives	Type	Action	Hazard	Timing	Status Narrative	
1 2 5 6	1.1 1.3 1.4 2.1 2.2 2.3 5.1 5.3 5.6 6.2 6.3 6.4 6.5	Property Protection	17	Elevate or acquire residential properties affected by flooding in targeted areas. Status: Not Completed.	Flood	Long-term	N/A
2 5 6	2.3 5.4 6.2 6.4	Property Protection	18	For the critical facilities listed as having a high vulnerability in the risk assessment and identified by the planning committee as a high priority, a technical report should be completed to provide information on first floor elevation and the base flood elevation. Mitigation alternatives and a detailed benefit/cost analysis should be completed. Status: Not completed.	Flood	Long-term	No.
2 5	2.2 5.1 5.3 5.4 6.2 6.3 6.4	Property Protection	19	Identify structures that would be candidates for retrofit projects. Prioritize and evaluate cost/benefits for candidate structures. Status: Not completed.	All	Long-term	N/A
2 4	2.1 2.3 4.2	Prevention	20	Include hazard mitigation planning in Washington County's new Comprehensive Plan, which is in the process of being developed.	All	Short-term	N/A
4 6 9	4.1 4.3 6.2 9.3	Prevention	21	Mitigate the top transportation accident locations in the county (CH.6).	Major Transportation Accident	Long-term	N/A



TABLE 5.4.A WASHINGTON COUNTY PROJECT STATUS (2017)

Goals	Objectives	Type	Action	Hazard	Timing	Status Narrative	
1 2 4 6	1.1 2.1 4.1 4.3 6.5	Prevention	22	Prepare CRS (Community Rating System) Application to reduce the cost of flood insurance within the county. Status: There are no incorporated or unincorporated areas in Washington County that are enrolled in the CRS program.	Flood	Long-term	N/A
4 5 7	4.3 5.2 5.5 7.3	Prevention	23	Prohibit or restrict additional housing in areas of high risk, particularly in the 100- year floodplain. Status: No additional changes have been made.	Flood	Short-term	N/A
4 6	4.3 6.3 6.5	Property Protection	24	Promote the new Citizen Emergency Notification System. Specifically flood hazard warning.	All	Long-term	N/A
1 4 5	1.3 1.4 4.1 4.3 5.2	Prevention	25	Study the effects of karst and its risk at a more detailed level specific to Washington County. The last report completed by the Maryland Geological Survey was in 2004, and is general in scope.	Karst (Land Subsidence)		N/A
4 6	4.1 4.3 6.2	Structural Projects	26	Target specific facilities for mitigation from the vulnerability listing that are affected by multiple hazards such as the County Roads Facility at 601 Northern Ave., Washington County Airport at 18434 Showalter Rd., and the Mt. Aetna Fire and Rescue Company at 10305 Crystal Falls Drive	All	Long-term	N/A
2 4 5 7	2.1 2.3 4.1 4.2 5.2 7.2	Natural Resource Protection	27	The 2009 Washington County Water and Sewer Plan also states, "All of the historic and recent water quality data seems to yield the same conclusions. A successful groundwater quality management plan will need to be designed to regulate point and non-point sources of surface bacteriological and chemical contaminants." Conduct this study.	Karst	Long-term	N/A



TABLE 5.4.A WASHINGTON COUNTY PROJECT STATUS (2017)

Goals	Objectives	Type		Action	Hazard	Timing	Status Narrative
2 5 7	2.3 5.2 5.3 5.5 7.3	Prevention	28	Update to the 2012 International Building Codes for the county and all municipalities.	All	Short-term	N/A
1	1.2 1.3	Emergency Services	29	Use MDE's Maryland Online Tier Two Reporting System (MOTTRS) A certified Tier Two Report to MDE using MOTTRS fulfills the reporting obligation to the State Emergency Response Commission (SERC). There is no need to mail a signed paper copy of the completed Report to MDE.	Hazmat	Short-term	N/A
4	4.1 4.2	Prevention	30	Using Commodities Flow Study results develop a plan to mitigate any identified risks. Status: Not completed.	Hazmat	Long-term	N/A
2 4 6 8	2.3 4.1 4.3 6.2 8.1	Emergency Services	31	Using the critical facilities list from this Plan for county and municipally owned buildings identify which facilities are most in need of generators.	Power Outage	Long-term	N/A
2 6	2.2 6.2 6.3 6.4	Emergency Services	32	Utilizing the Emergency Services Projects from the County's Capital Improvement Program, research grant funding to pay for these projects.	All	Short-term	N/A
3 4 5	3.3 4.1 5.2	Natural Resource Protection	33	Work with MDE to ensure the safety of the ground and surface water supplies due to karst topography.	Karst (Land Subsidence)	Long-term	N/A
2 3 4 5	2.1 3.1 4.1 5.4	Prevention	34	Work with Public Utility Companies to identify and prioritize utility structures at risk in high hazard areas. Status: Not Completed.	All	Long-term	N/A



APPENDIX 5

THREAT & HAZARD IDENTIFICATION AND RISK ASSESSMENT (THIRA)

As per the request for proposals (RFP) document, this appendix contains information that can be used to build a threat and hazard identification and risk assessment (THIRA) document with guidance from the U.S. Department of Homeland Security, Federal Emergency Management Agency (see CPG 201, Second Edition, USDHS, August 2013). The appendix contains a matrix listing the hazards profiles in Section 2.2 above as the “Y” axis and the 32 core capabilities (see National Preparedness Goal, 2nd edition, USDHS, 2015) as the “X” axis. The resultant cells outline the conditions that local officials should consider to build relevant capabilities for each potential hazard. This section closes with a brief narrative that specifically outlines (a) the threats and hazards for which Washington County should prepare, (b) the sharable resources that are required in order to be prepared for those threats and hazards, and (c) actions that the county can employ to avoid, lessen, or eliminate the threats and hazards.



Table 5.4.A₁

Mission Area:	Common (All)			Prevention	Prevention & Protection			Protection		
Hazard	Planning	Public Information & Warning	Operational Coordination	Forensics & Attribution	Intelligence & Information Sharing	Interdiction & Disruption	Screening, Search & Detection	Access Control & Identity Verification	Cybersecurity	Physical Protective Measures
Drought	Water contingency plan; distribution plan for water commodities	Identify state & fed. partners from which to gather info.; availability of multiple means of disseminating EPI	Potential EOC activation (as nexus for info. sharing between state/fed. Agencies & public)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Extreme Temperatures	Plans for special measures at outdoor events per set heat index levels	Coordinate w/ NWS to receive timely actionable updates; availability of multiple means of disseminating EPI	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood	EOPs include identification of flood-prone areas & ID ingress for responders as well as egress for evacuees	Warn at least 161 households w/in 12 hours per riverine flood (calc. w/ HAZUS-est. impacted households); ability to warn targeted communities within 15 mins. of flash flood conditions	Unified or area command for field ops., likely EOC activation to support COP	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Fire/Explosion	Fire depts. pre-plan for large facilities (e.g., industries, congregate facilities) in first due areas	Dispatch fire resources w/in 1 minute of notification	ICS established 100% of the time	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hazmat Incident	EOPs acknowledge limitations; off-site SARA plans for facilities w/ TPQ; up-to-date commodity flow study	Ability to warn 1,300 households w/in 3 mins. of notification (calc. w/ est. of HH in 1mi ² of Hagerstown)	ICS established 100% of the time, potential EOC activation to support COP (for large releases)	Preserve evidence indefinitely if hazmat incident appears intentional	N/A	N/A	N/A	N/A	N/A	N/A
Land Subsidence	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Major Transportation Accident	Traffic diversion plans for major corridors	Signage (x18) to alert motorists of detours (calc. w/ all lanes & ramps on I-70/81, US 11, & ramps at closest exits)	ICS established 100% of the time	Preserve evidence indefinitely if hazmat incident appears intentional	N/A	N/A	N/A	N/A	N/A	N/A



Hazard	Planning	Public Information & Warning	Operational Coordination	Forensics & Attribution	Intelligence & Information Sharing	Interdiction & Disruption	Screening, Search & Detection	Access Control & Identity Verification	Cybersecurity	Physical Protective Measures
Opioid Epidemic	Strategic plans for outreach, interdiction & response	Engaged social service, addiction recovery, & mental health resources to assist with info. sharing	N/A	N/A	N/A	Intercept drugs where appropriate; apprehend offenders	N/A	N/A	N/A	N/A
Reportable Disease Epidemic	Public health all-hazards plan in place; SNS (i.e., MCM) plans in place; point of dispensing plans in place; isolation/quarantine measures outlined & in-place	Systems capable of reaching approx.. 56,000 households w/ messaging at least once (w/in 24 hours)	ICS (likely unified command) established 100% of the time w/ public health participation; likely EOC activation to support COP	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Severe Summer Weather	N/A	Systems capable of reaching approx.. 56,000 households w/ messaging at least once (w/in 24 hours); system to target up to 500 households in 5 mins (for quick onset warnings)	Likely EOC activation to support COP & resource mgmt..	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Severe Winter Weather	N/A	Systems capable of reaching approx.. 56,000 households w/ messaging at least once (w/in 24 hours); system to target up to 500 households in 5 mins (for quick onset warnings)	Likely EOC activation to support COP & resource mgmt..	N/A	N/A	N/A	N/A	N/A	N/A	N/A



Table 5.4.A₂

Mission Area:	Protection		Mitigation				Response			
Hazard	Risk Mgmt. for Protection Programs & Activities	Supply Chain Integrity & Security	Community Resilience	Long-Term Vulnerability Reduction	Risk & Disaster Resilience Assessment*	Threats & Hazard Identification	Critical Transportation	Environmental Response/ Health & Safety	Fatality Management Services†	Fire Management & Suppression
Drought	N/A	N/A	Educate public as to water sources, special outreach to agricultural homes	Identify alt./ redundant water sources	3.67% of survey respondents "very concerned" w/ this hazard; 35.32% "not concerned at all"	Primary threat is to agricultural areas & water supplies	N/A	N/A	N/A	Wildland firefighting capability to include identified resource for air support
Extreme Temperatures	N/A	N/A	Target outreach to parents & elderly populations	N/A	10.14% of survey respondents "very concerned" w/ this hazard; 23.35% "not concerned at all"	Primary threat is to elderly and youth populations	N/A	N/A	N/A	De-icer for freeze-ups in extreme cold temperatures
Flood	N/A	Ensure critical transportation routes remain open or that detours are otherwise available	Continue mgmt. of NFIP & associated outreach re: flood proofing & resilient construction to SFHA	Restrict development in SFHA; remove structures from SFHA; elevate structures in flood hazard areas	8.33% of survey respondents "very concerned" w/ this hazard; 33.80% "not concerned at all"	Washington Co. contains Zones A, AE, X & areas w/ 0.2% annual chance of flood hazard; primary threat is to these areas	Ensure access to primary routes (i.e., unblocked by flooding) for evacuation & responder access; transit resources to support evacuation efforts	Proper PPE for response in flood waters; limit bacteria spread from standing waters	N/A	N/A
Fire/Explosion	N/A	Ensure fire suppression per appropriate codes in place at CI/KR receiving facilities	Push info. on fire protection in congregate & other large bldgs., common causes of residential fire by season; support MD DNR, Forestry efforts on wildfire education	Support engineering (use of sprinklers, smoke alarms, heat-regulating tech.), code enforcement, & education efforts; consider tax incentives for installation of sprinklers & other tech.	10.19% of survey respondents "very concerned" w/ this hazard; 38.89% "not concerned at all"	Wildfire threat to forested & grassy areas (west of I-81 corridor, southeastern portions of county); structure fires threat throughout county	Access to forested areas for wildland firefighting, particularly in western, more mountainous areas	Proper PPE, to include SCBA; air quality monitors (primarily for industrial fires)	Up to 4 fatalities (calc. w/ historical data from profile)	MOUs in place for personnel & equip. support; hydrants in densely-built areas; tankers & tanker task force in rural areas; brush attack unit, Type I & II engine, Type I aerial; emergency air unit (x1 min.); rehab unit (x1 min.); inspection capabilities
Hazmat Incident	N/A	Develop detour/ traffic diversion plans for major corridors to ensure commodity transport continues	Push info. on sheltering-in-place & 72-hour kits	Zone covered facilities away from residential areas & other vulnerable populations	14.22% of survey respondents "very concerned" w/ this hazard; 22.48% "not concerned at all"	Primary threat to I-70/I-81 corridors, industrial parks	Roadway access for evacuee egress & responder ingress near covered facilities	Proper PPE, to include SCBA, Tyvek, Levels A & B, etc.	Up to 15 fatalities	Access to AFFF, AR-AFFF, synthetic, Class A, wetting agent, fluoroprotein, and protein foam concentrates (contingent on material involved)



Hazard	Risk Mgmt. for Protection Programs & Activities	Supply Chain Integrity & Security	Community Resilience	Long-Term Vulnerability Reduction	Risk & Disaster Resilience Assessment*	Threats & Hazard Identification	Critical Transportation	Environmental Response/ Health & Safety	Fatality Management Services†	Fire Management & Suppression
Land Subsidence	N/A	N/A	Publish locations of karst areas	Regulate development in known subsidence-prone areas	14.29% of survey respondents "very concerned" w/ this hazard; 18.89% "not concerned at all"	Primary threat is areas in the Hagerstown Valley	Identify detours around subsidence-prone areas such as the east-central portions of the county (near Williamsport, Hagerstown, and Funkstown)	N/A	N/A	Access to floor plans/utility diagrams for large facilities (i.e., shut off gas if subsidence-damaged); MOU w/ relevant natural gas utilities for shut-offs if facilities are damaged by subsidence
Major Transportation Accident	N/A	Develop detour/ traffic diversion plans for major corridors to ensure commodity transport continues	N/A	Maintain major highway corridors	18.43% of survey respondents "very concerned" w/ this hazard; 18.43% "not concerned at all"	Primary threat to I-70/I-81 corridors; secondary threat to US 11, 40, 522 corridors	Quickly clear large accidents to ensure access to all parts of county; identify means of cutting through traffic that quickly backs up after an accident	Proper signage to alert other motorists of presence of responders	Up to 15 fatalities	N/A (per items noted above)
Opioid Epidemic	N/A	N/A	Support LE & public health outreach efforts	Support education in hopes of combating addiction	N/A	Primary threat is to countywide population; statistics note special considerations for adolescents & women	N/A	Proper PPE (i.e., for responses to fentanyl & its analogues); need for training on such responses	Approx. 60 fatalities per year (calc. w/ 2016 overdose deaths divided by 24 MD county/county equivalents)	N/A
Reportable Disease Epidemic	N/A	N/A	Support public health outreach efforts on hand washing, etc.	Support education on hygiene; encourage flu shots	10.23% of survey respondents "very concerned" w/ this hazard; 31.63% "not concerned at all"	Primary threat is to congregate population facilities & densely populated areas; secondary threat countywide	N/A	Proper PPE (e.g., N-95 masks, gloves, etc.)	Up to 3,757 fatalities (calc. w/ 2.5% mortality rate from 1918 Spanish flu against 2016 est. co. population)	N/A
Severe Summer Weather	N/A	N/A	Push info. on 72-hour kits, generator safety, general severe weather preparedness	N/A	11.47% of survey respondents "very concerned" w/ this hazard; 24.77% "not concerned at all"	Primary threat is countywide	Resources to cut trees from roadways, clear mudflows & other debris following heavy rains	Chain saw safety training; high visibility & breathable clothing	N/A	N/A (per items noted above)
Severe Winter Weather	N/A	N/A	Push info. on 72-hour kits, generator safety, general severe weather preparedness	N/A	23.50% of survey respondents "very concerned" w/ this hazard; 7.37% "not concerned at all"	Primary threat is countywide	Resources to cut trees from roadways, primary & redundant sources of plows	Warm apparel; chain saw safety training; chains & other traction aids	N/A	N/A (per items noted above)

† Some hazards may result in fatalities; however, based on historical records, the quantities would not likely rise to levels that could not be managed by existing mortuary facilities.

* Percentages based on 220 total responses.



Table 5.4.A₃

Mission Area:	Response							Response & Recovery	Recovery	
Hazard	Logistics & Supply Chain Management	Mass Care Services	Mass Search & Rescue Operations	On-Scene Security, Protection, & Law Enforcement	Operational Comms.	Public Health, Healthcare, & EMS	Situational Assessment	Infrastructure Systems	Economic Recovery	Health & Social Services
Drought	N/A	N/A	N/A	N/A	Network capable of accommodating NWS, MD DNR, Univ. of MD Ext., etc.	N/A	Capability for weekly briefings from state/fed. govt. partners	N/A	Economic impacts of approx.. \$11.5M (calc. w/ historical figures from profile)	N/A
Extreme Temperatures	N/A	N/A	N/A	N/A	N/A	Wellness checks for elderly during events	N/A	N/A	N/A	N/A
Flood	At least 1 watercraft for commodity delivery to impacted homes	Up to 89 households (calc. w/ HAZUS)	Swiftwater & USAR capabilities	LE details for major road closures	Network capable of accommodating local emergency services, highways, local govt., etc.	Lacerations & punctures from debris; water-borne diseases (e.g., typhoid fever, cholera, leptospirosis, hepatitis); vector-borne diseases (e.g., malaria, dengue, West Nile fever, yellow fever)	Briefings at 12-hr. intervals	Stabilize roadway wash-outs	Economic impacts of approx.. \$260,000 (calc. w/ business interruption estimates from HAZUS)	On-going monitoring for water-borne & vector-borne diseases
Fire/Explosion	Access to rural, mountainous areas for wildland fires	Up to 10 households (calc. w/ est. of WCS for apt. fire)	Wilderness SAR capabilities	Perimeter security, possible LE details for road closures	Interop. comms. between multiple fire companies; network w/ connectivity to LE & EMS	Up to 10 injuries per incident (calc. w/ historical data from profile)	Briefings at each operational period change (likely for larger industrial or wildland fires)	Public water system depletion from hydrant usage on large fires; WTP w/ ability to fill tankers for large rural area fires	Avg. of \$8,900 per incident (calc. w/ statistics from USFA)	On-going air quality monitoring following industrial or wildland fires; potential on-going water monitoring for industrial or wildland fires
Hazmat Incident	Detours for any closures along major corridors; ensure responder access to impact areas, esp. of residents are evacuating	Up to 3,300 residents (calc. w/ 1mi ² estimate based on Hagerstown pop.)	USAR capabilities; potential confined space & high angle capabilities	Enforcement of hot/warm zones; traffic control for evacuation; potential roadblocks contingent on location of incident	Interop. comms. between fire, LE, EMS, industry, state/fed. response teams, etc.	Up to 3,300 worried well (calc. w/ 1mi ² estimate based on Hagerstown pop.)	Briefings at each operational period change	Re-open roadways impacted by an incident (particularly major corridors)	Economic impacts of approx.. \$260 per incident (calc. w/ historical data from profile)	On-going air quality, water quality, and potentially soil testing following large incidents
Land Subsidence	Detours for any major corridors damaged by subsidence or slippage	N/A	N/A	LE details for road closures	N/A	N/A	N/A	Inspections of roadways, bridges, water/sewer lines, etc. should single instances of subsidence occur	Economic impacts of up to \$217,000 (calc. w/ historical data from profile)	N/A



Hazard	Logistics & Supply Chain Management	Mass Care Services	Mass Search & Rescue Operations	On-Scene Security, Protection, & Law Enforcement	Operational Comms.	Public Health, Healthcare, & EMS	Situational Assessment	Infrastructure Systems	Economic Recovery	Health & Social Services
Major Transportation Accident	Ensure I-70, I-81, US 11, US 40, and US 522 remain open for commodity deliveries	N/A	Personnel for SAR at site of an accident	LE details for road closures; signage for detours; LE officers for investigations	Network capable of accommodating local emergency services, highways, etc.	EMS transports for injured; hospital MCI capabilities; est. 7 injuries per major accident (calc. w/ historical data from profile)	N/A	Re-open major transportation corridors as quickly as possible	Up to \$207 per individual auto claim (calc. w/ historical data from profile)	N/A
Opioid Epidemic	N/A	N/A	N/A	Identify, apprehend, & prosecute distributors	N/A	Approx. 41 annual drug/alcohol-related deaths in Washington Co. (calc. w/ historical data from profile)	Quarterly mtgs. Of Governor's Inter-Agency Heroin & Opioid Coordinating Council	N/A	Economic impacts of approx.. \$92,000 per overdose patient (calc. w/ historical data from profile)	Availability of addiction recovery support groups
Reportable Disease Epidemic	N/A	N/A	N/A	N/A	Network for public health, hospitals, doctors, pharmacies, school nurses, etc. as well as emergency services	Avg. of 1,099 cases annually (calc. w/ historical data from profile); WCS of 42,000 infections (calc. w/ est. of % infected in 1918 pandemic)	Daily briefings, at minimum, during declared public health emergencies	N/A	Economic impacts of approx.. \$63,179,794 (calc. w/ est. of 2% impact of 1918 pandemic to world GDP X Washington Co. est. GDP)	On-going communicable disease surveillance w/ hospitals, doctors, congregate facilities, schools, pharmacies, etc.
Severe Summer Weather	N/A	Up to 150 individuals requesting mass care (calc. per exp. w/ weather hazards)	N/A	N/A	Network capable of accommodating NWS, FEMA, MEMA, local govt., & local emergency services	Up to 1 injury per event (calc. w/ historical data from profile)	Briefings at 12-hr. intervals	Restoration of the power grid w/in 72 hrs. following large-scale outages (calc. w/ presence of encouraging residents to prepare 72-hr. kits)	Economic impacts approx.. \$15,250 per event (calc. w/ historical data from profile)	N/A
Severe Winter Weather	Plows for I-70, I-81, US 11, US 40, and US 522 at minimum to ensure commodity delivery	Up to 150 individuals requesting mass care (calc. per exp. w/ weather hazards)	N/A	Potential response, similar to major transportation accident	Network capable of accommodating NWS, FEMA, MEMA, local govt., & local emergency services	Up to 1 injury per event (calc. w/ historical data from profile)	Briefings at 12-hr. intervals	Restoration of the power grid w/in 72 hrs. following large-scale outages (calc. w/ presence of encouraging residents to prepare 72-hr. kits)	Economic impacts approx.. \$705,000 (calc. w/ data from profile)	N/A



Table 5.4.A₄

Mission Area:	Recovery	
Hazard	Housing ^Ø	Natural & Cultural Resources
Drought	N/A	N/A
Extreme Temperatures	N/A	N/A
Flood	Up to 72 households (calc. w/ HAZUS)	8 historic structures in 100-year floodplain (calc. w/ GIS map)
Fire/Explosion	N/A	N/A
Hazmat Incident	N/A	N/A
Land Subsidence	N/A	N/A
Major Transportation Accident	N/A	N/A
Opioid Epidemic	N/A	N/A
Reportable Disease Epidemic	N/A	N/A
Severe Summer Weather	N/A	Up to 1 property that could potentially be struck by a fallen limb
Severe Winter Weather	N/A	Up to 1 property that could potentially collapse under snow weight

Ø Some homes could be damaged by hazards such as fire and land subsidence; however, those would total a small number for which local governments likely would not be responsible for providing long-term housing solutions



The above tables provide the baseline for preparedness considerations for each of the hazards included in the hazard mitigation plan. The following narrative identifies (a) the threats and hazards for which Washington County should prepare, (b) the sharable resources that are required in order to be prepared for those threats and hazards, and (c) actions that the county can employ to avoid, lessen, or eliminate the threats and hazards.

A. THREATS & HAZARDS FOR WHICH THE COUNTY SHOULD PREPARE

Within each of the identified hazards above, there is at least one more specific scenario toward which the county should build capabilities to respond.

- Drought
 - Situations similar to “severe drought” years 2007 and 2010

- Extreme Temperatures
 - Sustained period of extreme low temperatures similar to the 2014 and 2015 “polar vortex” events

- Flood
 - **Probable 1:** Fast-rising flash flood due to over-driven gray infrastructure
 - **Probable 2:** 100-year flooding event
 - **Worst-Case Scenario:** 500-year flooding event

- Fire/Explosion
 - Industrial explosion and resultant fire that impacts hazardous material storage, necessitating sustained protective actions in a densely-populated area

- Hazmat Incident
 - Release of toxic inhalation hazard, whether by truck, rail, or at a facility, in a densely-populated area, particularly at a location where day-time non-resident populations swell
 - Release of a material that necessitates long-term environmental (i.e., air, water, and soil) monitoring



- Land Subsidence
 - **Probable:** Sudden appearance of a sink hole in a densely-built residential area or a commercial area
 - **Worst-Case Scenario:** Subsidence occurrence that results in structural failure of a congregate-style facility (necessitating evacuation and long-term relocation)

- Major Transportation Accident
 - Accident at the interchange of I-70 and I-81 that disrupts traffic flow on both interstates, particularly during a morning or evening (weekday) rush hour

- Opioid Epidemic
 - Focus on capping overdose deaths at existing levels, then reducing those numbers

- Reportable Disease Epidemic
 - **Probable:** Pandemic similar to the 2009 H1N1 scenario
 - **Worst-Case Scenario:** Pandemic similar to the 1918 Spanish flu

- Severe Summer and Winter Weather
 - Scenarios resulting in extended power outages (i.e., seven or more days) similar to 2012 super derecho and 2012 Hurricane/Superstorm Sandy events

B. SHARABLE RESOURCES

The following list presents various types of resources, particularly those that could be shared, that would likely enable a more effective response to the above-noted threats and hazards.

- Access to and a variety of partners trained in the issuance of messages via the Emergency Alert System (EAS)
- Memoranda of understanding (MOUs) for use of the mass notification systems operated by various partners in the county (e.g., public health, schools) to ensure redundant notifications
- Specialty hazardous material clean-up teams



- Incident management team (statewide or focused on the Western Maryland region) that can ensure a leadership continuity during long-duration responses and to assist in training novice incident managers at the local level
- Airborne and ground attack wildland firefighting resources
- Governor's heroin and opioid task force
- Communicable disease information and support from the Centers for Disease Control & Prevention (CDC) and the Maryland Department of Health (MDH)
- Technical rescue capabilities (i.e., MOUs for back-up and general support)
- Variable messaging boards for traffic detour and other emergency warning signage
- Portable industrial generators for support of critical infrastructure (e.g., water distribution) operations
- MOUs for various locations for use as mass care facilities, points of dispensing, points of distribution for general commodities, etc.

C. MITIGATION ACTIONS

Based on the projects in Section 3.0 above and various mitigation strategy resources, the following list presents general types of mitigation actions Washington County officials can pursue to avoid, lessen, or eliminate the above threats and hazards.

- Drought
 - Identify redundant sources of drinking water (and non-potable water for agricultural and industrial uses)
 - Assess water quantity needs at various critical facilities (e.g., hospitals, nursing homes, schools) throughout the county and consider water contingency plans to ensure those levels
 - Consider mandatory water conservation measures during severe droughts
 - Maintain and upgrade water distribution systems to address, where necessary, water loss
 - Public education
- Extreme Temperatures
 - Consider green infrastructure projects to reduce urban heat island effects (e.g., tree cover, green streets, etc.)
 - Public education



- Flood
 - Various storm water management projects to address site-specific nuisance flooding
 - Consider green infrastructure projects (e.g., retention ponds, porous pavement, etc.) to capture storm water runoff, thereby decreasing the volume reaching storm water systems
 - Upgrades to culverts
 - Acquisition/relocation, elevation, and/or mitigation reconstruction projects in flood-prone areas
 - Continued participation in and enforcement of the National Flood Insurance Program
 - Consider participation in the Community Rating System (CRS)
 - Regular maintenance of draining and flood control systems
 - Encourage residents to purchase flood insurance
 - Public education

- Fire/Explosion
 - Code enforcement
 - Equipment/apparatus maintenance and upgrades
 - Personnel recruitment and training

- Hazmat Incident
 - Personnel training
 - Off-site planning
 - Maintenance of risk and vulnerability assessments
 - MOUs with special hazardous materials response and clean-up teams

- Land Subsidence
 - Regulate development in subsidence-prone areas
 - Public education

- **Major Transportation Accident: N/A**



- Opioid Epidemic
 - Public education

- Reportable Disease Epidemic
 - Multi-agency response planning led by the public health sector
 - Public education

- Severe Summer and Winter Weather
 - Strengthen auxiliary power capabilities at critical infrastructure, key resources, and congregate style facilities
 - Power line right-of-way maintenance (e.g., tree trimming)
 - Relocation of power lines underground
 - Public education



APPENDIX 6 CITATIONS

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APPENDIX 7

ADOPTING RESOLUTIONS

Upon approval from the state and FEMA, jurisdictions will adopt this plan; the resolutions will be included in this appendix.

